



OM-245 729C

2009-10

Processes



TIG (GTAW) Welding



Stick (SMAW) Welding

Description



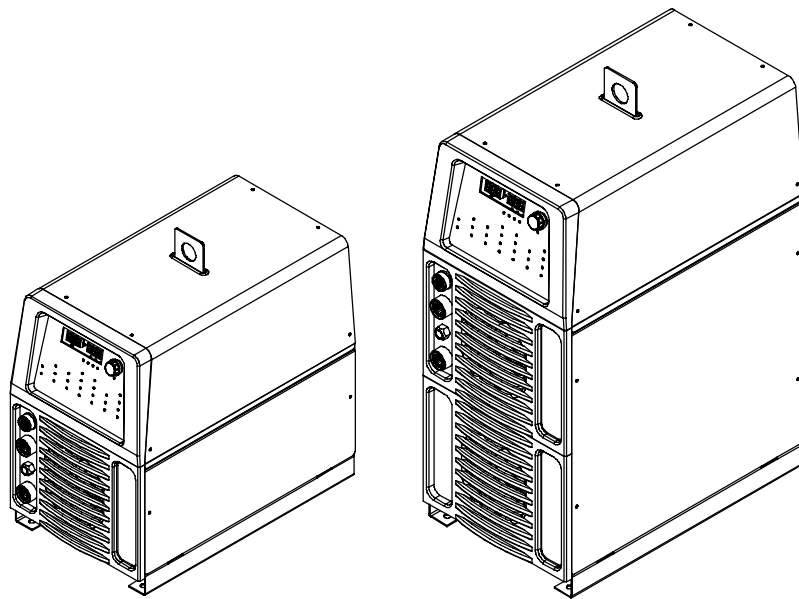
380/575 Volt Models W/Auto-Line™

Arc Welding Power Source

Dynasty[®] 350, 700

Maxstar[®] 350, 700

Including Optional Cart And Cooler CE Models



Visit our website at

www.MillerWelds.com

OWNER'S MANUAL

File: TIG (GTAW)



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 specification 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.



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DECLARATION OF CONFORMITY

for European Community (CE marked) products.

MILLER Electric Mfg. Co., 1635 Spencer Street, Appleton, WI 54914 U.S.A. declares that the product(s) identified in this declaration conform to the essential requirements and provisions of the stated Council Directive(s) and Standard(s).

Product/Apparatus Identification:

Product	Stock Number
Dynasty 350	907204021
Maxstar 350	907334021
Dynasty 700	907101021
Maxstar 700	907103021

Council Directives:

- 2006/95/EC Low Voltage
- 2004/108/EC Electromagnetic Compatibility

Standards:

- IEC 60974-1:2005 Arc welding equipment – Part 1: Welding power sources
- IEC 60974-3:2007 Arc welding equipment – Part 3: Arc striking and stabilizing devices
- IEC 60974-10:2007 Arc Welding Equipment – Part 10: Electromagnetic compatibility (EMC) requirements
- EN 50445:2008 Product family standard to demonstrate compliance of equipment for resistance welding, arc welding and allied processes with the basic restrictions related to human exposure to electromagnetic fields (0 Hz – 300Hz)

US Signatory:

August 20, 2009

David A. Werba

Date of Declaration


MANAGER, PRODUCT DESIGN COMPLIANCE


SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

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 Protect yourself and others from injury — read and follow these precautions.

1-1. Symbol Usage

 **DANGER!** – Indicates a hazardous situation which, if not avoided, will result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.

 Indicates a hazardous situation which, if not avoided, could result in death or serious injury. The possible hazards are shown in the adjoining symbols or explained in the text.


NOTICE – Indicates statements not related to personal injury.

 Indicates special instructions.



This group of symbols means Warning! Watch Out! 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 1-5. 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.
- Additional safety precautions are required when any of the following electrically hazardous conditions are present: in damp locations or while wearing wet clothing; on metal structures such as floors, gratings, or scaffolds; when in cramped positions such as sitting, kneeling, or lying; or when there is a high risk of unavoidable or accidental contact with the workpiece or ground. For these conditions, use the following equipment in order presented: 1) a semiautomatic DC constant voltage (wire) welder, 2) a DC manual (stick) welder, or 3) an AC welder with reduced open-circuit voltage. In most situations, use of a DC, constant voltage wire welder is recommended. And, do not work alone!
- 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.
- Keep cords dry, free of oil and grease, and protected from hot metal and sparks.
- 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.
- Do not touch electrode holders connected to two welding machines at the same time since double open-circuit voltage will be present.
- 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 in inverter welding power sources AFTER removal of input power.

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



HOT PARTS can burn.

- Do not touch hot parts bare handed.
- Allow cooling period before working on equipment.
- To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.



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 local forced ventilation at the arc to remove welding fumes and gases.
- If ventilation is poor, wear an approved air-supplied respirator.
- Read and understand 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 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 an approved welding helmet fitted with a proper shade of filter lenses to protect your face and eyes from arc rays and sparks 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, glare and sparks; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (leather, heavy cotton, or wool) and foot protection.

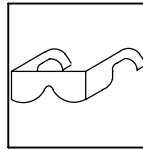


WELDING can cause fire or explosion.

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.

- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Do not weld where flying sparks can strike flammable material.
- Protect yourself and others from flying sparks and hot metal.
- 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).
- Do not weld where the atmosphere may contain flammable dust, gas, or liquid vapors (such as gasoline).
- 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, sparks, 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.
- After completion of work, inspect area to ensure it is free of sparks, glowing embers, and flames.
- Use only correct fuses or circuit breakers. Do not oversize or bypass them.
- Follow requirements in OSHA 1910.252 (a) (2) (iv) and NFPA 51B for hot work and have a fire watcher and extinguisher nearby.



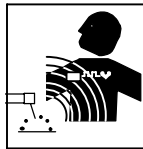
FLYING METAL or DIRT can injure eyes.

- 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.



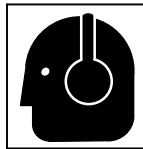
BUILDUP OF GAS can injure or kill.

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



ELECTRIC AND MAGNETIC FIELDS (EMF) can affect Implanted Medical Devices.

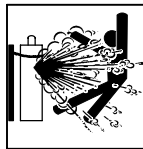
- Wearers of Pacemakers and other Implanted Medical Devices should keep away.
- Implanted Medical Device wearers should consult their doctor and the device manufacturer before going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations.



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, physical damage, 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.
- Use the right equipment, correct procedures, and sufficient number of persons to lift and move cylinders.
- Read and follow instructions on compressed gas cylinders, associated equipment, and Compressed Gas Association (CGA) publication P-1 listed in Safety Standards.

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



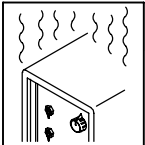
FIRE OR EXPLOSION hazard.

- 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.



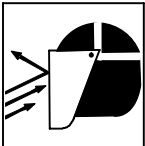
FALLING EQUIPMENT can injure.

- 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.
- Keep equipment (cables and cords) away from moving vehicles when working from an aerial location.
- Follow the guidelines in the Applications Manual for the Revised NIOSH Lifting Equation (Publication No. 94-110) when manually lifting heavy parts or equipment.



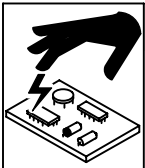
OVERUSE can cause OVERHEATING

- 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.



FLYING SPARKS can injure.

- Wear a face shield to protect eyes and face.
- Shape tungsten electrode only on grinder with proper guards in a safe location wearing proper face, hand, and body protection.
- Sparks can cause fires — keep flammables away.



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 injure.

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



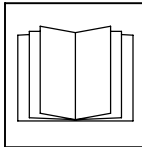
WELDING WIRE can injure.

- 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.



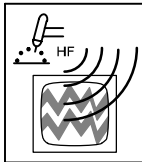
MOVING PARTS can injure.

- Keep away from moving parts such as fans.
- Keep all doors, panels, covers, and guards closed and securely in place.
- Have only qualified persons remove doors, panels, covers, or guards for maintenance and troubleshooting as necessary.
- Reinstall doors, panels, covers, or guards when maintenance is finished and before reconnecting input power.



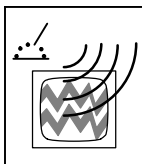
READ INSTRUCTIONS.

- Read and follow all labels and the Owner's Manual carefully before installing, operating, or servicing unit. Read the safety information at the beginning of the manual and in each section.
- Use only genuine replacement parts from the manufacturer.
- Perform maintenance and service according to the Owner's Manuals, industry standards, and national, state, and local codes.



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. California Proposition 65 Warnings


 Welding or cutting equipment 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.)

 Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Wash hands after handling.

For Gasoline Engines:

 Engine exhaust contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

For Diesel Engines:

 Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

1-5. Principal Safety Standards

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

Safe Practices for the Preparation of Containers and Piping for Welding and Cutting, American Welding Society Standard AWS F4.1, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Quincy, MA 02269 (phone: 1-800-344-3555, website: www.nfpa.org and www.sparky.org).

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 4221 Walney Road, 5th Floor, Chantilly, VA 20151 (phone: 703-788-2700, website: www.cganet.com).

Safety in Welding, Cutting, and Allied Processes, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 5060 Spectrum Way, Suite 100, Ontario, Canada L4W 5NS (phone: 800-463-6727, website: www.csa-international.org).

Safe Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute,

25 West 43rd Street, New York, NY 10036 (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, Quincy, MA 02269 (phone: 1-800-344-3555, website: www.nfpa.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 15250-7954 (phone: 1-866-512-1800) (there are 10 OSHA Regional Offices—phone for Region 5, Chicago, is 312-353-2220, website: www.osha.gov).

