



OM-203 860C

October 2002

Processes



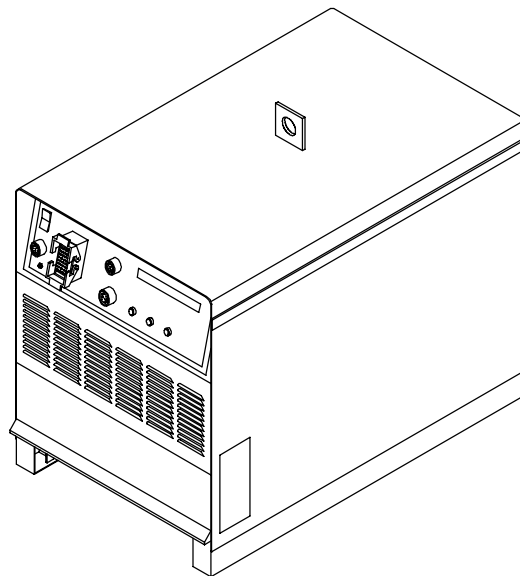
Gas Metal Arc (MIG) Welding

Description



Arc Welding Power Source

Auto Deltaweld[®] 452



OWNER'S MANUAL



Visit our website at
www.MillerWelds.com

From Miller to You

Thank you and congratulations on choosing Miller. Now you can get the job done and get it done right. We know you don't have time to do it any other way.

That's why when Niels Miller first started building arc welders in 1929, he made sure his products offered long-lasting value and superior quality. Like you, his customers couldn't afford anything less. Miller products had to be more than the best they could be. They had to be the best you could buy.

Today, the people that build and sell Miller products continue the tradition. They're just as committed to providing equipment and service that meets the high standards of quality and value established in 1929.

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards on the worksite.

We've made installation and operation quick and easy. With Miller you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is. The parts list will then help you to decide the exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.



Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001:2000 Quality System Standard.

Miller Electric manufactures a full line of welders and welding related equipment. For information on other quality Miller products, contact your local Miller distributor to receive the latest full line catalog or individual catalog sheets. **To locate your nearest distributor or service agency call 1-800-4-A-Miller, or visit us at www.MillerWelds.com on the web.**



Working as hard as you do – every power source from Miller is backed by the most hassle-free warranty in the business.

Miller offers a Technical Manual which provides more detailed service and parts information for your unit. To obtain a Technical Manual, contact your local distributor. Your distributor can also supply you with Welding Process Manuals such as SMAW, GTAW, GMAW, and GMAW-P.



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The following terms are used interchangeably throughout this manual:
Mig = GMAW

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 Section 25249.5 et seq.)

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1-1. Symbol Usage



Means Warning! Watch Out! There are possible hazards with this procedure! The possible hazards are shown in the adjoining symbols.

▲ Marks a special safety message.

☞ Means "Note"; not safety related.



This group of symbols means Warning! Watch Out! possible ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

1-2. Arc Welding Hazards

▲ The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-4. Read and follow all Safety Standards.

▲ Only qualified persons should install, operate, maintain, and repair this unit.

▲ During operation, keep everybody, especially children, away.



ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also

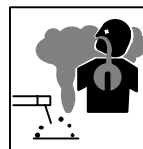
live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground – check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first – double-check connections.
- Frequently inspect input power cord for damage or bare wiring – replace cord immediately if damaged – bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.

- If earth grounding of the workpiece is required, ground it directly with a separate cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal.

SIGNIFICANT DC VOLTAGE exists after removal of input power on inverters.

- Turn Off inverter, disconnect input power, and discharge input capacitors according to instructions in Maintenance Section before touching any parts.



FUMES AND GASES can be hazardous.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
- If ventilation is poor, use an approved air-supplied respirator.
- Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.



ARC RAYS can burn eyes and skin.

Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

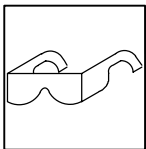
- Wear a welding helmet fitted with a proper shade of filter to protect your face and eyes when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (leather and wool) and foot protection.



WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

- Protect yourself and others from flying sparks and hot metal.
- Do not weld where flying sparks can strike flammable material.
- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.



FLYING METAL can injure eyes.

- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.



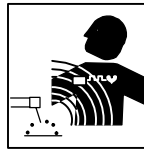
BUILDUP OF GAS can injure or kill.

- Shut off shielding gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.



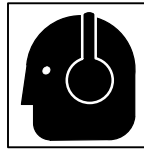
HOT PARTS can cause severe burns.

- Do not touch hot parts bare handed.
- Allow cooling period before working on gun or torch.



MAGNETIC FIELDS can affect pacemakers.

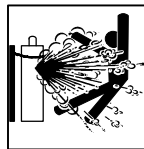
- Pacemaker wearers keep away.
- Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.



NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.



CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

- Protect compressed gas cylinders from excessive heat, mechanical shocks, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder – explosion will result.
- Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

1-3. Additional Symbols For Installation, Operation, And Maintenance



FIRE OR EXPLOSION hazard.

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



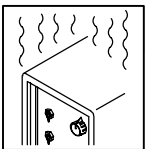
MOVING PARTS can cause injury.

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



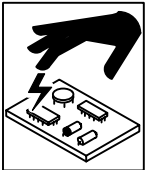
FALLING UNIT can cause injury.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
- Use equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.



OVERUSE can cause OVERHEATING

- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.



STATIC (ESD) can damage PC boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.



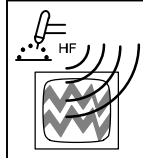
MOVING PARTS can cause injury.

- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.



WELDING WIRE can cause injury.

- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people, or any metal when threading welding wire.



H.F. RADIATION can cause interference.

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



ARC WELDING can cause interference.

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

1-4. Principal Safety Standards

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami FL 33126 (phone: 305-443-9353, website: www.aws.org).

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126 (phone: 305-443-9353, website: www.aws.org).

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, P.O. Box 9101, 1 Battery March Park, Quincy, MA 02269-9101 (phone: 617-770-3000, website: www.nfpa.org and www.sparky.org).

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1735 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102 (phone: 703-412-0900, website: www.cganet.com).

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale

Boulevard, Rexdale, Ontario, Canada M9W 1R3 (phone: 800-463-6727 or in Toronto 416-747-4044, website: www.csa-international.org).

Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 11 West 42nd Street, New York, NY 10036-8002 (phone: 212-642-4900, website: www.ansi.org).

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B, from National Fire Protection Association, P.O. Box 9101, 1 Battery March Park, Quincy, MA 02269-9101 (phone: 617-770-3000, website: www.nfpa.org and www.sparky.org).

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1926, Subpart J, from U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250 (there are 10 Regional Offices—phone for Region 5, Chicago, is 312-353-2220, website: www.osha.gov).

1-5. EMF Information

Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields

Welding current, as it flows through welding cables, will cause electromagnetic fields. There has been and still is some concern about such fields. However, after examining more than 500 studies spanning 17 years of research, a special blue ribbon committee of the National Research Council concluded that: "The body of evidence, in the committee's judgment, has not demonstrated that exposure to power-frequency electric and magnetic fields is a human-health hazard." However, studies are still going forth and evidence continues to be examined. Until the final conclusions of the research are reached, you may wish to minimize your exposure to electromagnetic fields when welding or cutting.

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

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep welding power source and cables as far away from operator as practical.
5. Connect work clamp to workpiece as close to the weld as possible.

About Pacemakers:

Pacemaker wearers consult your doctor first. If cleared by your doctor, then following the above procedures is recommended.

SECTION 1 – CONSIGNES DE SÉCURITÉ – À LIRE AVANT UTILISATION

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1-1. Signification des symboles



Signifie « Mise en garde. Faire preuve de vigilance. » Cette procédure présente des risques identifiés par les symboles adjacents aux directives.

▲ Identifie un message de sécurité particulier.

☞ Signifie « NOTA » ; n'est pas relatif à la sécurité.



Ce groupe de symboles signifie « Mise en garde. Faire preuve de vigilance. » Il y a des dangers liés aux CHOCS ÉLECTRIQUES, aux PIÈCES EN MOUVEMENT et aux PIÈCES CHAUDES. Se reporter aux symboles et aux directives ci-dessous afin de connaître les mesures à prendre pour éviter tout danger.

1-2. Dangers relatifs au soudage à l'arc

▲ Les symboles ci-après sont utilisés tout au long du présent manuel pour attirer l'attention sur les dangers potentiels et les identifier. Lorsqu'on voit un symbole, faire preuve de vigilance et suivre les directives mentionnées afin d'éviter tout danger. Les consignes de sécurité énoncées ci-après ne font que résumer le contenu des normes de sécurité mentionnées à la section 1-4. Lire et respecter toutes ces normes.

▲ L'installation, l'utilisation, l'entretien et les réparations ne doivent être confiés qu'à des personnes qualifiées.

▲ Pendant l'utilisation de l'appareil, tenir à l'écart toute personne, en particulier les enfants.



LES DÉCHARGES ÉLECTRIQUES peuvent être mortelles.

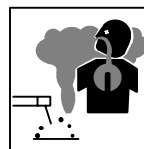
Un simple contact avec des pièces sous tension peut causer une électrocution ou des blessures graves. L'électrode et le circuit de soudage sont sous tension dès que l'appareil est en fonctionnement. Le circuit d'entrée et les circuits internes de l'appareil sont également sous tension. En soudage semi-automatique ou automatique, le fil, le dévidoir, le logement des galets d'entraînement et les pièces métalliques en contact avec le fil de soudage sont sous tension. Tout matériel mal installé ou mal mis à la terre présente un danger.

- Ne jamais toucher aux pièces électriques sous tension.
- Porter des gants et des vêtements de protection secs et exempts de trous.
- S'isoler de la pièce et de la terre au moyen de tapis ou autres dispositifs isolants suffisamment grands pour empêcher tout contact physique avec la pièce ou la terre.
- Ne pas se servir d'une source de courant alternatif dans les zones humides, les endroits confinés ou là où on risque de tomber.
- Ne se servir d'une source de courant alternatif QUE si le procédé de soudage l'exige.
- Si l'utilisation d'une source de courant alternatif s'avère nécessaire, se servir de la fonction de télécommande si l'appareil en est équipé.
- Couper l'alimentation ou arrêter le moteur avant de procéder à l'installation, à la réparation ou à l'entretien de l'appareil. Couper/étiqueter l'alimentation selon la norme OSHA 29 CFR 1910.147 (voir les normes de sécurité).
- Installer et mettre à la terre correctement l'appareil conformément à son manuel d'utilisation et aux codes nationaux, provinciaux et municipaux.
- Toujours vérifier la terre du cordon d'alimentation – Vérifier et s'assurer que le fil de terre du cordon d'alimentation est bien raccordé à la borne de terre du sectionneur ou que la fiche du cordon est raccordée à une prise correctement mise à la terre.
- Pour exécuter les branchements d'entrée, fixer d'abord le conducteur de mise à la terre adéquat et contre-vérifier les connexions.
- Vérifier fréquemment le cordon d'alimentation et s'assurer qu'il n'est ni endommagé ni dénudé ; le remplacer immédiatement s'il est endommagé – tout câble dénudé peut causer une électrocution.
- Mettre l'appareil hors tension quand on ne l'utilise pas.
- Ne pas utiliser de câbles usés, endommagés, de calibre insuffisant ou mal épissés.
- Ne pas s'enrouler les câbles autour du corps.
- Si la pièce soudée doit être mise à la terre, le faire directement avec un câble distinct.
- Ne pas toucher l'électrode quand on est en contact avec la pièce, la terre ou une électrode d'une autre machine.

- N'utiliser que du matériel en bon état. Réparer ou remplacer sur-le-champ les pièces endommagées. Entretien l'appareil conformément au présent manuel.
- Porter un harnais de sécurité quand on travaille en hauteur.
- Maintenir solidement en place tous les panneaux et capots.
- Fixer le câble de retour de façon à obtenir un bon contact métal sur métal avec la pièce à souder ou la table de travail, le plus près possible de la soudure.
- Ne pas connecter plus d'une électrode ou plus d'un câble de masse à un même terminal de sortie.

Il subsiste un COURANT CONTINU IMPORTANT dans les convertisseurs après la suppression de l'alimentation électrique.

- Arrêter les convertisseurs, débrancher le courant électrique et décharger les condensateurs d'alimentation selon les instructions énoncées à la section Entretien avant de toucher les pièces.



LES FUMÉES ET LES GAZ peuvent être dangereux.

Le soudage génère des fumées et des gaz dont l'inhalation peut être dangereuse pour la santé.

- Se tenir à distance des fumées et ne pas les inhaler.
- À l'intérieur, ventiler la zone et/ou utiliser un dispositif d'aspiration au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage.
- Si la ventilation est insuffisante, utiliser un respirateur à adduction d'air agréé.
- Lire les fiches techniques de santé-sécurité (FTSS) et les instructions du fabricant concernant les métaux, les consommables, les revêtements, les nettoyeurs et les dégraisseurs.
- Ne travailler dans un espace clos que s'il est bien ventilé ou porter un respirateur à adduction d'air. Demander toujours à un surveillant dûment formé de se tenir à proximité. Des fumées et des gaz de soudage peuvent se substituer à l'air, abaisser la teneur en oxygène et causer des lésions ou des accidents mortels. S'assurer que l'air est respirable.
- Ne pas souder à proximité d'opérations de dégraissage, de nettoyage ou de pulvérisation. La chaleur et les rayons de l'arc peuvent réagir en présence de vapeurs et former des gaz hautement toxiques et irritants.
- Ne pas souder de métaux munis d'un revêtement, tels que la tôle d'acier galvanisée, plombée ou cadmiée, à moins que le revêtement n'ait été enlevé dans la zone de soudage, que l'endroit soit bien ventilé, et si nécessaire, porter un respirateur à adduction d'air. Les revêtements et tous les métaux renfermant ces éléments peuvent dégager des fumées toxiques lorsqu'on les soude.



LES RAYONS DE L'ARC peuvent causer des brûlures oculaires et cutanées.

Le rayonnement de l'arc génère des rayons visibles et invisibles intenses (ultraviolets et infrarouges) susceptibles de causer des brûlures oculaires et cutanées. Des étincelles sont projetées pendant le soudage.

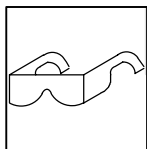
- Porter un masque de soudage muni d'un filtre de la nuance adéquate pour se protéger le visage et les yeux pendant le soudage ou pour regarder (voir les normes de sécurité ANSI Z49.1 et Z87.1).
- Porter des lunettes de sécurité à écrans latéraux sous le masque.
- Utiliser des écrans ou des barrières pour protéger les tiers de l'éclat éblouissant ou aveuglant de l'arc ; leur demander de ne pas regarder l'arc.
- Porter des vêtements de protection en matière durable et ignifuge (cuir ou laine) et des chaussures de sécurité.



LE SOUDAGE peut causer un incendie ou une explosion.

Le soudage effectué sur des récipients fermés tels que des réservoirs, des fûts ou des conduites peut causer leur éclatement. Des étincelles peuvent être projetées de l'arc de soudure. La projection d'étincelles, les pièces chaudes et les équipements chauds peuvent causer des incendies et des brûlures. Le contact accidentel de l'électrode avec tout objet métallique peut causer des étincelles, une explosion, un surchauffement ou un incendie. Avant de commencer le soudage, vérifier et s'assurer que l'endroit ne présente pas de danger.

- Se protéger et protéger les tiers de la projection d'étincelles et de métal chaud.
- Ne pas souder à un endroit où des étincelles peuvent tomber sur des substances inflammables.
- Placer toutes les substances inflammables à une distance de 10,7 m de l'arc de soudage. En cas d'impossibilité, les recouvrir soigneusement avec des protections agréées.
- Des étincelles et des matières en fusion peuvent facilement passer même par des fissures et des ouvertures de petites dimensions.
- Surveiller tout déclenchement d'incendie et tenir un extincteur à proximité.
- Le soudage effectué sur un plafond, un plancher, une paroi ou une cloison peut déclencher un incendie de l'autre côté.
- Ne pas souder des récipients fermés tels que des réservoirs, des fûts ou des conduites, à moins qu'ils n'aient été préparés conformément à l'AWS F4.1 (voir les normes de sécurité).
- Brancher le câble sur la pièce le plus près possible de la zone de soudage pour éviter que le courant ne circule sur une longue distance, par des chemins inconnus, et ne cause des risques d'électrocution et d'incendie.
- Ne pas utiliser le poste de soudage pour dégeler des conduites gelées.
- En cas de non utilisation, enlever la baguette d'électrode du porte-électrode ou couper le fil au raz du tube-contact.
- Porter des vêtements de protection exempts d'huile tels que des gants en cuir, une chemise en tissu épais, des pantalons sans revers, des chaussures montantes et un masque.
- Avant de souder, retirer tout produit combustible de ses poches, tel qu'un briquet au butane ou des allumettes.



LES PARTICULES PROJETÉES peuvent blesser les yeux.

- Le soudage, le burinage, le passage de la pièce à la brosse métallique et le meulage provoquent l'émission d'étincelles et de particules métalliques. Pendant leur refroidissement, les soudures risquent de projeter du laitier.
 - Porter des lunettes de sécurité à écrans latéraux agréés, même sous le masque de soudage.



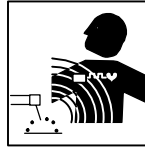
LES ACCUMULATIONS DE GAZ peuvent causer des blessures ou même la mort.

- Couper l'alimentation en gaz protecteur en cas de non utilisation.
- Veiller toujours à bien ventiler les espaces confinés ou porter un respirateur à adduction d'air agréé.



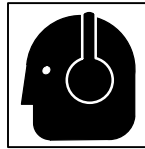
LES PIÈCES CHAUDES peuvent causer des brûlures graves.

- Ne pas toucher les pièces chaudes à main nue.
- Prévoir une période de refroidissement avant d'utiliser le pistolet ou la torche.



LES CHAMPS MAGNÉTIQUES peuvent perturber le fonctionnement des stimulateurs cardiaques.

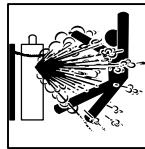
- Les personnes qui portent un stimulateur cardiaque doivent se tenir à distance.
- Ils doivent consulter leur médecin avant de s'approcher d'un lieu où on exécute des opérations de soudage à l'arc, de gougeage ou de soudage par points.



LE BRUIT peut affecter l'ouïe.

Le bruit de certains processus et équipements peut affecter l'ouïe.

- Porter des protecteurs d'oreille agréés si le niveau sonore est trop élevé.



Les BOUTEILLES endommagées peuvent exploser.

Les bouteilles de gaz protecteur contiennent du gaz sous haute pression. Toute bouteille endommagée peut exploser. Comme les bouteilles de gaz font normalement partie du procédé de soudage, les manipuler avec précaution.

- Protéger les bouteilles de gaz comprimé de la chaleur excessive, des chocs mécaniques, du laitier, des flammes nues, des étincelles et des arcs.
- Placer les bouteilles debout en les fixant dans un support stationnaire ou dans un porte-bouteilles pour les empêcher de tomber ou de se renverser.
- Tenir les bouteilles éloignées des circuits de soudage ou autres circuits électriques.
- Ne jamais poser une torche de soudage sur une bouteille de gaz.
- Ne jamais mettre une électrode de soudage en contact avec une bouteille de gaz.
- Ne jamais souder une bouteille contenant du gaz sous pression – elle risquerait d'exploser.
- N'utiliser que les bouteilles de gaz protecteur, régulateurs, tuyaux et raccords adéquats pour l'application envisagée ; les maintenir en bon état, ainsi que les pièces connexes.
- Détourner la tête lorsqu'on ouvre la soupape d'une bouteille.
- Laisser le capuchon protecteur sur la soupape, sauf en cas d'utilisation ou de branchement de la bouteille
- Lire et suivre les instructions concernant les bouteilles de gaz comprimé, les équipements associés et les publications P-1 de la CGA, mentionnées dans les normes de sécurité.

1-3. Autres symboles relatifs à l'installation, au fonctionnement et à l'entretien de l'appareil.



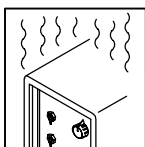
Risque D'INCENDIE OU D'EXPLOSION

- Ne pas placer l'appareil sur une surface inflammable, ni au-dessus ou à proximité d'elle.
- Ne pas installer l'appareil à proximité de produits inflammables.
- Ne pas surcharger l'installation électrique – s'assurer que l'alimentation est correctement dimensionnée et protégée avant de mettre l'appareil en service.



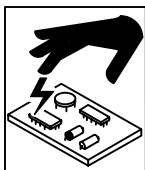
LA CHUTE DE L'APPAREIL peut blesser.

- N'utiliser que l'anneau de levage pour lever l'appareil. NE PAS utiliser le chariot, les bouteilles de gaz ou tout autre accessoire.
- Utiliser un engin de capacité adéquate pour lever l'appareil.
- Si on utilise un chariot élévateur pour déplacer l'unité, s'assurer que les fourches sont suffisamment longues pour dépasser du côté opposé de l'appareil.



L'EMPLOI EXCESSIF peut FAIRE SURCHAUFFER L'ÉQUIPEMENT.

- Prévoir une période de refroidissement ; respecter le cycle opératoire nominal.
- Réduire le courant ou le cycle opératoire avant de reprendre le soudage.
- Ne pas obstruer les orifices ou filtrer l'alimentation en air du poste.



LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

- Mettre un bracelet antistatique AVANT de manipuler des cartes ou des pièces.
- Utiliser des pochettes et des boîtes antistatiques pour stocker, déplacer ou expédier des cartes de circuits imprimés.



LES PIÈCES MOBILES peuvent causer des blessures.

- Se tenir à l'écart des pièces mobiles.
- Se tenir à l'écart des points de coincement tels que les dévidoirs.



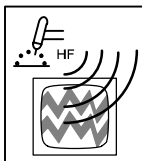
LES FILS DE SOUDAGE peuvent causer des blessures.

- Ne pas appuyer sur la gâchette avant d'en avoir reçu l'instruction.
- Ne pas diriger le pistolet vers soi, vers d'autres personnes ou vers toute pièce mécanique en engageant le fil de soudage.



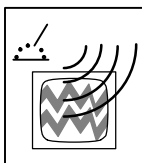
LES ORGANES MOBILES peuvent causer des blessures.

- Se tenir à l'écart des organes mobiles comme les ventilateurs.
- Maintenir fermés et bien fixés les portes, panneaux, recouvrements et dispositifs de protection.



LE RAYONNEMENT HAUTE FRÉQUENCE (H. F.) risque de causer des interférences.

- Le rayonnement haute fréquence peut causer des interférences avec les équipements de radio-navigation et de communication, les services de sécurité et les ordinateurs.
- Ne demander qu'à des personnes qualifiées familiarisées avec les équipements électroniques de faire fonctionner l'installation.
- L'utilisateur est tenu de faire corriger rapidement par un électricien qualifié les interférences causées par l'installation.
- Si la Federal Communications Commission signale des interférences, arrêter immédiatement l'appareil.
- Faire régulièrement contrôler et entretenir l'installation.
- Maintenir soigneusement fermés les panneaux et les portes des sources de haute fréquence, maintenir le jeu d'éclatement au réglage adéquat et utiliser une terre et un blindage pour réduire les interférences éventuelles.



LE SOUDAGE À L'ARC peut causer des interférences.

- L'énergie électromagnétique peut causer des interférences avec l'équipement électronique sensible tel que les ordinateurs et l'équipement commandé par ordinateur tel que les robots.
- Veiller à ce que tout l'équipement de la zone de soudage soit compatible au point de vue électromagnétique.
- Pour réduire la possibilité d'interférence, maintenir les câbles de soudage aussi courts que possible, les grouper, et les poser aussi bas que possible (par ex. : à terre).
- Veiller à souder à une distance de 100 mètres de tout équipement électronique sensible.
- Veiller à ce que le poste de soudage soit posé et mis à la terre conformément au présent manuel.
- En cas d'interférences après exécution des directives précédentes, il incombe à l'utilisateur de prendre des mesures supplémentaires telles que le déplacement du poste, l'utilisation de câbles blindés, l'utilisation de filtres de ligne ou la pose de protecteurs dans la zone de travail.



LES CHAMPS MAGNÉTIQUES peuvent affecter les stimulateurs cardiaques.

- Porteurs de stimulateur cardiaque, restez à distance.
- Les porteurs d'un stimulateur cardiaque doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de gougeage ou de soudage par points.

1-4. Principales normes de sécurité

Safety in Welding, Cutting, and Allied Processes, norme ANSI Z49.1, de l'American Welding Society, 550 N.W. LeJeune Rd, Miami FL 33126 (téléphone : (305) 443-9353, site Web : www.aws.org).

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping, norme American Welding Society AWS F4.1, de l'American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126 (téléphone : (305) 443-9353, site Web : www.aws.org).

National Electrical Code, norme NFPA 70, de la National Fire Protection Association, P.O. Box 9101, 1 Battery March Park, Quincy, MA 02269-9101 (téléphone : (617) 770-3000, sites Web : www.nfpa.org et www.sparky.org).

Safe Handling of Compressed Gases in Cylinders, brochure CGA P-1, de la Compressed Gas Association, 1735 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102 (téléphone : (703) 412-0900, site Web : www.cganet.com).

Code for Safety in Welding and Cutting, norme CSA W117.2, de la Canadian Standards Association, Standards Sales, 178 boulevard

Rexdale, Rexdale (Ontario) Canada M9W 1R3 (téléphone : (800) 463-6727 ou à Toronto : (416) 747-4044, site Web : www.csa-international.org).

Practice For Occupational And Educational Eye And Face Protection, norme ANSI Z87.1, de l'American National Standards Institute, 11 West 42nd Street, New York, NY 10036-8002 (téléphone : (212) 642-4900, site Web : www.ansi.org).