U.S. Consumer Product Safety Commission (CPSC), 4330 East West Highway, Bethesda, MD 20814 (phone: 301-504-7923, website: www.cpsc.gov).

Applications Manual for the Revised NIOSH Lifting Equation, The National Institute for Occupational Safety and Health (NIOSH), 1600 Clifton Rd, Atlanta, GA 30333 (phone: 1-800-232-4636, website: www.cdc.gov/NIOSH).

1-6. EMF Information

Electric current flowing through any conductor causes localized electric and magnetic fields (EMF). Welding current creates an EMF field around the welding circuit and welding equipment. EMF fields may interfere with some medical implants, e.g. pacemakers. Protective measures for persons wearing medical implants have to be taken. For example, access restrictions for passers-by or individual risk assessment for welders. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

1. Keep cables close together by twisting or taping them, or using a cable cover.
2. Do not place your body between welding cables. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.

4. Keep head and trunk as far away from the equipment in the welding circuit as possible.
5. Connect work clamp to workpiece as close to the weld as possible.
6. Do not work next to, sit or lean on the welding power source.
7. Do not weld whilst carrying the welding power source or wire feeder.

About Implanted Medical Devices:

Implanted Medical Device wearers should consult their doctor and the device manufacturer before performing or going near arc welding, spot welding, gouging, plasma arc cutting, or induction heating operations. If cleared by your doctor, then following the above procedures is recommended.

SECTION 2 – CONSIGNES DE SÉCURITÉ – LIRE AVANT UTILISATION

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! Se protéger et protéger les autres contre le risque de blessure — lire et respecter ces consignes.

2-1. Symboles utilisés

! **DANGER!** – Indique une situation dangereuse qui si on l'évite pas peut donner la mort ou des blessures graves. Les dangers possibles sont montrés par les symboles joints ou sont expliqués dans le texte.

! Indique une situation dangereuse qui si on l'évite pas peut donner la mort ou des blessures graves. Les dangers possibles sont montrés par les symboles joints ou sont expliqués dans le texte.

NOTE – Indique des déclarations pas en relation avec des blessures personnelles.

 Indique des instructions spécifiques.



Ce groupe de symboles veut dire Avertissement! Attention! DANGER DE CHOC ELECTRIQUE, PIECES EN MOUVEMENT, et PIECES CHAUDES. Consulter les symboles et les instructions ci-dessous y afférant pour les actions nécessaires afin d'éviter le danger.

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

! Les symboles représentés ci-dessous sont utilisés dans ce manuel pour attirer l'attention et identifier les dangers possibles. En présence de l'un de ces symboles, prendre garde et suivre les instructions afférentes pour éviter tout risque. Les instructions en matière de sécurité indiquées ci-dessous ne constituent qu'un sommaire des instructions de sécurité plus complètes fournies dans les normes de sécurité énumérées dans la Section 2-5. Lire et observer toutes les normes de sécurité.

! Seul un personnel qualifié est autorisé à installer, faire fonctionner, entretenir et réparer cet appareil.

! Pendant le fonctionnement, maintenir à distance toutes les personnes, notamment les enfants de l'appareil.



UNE DÉCHARGE ÉLECTRIQUE peut entraîner la mort.

Le contact d'organes électriques sous tension peut provoquer des accidents mortels ou des brûlures graves. Le circuit de l'électrode et de la pièce est sous tension lorsque le courant est délivré à la sortie. Le circuit d'alimentation et les circuits internes de la machine sont également sous tension lorsque l'alimentation est sur Marche. Dans le mode de soudage avec du fil, le fil, le dérouleur, le bloc de commande du rouleau et toutes les parties métalliques en contact avec le fil sont sous tension électrique. Un équipement installé ou mis à la terre de manière incorrecte ou impropre constitue un danger.

- Ne pas toucher aux pièces électriques sous tension.
- Porter des gants isolants et des vêtements de protection secs et sans trous.
- S'isoler de la pièce à couper et du sol en utilisant des housses ou des tapis assez grands afin d'éviter tout contact physique avec la pièce à couper ou le sol.
- Ne pas se servir de source électrique à courant électrique dans les zones humides, dans les endroits confinés ou là où on risque de tomber.
- Se servir d'une source électrique à courant électrique UNIQUEMENT si le procédé de soudage le demande.
- Si l'utilisation d'une source électrique à courant électrique s'avère nécessaire, se servir de la fonction de télécommande si l'appareil en est équipé.
- D'autres consignes de sécurité sont nécessaires dans les conditions suivantes : risques électriques dans un environnement humide ou si l'on porte des vêtements mouillés ; sur des structures métalliques telles que sols, grilles ou échafaudages ; en position coincée comme assise, à genoux ou couchée ; ou s'il y a un risque élevé de contact inévitable ou accidentel avec la pièce à souder ou le sol. Dans ces conditions, utiliser les équipements suivants,

dans l'ordre indiqué : 1) un poste à souder DC à tension constante (à fil), 2) un poste à souder DC manuel (électrode) ou 3) un poste à souder AC à tension à vide réduite. Dans la plupart des situations, l'utilisation d'un poste à souder DC à fil à tension constante est recommandée. En outre, ne pas travailler seul !

- Couper l'alimentation ou arrêter le moteur avant de procéder à l'installation, à la réparation ou à l'entretien de l'appareil. Déverrouiller l'alimentation selon la norme OSHA 29 CFR 1910.147 (voir normes de sécurité).
- Installer le poste correctement et le mettre à la terre convenablement selon les consignes du manuel de l'opérateur et les normes nationales, provinciales et locales.
- 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.
- En effectuant les raccordements d'entrée, fixer d'abord le conducteur de mise à la terre approprié et contre-vérifier les connexions.
- Les câbles doivent être exempts d'humidité, d'huile et de graisse; protégez-les contre les étincelles et les pièces métalliques chaudes.
- Vérifier fréquemment le cordon d'alimentation afin de s'assurer qu'il n'est pas altéré ou à nu, le remplacer immédiatement s'il l'est. Un fil à nu peut entraîner la mort.
- L'équipement doit être hors tension lorsqu'il n'est pas utilisé.
- Ne pas utiliser des câbles usés, endommagés, de grosseur insuffisante ou mal épissés.
- Ne pas 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 provenant d'une autre machine.
- Ne pas toucher des porte électrodes connectés à deux machines en même temps à cause de la présence d'une tension à vide doublée.
- N'utiliser qu'un matériel en bon état. Réparer ou remplacer sur-le-champ les pièces endommagées. Entretenir l'appareil conformément à ce manuel.
- Porter un harnais de sécurité si l'on doit travailler au-dessus du sol.
- S'assurer que tous les panneaux et couvercles sont correctement en place.
- Fixer le câble de retour de façon à obtenir un bon contact métal-métal avec la pièce à souder ou la table de travail, le plus près possible de la soudure.
- Isoler la pince de masse quand pas mis à la pièce pour éviter le contact avec tout objet métallique.
- Ne pas raccorder plus d'une électrode ou plus d'un câble de masse à une même borne de sortie de soudage.

Il reste une TENSION DC NON NÉGLIGEABLE dans les sources de soudage onduleur UNE FOIS l'alimentation coupée.

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



LES PIÈCES CHAUDES peuvent provoquer des brûlures.

- Ne pas toucher à mains nues les parties chaudes.
- Prévoir une période de refroidissement avant de travailler à l'équipement.
- Ne pas toucher aux pièces chaudes, utiliser les outils recommandés et porter des gants de soudage et des vêtements épais pour éviter les brûlures.



LES FUMÉES ET LES GAZ peuvent être dangereux.

Le soudage génère des fumées et des gaz. Leur inhalation peut être dangereux pour votre santé.

- Eloigner votre tête des fumées. Ne pas respirer les fumées.
- À l'intérieur, ventiler la zone et/ou utiliser une ventilation forcée au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage.
- Si la ventilation est médiocre, porter un respirateur anti-vapeurs approuvé.
- Lire et comprendre les spécifications de sécurité des matériaux (MSDS) et les instructions du fabricant concernant les métaux, les consommables, les revêtements, les nettoyants et les dégraissants.
- Travailler dans un espace fermé seulement s'il est bien ventilé ou en portant un respirateur à alimentation d'air. Demander toujours à un surveillant dûment formé de se tenir à proximité. Des fumées et des gaz de soudage peuvent déplacer l'air et abaisser le niveau d'oxygène provoquant des blessures ou des accidents mortels. S'assurer que l'air de respiration ne présente aucun danger.
- Ne pas souder dans des endroits situés 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 des métaux munis d'un revêtement, tels que l'acier galvanisé, plaqué en plomb ou au cadmium à moins que le revêtement n'ait été enlevé dans la zone de soudure, que l'endroit soit bien ventilé, et en portant un respirateur à alimentation d'air. Les revêtements et tous les métaux renfermant ces éléments peuvent dégager des fumées toxiques en cas de soudage.



LES RAYONS DE L'ARC peuvent provoquer des brûlures dans les yeux et sur la peau.

Le rayonnement de l'arc du procédé de soudage génère des rayons visibles et invisibles intenses (ultraviolets et infrarouges) susceptibles de provoquer des brûlures dans les yeux et sur la peau. Des étincelles sont projetées pendant le soudage.