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, norme NFPA 51B, de la National Fire Protection Association, P.O. Box 9101, 1 Battery March Park, Quincy, MA 02269-9101 (téléphone : (617) 770-3000, site Web : www.nfpa.org et www.sparky.org).

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1926, Subpart J, de l'U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250 (il y a 10 bureaux régionaux – Téléphone pour la Région 5, Chicago : (312) 353-2220, site Web : www.osha.gov).

1-5. Information sur les champs électromagnétiques

Données sur le soudage électrique et les effets des champs magnétiques basse fréquence sur l'organisme

En parcourant les câbles de soudage, le courant crée des champs électromagnétiques. Les effets potentiels de tels champs restent préoccupants. Cependant, après avoir examiné plus de 500 études qui ont été faites pendant une période de recherche de 17 ans, un comité de spécialistes du National Research Council a conclu : « L'accumulation de preuves n'a pas démontré que l'exposition aux champs magnétiques et aux champs électriques à haute fréquence constitue un risque pour la santé humaine ». Toutefois, les études et l'examen des preuves se poursuivent. En attendant les conclusions finales de la recherche, il serait souhaitable de réduire l'exposition aux champs électromagnétiques pendant le soudage ou le coupage.

Afin de réduire les champs électromagnétiques en milieu de travail, respecter les consignes suivantes :

1. Garder les câbles ensemble en les torsadant ou en les fixant avec du ruban adhésif.
2. Mettre tous les câbles du côté opposé à l'opérateur.
3. Ne pas s'enrouler les câbles autour du corps.
4. Garder le poste de soudage et les câbles le plus loin possible de soi.
5. Placer la pince de masse le plus près possible de la zone de soudage.

Consignes relatives aux stimulateurs cardiaques :

Les personnes qui portent un stimulateur cardiaque doivent avant tout consulter leur médecin. Si ce dernier les déclare aptes, il leur est recommandé de respecter les consignes ci-dessus.



SECTION 2 – INSTALLATION

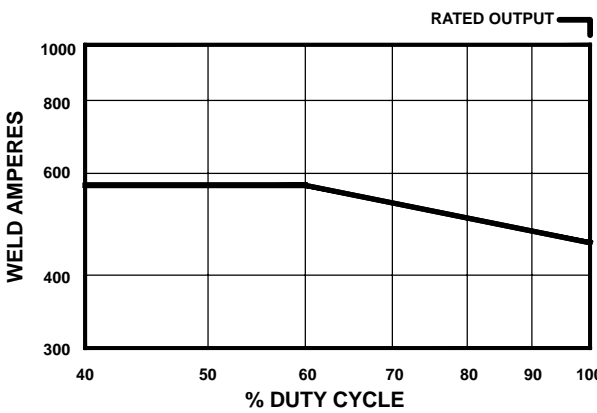
2-1. Specifications

Model	Rated Welding Output	Voltage Range DC	Max OCV DC	Amperes Input at Rated Load Output, 50 or 60 Hz, Three-Phase							KVA	KW
				200 V	230 V	380 V	400 V	440 V	460 V	575 V		
450 Amp	450 A @ 38 (36.5) Volts DC, 100% Duty Cycle	10 – 38	48	72 3.2*	63 2.7*	39 2.6*	37 2.2*	33 2.1*	32 1.4*	25 1.1*	25.1 1.09*	21.1 0.26*

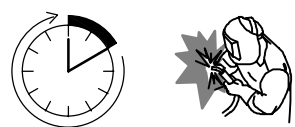
*While idling

2-2. Duty Cycle And Overheating



100% Duty Cycle




Continuous Welding


Duty Cycle is percentage of 10 minutes that unit can weld at rated load without overheating.


If unit overheats, thermostat(s) opens, output stops, and cooling fan runs. Wait fifteen minutes for unit to cool. Reduce amperage or duty cycle before welding.


▲ Exceeding duty cycle can damage unit and void warranty.

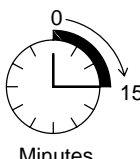
Overheating














Minutes






OR

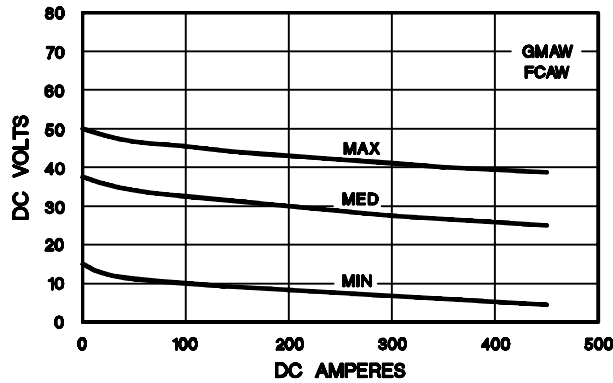
Reduce Duty Cycle





duty1 4/95 / Ref. 168 918

2-3. Volt-Ampere Curves



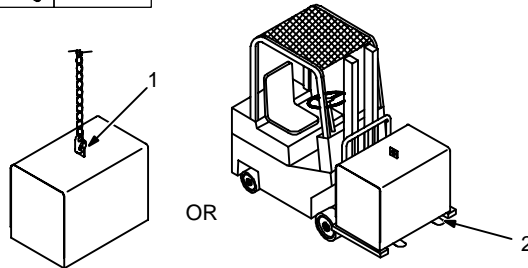
Volt-ampere curves show minimum and maximum voltage and amperage output capabilities of unit. Curves of other settings fall between curves shown.

va_curve1 - 4/95 - 171 224 / 171 225 / 171 226

2-4. Selecting A Location



Movement



- 1 Lifting Eye
- 2 Lifting Forks

Use lifting eye or lifting forks to move unit.

If using lifting forks, extend forks beyond opposite side of unit.

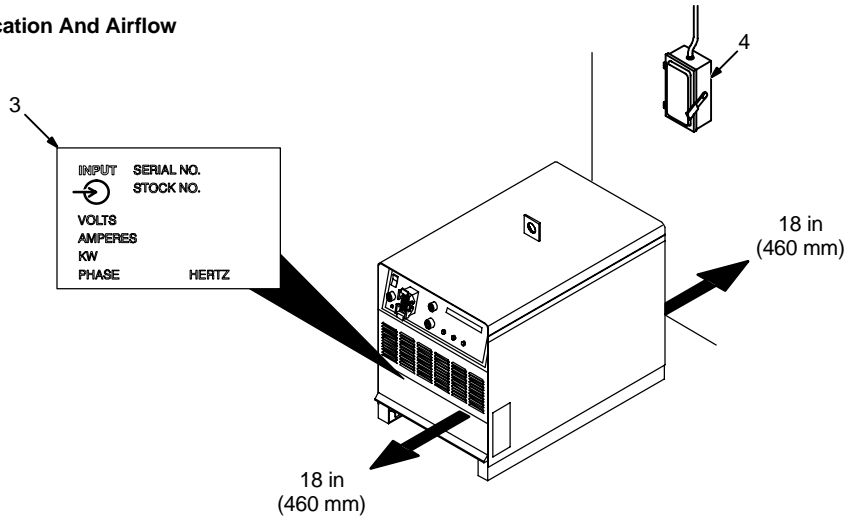
- 3 Rating Label

Use rating label to determine input power needs. Label located under front access door.

- 4 Line Disconnect Device

Locate unit near correct input power supply.

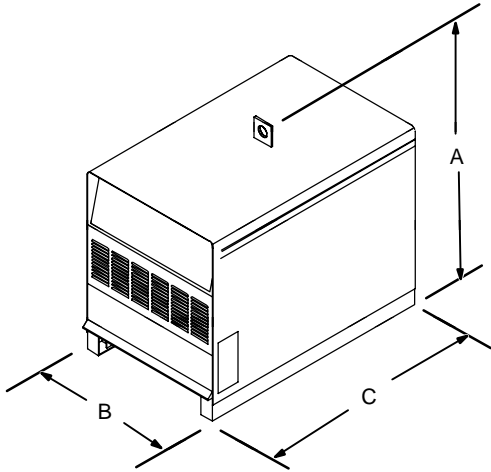
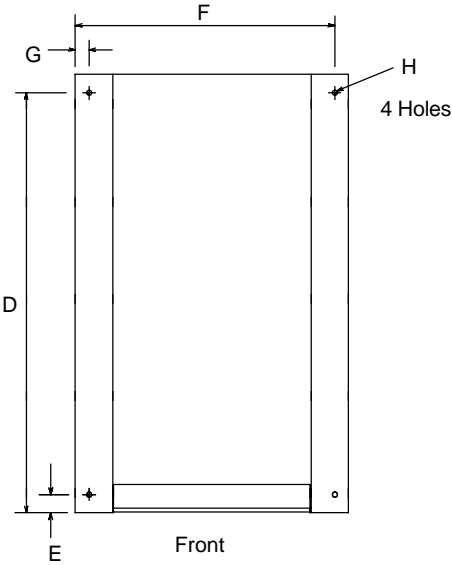
Location And Airflow



▲ **Special installation may be required where gasoline or volatile liquids are present – see NEC Article 511 or CEC Section 20.**

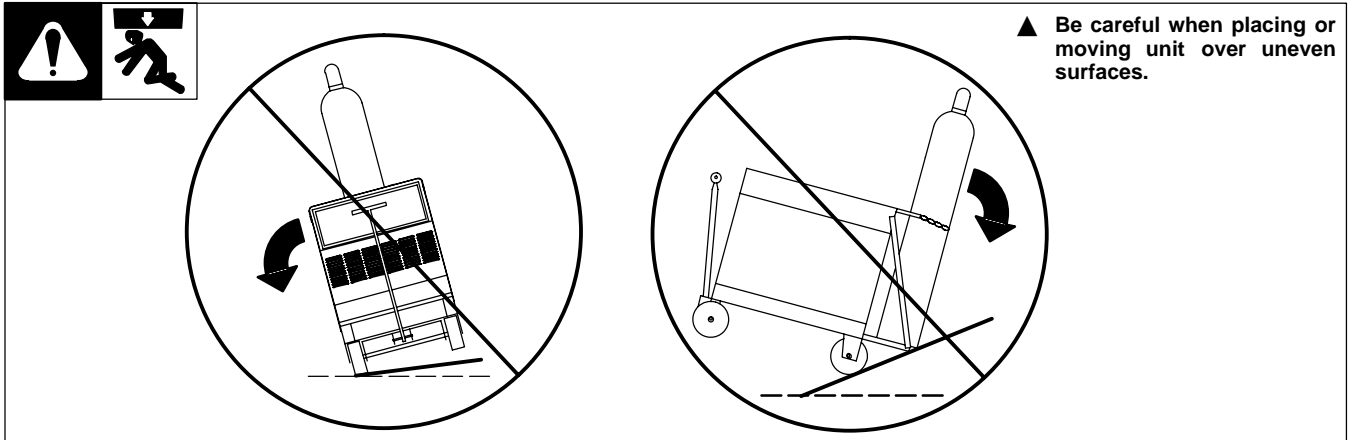
802 962

2-5. Dimensions And Weights

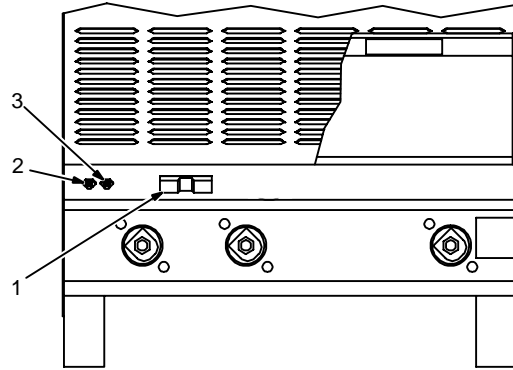
	Dimensions	
	A	30 in (762 mm) Including lift eye
	B	23 in (584 mm)
	C	38 in (965 mm) Including strain relief
	D	35 in (889 mm)
	E	1-1/4 in (32 mm)
	F	21-1/8 in (537 mm)
	G	1-1/8 in (29 mm)
	H	7/16 in (11 mm) Dia
	Weight	
	545 lb (247 kg)	

800 453-A / 801 530

2-6. Tipping



2-7. 115 VAC Receptacle And Circuit Breakers



▲ **Turn Off power before connecting to receptacle.**

- 1 115 V 15 A AC Receptacle RC9

Power is shared between RC9 and Remote 14 receptacle RC8.

- 2 Circuit Breaker CB1
- 3 Circuit Breaker CB2

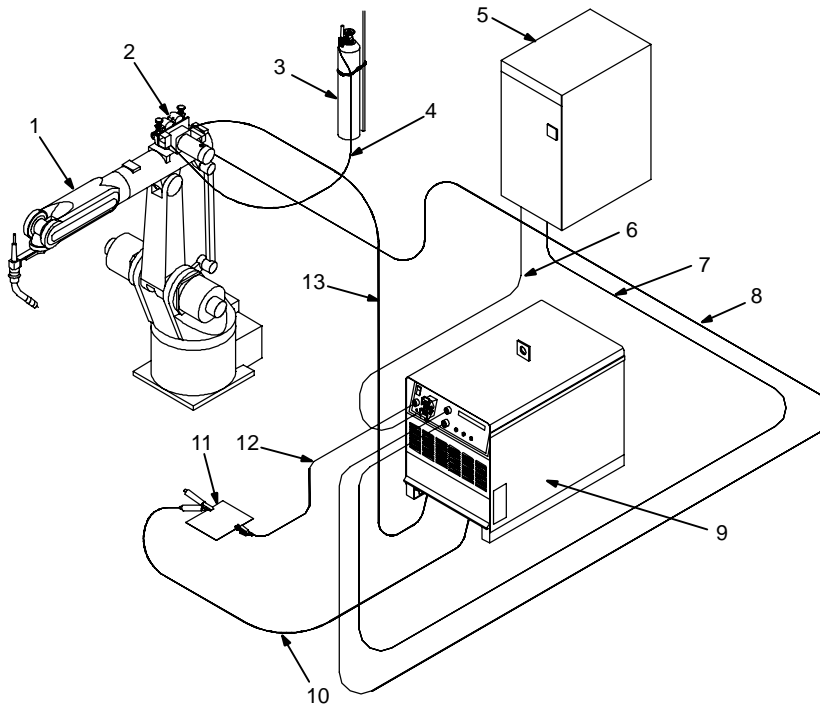
CB1 protects the 115 volts ac portion of RC8 and RC9 from overload.

CB2 protects the 24 volts ac portion of RC8.

Press button to reset breaker.

Ref. 800 166-D

2-8. Connection Diagram



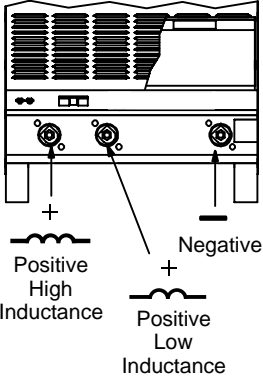
☞ *The proper robot adapter cord must be connected to the interface unit to allow it to be connected to the robot.*

- 1 Robot (Will Vary According To Application)
 - 2 Motor/Drive Assembly
 - 3 Gas Cylinder
 - 4 Gas Hose
 - 5 Robot Control
 - 6 Robot Input/Output Cable
 - 7 Remote Program Select Cable (Optional)
 - 8 Gas And Motor Control Cable
 - 9 Welding Power Source/Interface Unit
 - 10 Negative (-) Weld Cable
 - 11 Workpiece
 - 12 Voltage Sensing Lead
- ☞ *Positive (+) voltage sensing lead is contained in the motor cable.*
- 13 Positive (+) Weld Cable

802 963

2-9. Weld Output Terminals And Selecting Cable Sizes



<p>▲ Turn off power before connecting to weld output terminals.</p> <p>▲ Do not use worn, damaged, undersized, or poorly spliced cables.</p> 	Total Cable (Copper) Length In Weld Circuit Not Exceeding							
	100 ft (30 m) Or Less		150 ft (45 m)	200 ft (60 m)	250 ft (70 m)	300 ft (90 m)	350 ft (105 m)	400 ft (120 m)
	Welding Amperes	10 – 60% Duty Cycle	60 – 100% Duty Cycle	10 – 100% Duty Cycle				
100	4	4	4	3	2	1	1/0	1/0
150	3	3	2	1	1/0	2/0	3/0	3/0
200	3	2	1	1/0	2/0	3/0	4/0	4/0
250	2	1	1/0	2/0	3/0	4/0	2-2/0	2-2/0
300	1	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-3/0
350	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-3/0	2-4/0
400	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-4/0	2-4/0
500	2/0	3/0	4/0	2-2/0	2-3/0	2-4/0	3-3/0	3-3/0
600	3/0	4/0	2-2/0	2-3/0	2-4/0	3-3/0	3-4/0	3-4/0
700	4/0	2-2/0	2-3/0	2-4/0	3-3/0	3-4/0	3-4/0	4-4/0

*Weld cable size (AWG) is based on either a 4 volts or less drop or a current density of at least 300 circular mils per ampere. Contact your distributor for the mm² equivalent weld cable sizes.

S-0007-E

2-10. Electrical Service Guide

60 Hertz Models	450 Amp Model			
Input Voltage	200	230	460	575
Input Amperes At Rated Output	72	63	32	25
Max Recommended Standard Fuse Rating In Amperes ¹				
Time-Delay ²	90	70	40	30
Normal Operating ³	110	90	45	40
Min Input Conductor Size In AWG/Kcmil	4	6	8	10
Max Recommended Input Conductor Length In Feet (Meters)	163 (50)	142 (43)	366 (112)	379 (115)
Min Grounding Conductor Size In AWG/Kcmil	6	8	10	10

Reference: 1999 National Electrical Code (NEC)

1 Consult factory for circuit breaker applications.

2 "Time-Delay" fuses are UL class "RK5" .

3 "Normal Operating" (general purpose - no intentional delay) fuses are UL class "K5" (up to and including 60 amp), and UL class "H" (65 amp and above).

50 Hertz Models	450 Amp Model		
Input Voltage	380	400	440
Input Amperes At Rated Output	39	37	33
Max Recommended Standard Fuse Rating In Amperes ¹			
Time-Delay ²	45	45	40
Normal Operating ³	60	50	50
Min Input Conductor Size In AWG/Kcmil	8	8	8
Max Recommended Input Conductor Length In Feet (Meters)	250 (76)	277 (84)	335 (102)
Min Grounding Conductor Size In AWG/Kcmil	10	10	10

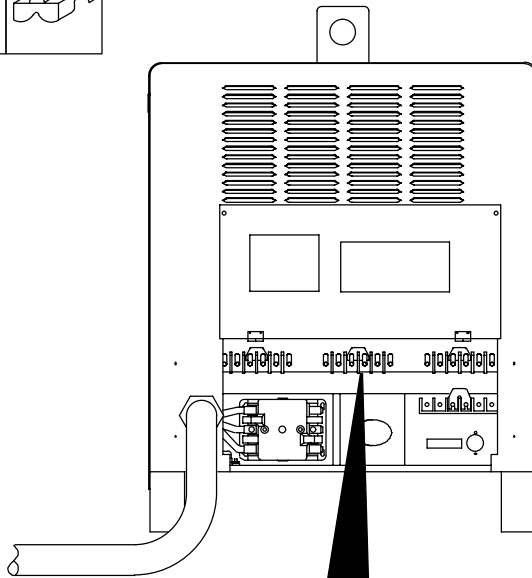
Reference: 1999 National Electrical Code (NEC)

1 Consult factory for circuit breaker applications.

2 "Time-Delay" fuses are UL class "RK5" .

3 "Normal Operating" (general purpose – no intentional delay) fuses are UL class "K5" (up to and including 60 amp), and UL class "H" (65 amp and above).

2-11. Placing Jumper Links



▲ **Disconnect and lockout/tag-out input power before installing or moving jumper links.**

Check input voltage available at site.

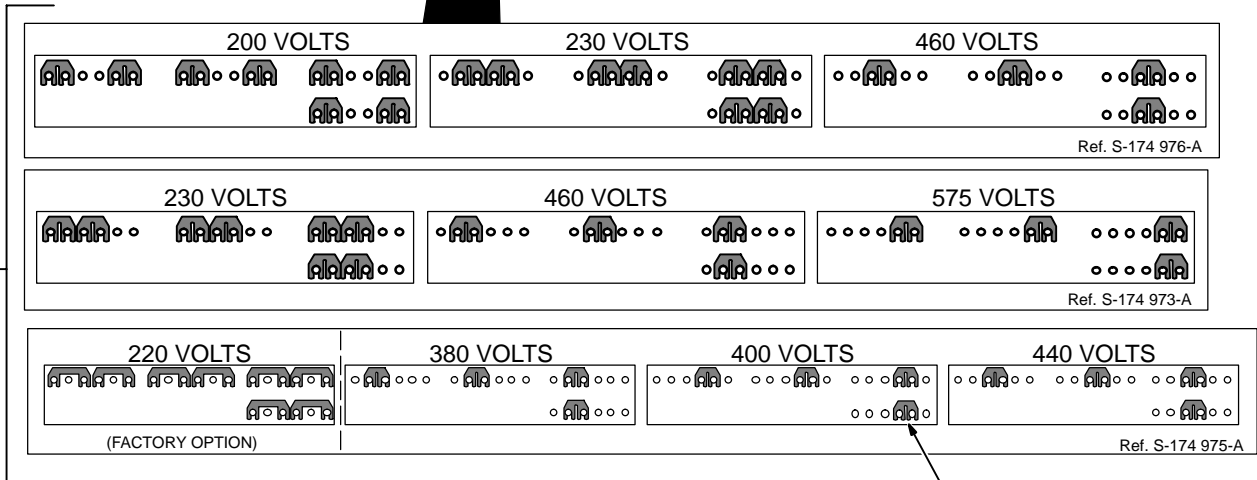
1 Jumper Link Label

Check label – only one is on unit.

2 Jumper Links

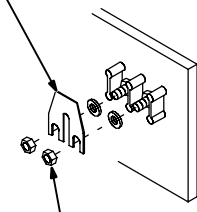
Move jumper links to match input voltage.

Close access door, or go on to Section 2-12.



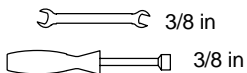
1

2



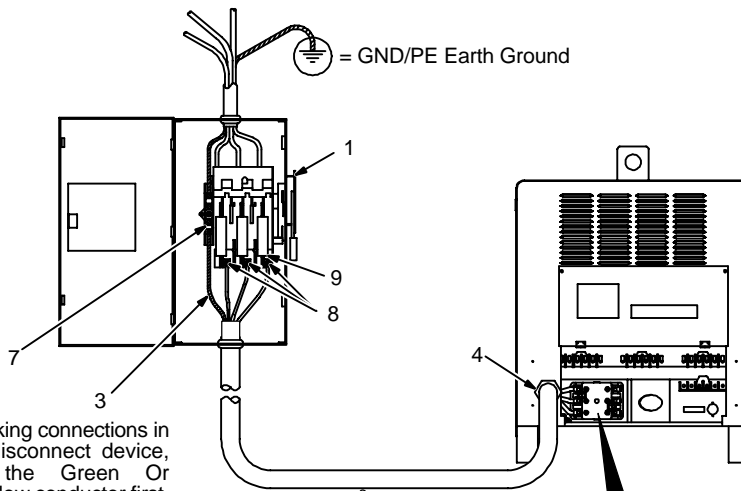
Do not overtighten jumper link nuts.

Tools Needed:



Ref. ST-800 103-A

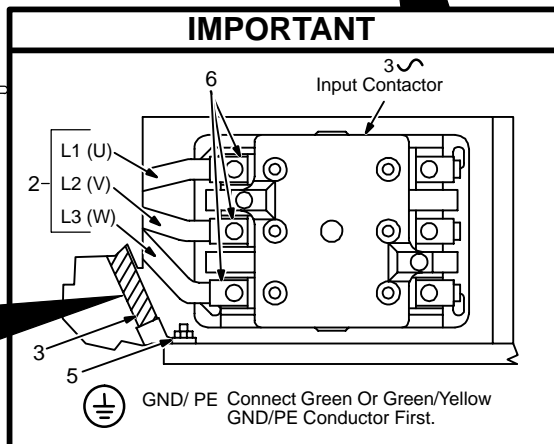
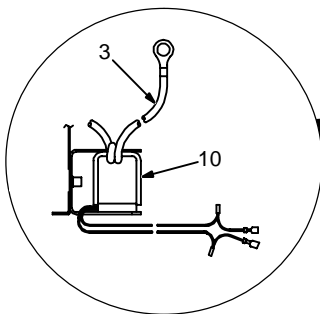
2-12. Connecting Input Power



When making connections in the line disconnect device, connect the Green Or Green/Yellow conductor first.

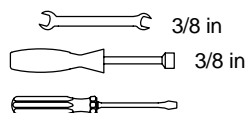
Install conductors into a deenergized line disconnect device.

Make connections to machine first and supply last.



GND/ PE Connect Green Or Green/Yellow GND/PE Conductor First.

Tools Needed:



▲ **Disconnect and lockout/tagout input power before connecting input conductors from unit.**

▲ **Have only qualified persons make this installation.**

See rating label on unit and check input voltage available at site.

- 1 Line Disconnect Device
- 2 Input Conductors
- 3 Grounding Conductor

Select size and length using Section 2-10. Conductors must comply with national, state, and local electrical codes. If applicable, use lugs of proper amperage capacity and correct hole size.

- 4 Strain Relief

Route conductors through strain relief.

- 5 Machine Grounding Terminal
- 6 Line Terminals

▲ **Make input power connections to the welding power source before making connections into a deenergized line disconnect device.**

Connect green or green/yellow grounding conductor to machine grounding terminal first. Then connect input conductors to line terminals.

Close access door.

- 7 Disconnect Device (Supply) Grounding Terminal

- 8 Disconnect Device Line Terminals

▲ **In the deenergized line disconnect device, connect green or green/yellow grounding conductor to supply grounding terminal first, never to a line terminal. Be sure grounding conductor goes to an earth ground.**

Connect input conductors to line terminals.

- 9 Overcurrent Protection

Select type and size using Section 2-10 (fused disconnect switch shown).

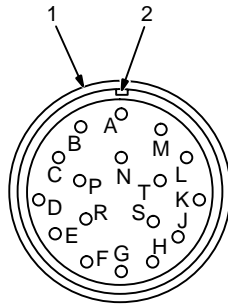
Close door on line disconnect device.

- 10 Reed Switch (Ground Current Sensor) (Optional)

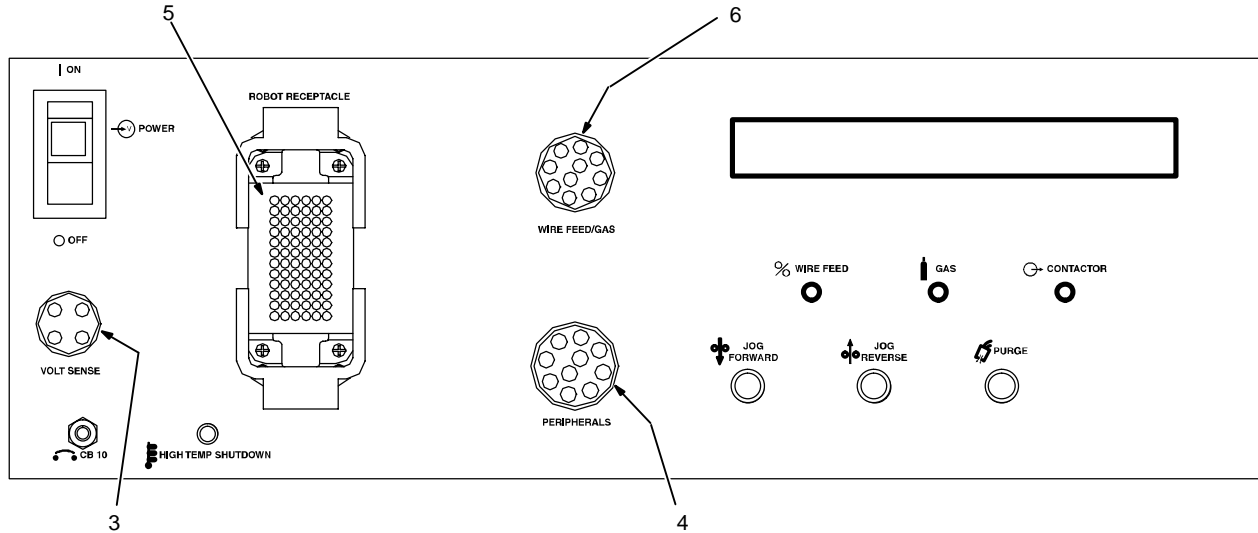
If unit is equipped with optional ground current sensor, route grounding conductor through reed switch two times and connect to ground terminal.

Close access door.

2-13. Front Panel Connections



Example Receptacle



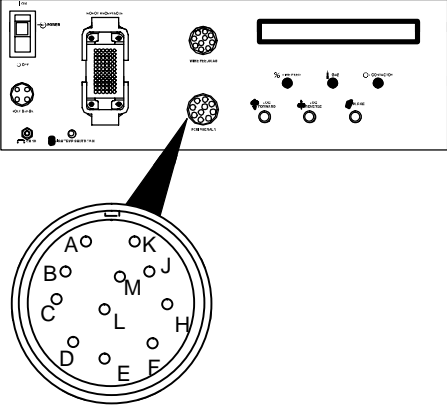
Ref. S-0003-A / Ref. 203 394

- 1 Receptacle
 - 2 Keyway
 - 3 4-Pin Receptacle (Optional External Voltage Sensing Connection)
- To connect interconnecting cord to receptacle, align keyway, insert plug, and tighten threaded collar.
- Secure ring terminal on remaining end of

- cord to work.
- 4 Peripheral Receptacle
- Receptacle provides connection to water flow switch, jog +/-, and shielding gas purge circuitry.
- 5 Robot Control Receptacle (Remote Program Select Connection To Robot Control)

- To connect matching interconnecting cord to one of the above receptacles, align keyway, insert plug, and tighten threaded collar. Connect remaining end of cord to matching receptacle on applicable equipment (see Section 2-8).
- 6 10-Socket Receptacle (Wire Feed/Shielding Gas Control Connection To Motor Drive Assembly)

2-14. Peripheral Receptacle Functions

	Function	Socket	Socket Information
 <p data-bbox="553 625 649 646">Rer. 203 394</p>	Purge	C*	Circuit common.
	Coolant Flow Switch Input Signal	D	Contact closure to C completes 24 volts dc solenoid circuit to purge shielding gas line.
		E	Contact closure to F indicates coolant flow switch is closed and recirculating coolant system is operational.
	Jog +	H**	Contact closure to circuit common advances welding wire at wire drive assembly.
	Jog -	J**	Contact closure to circuit common retracts welding wire at wire drive assembly.
<p data-bbox="151 667 621 695">*Circuit common is same electrical reference point.</p> <p data-bbox="151 701 594 728">**Speed of Jog + and Jog - defaults to 200 ipm.</p> <p data-bbox="151 735 797 762">Note: A matching amphenol plug is supplied with a flow switch jumper.</p>			

SECTION 3 – OPERATION

3-1. Upper Front Panel Controls

1 Jog Forward Push Button
Advances wire out of the gun.

2 Wirefeed Indicator LED
LED lights when wire feed motor is energized.

3 Jog Reverse Push Button
Retracts wire up into the gun.

4 Gas Indicator LED
LED lights when gas solenoid is energized.

5 Purge Push Button
Momentarily energizes gas solenoid to purge air from gun shielding gas line, or to adjust shielding gas regulator.

6 Contactor Indicator LED
LED lights when welding power source contactor is energized.

7 Main Display
Shows system state, error messages, commands at idle and actual feedback during welding.

8 Motor Circuit Breaker

9 High Temperature Shutdown Light

Ref. 203 394

3-2. Meter Functions

Mode	Meter Reading At Idle		Meter Reading While Welding		
	V	IPM	V	A	IPM
MIG	24.5V Command Volts	0I Command WFS	24.5V Actual Volts	0A Actual Amps	0I Actual WFS

3-3. Resetting Memory

1 Front Panel Control Buttons
2 Power Switch On Front Panel

All three buttons must be held down for 3 seconds after unit is energized.

Press and hold down all three buttons while turning On unit.

SECTION 4 – MAINTENANCE & TROUBLESHOOTING

4-1. Routine Maintenance

Disconnect power before maintaining.

Maintain more often during severe conditions.

3 Months

Replace damaged or unreadable label.

Repair or replace cracked cables.

Replace cracked torch body.

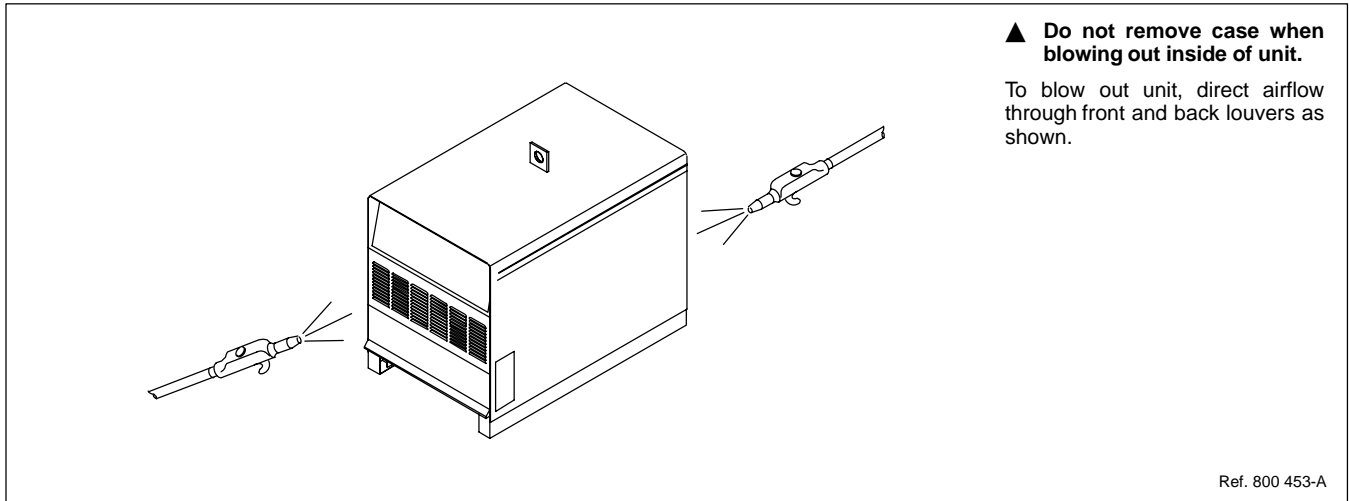
Repair or replace cracked cables and cords.

6 Months

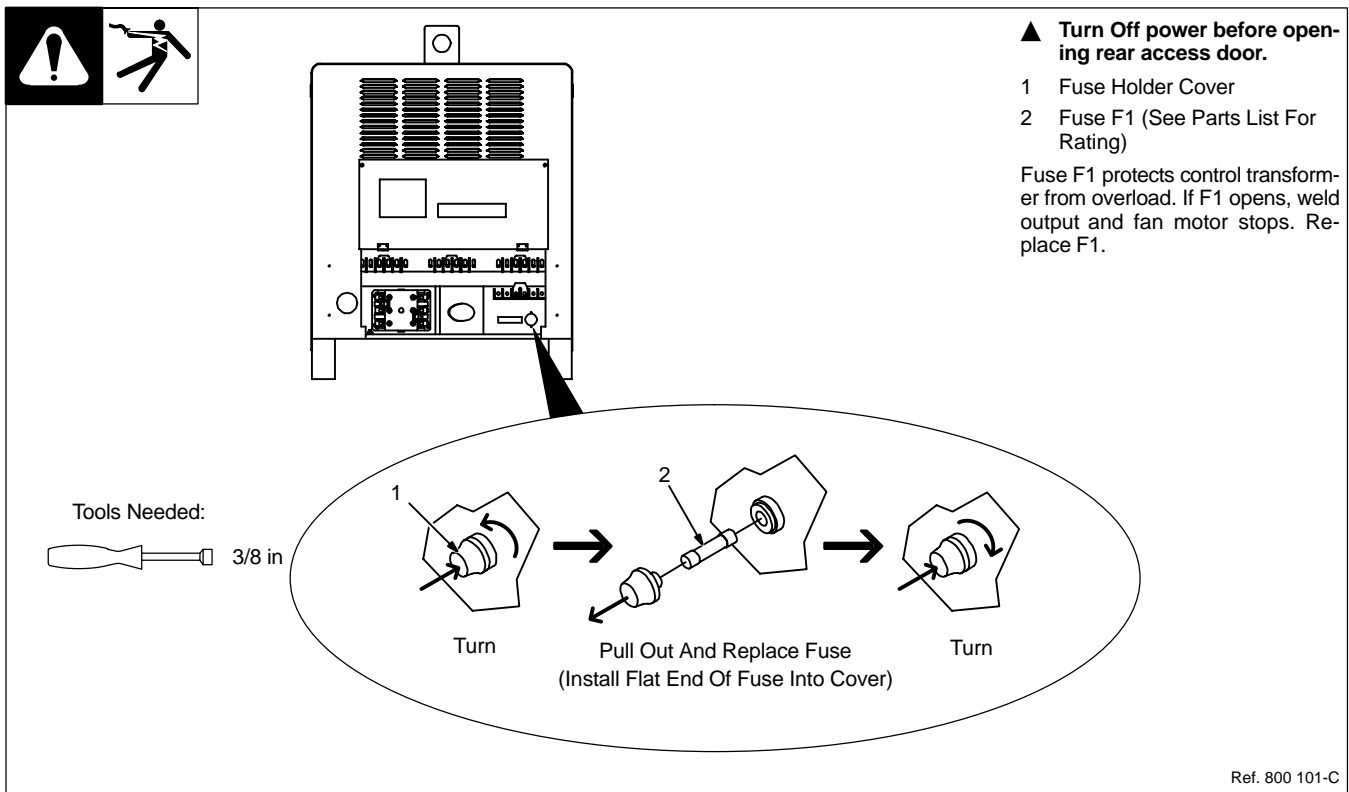
Clean and tighten weld terminals.

Blow out inside.

4-2. Blowing Out Inside Of Unit



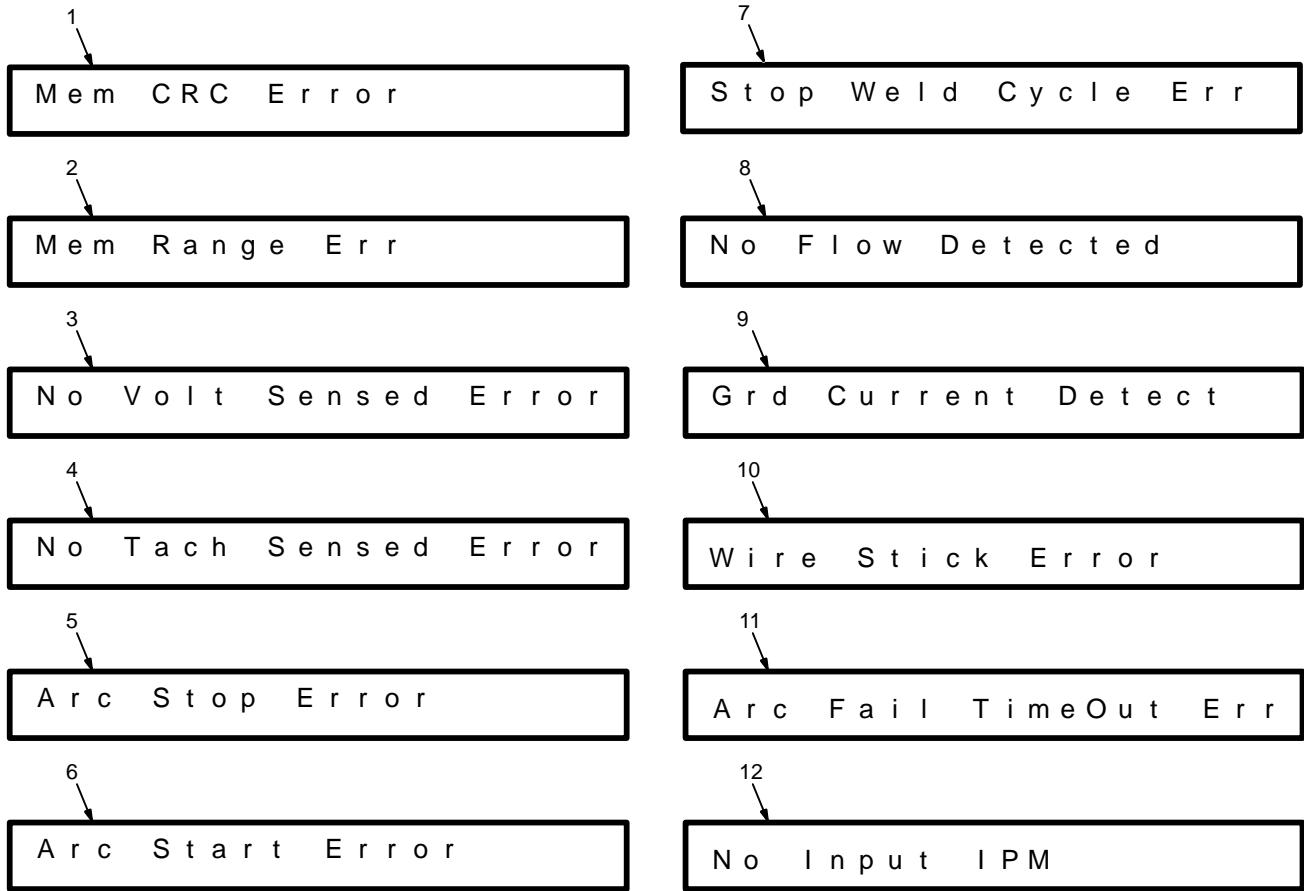
4-3. Fuse F1



4-4. Short Circuit Shutdown

When contact tip is shorted and sticks to workpiece, the unit output falls to a safe operating level. To resume operation, release gun trigger, turn Off unit, and remove contact tip from workpiece. Check contact tip and replace if damaged. Turn On unit to continue operation.

4-5. Front Panel Error Displays



1 Memory CRC Error Display

Corrupted program data has been detected or loaded. The "X" value indicates the program number.

May be caused by incompatible information on the data card or bad memory.

2 Memory Range Error Display

Improper welding power source range is selected. The "X" value indicates the program number.

May be caused by improper range settings or improper data loaded into the interface unit.

3 No Volt Sensed Error Display

The arc voltage sense circuit did not receive feedback within the required time after an arc was established.

May be caused by an inability to establish an arc in the pulse schedule, or a lack of voltage feedback.

4 No Tach Sensed Error Display

The motor tachometer feedback is not reaching the control.

May be caused by obstructions in the wire feed system or a faulty wire drive system.

5 Arc Stop Error Display

Trouble is occurring at arc end.

May be caused by obstructions in the wire feed system or a faulty wire drive system or torch is touching part at end of weld.

6 Arc Start Error Display

Trouble is occurring at arc start.

May be caused by obstructions in the wire feed system or a faulty wire drive system.

7 Stop Weld Cycle Error Display

An error has been detected and the robot hasn't stopped the weld cycle, causing the interface unit to stop the weld cycle and wait for the robot to stop.

8 No Flow Detected

No coolant is detected after preflow in the weld cycle. Check coolant system and flow switch for proper operation.

9 Ground Current Detect Error Display

Weld current has been detected in the earth ground connection.

May be caused by a conductor making connection to the unit chassis.

10 Wire Stick Error Display

The welding wire has stuck to the workpiece at the end of the weld.

May be caused by poor weld conditions.

11 Arc Fail Time Out Error Display

An arc was not established within the allotted time.

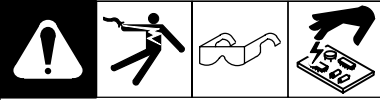
May be caused by an inoperable wire drive, absence of shield gas, or improperly operating welding power source.

12 No Input IPM Display

Analog IPM (inches per minute) from robot is not being received.

May be caused by having no wire feed speed programmed at the robot.

4-6. Weld Interface Board PC12 Diagnostic LED's

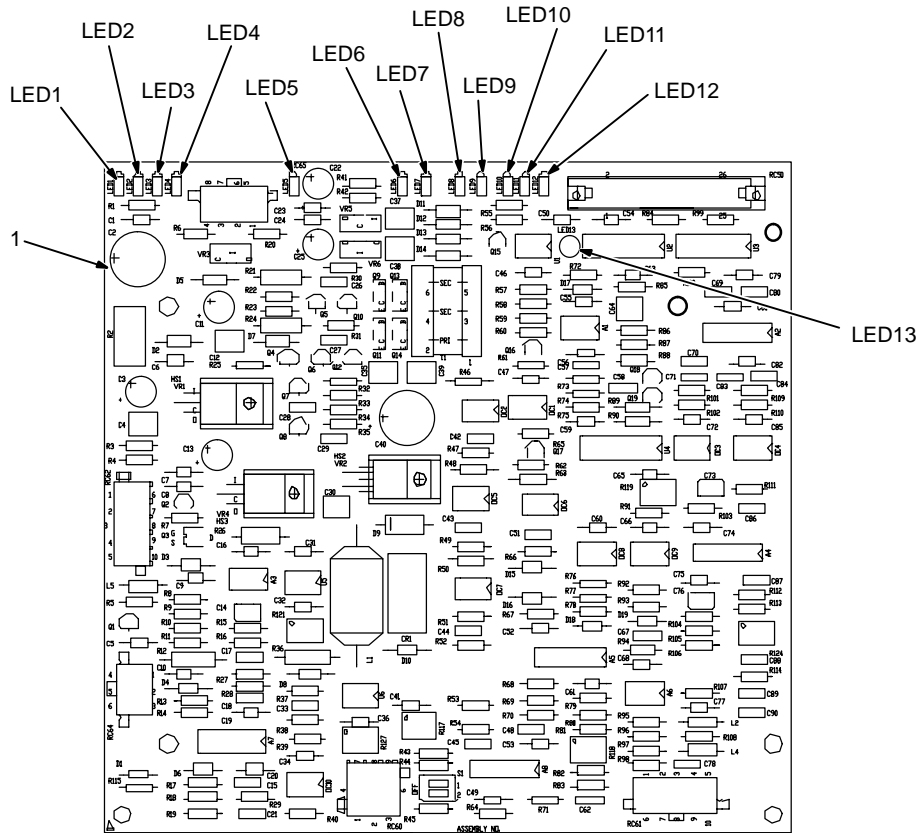


1 Weld Interface Board PC12

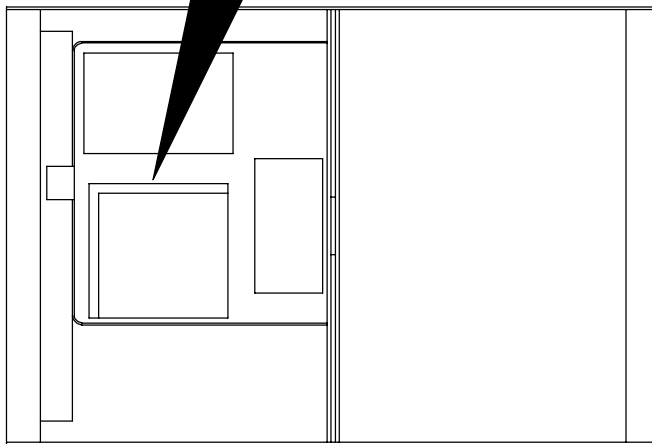
Diagnostic LED's are visible inside unit, located on PC12 (see illustration for board location).

Refer to Section 4-7 for information on diagnostic LED's.

Reinstall cover and left side panel after checking diagnostic LED's.



Front

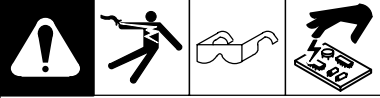


Top View

4-7. Diagnostic LED's On Weld Interface Board PC12

LED	Status	Diagnosis
1	On	Indicates auxiliary output relay is not energized.
	Off	Indicates auxiliary output relay is energized.
2	On	Indicates gas valve is not energized.
	Off	Indicates gas valve is energized.
3	On	Indicates +24 volts dc is present for gas valve.
	Off	Indicates +24 volts dc is not present for gas valve.
4	On	Indicates +15 volts dc is present on weld interface board PC12.
	Off	Indicates +15 volts dc is not present on weld interface board PC12.
5	On	Indicates -15 volts dc is present on weld interface board PC12.
	Off	Indicates -15 volts dc is not present on weld interface board PC12.
6	On	Indicates +15 volts dc power source supply is present on weld interface board PC12.
	Off	Indicates +15 volts dc power source supply is not present on weld interface board PC12.
7	On	Indicates -15 volts dc power source supply is present on weld interface board PC12.
	Off	Indicates -15 volts dc power source supply is not present on weld interface board PC12.
8	On	Indicates +5 volts dc is present on weld interface board PC12.
	Off	Indicates +5 volts dc is not present on weld interface board PC12.
9	On	Input signal for no Jog retract.
	Off	Input signal for Jog retract.
10	On	Input signal for no Jog advance.
	Off	Input signal for Jog advance.
11	On	Indicates CV mode is selected.
	Off	Indicates CC mode is selected.
12	On	Input signal for no welding power source contactor.
	Off	Input signal for welding power source contactor.
13	On	Indicates an Emergency Stop condition is not present.
	Off	Indicates an Emergency Stop condition is present.