- Porter un casque de soudage approuvé muni de verres filtrants appropriés pour protéger visage et yeux pour protéger votre visage et vos yeux pendant le soudage ou pour regarder (voir ANSI Z49.1 et Z87.1 énuméré dans les normes de sécurité).
- Porter des lunettes de sécurité avec écrans latéraux même sous votre casque.
- Avoir recours à des écrans protecteurs ou à des rideaux pour protéger les autres contre les rayonnements les éblouissements et les étincelles ; prévenir toute personne sur les lieux de ne pas regarder l'arc.

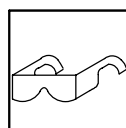
- Porter des vêtements confectionnés avec des matières résistantes et ignifuges (cuir, coton lourd ou laine) et des bottes de protection.



LE SOUDAGE peut provoquer un incendie ou une explosion.

Le soudage effectué sur des conteneurs fermés tels que des réservoirs, tambours ou des conduites peut provoquer leur éclatement. Des étincelles peuvent être projetées de l'arc de soudage. La projection d'étincelles, des pièces chaudes et des équipements chauds peut provoquer des incendies et des brûlures. Le contact accidentel de l'électrode avec des objets métalliques peut provoquer 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.

- Déplacer 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 homologués.
- Ne pas souder dans un endroit où des étincelles peuvent tomber sur des substances inflammables.
- Se protéger et d'autres personnes de la projection d'étincelles et de métal chaud.
- Des étincelles et des matériaux chauds du soudage peuvent facilement passer dans d'autres zones en traversant de petites fissures et des ouvertures.
- Surveiller tout déclenchement d'incendie et tenir un extincteur à proximité.
- Le soudage effectué sur un plafond, plancher, paroi ou séparation peut déclencher un incendie de l'autre côté.
- Ne pas effectuer le soudage sur des conteneurs fermés tels que des réservoirs, tambours, ou conduites, à moins qu'ils n'aient été préparés correctement conformément à AWS F4.1 (voir les normes de sécurité).
- Ne soudez pas si l'air ambiant est chargé de particules, gaz, ou vapeurs inflammables (vapeur d'essence, par exemple).
- Brancher le câble de masse sur la pièce la plus près possible de la zone de soudage pour éviter le transport du courant sur une longue distance par des chemins inconnus éventuels en provoquant des risques d'électrocution, d'étincelles et d'incendie.
- Ne pas utiliser le poste de soudage pour dégeler des conduites gelées.
- En cas de non utilisation, enlever la bague d'électrode du porte-électrode ou couper le fil à la pointe de contact.
- Porter des vêtements de protection dépourvus d'huile tels que des gants en cuir, une chemise en matériau lourd, des pantalons sans revers, des chaussures hautes et un couvre chef.
- Avant de souder, retirer toute substance combustible de vos poches telles qu'un allumeur au butane ou des allumettes.
- Une fois le travail achevé, assurez-vous qu'il ne reste aucune trace d'étincelles incandescentes ni de flammes.
- Utiliser exclusivement des fusibles ou coupe-circuits appropriés. Ne pas augmenter leur puissance; ne pas les ponter.
- Une fois le travail achevé, assurez-vous qu'il ne reste aucune trace d'étincelles incandescentes ni de flammes.
- Utiliser exclusivement des fusibles ou coupe-circuits appropriés. Ne pas augmenter leur puissance; ne pas les ponter.
- Suivre les recommandations dans OSHA 1910.252(a)(2)(iv) et NFPA 51B pour les travaux à chaud et avoir de la surveillance et un extincteur à proximité.



DES PIÈCES DE MÉTAL ou DES SALETES peuvent provoquer des blessures dans les yeux.

- Le soudage, l'écaillage, le passage de la pièce à la brosse en fil de fer, et le meulage génèrent des étincelles et des particules métalliques volantes. Pendant la période de refroidissement des soudures, elles risquent de projeter du laitier.
- Porter des lunettes de sécurité avec écrans latéraux ou un écran facial.



LES ACCUMULATIONS DE GAZ risquent de provoquer des blessures ou même la mort.

- Fermer l'alimentation du gaz protecteur en cas de non-utilisation.
- Veiller toujours à bien aérer les espaces confinés ou se servir d'un respirateur d'adduction d'air homologué.



Les CHAMPS ÉLECTROMAGNÉTIQUES (CEM) peuvent affecter les implants médicaux.

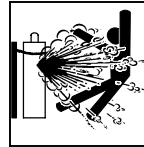
- Les porteurs de stimulateurs cardiaques et autres implants médicaux doivent rester à distance.
- Les porteurs d'implants médicaux doivent consulter leur médecin et le fabricant du dispositif avant de s'approcher de la zone où se déroule du soudage à l'arc, du soudage par points, du gougeage, de la découpe plasma ou une opération de chauffage par induction.



LE BRUIT peut endommager l'ouïe.

Le bruit des processus et des équipements peut affecter l'ouïe.

- Porter des protections approuvées pour les oreilles si le niveau sonore est trop élevé.



LES BOUTEILLES peuvent exploser si elles sont endommagées.

Des bouteilles de gaz protecteur contiennent du gaz sous haute pression. Si une bouteille est endommagée, elle peut exploser. Du fait que les bouteilles de gaz font normalement partie du procédé de soudage, les manipuler avec précaution.

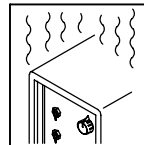
- Protéger les bouteilles de gaz comprimé d'une chaleur excessive, des chocs mécaniques, des dommages physiques, du laitier, des flammes ouvertes, des étincelles et des arcs.
- Placer les bouteilles debout en les fixant dans un support stationnaire ou dans un porte-bouteilles pour les empêcher de tomber ou de se renverser.
- Tenir les bouteilles éloignées des circuits de soudage ou autres circuits électriques.
- Ne jamais placer une torche de soudage sur une bouteille à gaz.
- Une électrode de soudage ne doit jamais entrer en contact avec une bouteille.
- Ne jamais souder une bouteille pressurisée – risque d'explosion.
- Utiliser seulement des bouteilles de gaz protecteur, régulateurs, tuyaux et raccords convenables pour cette application spécifique ; les maintenir ainsi que les éléments associés en bon état.
- Détourner votre visage du détendeur-régulateur lorsque vous ouvrez la soupape de la bouteille.
- Le couvercle du détendeur doit toujours être en place, sauf lorsque la bouteille est utilisée ou qu'elle est reliée pour usage ultérieur.
- Utiliser les équipements corrects, les bonnes procédures et suffisamment de personnes pour soulever et déplacer les bouteilles.
- Lire et suivre les instructions sur les bouteilles de gaz comprimé, l'équipement connexe et le dépliant P-1 de la CGA (Compressed Gas Association) mentionné dans les principales normes de sécurité.

2-3. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance



Risque D'INCENDIE OU D'EXPLOSION.

- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces inflammables.
- 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.



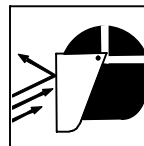
L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

- Prévoir une période de refroidissement ; respecter le cycle opératoire nominal.
- Réduire le courant ou le facteur de marche avant de poursuivre le soudage.
- Ne pas obstruer les passages d'air du poste.



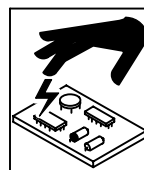
LA CHUTE DE L'ÉQUIPEMENT peut provoquer des blessures.

- Utiliser l'anneau de levage uniquement pour soulever l'appareil, NON PAS les chariots, les bouteilles de gaz ou tout autre accessoire.
- Utiliser un équipement de levage de capacité suffisante pour lever l'appareil.
- En utilisant des fourches de levage pour déplacer l'unité, s'assurer que les fourches sont suffisamment longues pour dépasser du côté opposé de l'appareil.
- Tenir l'équipement (câbles et cordons) à distance des véhicules mobiles lors de toute opération en hauteur.
- Suivre les consignes du Manuel des applications pour l'équation de levage NIOSH révisée (Publication N°94-110) lors du levage manuel de pièces ou équipements lourds.



LES ÉTINCELLES PROJÉTÉES peuvent provoquer des blessures.

- Porter un écran facial pour protéger le visage et les yeux.
- Affûter l'électrode au tungstène uniquement à la meuleuse dotée de protecteurs. Cette manœuvre est à exécuter dans un endroit sûr lorsque l'on porte l'équipement homologué de protection du visage, des mains et du corps.
- Les étincelles risquent de causer un incendie – éloigner toute substance inflammable.



LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

- Établir la connexion avec la barrette de terre 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.

- Ne pas s'approcher des organes mobiles.
- Ne pas s'approcher des points de coincement tels que des rouleaux de commande.



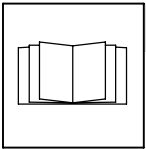
LES FILS DE SOUDAGE peuvent provoquer des blessures.

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



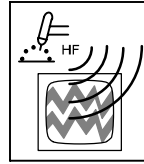
Les PIÈCES MOBILES peuvent causer des blessures.

- S'abstenir de toucher des organes mobiles tels que des ventilateurs.
- Maintenir fermés et verrouillés les portes, panneaux, recouvrements et dispositifs de protection.
- Lorsque cela est nécessaire pour des travaux d'entretien et de dépannage, faire retirer les portes, panneaux, recouvrements ou dispositifs de protection uniquement par du personnel qualifié.
- Remettre les portes, panneaux, recouvrements ou dispositifs de protection quand l'entretien est terminé et avant de rebrancher l'alimentation électrique.



LIRE LES INSTRUCTIONS.

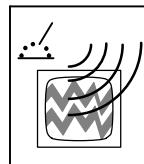
- Lire et appliquer les instructions sur les étiquettes et le Mode d'emploi avant l'installation, l'utilisation ou l'entretien de l'appareil. Lire les informations de sécurité au début du manuel et dans chaque section.
- N'utiliser que les pièces de rechange recommandées par le constructeur.
- Effectuer l'entretien en respectant les manuels d'utilisation, les normes industrielles et les codes nationaux, d'état et locaux.



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

- Le rayonnement haute fréquence (H.F.) peut provoquer des interférences avec les équipements de radio-navigation et de communication, les services de sécurité et les ordinateurs.

- Demander seulement à des personnes qualifiées familiarisées avec des équipements électroniques de faire fonctionner l'installation.
- L'utilisateur est tenu de faire corriger rapidement par un électricien qualifié les interférences résultant de l'installation.
- Si le FCC signale des interférences, arrêter immédiatement l'appareil.
- Effectuer régulièrement le contrôle et l'entretien de l'installation.
- Maintenir soigneusement fermés les portes et les panneaux des sources de haute fréquence, maintenir les éclateurs à une distance correcte et utiliser une terre et un blindage pour réduire les interférences éventuelles.



LE SOUDAGE À L'ARC risque de provoquer des interférences.

- L'énergie électromagnétique risque de provoquer des interférences pour 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 électromagnétiquement.
- Pour réduire la possibilité d'interférence, maintenir les câbles de soudage aussi courts que possible, les grouper, et les poser aussi bas que possible (ex. par terre).
- Veiller à souder à une distance de 100 mètres de tout équipement électronique sensible.
- Veiller à ce que ce poste de soudage soit posé et mis à la terre conformément à ce mode d'emploi.
- En cas d'interférences après avoir pris les mesures 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.

2-4. Proposition californienne 65 Avertissements

⚠ Les équipements de soudage et de coupage produisent des fumées et des gaz qui contiennent des produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des malformations congénitales et, dans certains cas, des cancers. (Code de santé et de sécurité de Californie, chapitre 25249.5 et suivants)

⚠ Les batteries, les bornes et autres accessoires contiennent du plomb et des composés à base de plomb, produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des cancers et des malformations congénitales ou autres problèmes de procréation. Se laver les mains après manipulation.

Pour les moteurs à essence :

⚠ Les gaz d'échappement des moteurs contiennent des produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des cancers et des malformations congénitales ou autres problèmes de procréation.

Pour les moteurs diesel :

⚠ Les gaz d'échappement des moteurs diesel et certains de leurs composants sont reconnus par l'État de Californie comme provoquant des cancers et des malformations congénitales ou autres problèmes de procréation.

2-5. Principales normes de sécurité

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, de Global Engineering Documents (téléphone : 1-877-413-5184, site Internet : www.global.ihc.com).

Safe Practices for the Preparation of Containers and Piping for Welding and Cutting, American Welding Society Standard AWS F4.1, de Global Engineering Documents (téléphone : 1-877-413-5184, site internet : www.global.ihc.com).

National Electrical Code, NFPA Standard 70, de National Fire Protection Association, Quincy, MA 02269 (téléphone : 800-344-3555, site Internet : www.nfpa.org et www.sparky.org).

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, de Compressed Gas Association, 4221 Walney Road, 5th Floor, Chantilly, VA 20151 (téléphone : 703-788-2700, site Internet : www.cganet.com).

Safety in Welding, Cutting, and Allied Processes, CSA Standard W117.2, de Canadian Standards Association, Standards Sales, 5060 Spectrum Way, Suite 100, Ontario, Canada L4W 5NS (téléphone : 800-463-6727, site internet : www.csa-international.org).

Safe Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, de American National Standards Institute,

25 West 43rd Street, New York, NY 10036 (téléphone : 212-642-4900, site Internet : www.ansi.org).

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B, de National Fire Protection Association, P.O. Box 9101, Quincy, MA 02269-9101 (téléphone : 617-770-3000, site Internet : www.nfpa.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 U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 (téléphone : 1-866-512-1800) (il y a 10 bureaux régionaux – le téléphone de la région 5, Chicago, est 312-353-2220, site Internet : www.osha.gov).

U.S. Consumer Product Safety Commission (CPSC), 4330 East West Highway, Bethesda, MD 20814 (téléphone : 301-504-7923, site internet : www.cpsc.gov).

Applications Manual for the Revised NIOSH Lifting Equation, The National Institute for Occupational Safety and Health (NIOSH), 1600 Clifton Rd, Atlanta, GA 30333 (téléphone : 1-800-232-4636, site internet : www.cdc.gov/NIOSH).

2-6. Informations relatives aux CEM

Le courant électrique qui traverse tout conducteur génère des champs électromagnétiques (CEM) à certains endroits. Le courant de soudage crée un CEM autour du circuit et du matériel de soudage. Les CEM peuvent créer des interférences avec certains implants médicaux comme des stimulateurs cardiaques. Des mesures de protection pour les porteurs d'implants médicaux doivent être prises: par exemple, des restrictions d'accès pour les passants ou une évaluation individuelle des risques pour les soudeurs. Tous les soudeurs doivent appliquer les procédures suivantes pour minimiser l'exposition aux CEM provenant du circuit de soudage:

- 1 Rassembler les câbles en les torsadant ou en les attachant avec du ruban adhésif ou avec une housse.
- 2 Ne pas se tenir au milieu des câbles de soudage. Disposer les câbles d'un côté et à distance de l'opérateur.
- 3 Ne pas courber et ne pas entourer les câbles autour de votre corps.

- 4 Maintenir la tête et le torse aussi loin que possible du matériel du circuit de soudage.
- 5 Connecter la pince sur la pièce aussi près que possible de la soudure.
- 6 Ne pas travailler à proximité d'une source de soudage, ni s'asseoir ou se pencher dessus.
- 7 Ne pas souder tout en portant la source de soudage ou le dévidoir.

En ce qui concerne les implants médicaux :

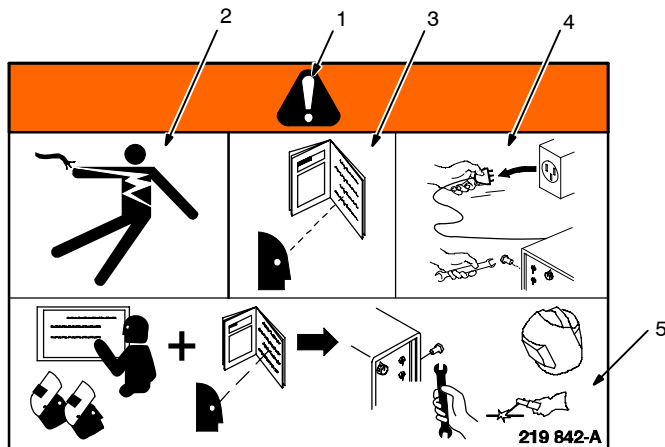
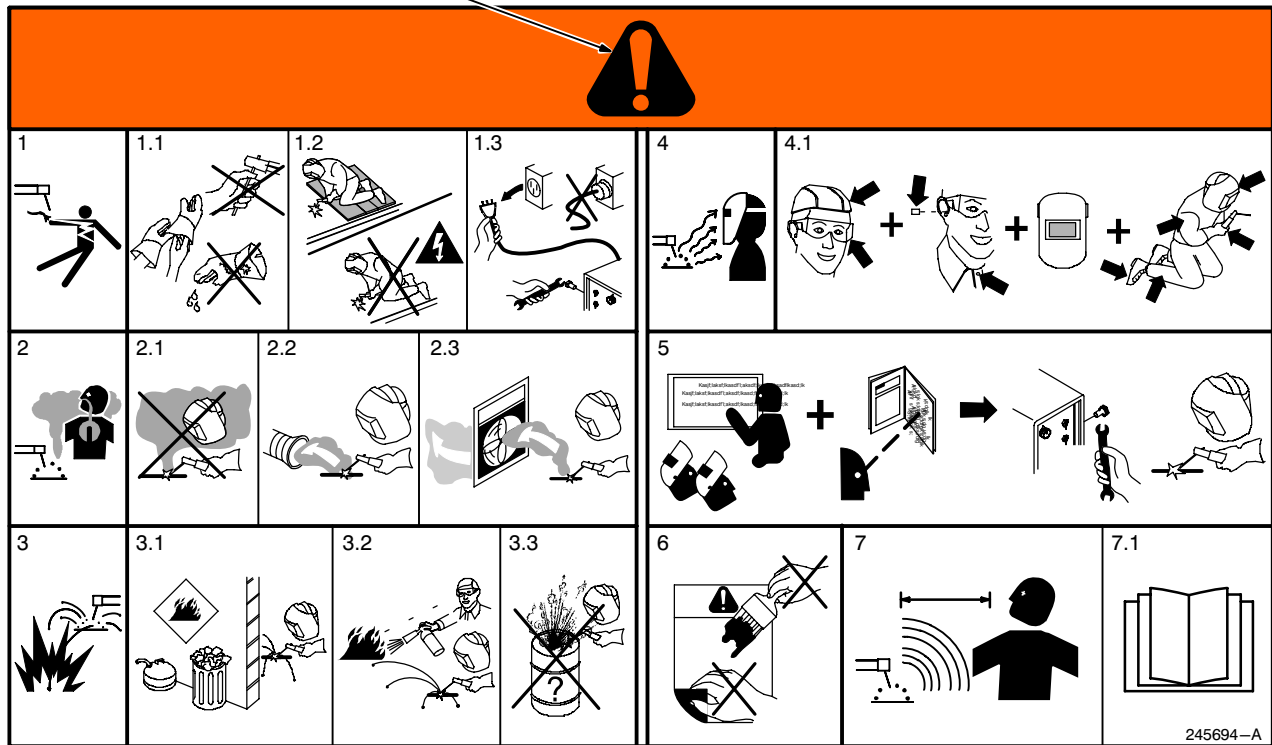
Les porteurs d'implants doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de soudage par points, de gougeage, du coupage plasma ou de chauffage par induction. Si le médecin approuve, il est recommandé de suivre les procédures précédentes.