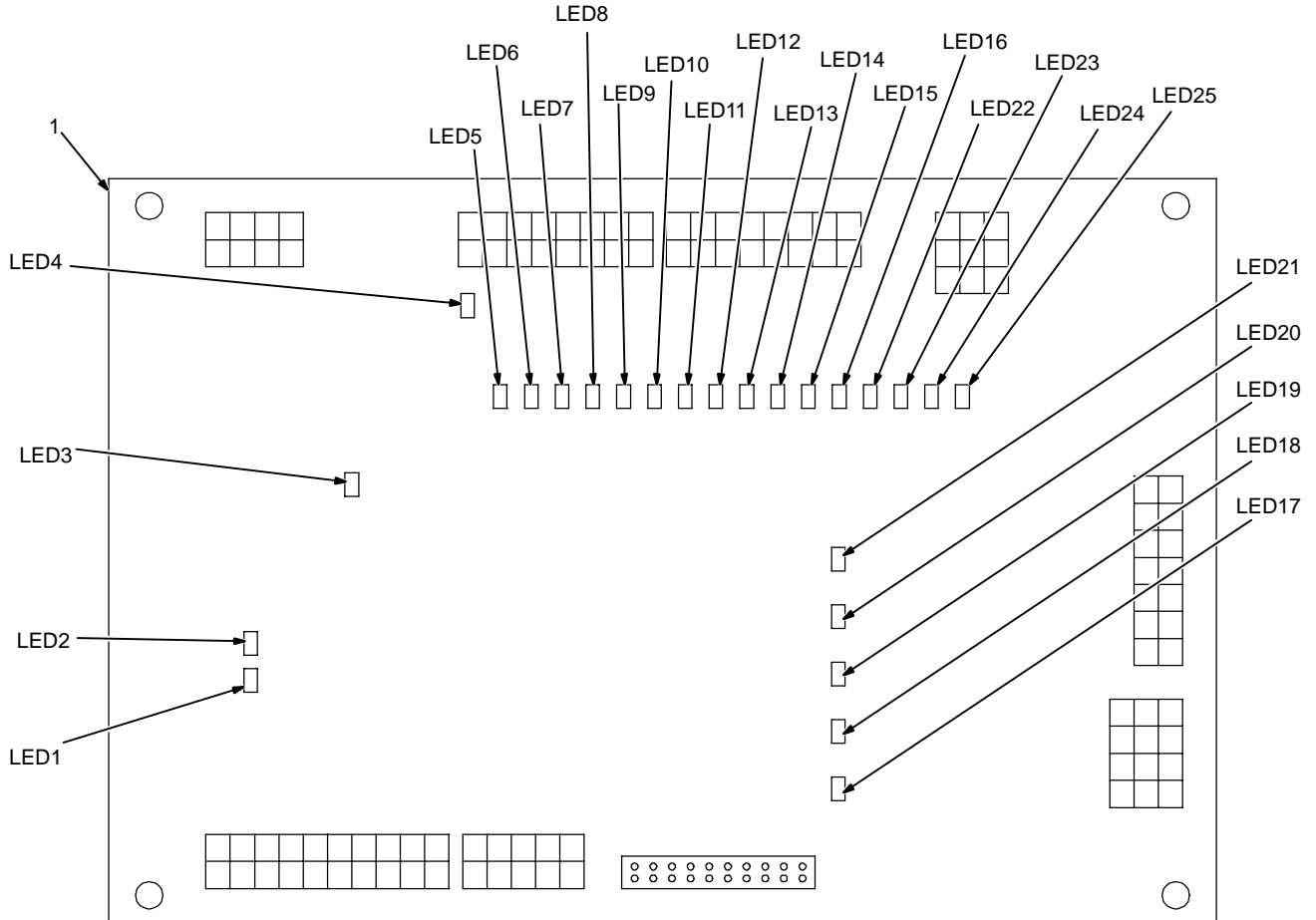
4-8. Customer Interface Board PC14 Diagnostic LED's



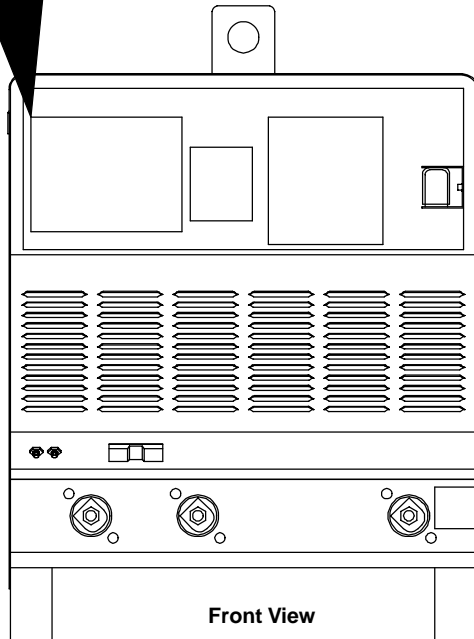
1 Customer Interface Board PC14
Diagnostic LED's are visible inside unit, located on PC14 (see illustration for board location).

Refer to Section 4-9 for information on diagnostic LED's.

Reinstall front control panel after checking diagnostic LED's.



Front Control Panel Removed

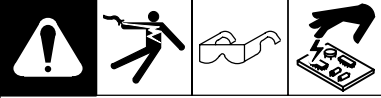


4-9. Diagnostic LED's On Customer Interface Board PC14

LED	Status	Diagnosis
1	On	Indicates -15 volts dc RA supply is present on customer interface board PC14.
	Off	Indicates -15 volts dc RA supply is not present on customer interface board PC14.
2	On	Indicates +15 volts dc RA supply is present on customer interface board PC14.
	Off	Indicates +15 volts dc RA supply is not present on customer interface board PC14.
3	On	Input signal On from robot for no Emergency Stop.
	Off	Input signal Off from robot for Emergency Stop.
4	On	Indicates +24 volts dc RD supply is present on customer interface board PC14.
	Off	Indicates +24 volts dc RD supply is not present on customer interface board PC14.
5	On	Input signal On from robot for shielding gas.
	Off	Input signal Off from robot for no shielding gas.
6	On	Input signal On from robot to energize contactor.
	Off	Input signal Off from robot to not energize contactor.
7	On	Input signal On from robot for jog retract.
	Off	Input signal Off from robot for no jog retract.
8	On	Input signal On from robot for jog advance.
	Off	Input signal Off from robot for no jog advance.
9	On	Indicates automatic configuration Bit D is set.
	Off	Indicates automatic configuration Bit D is not set.
10	On	Input signal On for RPS-C.
	Off	Input signal Off for RPS-C.
11	On	Input signal On for RPS-B.
	Off	Input signal Off for RPS-B.
12	On	Indicates remote program A selected.
	Off	Indicates remote program A not selected.
13	On	Input signal On from peripheral for touch sensor.
	Off	Input signal Off from peripheral for no touch sensor.
14	On	Indicates automatic configuration Bit B is set.
	Off	Indicates automatic configuration Bit B is not set.
15	On	Indicates automatic configuration Bit A is set.
	Off	Indicates automatic configuration Bit A is not set.
16	On	Indicates automatic configuration Bit C is set.
	Off	Indicates automatic configuration Bit C is not set.
17	On	Input signal On from relay CR4 for wire stuck in weld joint.
	Off	Input signal Off from relay CR4 for wire not stuck in weld joint.
18	On	Input signal On from relay CR6 for flow (shielding gas or coolant) present.
	Off	Input signal Off from relay CR6 for flow (shielding gas or coolant) not present.
19	On	Input signal On from relay CR5 for arc detect.
	Off	Input signal Off from relay CR5 for no arc detect.
20	On	Input signal On from relay CR2.
	Off	Input signal Off from relay CR2.
21	On	Input signal On from relay CR1 for welding power source ready and no detected errors present.
	Off	Input signal Off from relay CR1 for welding power source not ready, detected errors are present, or unit is in Setup or Control mode.
22	On	Input signal On from peripheral for flow switch.
	Off	Input signal Off from peripheral for no flow switch.

LED	Status	Diagnosis
23	On	Input signal On from peripheral for jog advance.
	Off	Input signal Off from peripheral for no jog advance.
24	On	Input signal On from peripheral for jog retract.
	Off	Input signal Off from peripheral for no jog retract.
25	On	Input signal On from peripheral for shielding gas purge.
	Off	Input signal Off from peripheral for no shielding gas purge.
26	On	Input signal On for touch sensor.
	Off	Input signal Off for no touch sensor.

4-10. Motor Board PC13 Diagnostic LED's

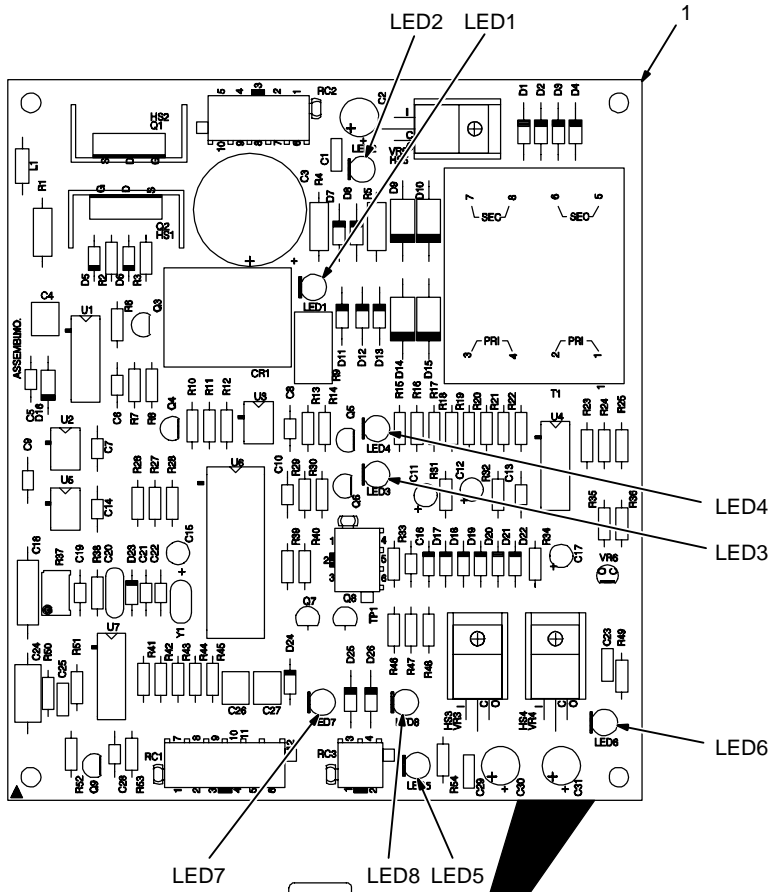


1 Motor Board PC13

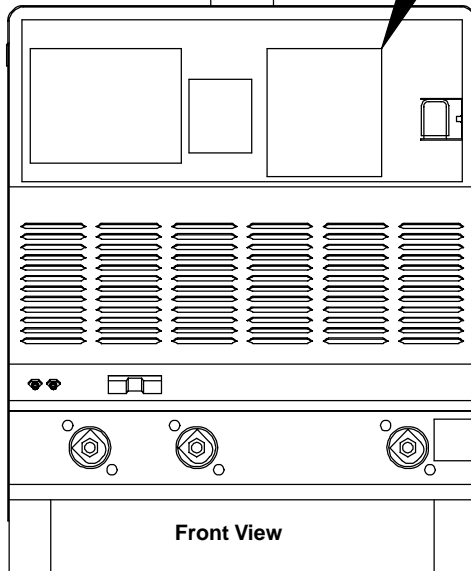
Diagnostic LED's are visible inside unit, located on PC13 (see illustration for board location).

Refer to Section 4-11 for information on diagnostic LED's.

Reinstall front control panel after checking diagnostic LED's.



Front Control Panel Removed

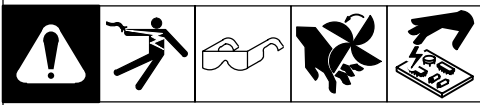


Front View

4-11. Diagnostic LED's On Motor Board PC13

LED	Status	Diagnosis
1	On	Indicates motor reverse relay is energized.
	Off	Indicates motor reverse relay is not energized.
2	On	Indicates bus voltage is present.
	Off	Indicates bus voltage is not present.
3	On	Indicates microprocessor is operational.
	Off	Indicates microprocessor is not operational.
4	On	Indicates tachometer feedback signal is present.
	Off	Indicates tachometer feedback signal is not present.
5	On	Indicates +5 volts dc is present on motor board PC13.
	Off	Indicates +5 volts dc is not present on motor board PC13.
6	On	Indicates +15 volts dc is present on motor board PC13.
	Off	Indicates +15 volts dc is not present on motor board PC13.
7	On	Indicates auxiliary forward signal is present.
	Off	Indicates auxiliary forward signal is not present.
8	On	Indicates auxiliary output signal is present.
	Off	Indicates auxiliary output signal is not present.

4-12. Troubleshooting



Trouble	Remedy
No weld output; unit completely inoperative.	Place line disconnect switch in On position (see Section 2-11).
	Check and replace line fuse(s), if necessary, or reset circuit breaker (see Section 2-11)).
	Check for proper input power connections (see Section 2-11).
	Check fuse F1, and replace if necessary (see Section 4-3).
	Check for proper jumper link position (see Section 2-11).
No weld output; Power switch pilot light on; fan on; meter display On.	Check, repair, or replace remote control.
	Unit overheated. Allow unit to cool with fan On (see Section 2-2).
	Check voltmeter/ammeter Help displays.
	Unit overheated. Allow unit to cool with fan On (see Section 2-2).
	Have Factory Authorized Service Agent check control board PC1.
Unit provides only maximum or minimum weld output.	Have Factory Authorized Service Agent check control board PC1.
Erratic or improper weld output.	Use proper size and type of weld cable (see Section 2-9).
	Clean and tighten all weld connections.
	Have Factory Authorized Service Agent check control board PC1 and/or SCR in main rectifier.
Fan not operating. Note: fan runs only when cooling is necessary.	Check for and remove anything blocking fan movement.
	Have Factory Authorized Service Agent check fan motor.

SECTION 5 – ELECTRICAL DIAGRAM

For Primary Circuit Diagram Portion, refer to Circuit Diagram located inside wrapper of welding power source.

⚠ WARNING

- Do not touch live electrical parts.
- Disconnect input power or stop engine before servicing.
- Do not operate with covers removed.
- Have only qualified persons install, use, or service this unit.

ELECTRIC SHOCK HAZARD

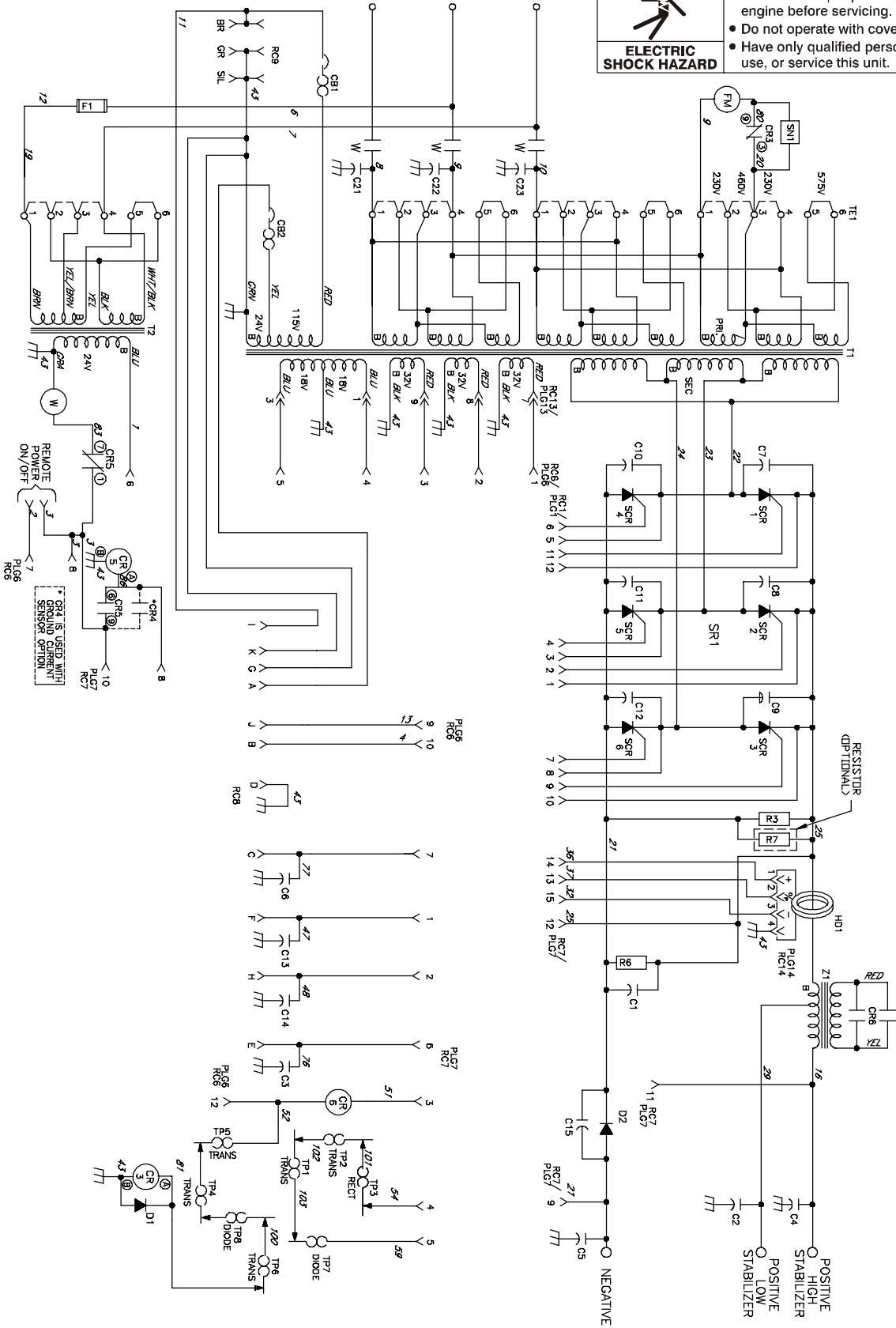



Figure 5-1. Circuit Diagram For Welding Power Source

	⚠ WARNING	<ul style="list-style-type: none"> Do not touch live electrical parts. Disconnect input power or stop engine before servicing. Do not operate with covers removed. Have only qualified persons install, use, or service this unit.
	ELECTRIC SHOCK HAZARD	

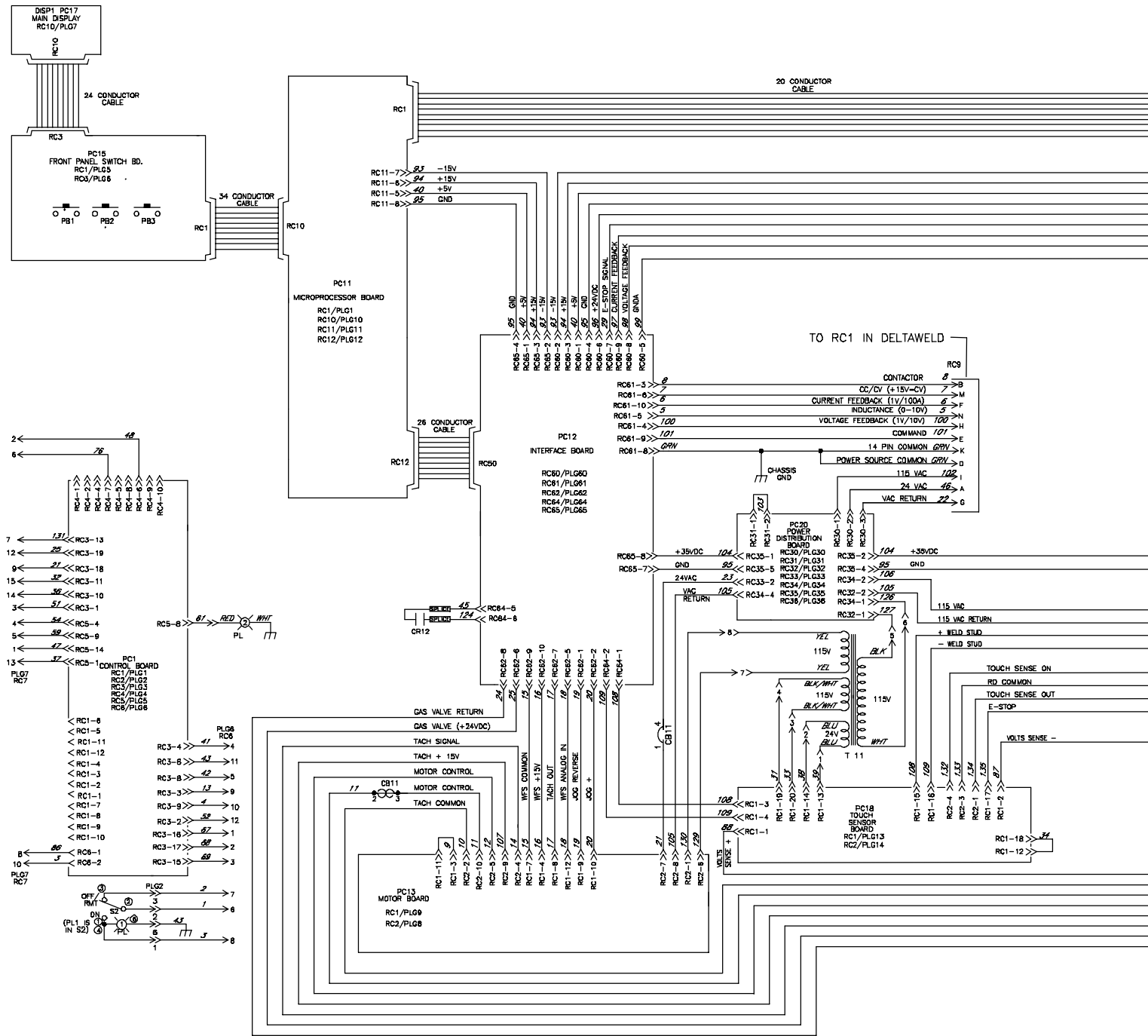
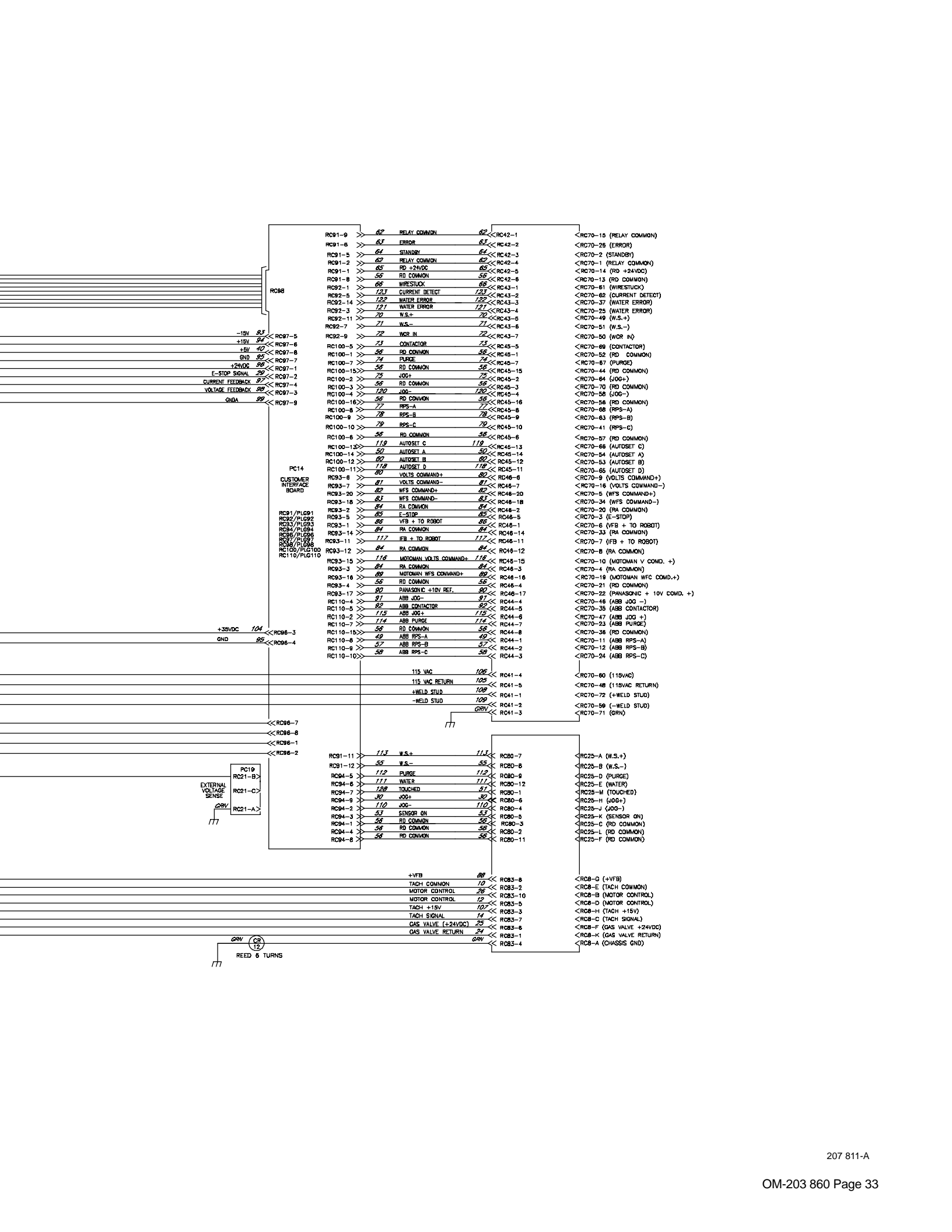


Figure 5-2. Circuit Diagram For Interface Module



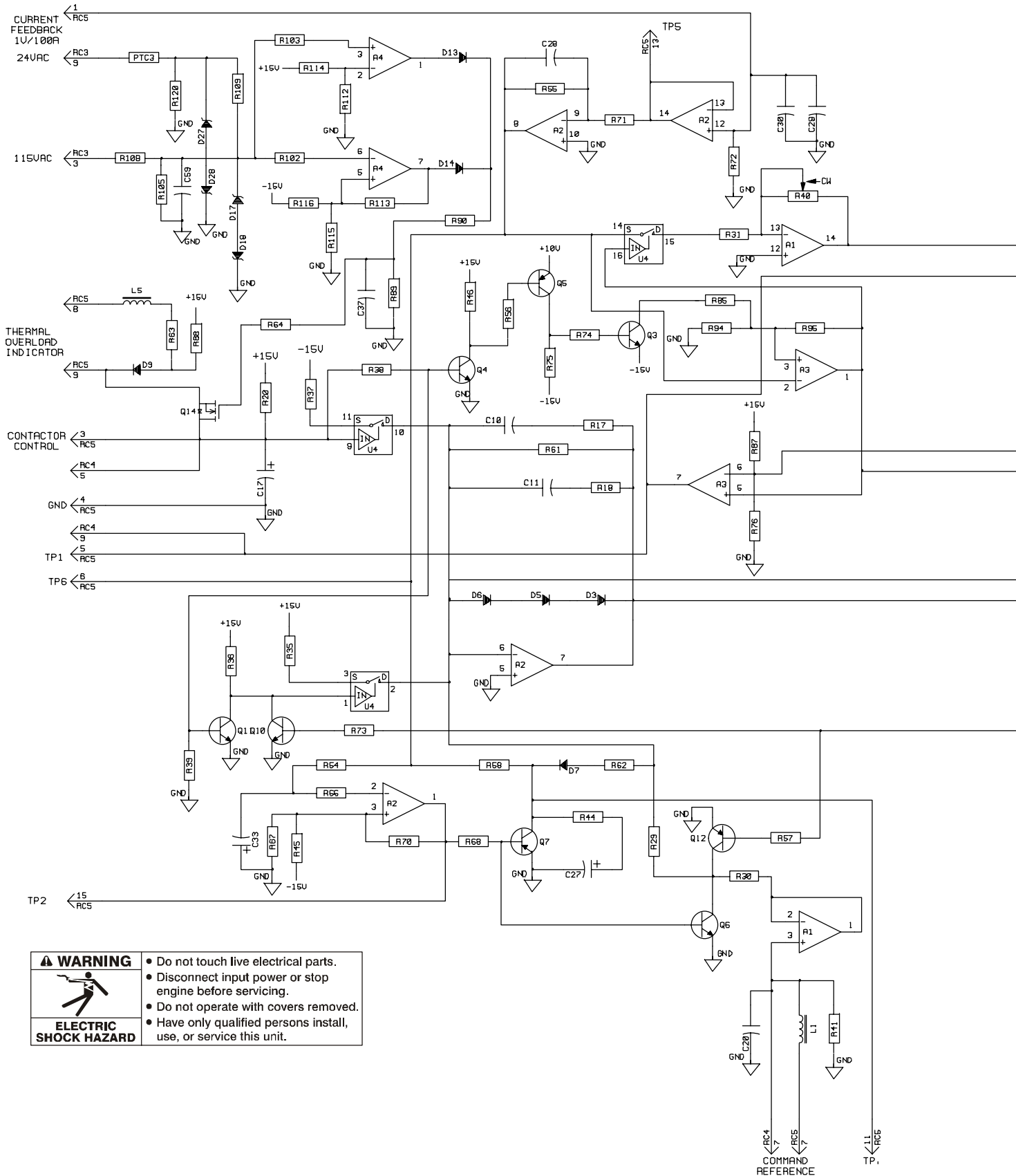
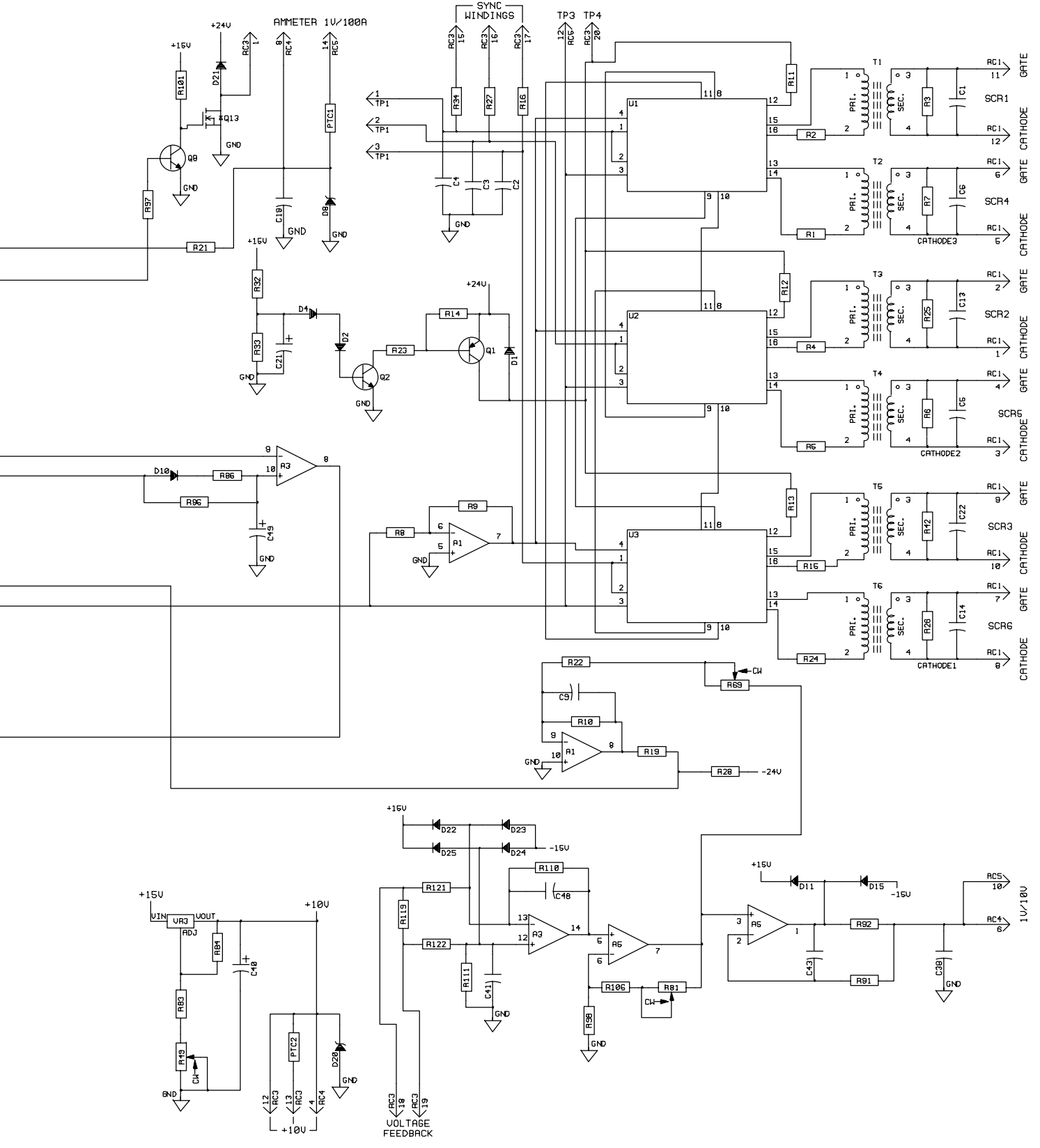
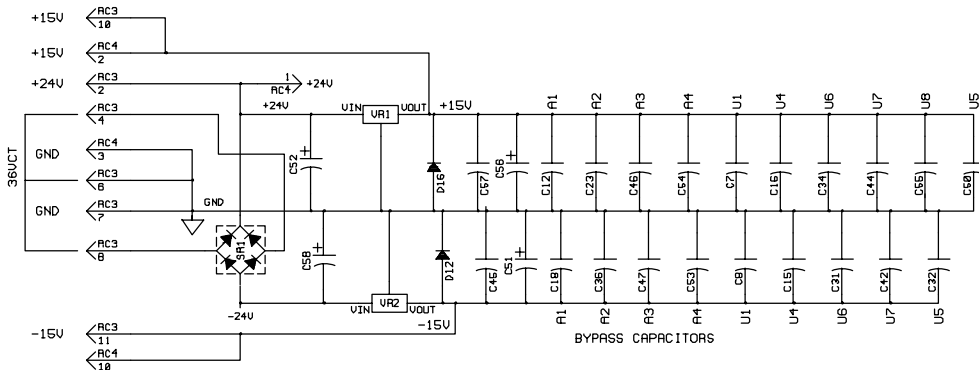


Figure 5-3. Circuit Diagram For Control Board PC1 (Part 1 Of 2)





WARNING

ELECTRIC SHOCK HAZARD

- Do not touch live electrical parts.
- Disconnect input power or stop engine before servicing.
- Do not operate with covers removed.
- Have only qualified persons install, use, or service this unit.

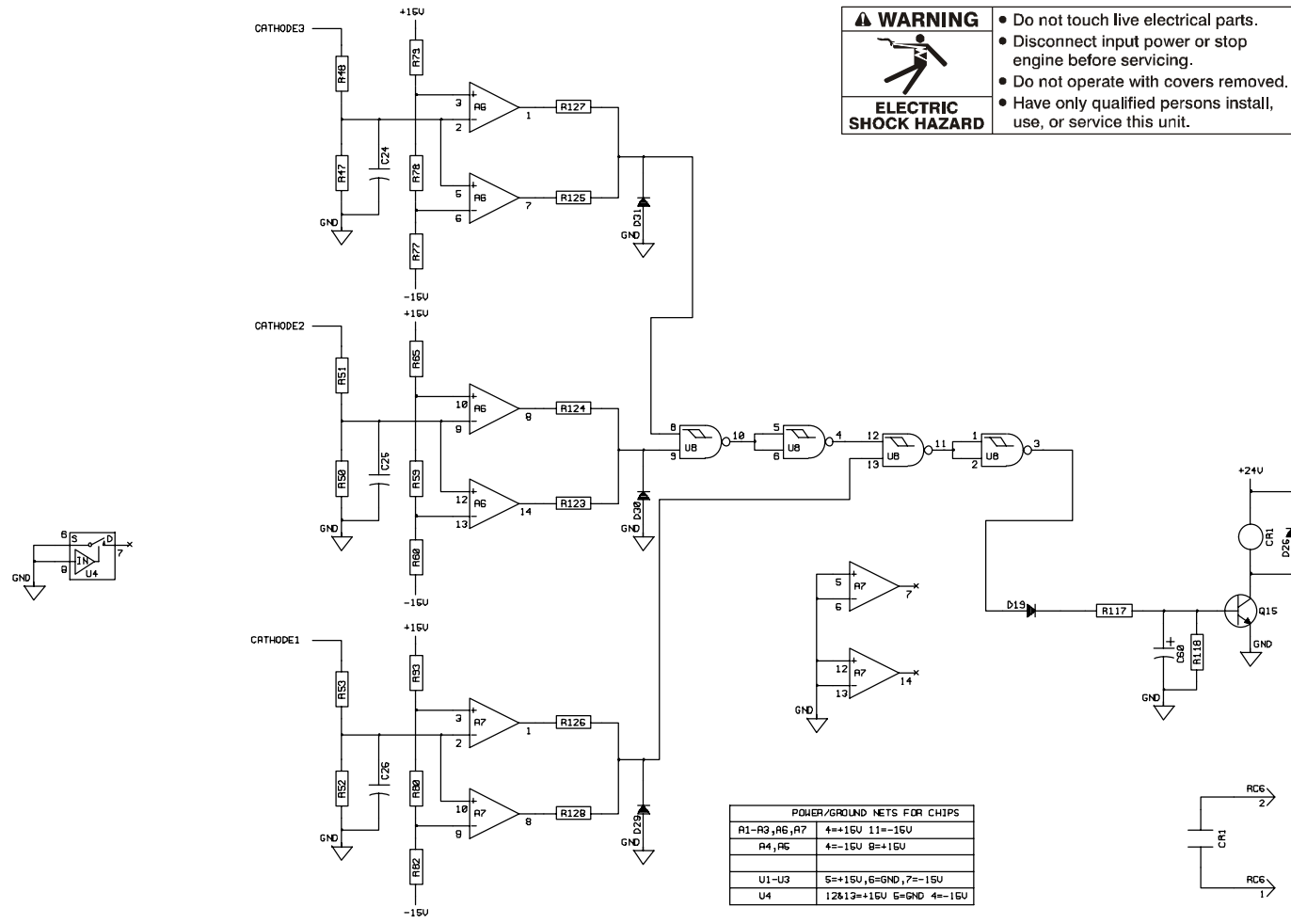


Figure 5-4. Circuit Diagram For Control Board PC1 (Part 2 Of 2)



- Do not touch live electrical parts.
- Disconnect input power or stop engine before servicing.
- Do not operate with covers removed.
- Have only qualified persons install, use, or service this unit.

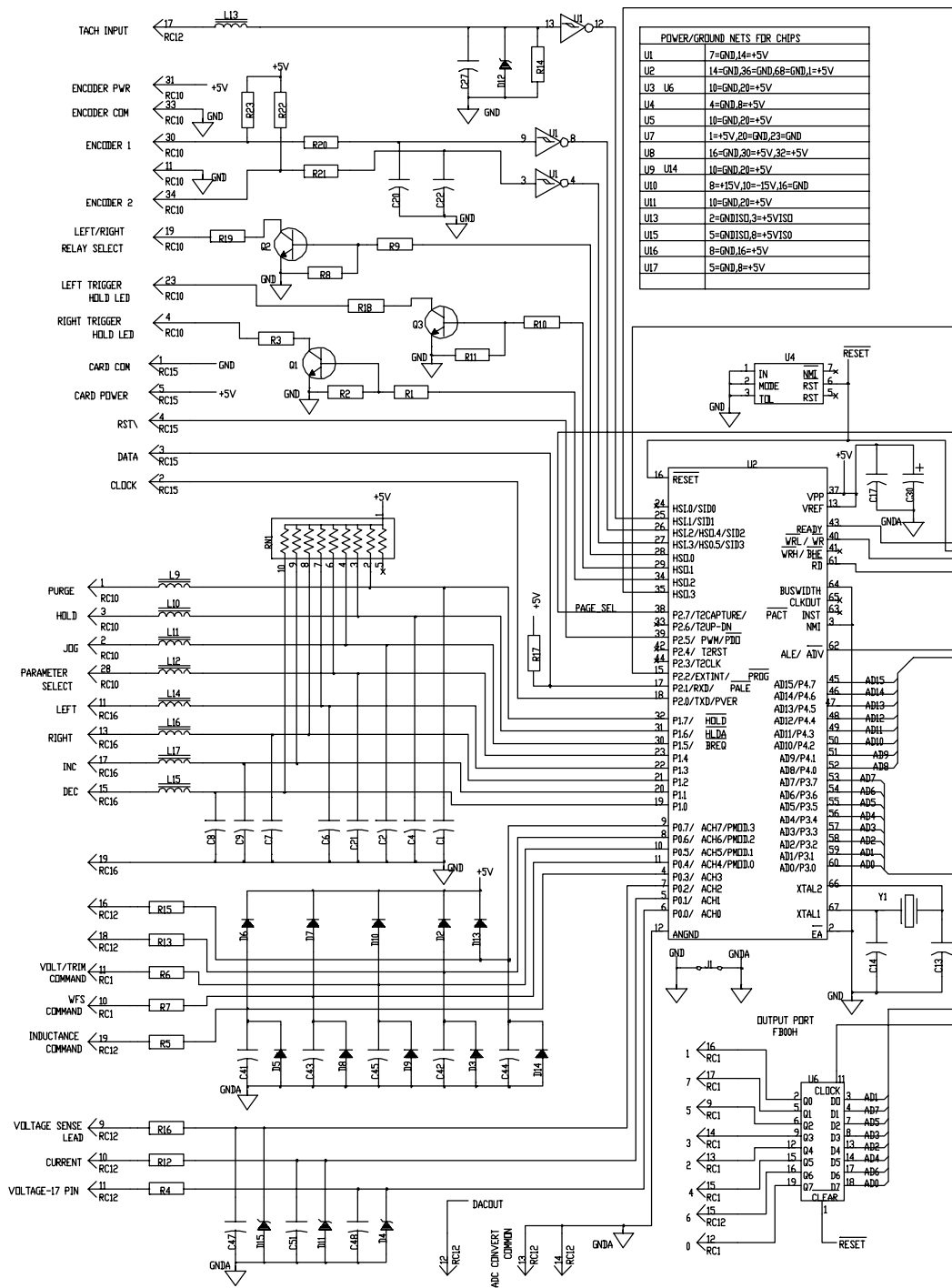
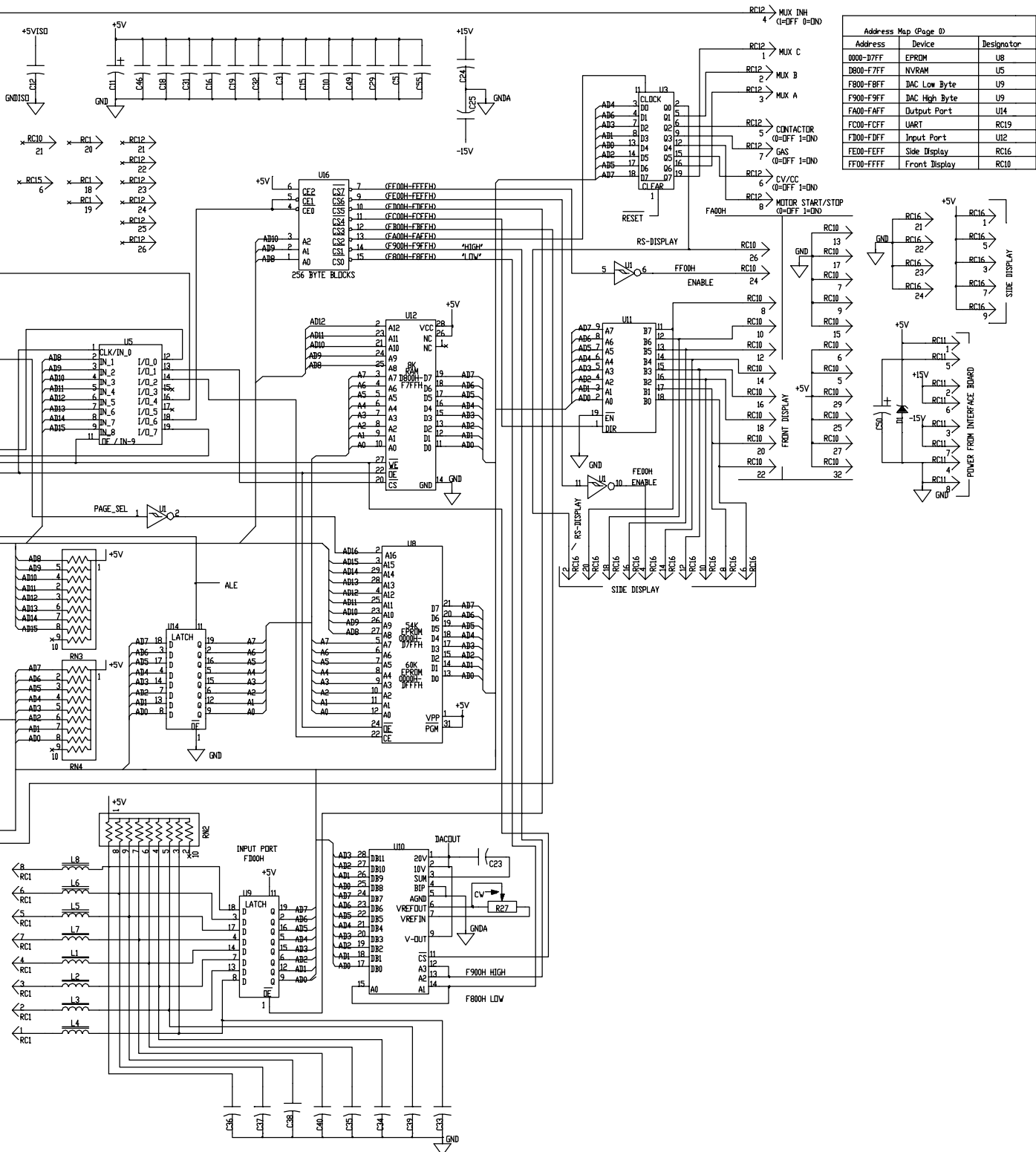


Figure 5-5. Circuit Diagram For Microprocessor Board PC11



Address Map (Page 0)		
Address	Device	Designator
0000-07FF	EPROM	U8
0800-0FFF	NVRAM	U5
F800-F8FF	DAC Low Byte	U9
F900-F9FF	DAC High Byte	U9
FA00-FAFF	Output Port	U14
FC00-FCFF	UART	U19
FD00-FDFF	Input Port	U12
FE00-FEFF	Side Display	RC16
FF00-FFFF	Front Display	RC10



- Do not touch live electrical parts.
- Disconnect input power or stop engine before servicing.
- Do not operate with covers removed.
- Have only qualified persons install, use, or service this unit.

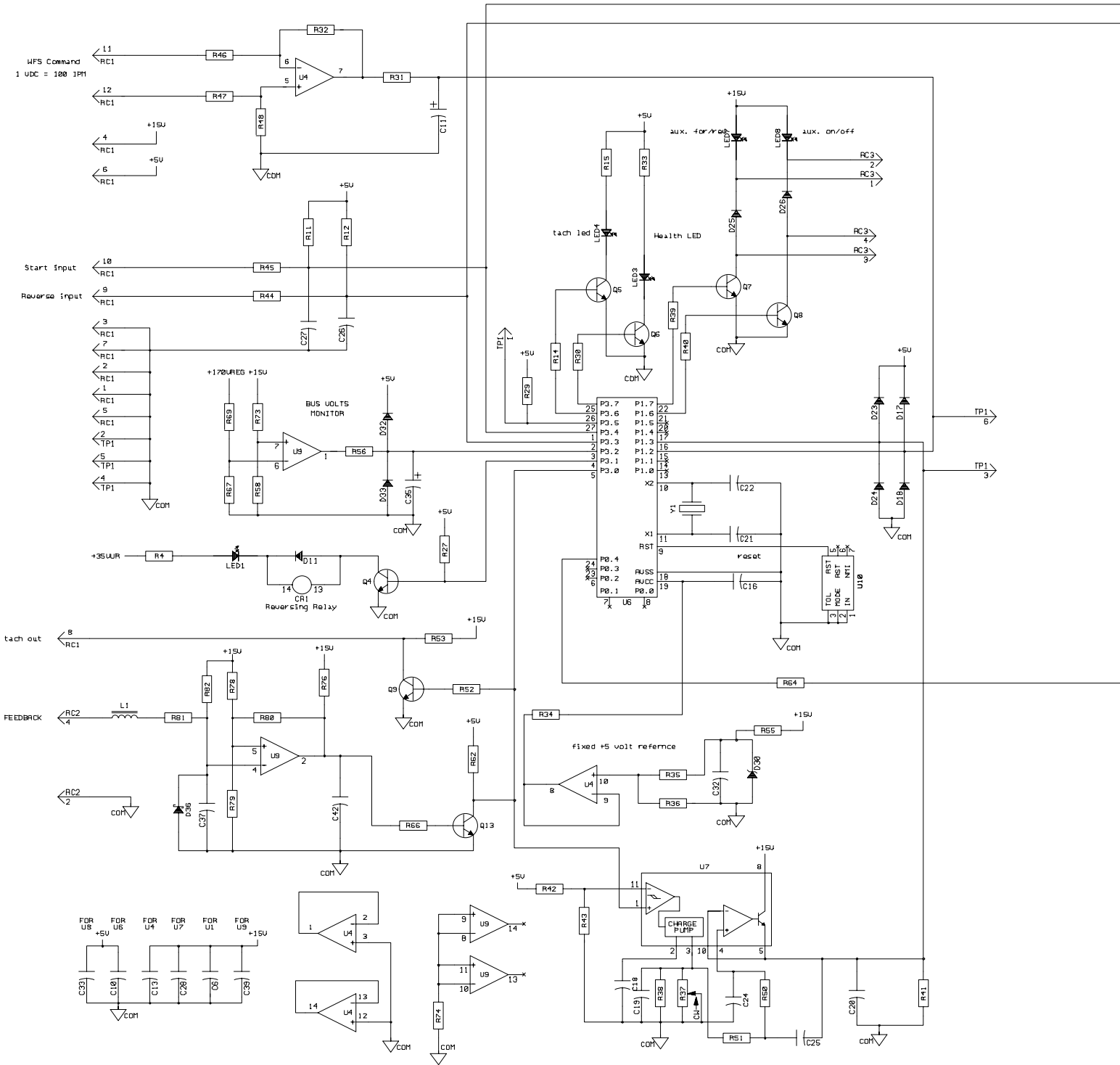
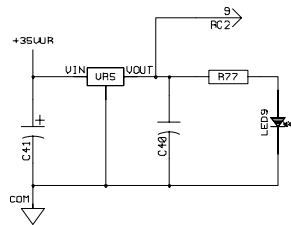
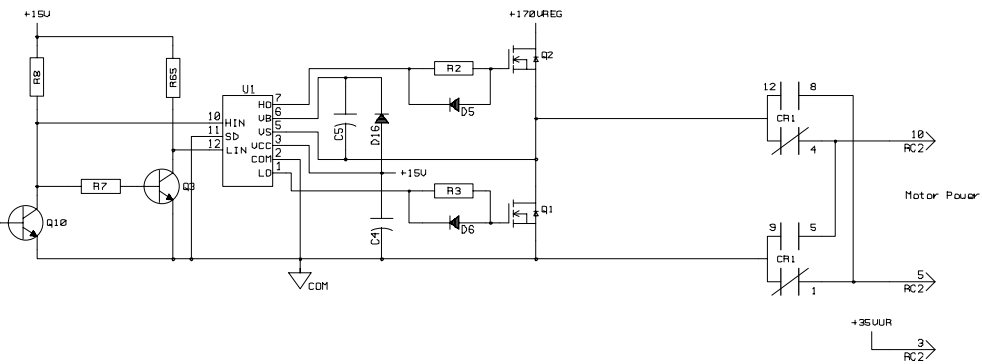
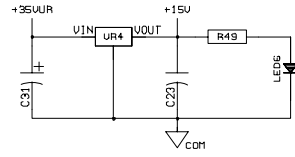
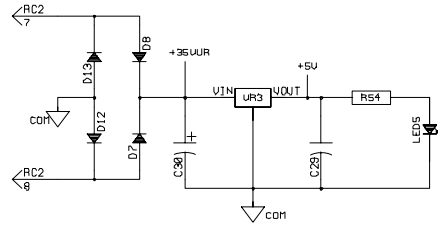
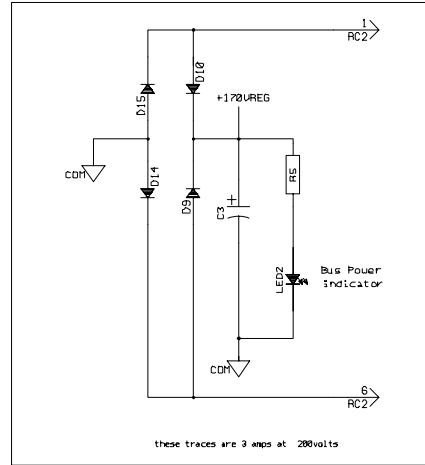
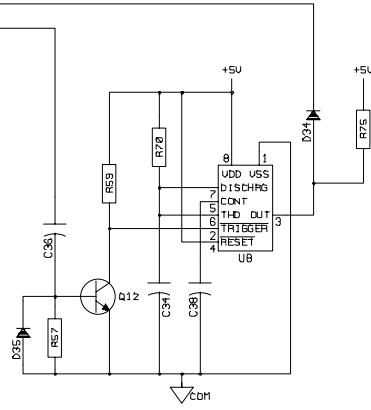