SECTION 3 – DEFINITIONS (CE Models Only)

3-1. Warning Label Definitions

Warning! Watch Out! There are possible hazards as shown by the symbols.

- 1 Electric shock from welding electrode or wiring can kill.
- 1.1 Wear dry insulating gloves. Do not touch electrode with bare hand. Do not wear wet or damaged gloves.
- 1.2 Protect yourself from electric shock by insulating yourself from work and ground.
- 1.3 Disconnect input plug or power before working on machine.
- 2 Breathing welding fumes can be hazardous to your health.
- 2.1 Keep your head out of the fumes.
- 2.2 Use forced ventilation or local exhaust to remove the fumes.
- 2.3 Use ventilating fan to remove fumes.
- 3 Welding sparks can cause explosion or fire.
- 3.1 Keep flammables away from welding. Do not weld near flammables.
- 3.2 Welding sparks can cause fires. Have a fire extinguisher nearby, and have a watchperson ready to use it.
- 3.3 Do not weld on drums or any closed containers.
- 4 Arc rays can burn eyes and injure skin.
- 4.1 Wear hat and safety glasses. Use ear protection and button shirt collar. Use welding helmet with correct shade of filter. Wear complete body protection.
- 5 Become trained and read the instructions before working on the machine or welding.
- 6 Do not remove or paint over (cover) the label.
- 7 Welding current creates an electric and magnetic field (EMF) around the welding circuit and welding equipment. Follow compliance boundaries to stay within EMF exposure limits in an occupational environment.
- 7.1 Read the Owner's Manual for EMF information.

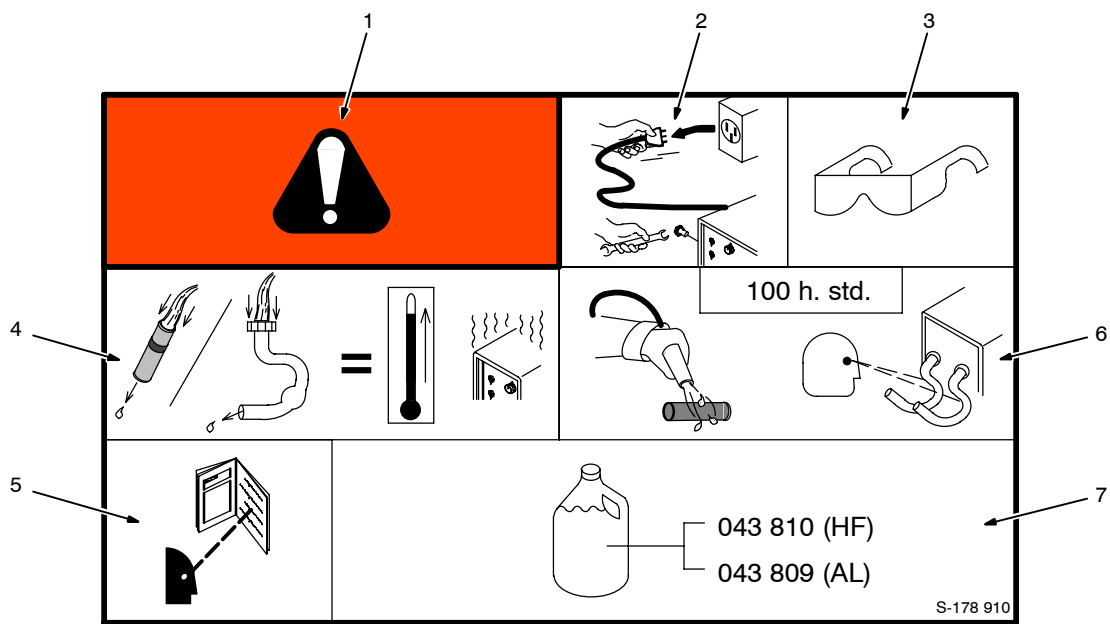


- 1 Warning! Watch Out! There are possible hazards as shown by the symbols.
- 2 Electric shock from wiring can kill.
- 3 Read the Owner's Manual before working on this machine.
- 4 Disconnect input plug or power before working on machine.
- 5 Become trained and read the instructions before working on the machine or welding.

Warning! Watch Out! There are possible hazards as shown by the symbols.

- 1 Electric shock from wiring can kill.
- 2 Disconnect input plug or power before working on machine.
- 3 Hazardous voltage remains on input capacitors after power is turned off. Do not touch fully charged capacitors.
- 4 Always wait 5 minutes after power is turned off before working on unit, OR
- 5 Check input capacitor voltage, and be sure it is near 0 before touching any parts.
- 6 When power is applied failed parts can explode or cause other parts to explode.
- 7 Flying pieces of parts can cause injury. Always wear a face shield when servicing unit.
- 8 Always wear long sleeves and button your collar when servicing unit.
- 9 After taking proper precautions as shown, connect power to unit.

- 1 Warning! Watch Out! There are possible hazards as shown by the symbols.
- 2 Electric shock from wiring can kill.
- 3 Disconnect input plug or power before working on machine.
- 4 Moving parts, such as fans, can cut fingers and hands and cause injury. Keep away from moving parts.
- 5 Wear safety glasses with side shields.
- 6 Read the Owner's Manual before working on this machine.
- 7 Read the labels on the welding power source, wire feeder, or other major equipment for welding safety information.
- 8 Recycle or dispose of used coolant in an environmentally safe way.
- 9 Do not remove or paint over (cover) the label.

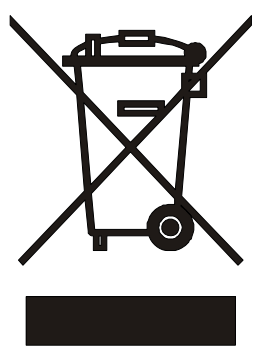


- 1 Warning! Watch Out! There are possible hazards as shown by the symbols.
- 2 Disconnect input plug or power before working on machine.
- 3 Wear safety glasses with side shields.
- 4 Plugged filter or hoses cause

- overheating and damage.
- 5 Read Owner's Manual.
- 6 Check and clean filter every 100 hours; also check condition of hoses.
- 7 Use Low Conductivity Coolant No. 043 810 for High-Frequency assisted or





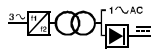


















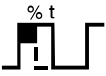
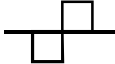

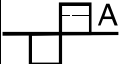

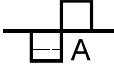






Gas Tungsten Arc Welding applications. Use Aluminum Protecting Coolant No. 043 809 where coolant contacts aluminum parts or for Gas Metal Arc Welding applications or where High Frequency is not used.

3-2. WEEE Label (For Products Sold Within The EU)



Do not discard product (where applicable) with general waste. Reuse or recycle Waste Electrical and Electronic Equipment (WEEE) by disposing at a designated collection facility. Contact your local recycling office or your local distributor for further information.

3-3. Symbols And Definitions

A Amperes	 Output	 Gas Tungsten Arc Welding (GTAW)	 Shielded Metal Arc Welding (SMAW)
V Volts	 Input	 3 Phase Static Frequency Converter-Transformer-Rectifier	
 Output	 Supplementary Protector	 Remote	 Lift-Arc (GTAW)
 Protective Earth (Ground)	 Postflow Timer	 Preflow Timer	S Seconds
I On	O Off	+ Positive	- Negative
 Alternating Current	 Gas Input	 Gas Output	I₂ Rated Welding Current
X Duty Cycle	 Direct Current	 Line Connection	U₂ Conventional Load Voltage
U₁ Primary Voltage	IP Degree Of Protection	I_{1max} Rated Maximum Supply Current	I_{1eff} Maximum Effective Supply Current
U₀ Rated No Load Voltage (Average)	 Polarity Control	 Initial Amperage	 Increase/Decrease Of Quantity
 Remote Standard	 Gas/DIG Control	 Gas/DIG Control	% Percent
Hz Hertz	 Recall From Memory	 Arc Force (DIG)	 Impulse Starting (GTAW)
 Final Slope	 Final Amperage	 Pulse Percent On Time	 Initial Slope
 AC Waveshape Control	 Pulser	 EP Amperage	 Pulse Frequency
 Work	 Electrode	 EN Amperage	 Process
S Unit may be used in environments with increased hazard of electric shock	 Sequence	 Background Amperage	 AC Frequency
 Water (Coolant) Input	 Water (Coolant) Output	 Circulating Unit With Coolant Pump	

SECTION 4 – INSTALLATION

4-1. Important Information Regarding CE Products (Sold Within The EU)



This equipment shall not be used by the general public as the EMF limits for the general public might be exceeded during welding.

This equipment is built in accordance with EN 60974-1 and is intended to be used only in an occupational environment (where the general public access is prohibited or regulated in such a way as to be similar to occupational use) by an expert or an instructed person.

Wire feeders and ancillary equipment (such as torches, liquid cooling systems and arc striking and stabilizing devices) as part of the welding circuit may not be a major contributor to the EMF. See the Owner's Manuals for all components of the welding circuit for additional EMF exposure information.