Figure 5-6. Circuit Diagram For Motor Board PC13



POWER/GROUND NETS FOR CHIPS	
U1	13=CDM 9=+15U
U4	11=CDM 4=+15U
U6	12=CDM 28=+15U
U7	12=CDM 9=+15U
UB	1=CDM 8=+5U
U10	4=CDM 9=+5U

	WARNING <ul style="list-style-type: none"> Do not touch live electrical parts. Disconnect input power or stop engine before servicing. Do not operate with covers removed. Have only qualified persons install, use, or service this unit.
	ELECTRIC SHOCK HAZARD

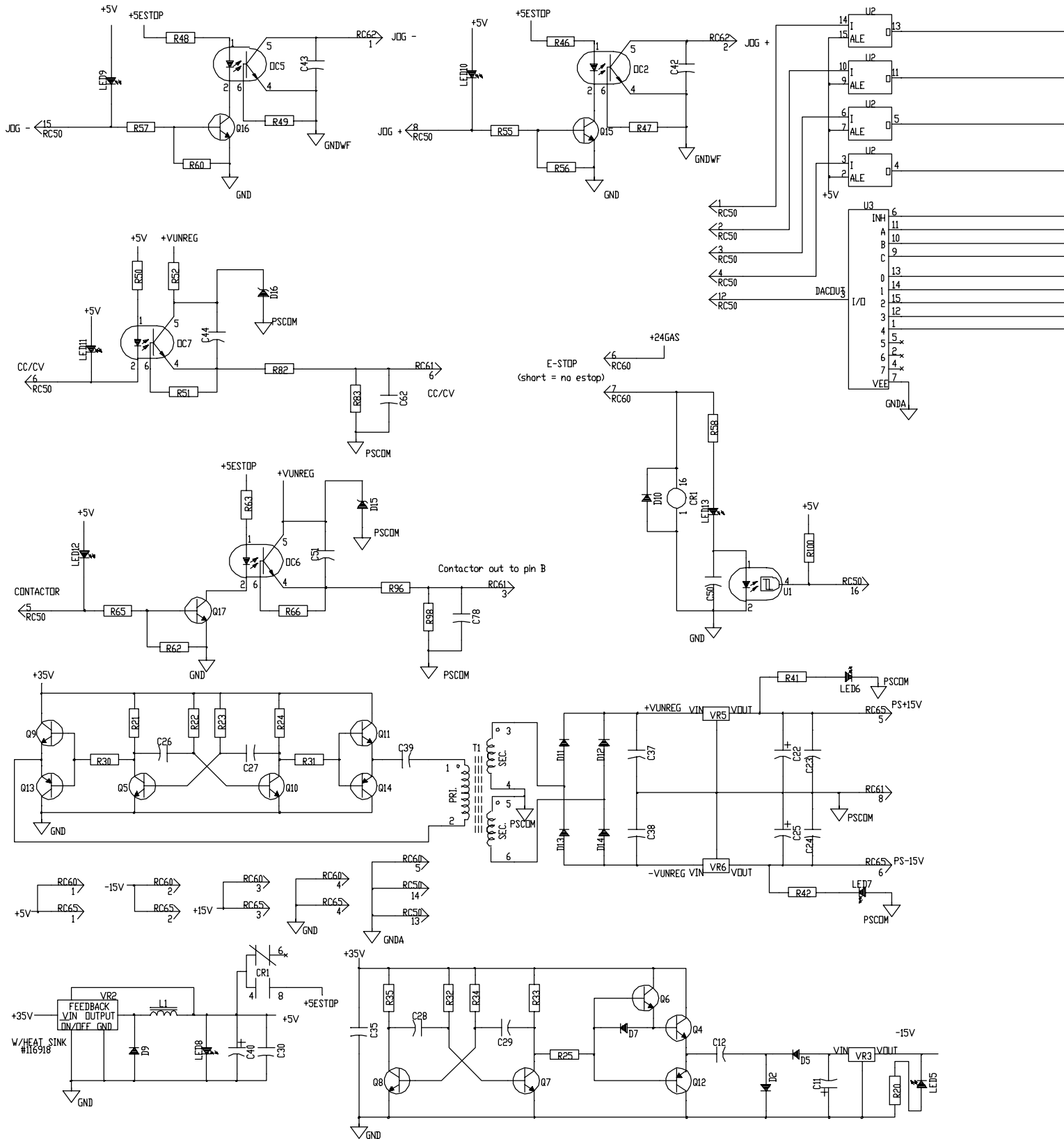
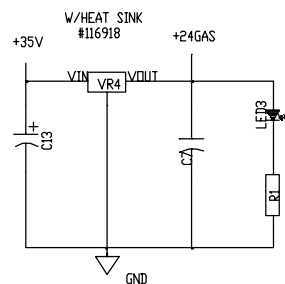
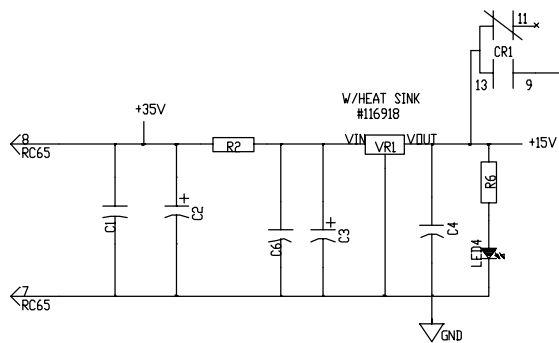
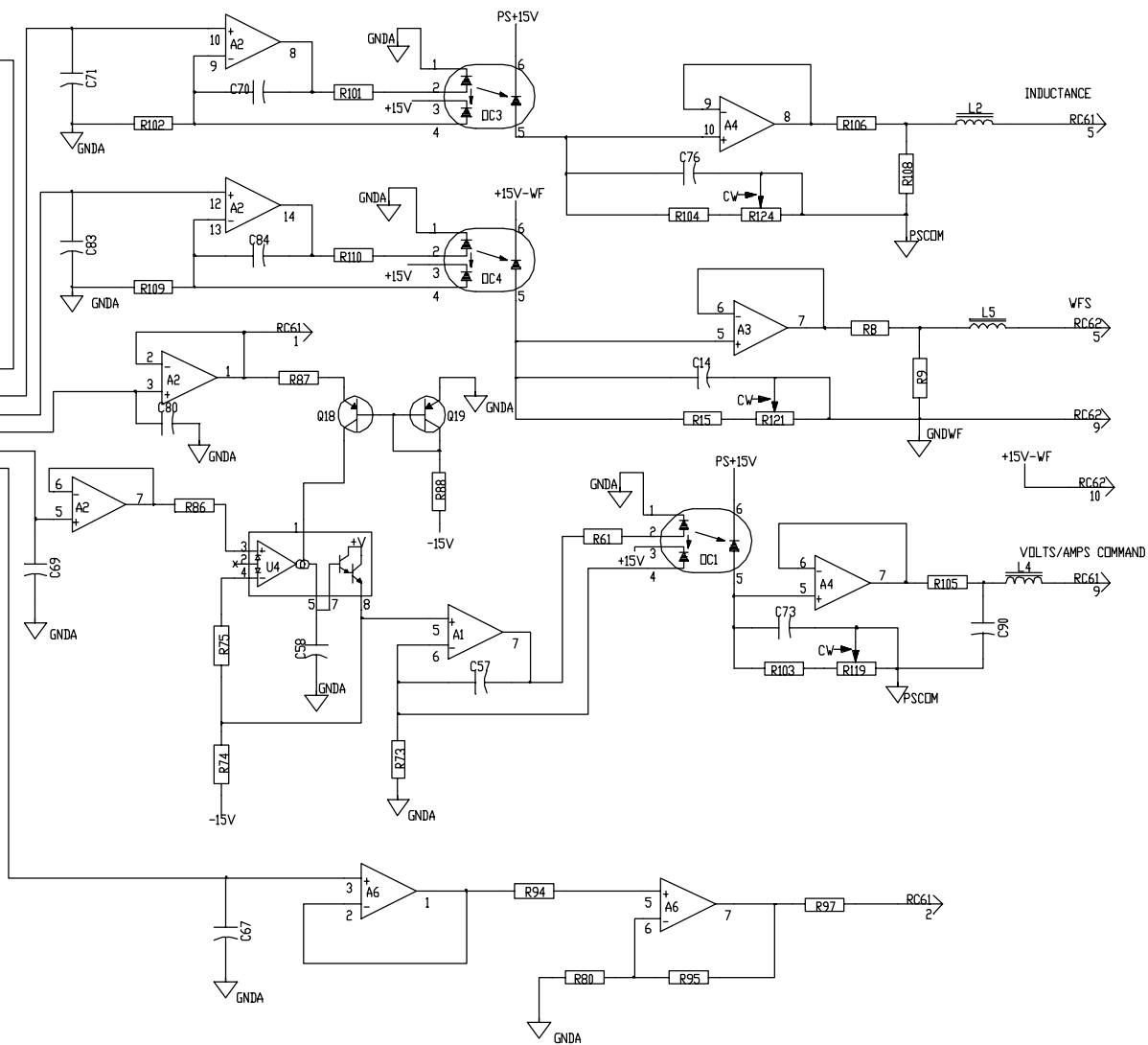



Figure 5-7. Circuit Diagram For Interface Board PC12 (Part 1 of 2)



	WARNING <ul style="list-style-type: none"> Do not touch live electrical parts. Disconnect input power or stop engine before servicing. Do not operate with covers removed. Have only qualified persons install, use, or service this unit.
	ELECTRIC SHOCK HAZARD

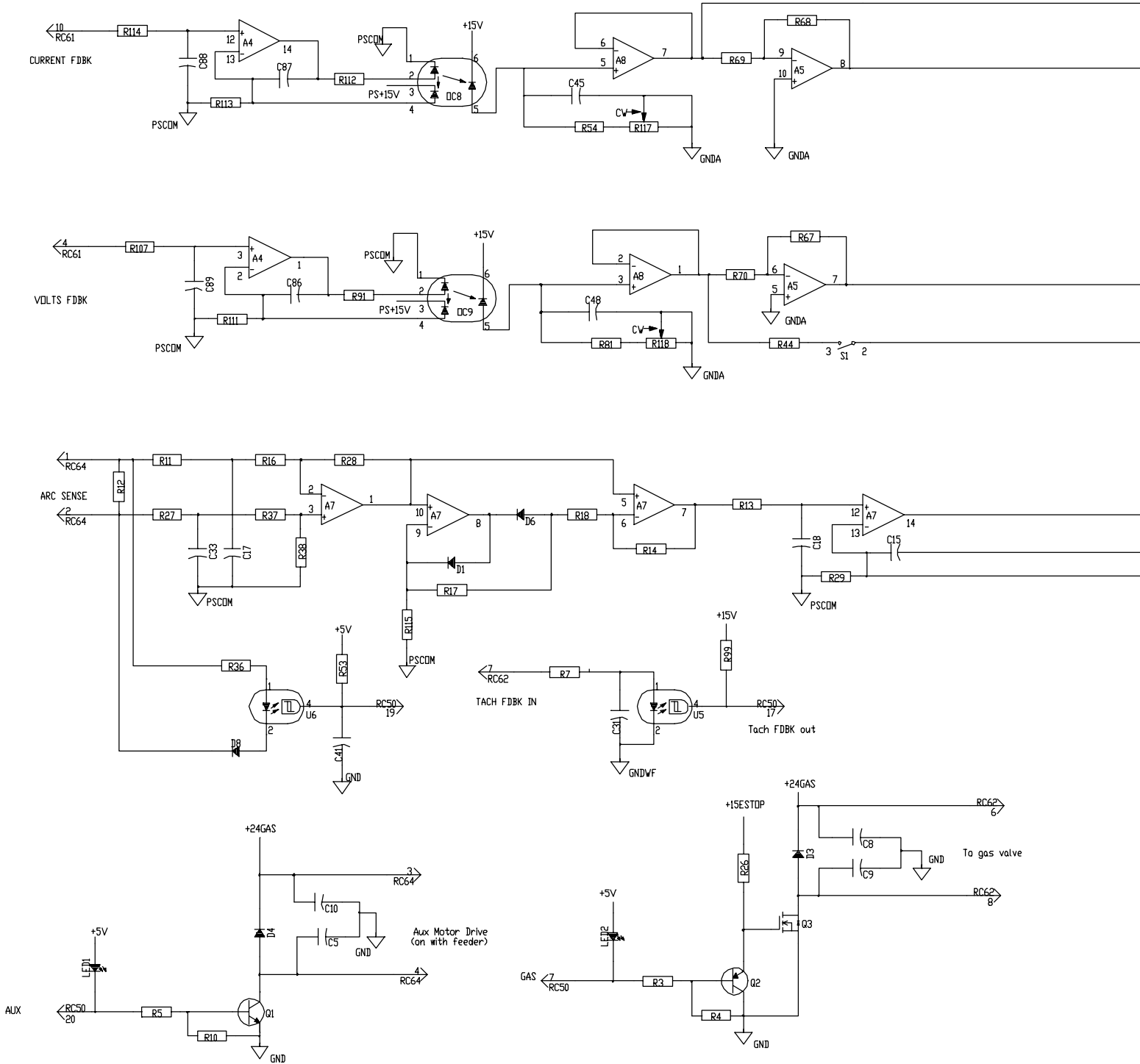
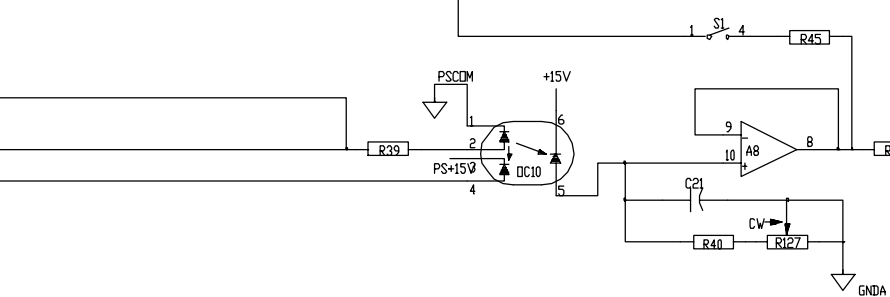
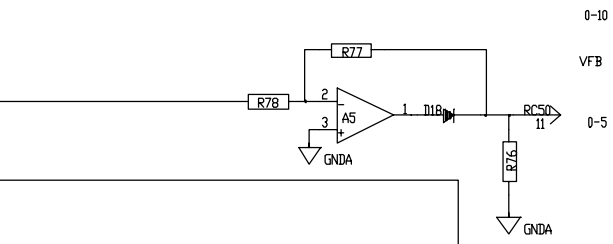
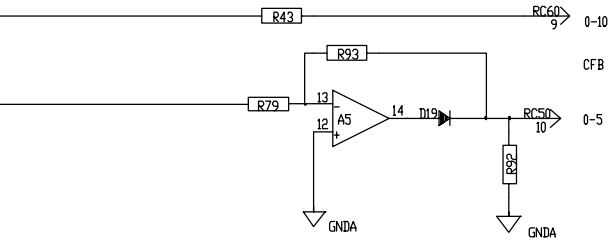
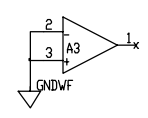
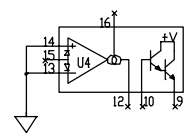
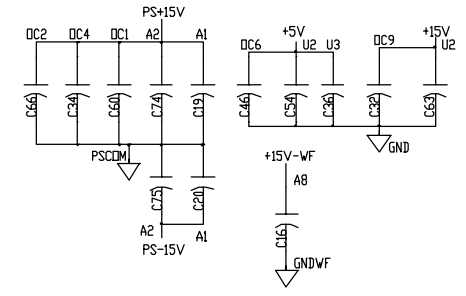
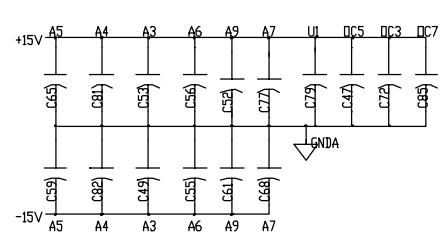
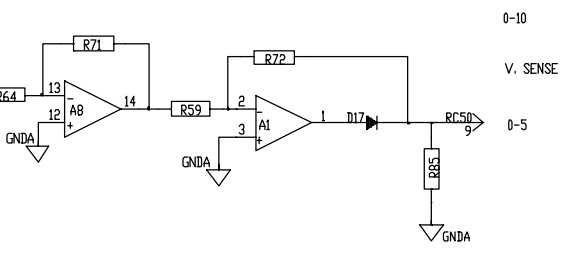
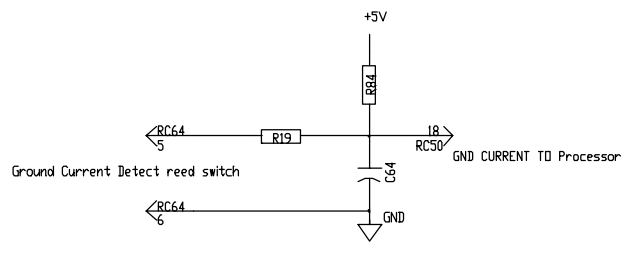



Figure 5-8. Circuit Diagram For Interface Board PC12 (Part 2 of 2)



POWER/GROUND NETS FOR CHIPS	
U1	5=GND,6=+5V
U2	8=GND,16=+15V,1=+5V
U3	8=GND,16=+15V
U4	11=+15V,6=-15V
U5	5=GND,6=+15V
U6	5=GND,6=+15V
A1	4=-15V,8=+15V
A2	4=+15V,11=-15V
A3	4=GNDWF,8=+15V-WF
A4	4=PS+15V,11=PS-15V
A5	4=+15V,11=-15V
A6	4=-15V,8=+15V
A7	4=PS+15V,11=PS-15V
A8	4=+15V,11=-15V



	⚠ WARNING
	<ul style="list-style-type: none"> • Do not touch live electrical parts. • Disconnect input power or stop engine before servicing. • Do not operate with covers removed.
ELECTRIC SHOCK HAZARD	<ul style="list-style-type: none"> • Have only qualified persons install, use, or service this unit.