- The EMF assessment on this equipment was conducted at 0.5 meter.
- At a distance of 1 meter the EMF exposure values were less than 20% of the permissible values.

The weld cable occupational exposure assessment was performed at the center of a radius of a curved weld cable under worst-case conditions. The following special conditions apply to the operation of this equipment:

- To meet the limits as specified in EN 50444 and EN 50445, keep your head and trunk at least 0.35 meter from the inside of the radius of a curved weld cable during AC welding and 0.25 meter from the inside of the radius of a curved weld cable during DC pulse welding.
- Use mechanized welding operations when welding with AC or pulsed DC processes and power source settings are above 350 A.

4-2. Serial Number And Rating Label Location

The serial number and rating information for the power source is located on the front of the machine. Use the rating labels to determine input power requirements and/or rated output. For future reference, write serial number in space provided on back cover of this manual.

4-3. Specifications

A. Dynasty 350 Models

Input Power	Rated Welding Output	Apeage Range	Max Open-Circuit Voltage DC (Uo)	Rated Peak Striking Voltage (Up)	Amperes Input at Rated Load Output 50/60 Hz					
					380 V	400 V	460 V	575 V	KVA	KW
Three Phase	250 A @ 30 Volts, 100% Duty Cycle	5-350	75V	15 KV**	16	15	13	10	10.3	9.9 *(.06)
	300 A @ 32 Volts, 60% Duty Cycle		10-15◆		19	18	16	13	12.7	12.1 *(.06)

*While idling

** Arc starting device is designed for manual guided operations.

◆ Low open-circuit voltage while in TIG Lift Arc™, or while in Stick with low open-circuit voltage selected (see Section 6-7).

∇ Normal open-circuit voltage (75 volts) is present while in Stick with normal open-circuit voltage selected (see Section 6-7).

☞ This unit is equipped with Auto-Line™. Auto-Line is an internal inverter power source circuit that automatically links the power source to any primary input voltage from 380 to 625 volts, single-or-three-phase, 50 or 60 hertz. Also adjusts for voltage spikes within the entire range.

B. Maxstar 350 Models

Input Power	Rated Welding Output	Amperage Range	Max Open-Circuit Voltage DC (U _o)	Rated Peak Striking Voltage (U _p)	Amperes Input at Rated Load Output 50/60 Hz					
					380 V	400 V	460 V	575 V	KVA	KW
Three Phase	250 A @ 30 Volts, 100% Duty Cycle	5-350	75∇	15 KV**	15	14	12	9	9.7	9.3 *(.06)
	300 A @ 32 Volts, 60% Duty Cycle		10-15◆		18	17	15	12	12	11.5 *(.06)

*While idling

** Arc starting device is designed for manual guided operations.

◆ Low open-circuit voltage while in TIG Lift Arc™, or while in Stick with low open-circuit voltage selected (see Section 6-7).

∇ Normal open-circuit voltage (75 volts) is present while in Stick with normal open-circuit voltage selected (see Section 6-7).

☞ This unit is equipped with Auto-Line™. Auto-Line is an internal inverter power source circuit that automatically links the power source to any primary input voltage from 380 to 625 volts, single-or-three-phase, 50 or 60 hertz. Also adjusts for voltage spikes within the entire range.

C. Dynasty 700 Models

Input Power	Rated Welding Output	Amperage Range	Max Open-Circuit Voltage DC (U _o)	Rated Peak Striking voltage (U _p)	Amperes Input at Rated Load Output 50/60 Hz					
					380 V	400 V	460 V	575 V	KVA	KW
Three Phase	500 A @ 40 Volts, 100% Duty Cycle	5-700	75∇	15 KV **	41	39	34	27	27	26 *(.08)
	600 A @ 44 Volts, 60% Duty Cycle		10-15◆		53	51	43	33	35	34 *(.08)

*While idling

** Arc starting device is designed for manual guided operations.

◆ Low open-circuit voltage while in TIG Lift Arc™, or while in Stick with low open-circuit voltage selected (see Section 6-7).

∇ Normal open-circuit voltage (75 volts) is present while in Stick with normal open-circuit voltage selected (see Section 6-7).

☞ This unit is equipped with Auto-Line™. Auto-Line is an internal inverter power source circuit that automatically links the power source to any primary input voltage from 380 to 625 volts, single-or-three-phase, 50 or 60 hertz. Also adjusts for voltage spikes within the entire range.

D. Maxstar 700 Models

Input Power	Rated Welding Output	Amperage Range	Max Open-Circuit Voltage DC (U _o)	Rated Peak Striking Voltage (Up)	Amperes Input at Rated Load Output 50/60 Hz					
					380 V	400 V	460 V	575 V	KVA	KW
Three Phase	500 A @ 40 Volts, 100% Duty Cycle	5-700	75V	15 KV**	36	35	30	24	24	23 *(.08)
	600 A @ 44 Volts, 60% Duty Cycle		10-15♦		49	46	40	31	32	31 *(.08)

*While idling

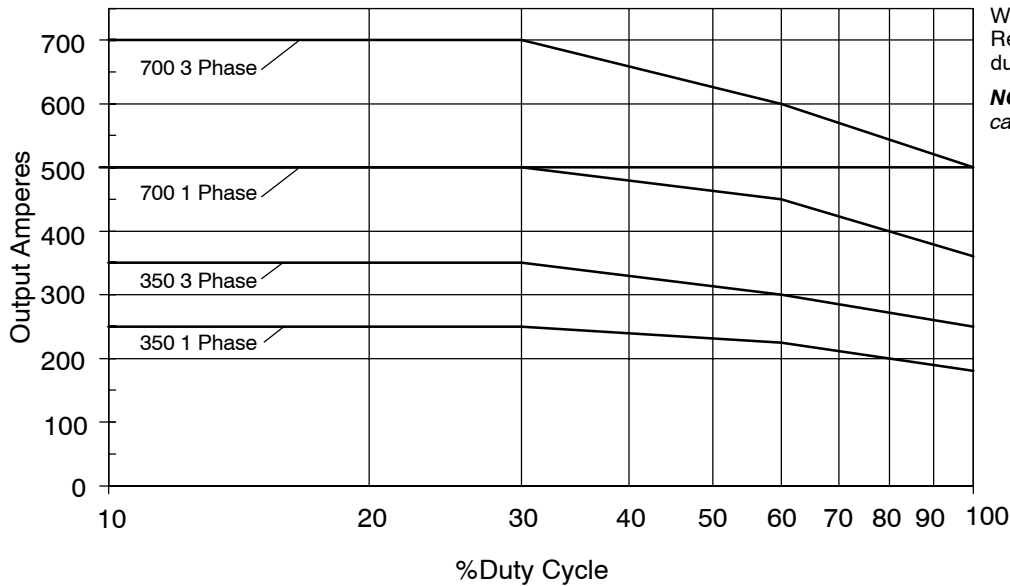
** Arc starting device is designed for manual guided operations.

♦ Low open-circuit voltage while in TIG Lift Arc™, or while in Stick with low open-circuit voltage selected (see Section 6-7).

▽ Normal open-circuit voltage (75 volts) is present while in Stick with normal open-circuit voltage selected (see Section 6-7).

☑ This unit is equipped with Auto-Line™. Auto-Line is an internal inverter power source circuit that automatically links the power source to any primary input voltage from 380 to 625 volts, single-or-three-phase, 50 or 60 hertz. Also adjusts for voltage spikes within the entire range.

4-4. Duty Cycle and Overheating

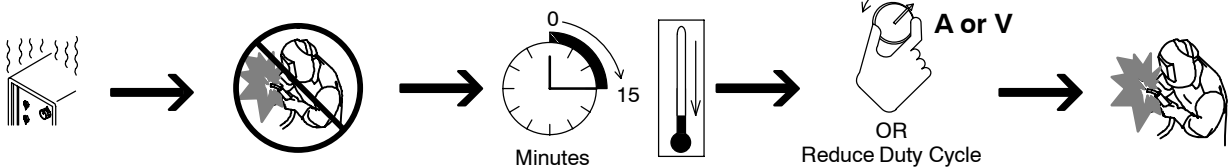


Duty Cycle is the percentage of 10 minutes that unit can weld at rated load without overheating.

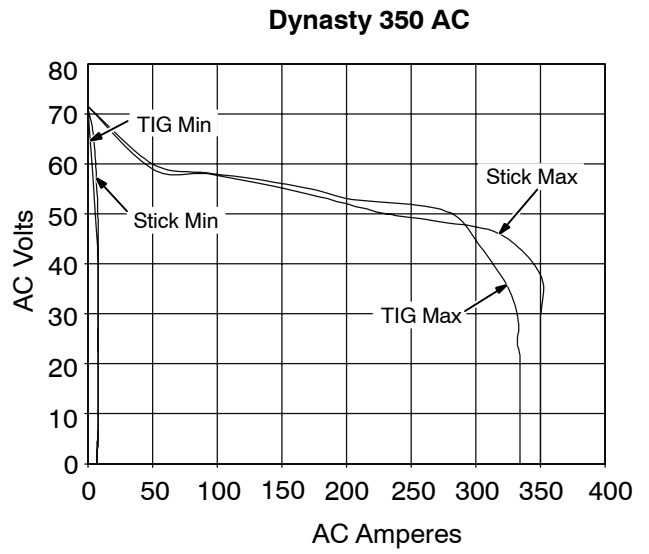
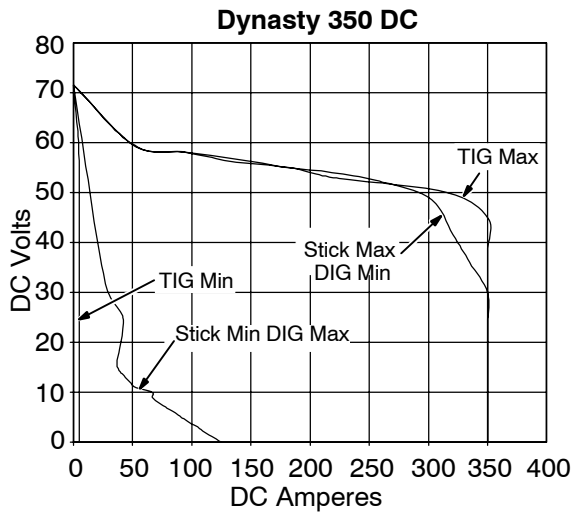
If unit overheats, output stops, a Help message is displayed (see Section 7-4), and cooling fan runs. Wait fifteen minutes for unit to cool. Reduce amperage or voltage, or duty cycle before welding.