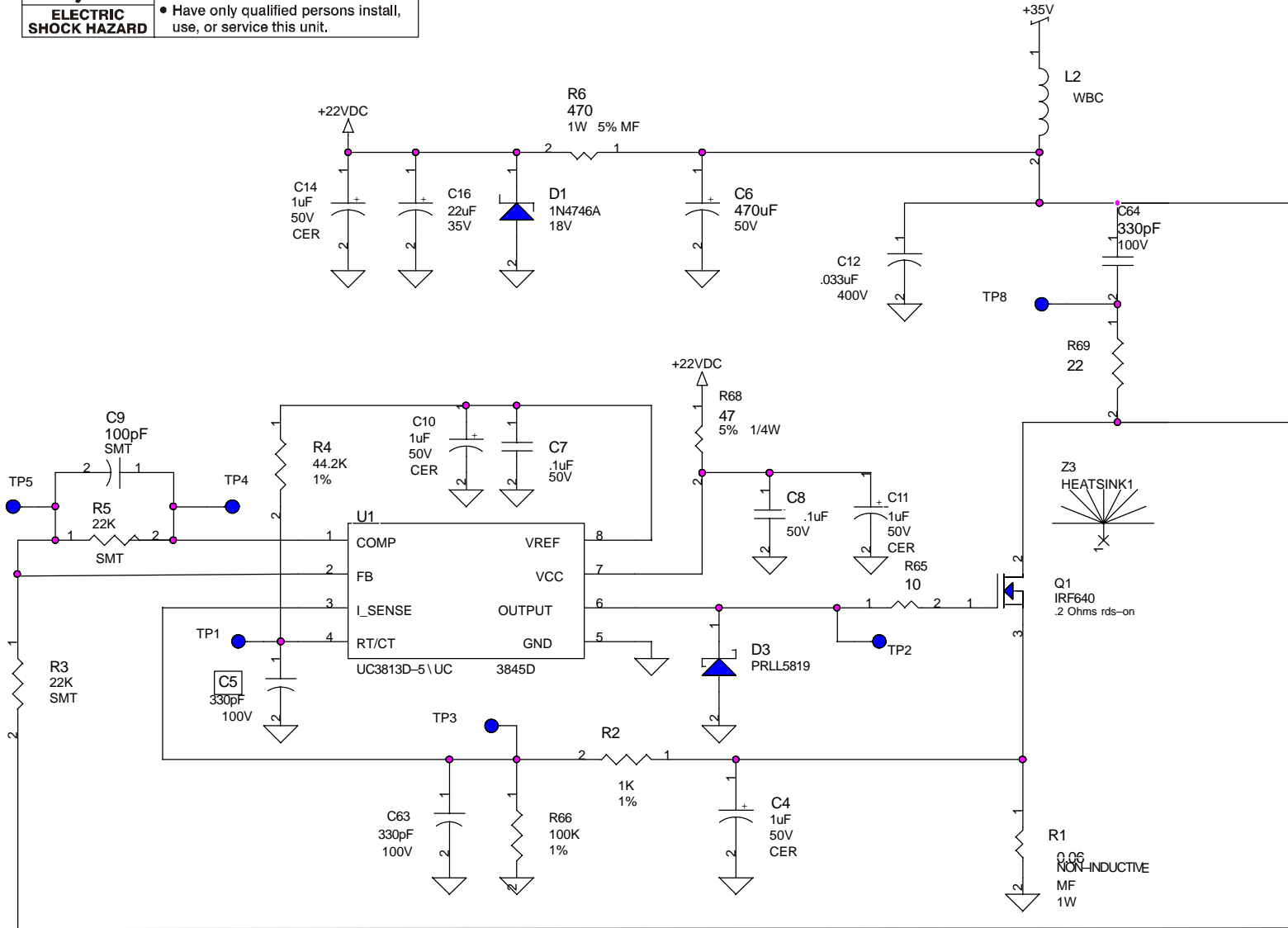
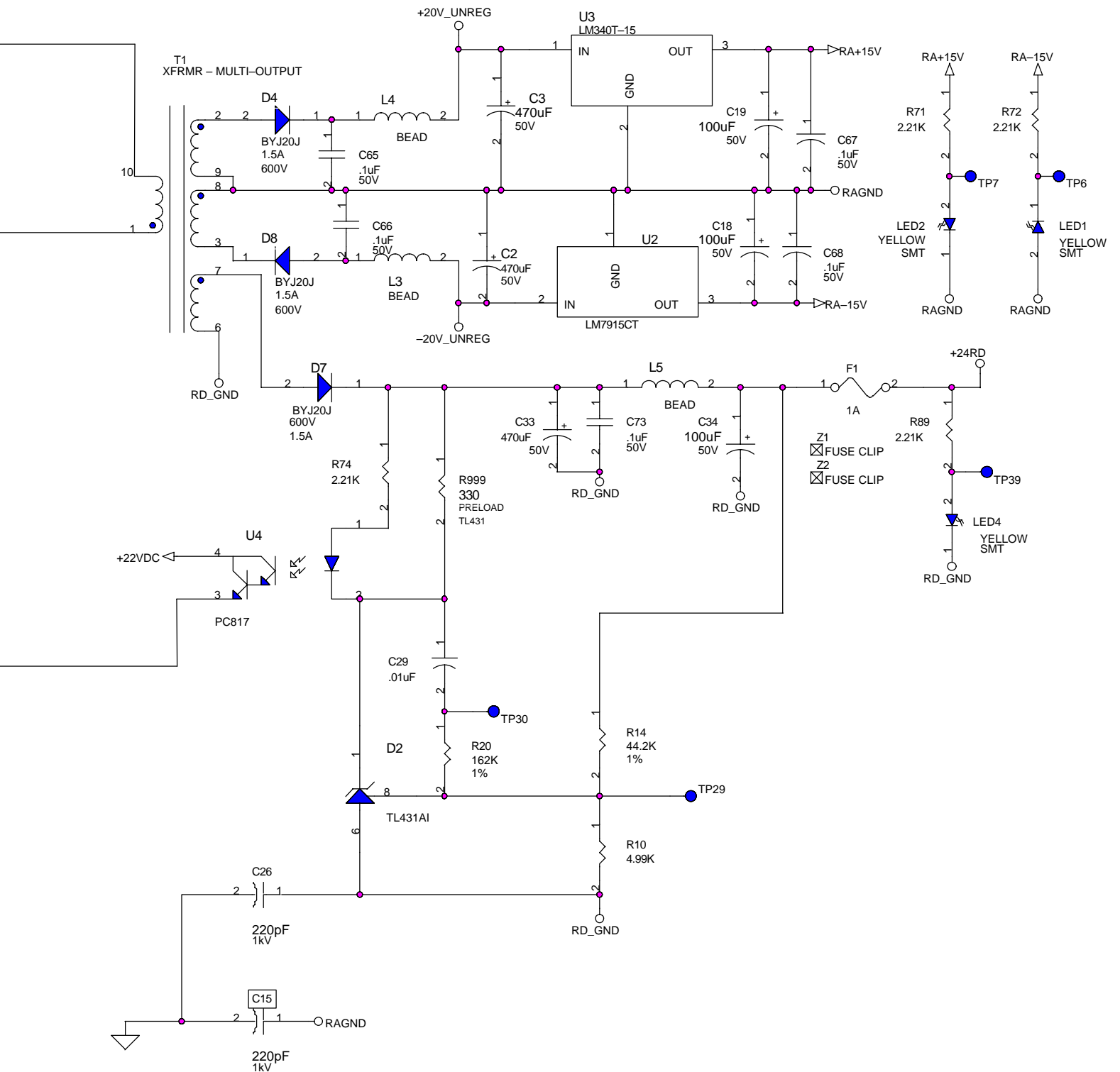
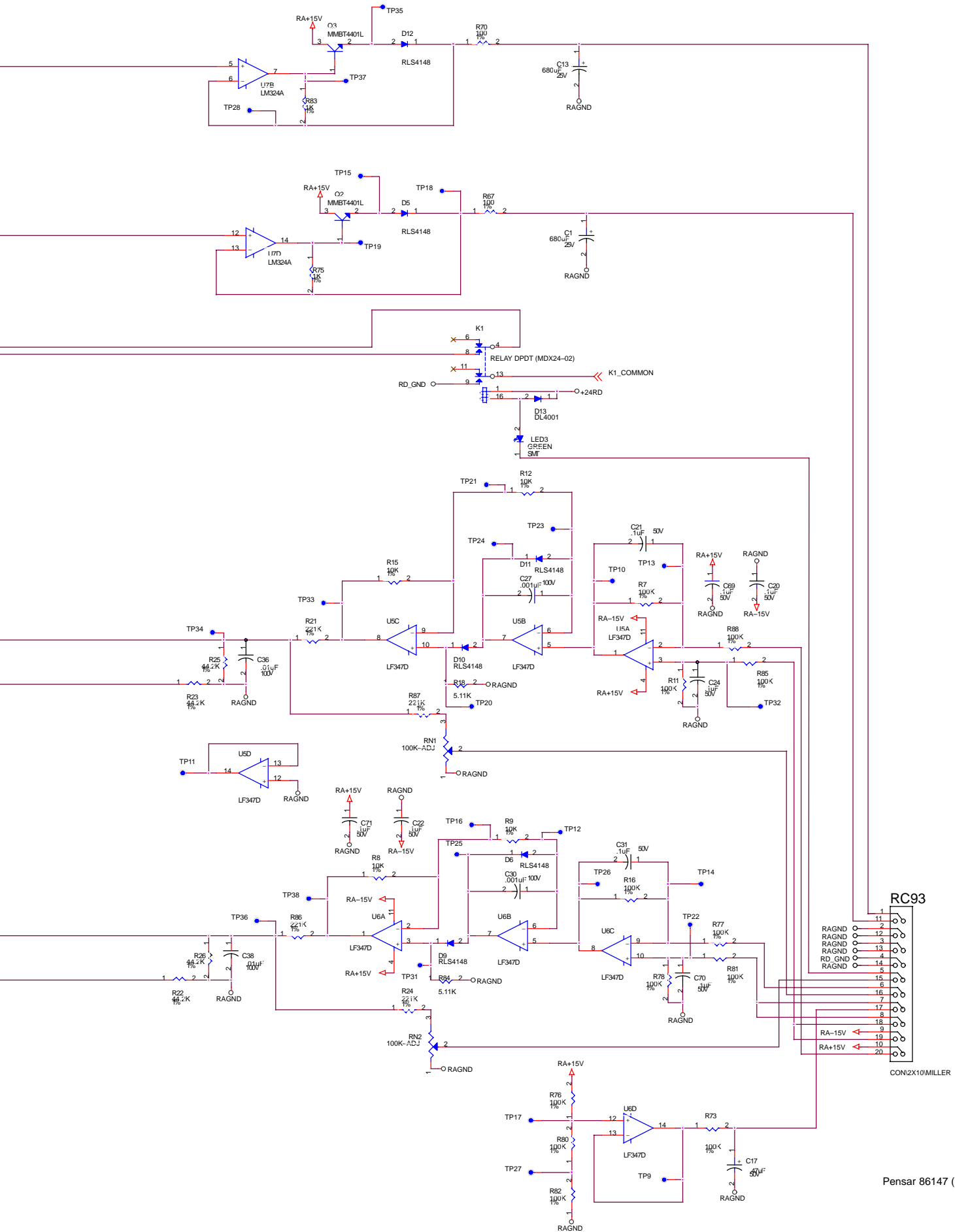
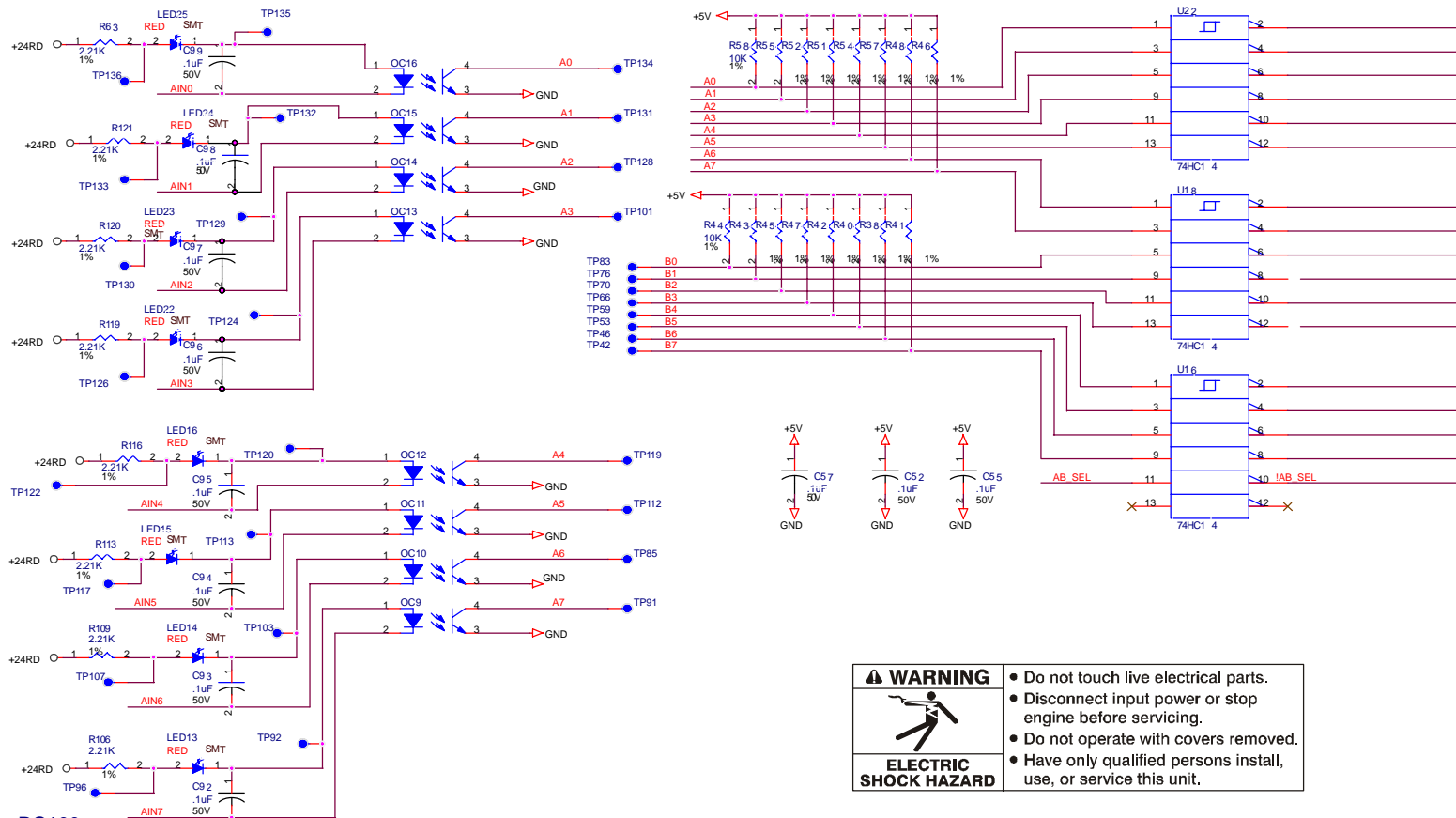


Figure 5-9. Circuit Diagram For Customer Interface Board PC14 (Part 1 of 3)



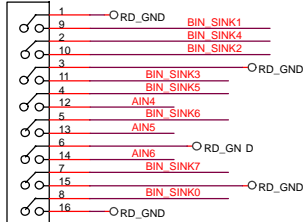


Pensar 86147 (Part 2 of 3)



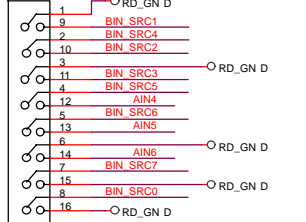
	WARNING Do not touch live electrical parts. Disconnect input power or stop engine before servicing. Do not operate with covers removed.
	ELECTRIC SHOCK HAZARD Have only qualified persons install, use, or service this unit.

RC100



CON:2X8MILLER

RC110



CON:2X8MILLER

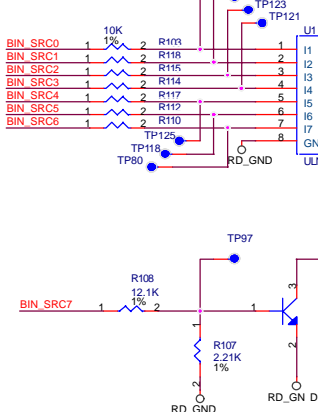
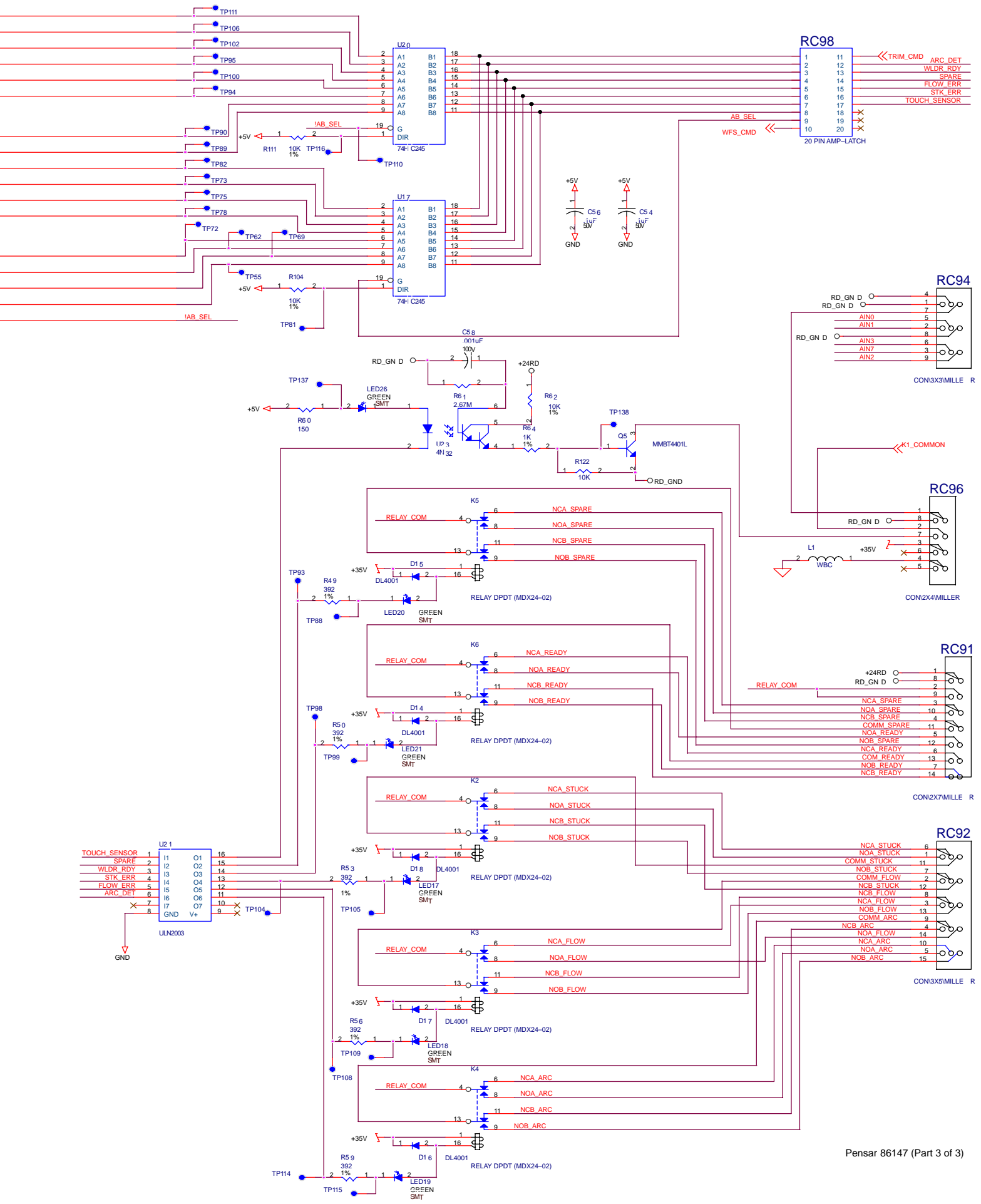

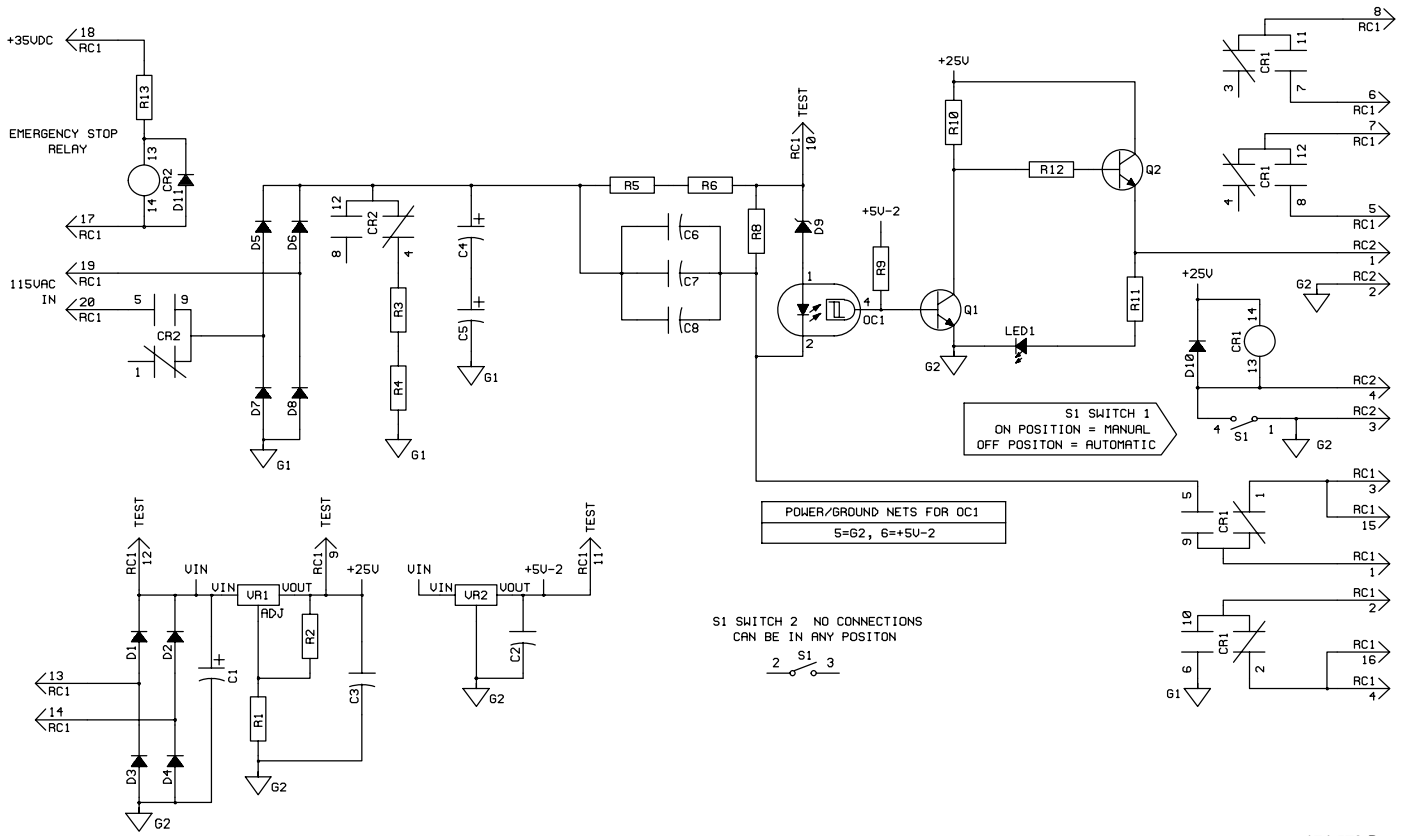


Figure 5-11. Circuit Diagram For Customer Interface Board PC14 (Part 3 of 3)




Pensar 86147 (Part 3 of 3)

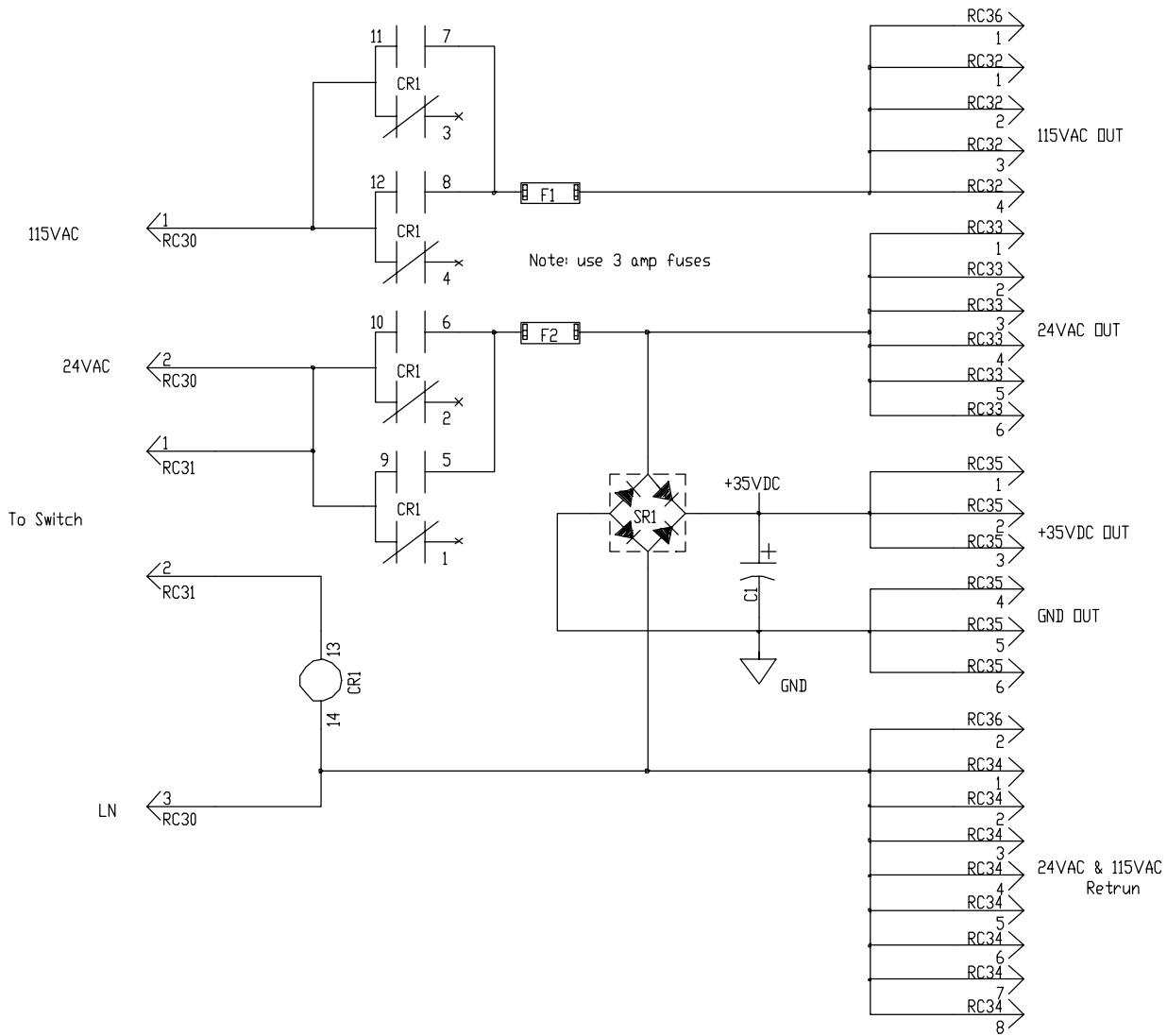
	⚠ WARNING
	<ul style="list-style-type: none"> Do not touch live electrical parts. Disconnect input power or stop engine before servicing. Do not operate with covers removed. Have only qualified persons install, use, or service this unit.
ELECTRIC SHOCK HAZARD	



174 578-B

Figure 5-12. Circuit Diagram For Touch Sensor Board PC18

	WARNING
	<ul style="list-style-type: none"> Do not touch live electrical parts. Disconnect input power or stop engine before servicing. Do not operate with covers removed.
ELECTRIC SHOCK HAZARD	<ul style="list-style-type: none"> Have only qualified persons install, use, or service this unit.



191 531

Figure 5-13. Circuit Diagram For Power Distribution Board PC20

SECTION 6 – PARTS LIST

☞ Hardware is common and not available unless listed.

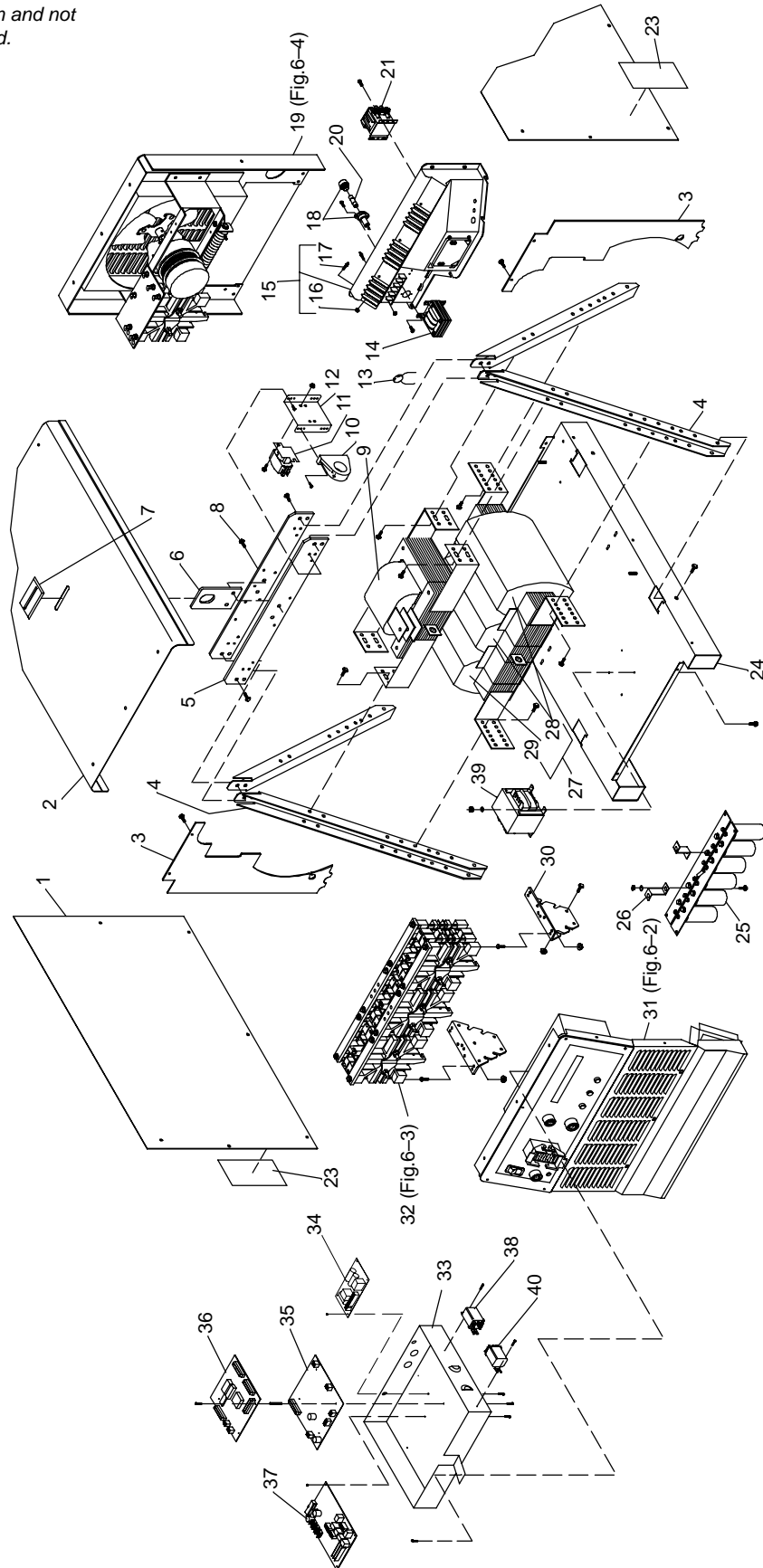


Figure 6-1. Main Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
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Figure 6-1 Main Assembly