NOTICE – Exceeding duty cycle can damage unit and void warranty.

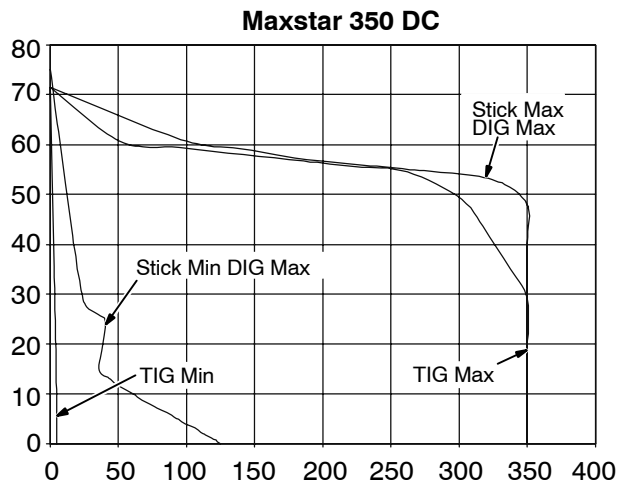
Overheating



4-5. Volt-Ampere Curves



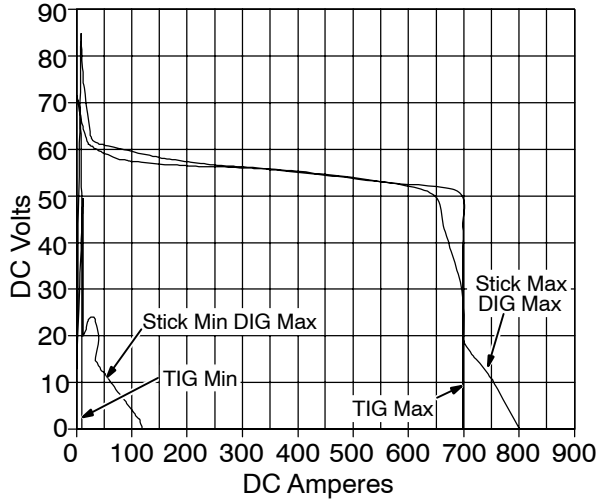
215 138-A / 215 139-A



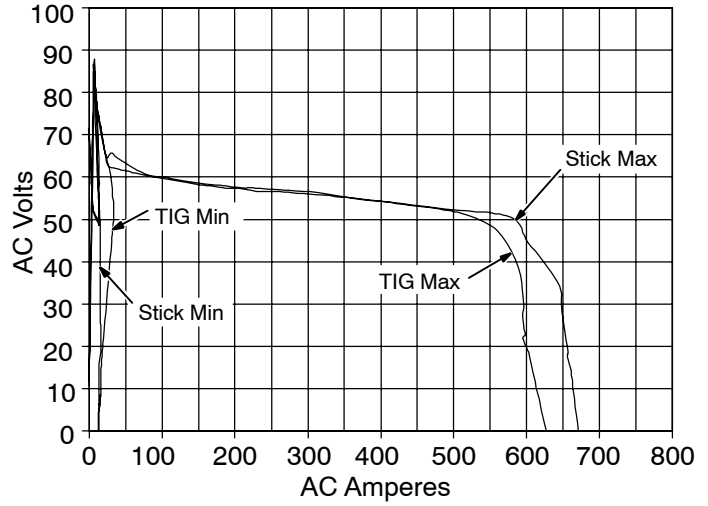
224 527-A

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

Dynasty 700 DC

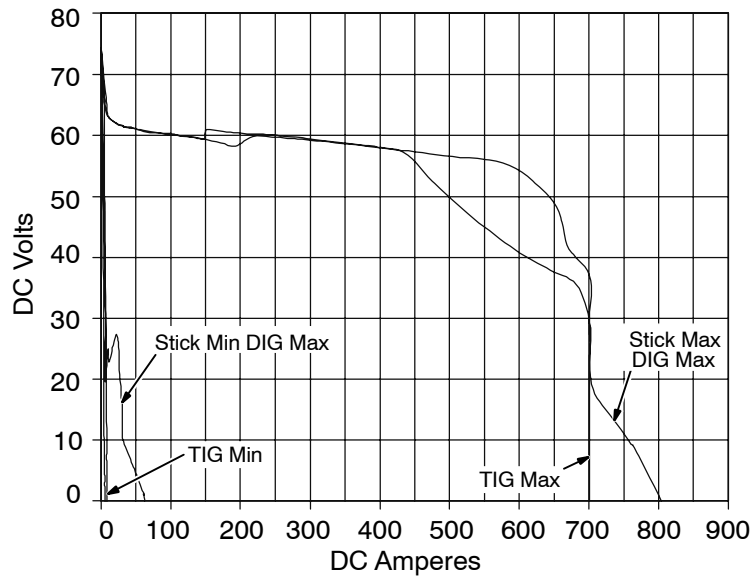


Dynasty 700 AC



213 342-A / 213 344-A

Maxstar 700 DC

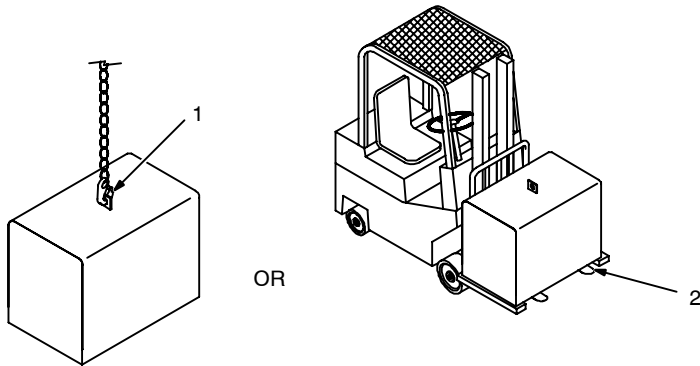


215 126-A

4-6. Selecting A Location



Movement



⚠ Falling Unit Can Cause Injury.

Use equipment of adequate capacity to lift and support unit.

- 1 Lifting Eye
- 2 Lifting Forks

Use lifting eye or lifting forks to move unit.

Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.

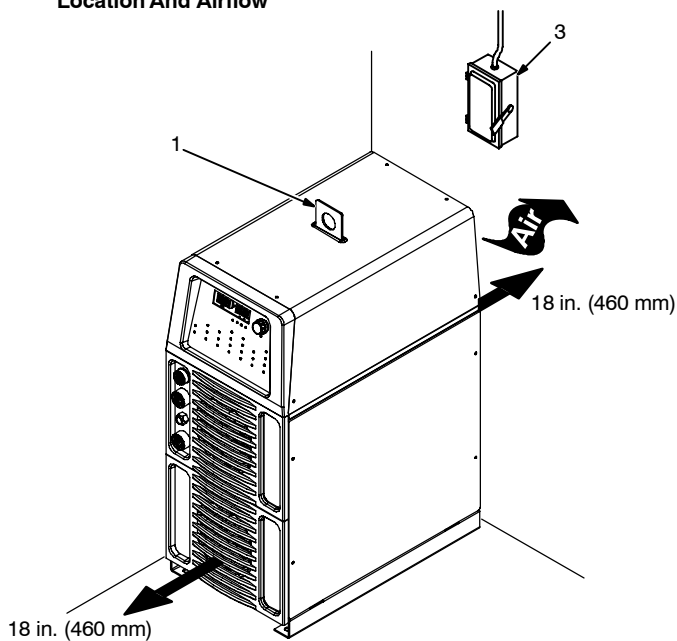
If using lifting forks, extend forks beyond opposite side of unit.

- 3 Line Disconnect Device

Locate unit near correct input power supply.