...	1	...	+179 432	..	PANEL, side	...	2
...	2	...	179 431	..	COVER, top	...	1
...	3	...	164 699	..	BAFFLE, air	...	2
...	4	...	162 816	..	CHANNEL, upright	...	4
...	5	...	162 820	..	BAR, mtg lift eye	...	2
...	6	...	162 830	..	LIFT EYE	...	1
...	7	...	177 279	..	GASKET, lift eye	...	1
...	8	...	604 536	..	SCREW, .312-18 x 1.75 hexhd-pln gr 5	...	2
...	9	Z1	166 364	..	STABILIZER	...	1
...	10	HD1	168 829	..	TRANSDUCER, current 1000A	...	1
...	11	CR6	160 966	..	CONTACTOR, def prp 25A 2P 24VDC	...	1
...	12	...	173 605	..	BRACKET, mtg contactor	...	1
...	13	C21-23	163 906	..	CAPACITOR, 50 and 60Hz	...	3
...	14	T2	159 042	..	TRANSFORMER, control 50VA 24V 230/460/575 (60Hz)	...	1
...	14	T2	159 041	..	TRANSFORMER, control 50VA 24V 200/230/460 (60Hz)	...	1
...	14	T2	159 043	..	TRANSFORMER, control 50A 24V (50Hz)	...	1
...	15	TE1	159 244	..	PRIMARY BOX, (consisting of)	...	1
...	16	...	601 835	..	NUT, 10-32 brs	...	24
...	17	...	038 887	..	STUD, pri bd brs 10-32 x 1.375	...	24
...	...	...	010 913	..	WASHER, flat .218 ID brs	...	24
...	...	...	601 835	..	NUT, 10-32 brs	...	24
...	...	...	038 618	..	LINK, jumper term bd pri	...	8
...	18	...	159 034	..	HOLDER, fuse mintr	...	1
...	19	...	Fig 6-5	..	PANEL, rear w/components	...	1
...	20	F1	*156 065	..	FUSE, crtg .5A 600V time delay	...	1
...	21	W	160 793	..	CONTACTOR, def prp 60A 3P 24VAC	...	1
...	23	...	134 464	..	LABEL, warning general precautionary	...	2
...	24	...	163 359	..	BASE	...	1
...	25	C1	182 661	..	CAPACITOR ASSEMBLY, (consisting of)	...	1
...	...	...	163 535	..	CAPACITOR, elctlt 16000uf 60VDC	...	6
...	...	R6	140 002	..	RESISTOR, WW fxd 10W 500 ohm	...	1
...	...	...	162 817	..	BUS BAR, capacitor	...	2
...	26	...	182 660	..	BUS BAR, mtg capacitor	...	4
...	27	T1	189 835	..	TRANSFORMER, pwr main 200/230/460 (consisting of)	...	1
...	28	...	166 442	..	COIL, pri/sec 200/230/460 (center & RH)	...	2
...	29	...	166 441	..	COIL, pri/sec 200/230/460 (LH)	...	1
...	27	T1	189 836	..	TRANSFORMER, pwr main 230/460/575 (consisting of)	...	1
...	28	...	172 309	..	COIL, pri/sec 230/460/575 (center & RH)	...	2
...	29	...	172 308	..	COIL, pri/sec 230/460/575 (LH)	...	1
...	27	T1	189 837	..	TRANSFORMER, pwr main 380/400/440 (consisting of)	...	1
...	28	...	172 427	..	COIL, pri/sec (center & RH)	...	2
...	29	...	172 426	..	COIL, pri/sec (LH)	...	1
...	...	TP1,2	175 405	..	THERMOSTAT, NC (Included w/T1)	...	2
...	...	TP4,5	168 891	..	THERMOSTAT, NC (Included w/T1)	...	2
...	...	PLG13	189 873	..	CONNECTOR & PINS	...	1
...	...	RC13	189 874	..	CONNECTOR & SOCKETS	...	1
...	...	PLG6	168 847	..	CONNECTOR & SOCKETS	...	1
...	...	RC6	168 845	..	CONNECTOR & PINS	...	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
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Figure 6-1 Main Assembly (Continued)


... 30		161 294	.. BRACKET, mtg rectifier	2
... 31		Fig 6-2	.. PANEL, front w/components	1
... 32	SR1	192 672	.. RECTIFIER, SCR main (Fig 6-4)	1
	PLG14	115 094	.. CONNECTOR & SOCKETS	1
	PLG7	152 249	.. CONNECTOR & PINS	1
	RC7	168 846	.. CONNECTOR & SOCKETS	1
		010 467	.. CONNECTOR, clamp cable 1.250	1
	R7	◆ 114 808	.. RESISTOR, WW fxd 375W 5 ohm	1
... 33		204 069	.. ELECTRONICS BOX (consisting of)	1
... 34	PC18	174 573	.... CIRCUIT CARD ASSY, touch sensor	1
... 35	PC12	191 841	.... CIRCUIT CARD ASSY, weld interface	1
... 36	PC11	210 361	.... CIRCUIT CARD ASSY, processor w/prom	1
... 37	PC1	208 197	.... CIRCUIT CARD ASSY, control	1
... 38	CR3	052 964	.. RELAY, encl 24VDC DPDT	1
... 39	T11	204 979	.. TRANSFORMER, control 200VA	1
... 40	CR5	006 393	.. RELAY, encl 24VAC DPDT	1

◆ Part of Option 043 286 Additional Resistor

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

*Recommended Spare Parts.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

 Hardware is common and not available unless listed.

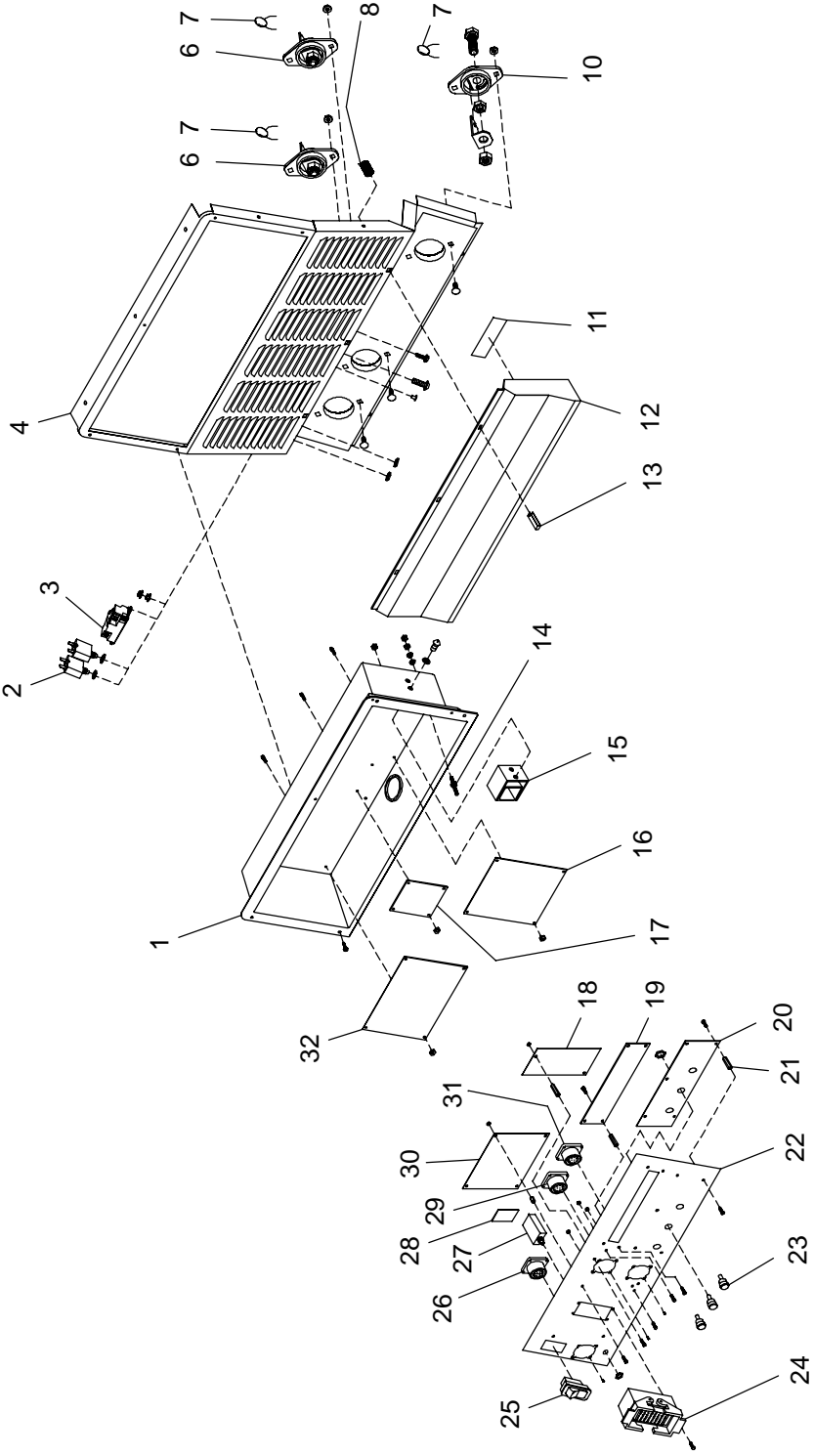


Figure 6-2. Panel, Front w/Components

802 997-A

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
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Figure 6-2 Panel, Front w/Components (Fig 6-1 Item 31)

...	1	203 630	.. ELECTRONICS BOX	1
...	2	CB1,2 093 995	.. CIRCUIT BREAKER, man reset 1P 15A 250VAC	2
...	3	RC9 604 176	.. RECEPTACLE, str dx grd 2P3W 15A 125V	1
...	4	204143	.. PANEL, front	1
...	6	POS 181 245	.. TERMINAL, pwr output red	2
...	7	C2,4,5 128 750	.. CAPACITOR, cer disc .1uf 500VDC	3
...	8	161 303	.. SPRING, cprsn .600 OD x .072 wire x 1.500 lg	3
...	10	NEG 181 246	.. TERMINAL, pwr output black	1
...	11	162 891	.. LABEL, warning electric shock	1
...	12	+172 587	.. COVER, stud output	1
...	13	160 935	.. CLIP, spring	3
...	14	038 887	.. STUD, pri bd brs 10-32 x 1.375	1
...	15	204 067	.. SWITCH, reed	1
...	16	PC13 209 249	.. CIRCUIT CARD ASSY, 115V motor board	1
...	17	PC20 191 533	.. CIRCUIT CARD ASSY, power distribution	1
...	18	PC22 200 073	.. CIRCUIT CARD ASSY, filter hf	1
...	19	PC17 177 290	.. DISPLAY, LED	1
...	20	PC15 182 998	.. CIRCUIT CARD ASSY, switch board	1
...	21	091 772	.. STAND-OFF, NO 6-32 x .625 LG .250 hex	4
...	22	203 628	.. PANEL, front	1
...	23	144 842	.. ACTUATOR, switch	3
...	24	RC70 201 058	.. CONN, rect 72 pin assy	1
...	25	S2 159 039	.. SWITCH, rocker SPDT 15A 125VAC	1
...	26	RC21 200 082	.. CONN, circ 97/met 4 pin	1
...	27	CB11 011 991	.. CIRCUIT BREAKER, man reset 1P 1.5A 250V	1
...	28	PC19 134 560	.. CIRCUIT CARD ASSY, filter hf	1
...	29	RC8 200 589	.. CONN, circ 97/met 10 skt	1
...	30	PC21 200 077	.. CIRCUIT CARD ASSY, robot interface filter hf	1
...	31	RC25 200 591	.. CONN, circ 97/met 11 skt	1
...	32	PC14 203 665	.. CIRCUIT CARD ASSY, customer interface	1

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

☞ Hardware is common and not available unless listed.

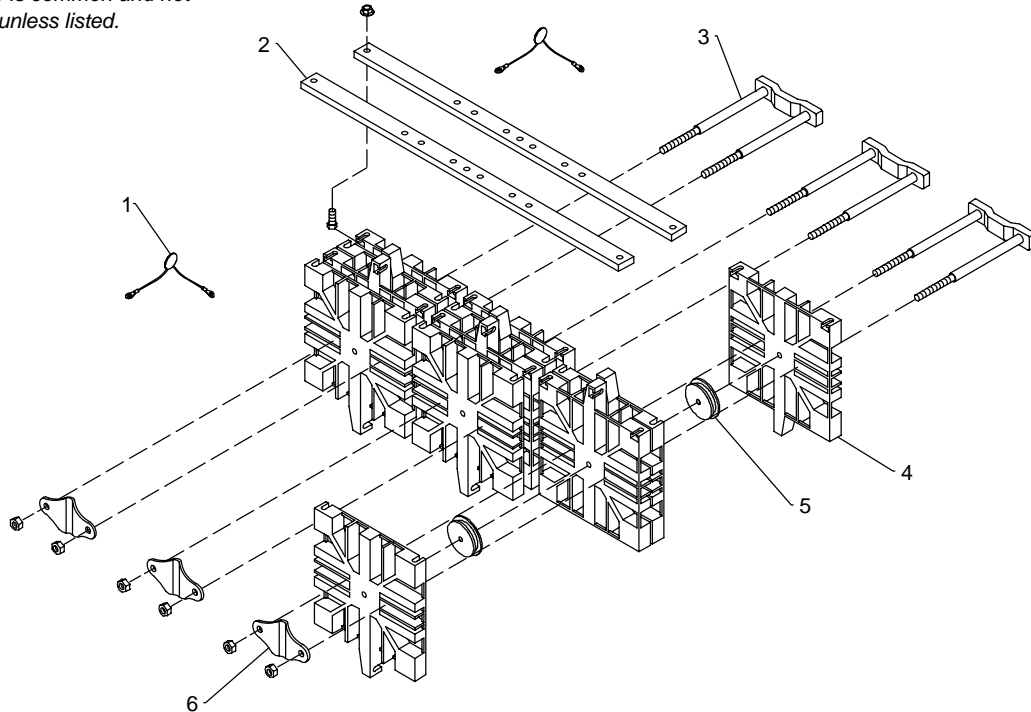


Figure 6-3. Rectifier, SCR Main SR1

802 351


Item No.	Dia. Mkgs.	Part No.	Description	Quantity			
Figure 6-3 Rectifier, SCR Main (Fig 6-1 Item 32)				192 672			
SR1							
...	1	C7-12	...	048 420	.. CAPACITOR, cer disc .01uf 1000VDC	...	6
...	2		...	191 989	.. BAR, mtg rectifier	...	2
...	3		...	188 691	.. CLAMP, thyristor rectifier 5.375	...	3
...	4		...	188 839	.. HEAT SINK, rectifier snowflake .800	...	12
...	5	SCR1-6	...	161 668	.. THYRISTOR, SCR 300A 300V hockey puck	...	6
...	6		...	166 667	.. CLAMP, spring thyristor rectifier 5.500	...	3
...		PLG1	...	158 720	.. CONNECTOR & SOCKETS	...	1
...		TP3	...	192 673	.. THERMOSTAT, rectifier	...	1
...		TP6	...	192 674	.. THERMOSTAT, rectifier	...	1

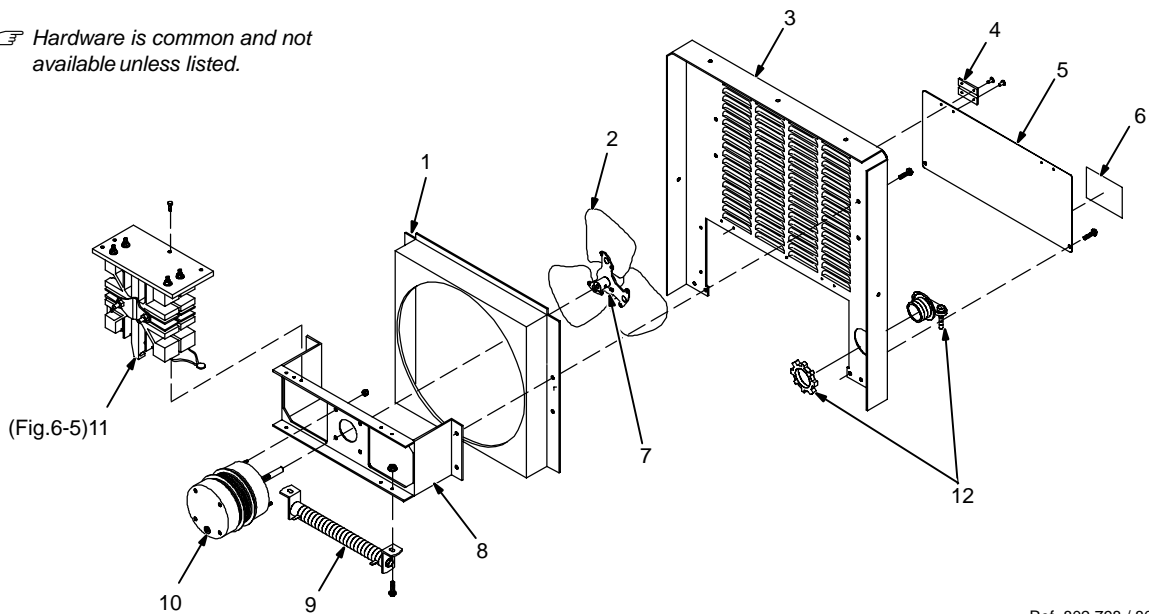
To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
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Figure 6-4 Panel, Rear w/Components (Fig 6-1 Item 19)

... 1	...	173 283	.. CHAMBER, plenum 14 in	1
... 2	...	180 165	.. BLADE, fan 14 in 3wg 28deg .375 bore CCW	1
... 3	...	162 807	.. PANEL, rear	1
... 4	...	168 343	.. HINGE, door primary	2
... 5	...	+162 818	.. DOOR, access primary	1
... 6	...	168 384	.. LABEL, warning electric shock	1
... 7	...	602 177	.. SCREW, set .250-20 x .250knrpt sch stl	2
... 8	...	124 274	.. BRACKET, mtg fan motor	1
... 9	R3	114 808	.. RESISTOR, WW fxd 375W 5 ohm	1
... 10	FM	116 190	.. MOTOR, 1/12HP 230V 1550RPM 50/60Hz 1.5A	1
... 11	...	194 745	.. BLOCKING DIODE	1
... 12	...	010 467	.. CONNECTOR, clamp cable 1.250	1

 Hardware is common and not available unless listed.

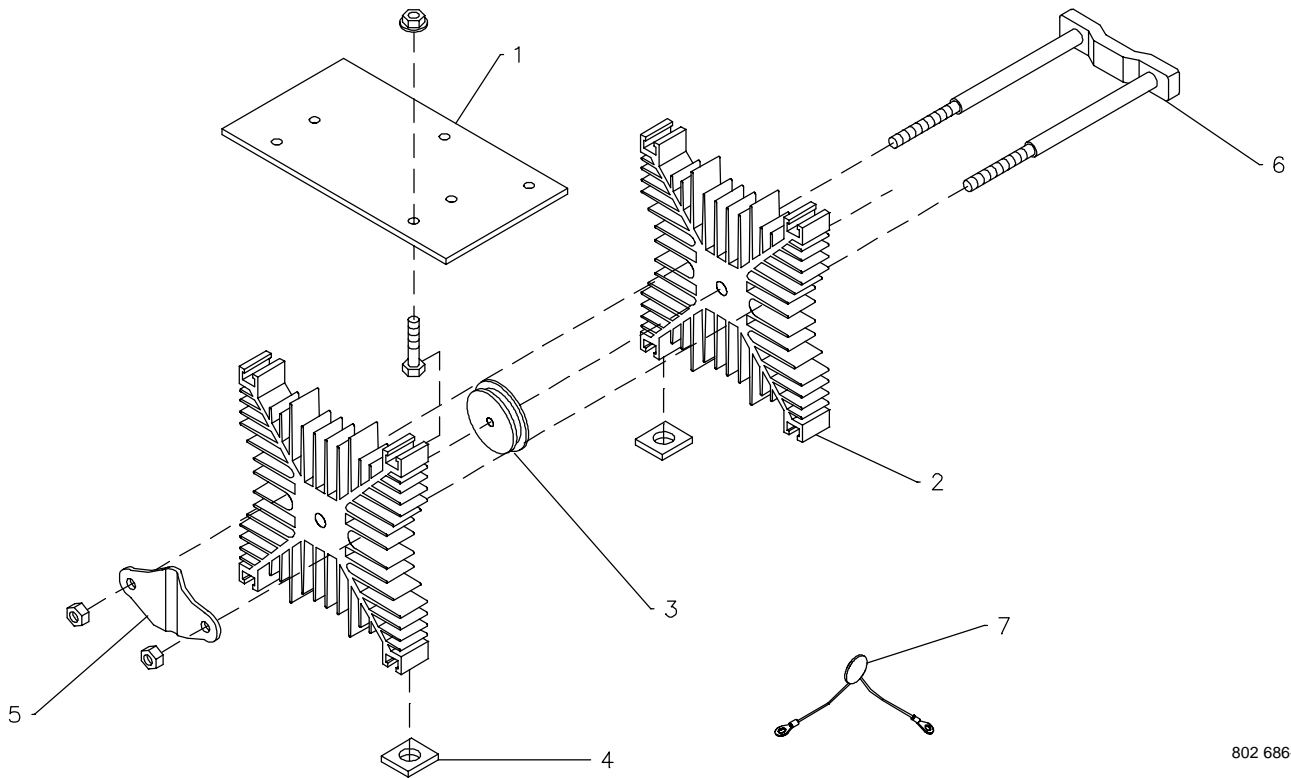


Ref. 802 798 / 800 707-B

Figure 6-4. Panel, Rear w/Components

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.



802 686-A

Figure 6-5. Blocking Diode

Item No.	Part No.	Description	Quantity
Figure 6-5. Blocking Diode (Fig 6-4 Item 11)			
1	200 355	Bracket, Mtg Diode	1
2	191 248	Heat Sink, rectifier snowflake	2
3	086 353	Diode, Rect 800A 300V R7S Hockey	1
4	048 775	Bus Bar, Tab Connecting	2
5	166 667	Clamp, spring thyristor rectifier	1
6	201 059	Clamp, thyristor rectifier 4.75	1
7	048 420	Capacitor, cer disc .01 uf	1
	168 894	Thermostat, Nc Open 125F Close 105F No Flangew/leads	1
	192 731	Thermostat, Nc Open 203F Close 173F No Flangew/leads	1

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

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WARRANTY

Effective January 1, 2002

(Equipment with a serial number preface of "LC" or newer)

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Support

Need fast answers to the tough welding questions? Contact your distributor. The expertise of the distributor and Miller is there to help you, every step of the way.

LIMITED WARRANTY – Subject to the terms and conditions below, Miller Electric Mfg. Co., Appleton, Wisconsin, warrants to its original retail purchaser that new Miller equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Miller. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Miller must be notified in writing within thirty (30) days of such defect or failure, at which time Miller will provide instructions on the warranty claim procedures to be followed.

Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the date that the equipment was delivered to the original retail purchaser, or one year after the equipment is sent to a North American distributor or eighteen months after the equipment is sent to an International distributor.

1. 5 Years Parts — 3 Years Labor
 - * Original main power rectifiers
 - * Inverters (input and output rectifiers only)
2. 3 Years — Parts and Labor
 - * Transformer/Rectifier Power Sources
 - * Plasma Arc Cutting Power Sources
 - * Semi-Automatic and Automatic Wire Feeders
 - * Inverter Power Supplies
 - * Intelligig
 - * Engine Driven Welding Generators
(NOTE: Engines are warranted separately by the engine manufacturer.)
3. 1 Year — Parts and Labor Unless Specified
 - * DS-2 Wire Feeder
 - * Motor Driven Guns (w/exception of Spoolmate Spoolguns)
 - * Process Controllers
 - * Positioners and Controllers
 - * Automatic Motion Devices
 - * RFCS Foot Controls
 - * Induction Heating Power Sources
 - * Water Coolant Systems
 - * Flowgauge and Flowmeter Regulators (No Labor)
 - * HF Units
 - * Grids
 - * Maxstar 85, 140
 - * Spot Welders
 - * Load Banks
 - * Racks
 - * Running Gear/Trailers
 - * Plasma Cutting Torches (except APT & SAF Models)
 - * Field Options
(NOTE: Field options are covered under True Blue[®] for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
4. 6 Months — Batteries
5. 90 Days — Parts
 - * MIG Guns/TIG Torches
 - * Induction Heating Coils and Blankets

- * APT, ZIPCUT & PLAZCUT Model Plasma Cutting Torches
- * Remote Controls
- * Accessory Kits
- * Replacement Parts (No labor)
- * Spoolmate Spoolguns
- * Canvas Covers

Miller's True Blue[®] Limited Warranty shall not apply to:

1. **Consumable components; such as contact tips, cutting nozzles, contactors, brushes, slip rings, relays or parts that fail due to normal wear. (Exception: brushes, slip rings, and relays are covered on Bobcat, Trailblazer, and Legend models.)**
2. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

MILLER PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL/INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at Miller's option: (1) repair; or (2) replacement; or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. Miller's option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a Miller authorized service facility as determined by Miller. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

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

Some states in the U.S.A. do not allow limitations of how long an implied warranty lasts, or the exclusion of incidental, indirect, special or consequential damages, so the above limitation or exclusion may not apply to you. This warranty provides specific legal rights, and other rights may be available, but may vary from state to state.

In Canada, legislation in some provinces provides for certain additional warranties or remedies other than as stated herein, and to the extent that they may not be waived, the limitations and exclusions set out above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary from province to province.





Owner's Record

Please complete and retain with your personal records.

Model Name	Serial/Style Number
Purchase Date	(Date which equipment was delivered to original customer.)
Distributor	
Address	
City	
State	Zip



For Service

Call 1-800-4-A-Miller or see our website at www.MillerWelds.com to locate a DISTRIBUTOR or SERVICE AGENCY near you.

Always provide Model Name and Serial/Style Number.

Contact your Distributor for:

- Welding Supplies and Consumables
- Options and Accessories
- Personal Safety Equipment
- Service and Repair
- Replacement Parts
- Training (Schools, Videos, Books)
- Technical Manuals (Servicing Information and Parts)
- Circuit Diagrams
- Welding Process Handbooks

Contact the Delivering Carrier to:

- File a claim for loss or damage during shipment.
- For assistance in filing or settling claims, contact your distributor and/or equipment manufacturer's Transportation Department.

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