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

Location And Airflow

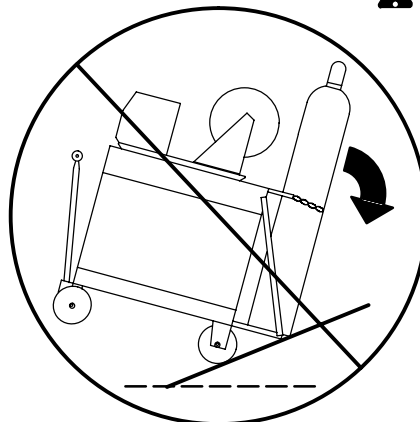
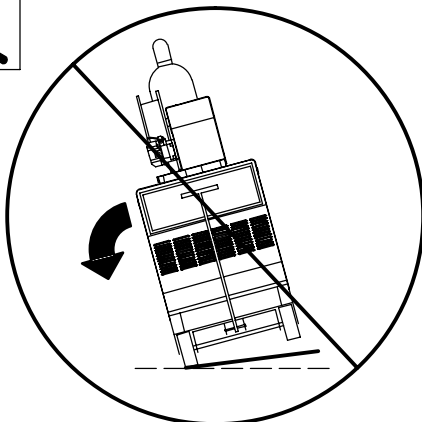


Ref. 117 264-C / 803 900-B / 223 259-A / 223 275-A

4-7. Tipping Warnings



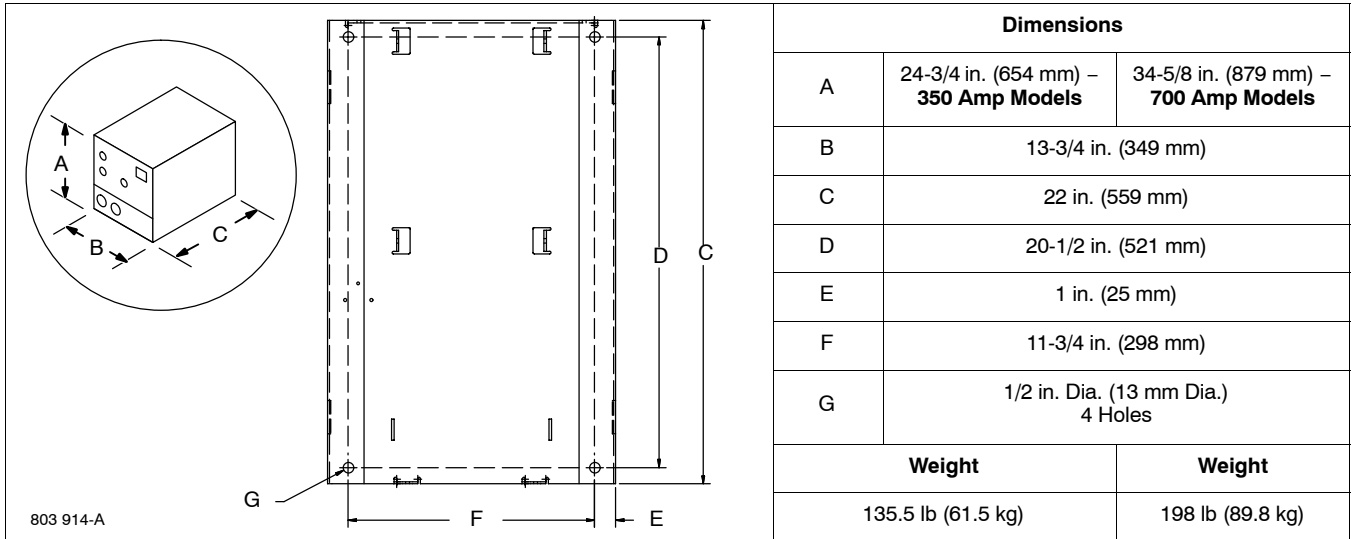
⚠ Do not move or operate unit where it could tip.



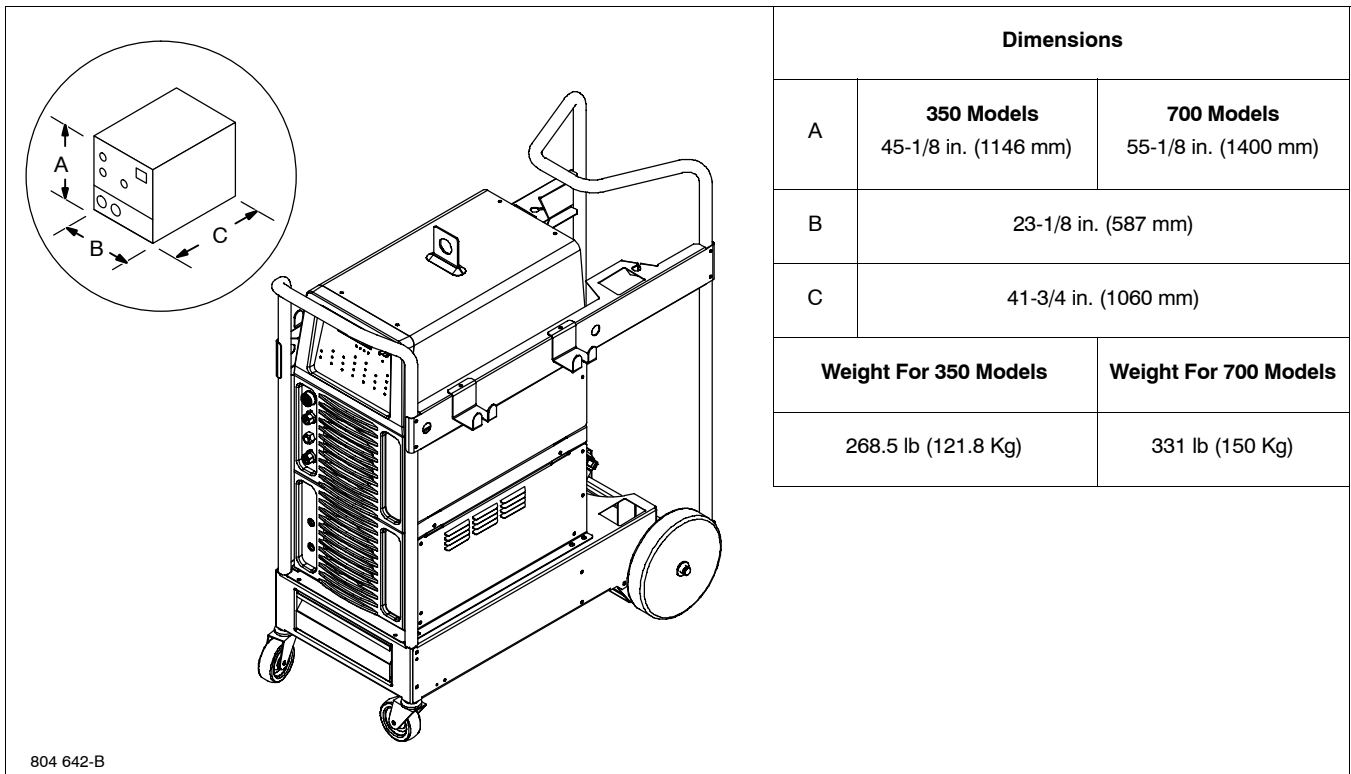
4-8. Dimensions, Weights And Base Mounting Hole Layout

☞ Overall dimensions (A, B, and C) include lifting eye, handles, hardware, etc.

A. Welding Power Source



B. Welding Power Source With Cart And Cooler



4-9. Electrical Service Guide

A. Dynasty 350 Models

☞ Actual input voltage should not be 10% less than minimum (5% for 380 volt CE models) and/or 10% more than maximum input voltages listed in table. If actual input voltage is outside this range, output may not be available.

NOTICE – INCORRECT INPUT POWER can damage this welding power source. Phase to ground voltage shall not exceed +10% of rated input voltage.

⚠ Failure to follow these electrical service guide recommendations could create an electric shock or fire hazard. These recommendations are for a dedicated branch circuit sized for the rated output and duty cycle of the welding power source.

Input Voltage	Three-Phase			
	380	400	460	575
Input Amperes At Rated Output - 300 amps @ 32 volts	19	18	16	13
Max Recommended Standard Fuse Rating In Amperes ¹				
Normal Operating ³				
	30	25	25	20
Min Input Conductor Size In AWG ⁴	12	14	14	14
Max Recommended Input Conductor Length In Feet (Meters)	177 (54)	127 (39)	168 (51)	262 (80)
Min Grounding Conductor Size In AWG ⁴	12	14	14	14

Reference: 2008 National Electrical Code (NEC) (including article 630)

- 1 If a circuit breaker is used in place of a fuse, choose a circuit breaker with time-current curves comparable to the recommended fuse.
- 2 "Time-Delay" fuses are UL class "RK5" . See UL 248.
- 3 "Normal Operating" (general purpose - no intentional delay) fuses are UL class "K5" (up to and including 60 amps), and UL class "H" (65 amps and above).
- 4 Conductor data in this section specifies conductor size (excluding flexible cord or cable) between the panelboard and the equipment per NEC Table 310.16. If a flexible cord or cable is used, minimum conductor size may increase. See NEC Table 400.5(A) for flexible cord and cable requirements.

B. Maxstar 350 Models

☞ Actual input voltage should not be 10% less than minimum (5% for 380 volt CE models) and/or 10% more than maximum input voltages listed in table. If actual input voltage is outside this range, output may not be available.

NOTICE – INCORRECT INPUT POWER can damage this welding power source. Phase to ground voltage shall not exceed +10% of rated input voltage.

⚠ Failure to follow these electrical service guide recommendations could create an electric shock or fire hazard. These recommendations are for a dedicated branch circuit sized for the rated output and duty cycle of the welding power source.

Input Voltage	Three-Phase			
	380	400	460	575
Input Amperes At Rated Output - 300 amps @ 32 volts	18	17	15	12
Max Recommended Standard Fuse Rating In Amperes ¹				
Normal Operating ³				
	25	25	20	20
Min Input Conductor Size In AWG ⁴	14	14	14	14
Max Recommended Input Conductor Length In Feet (Meters)	121 (37)	134 (41)	177 (54)	276 (84)
Min Grounding Conductor Size In AWG ⁴	14	14	14	14

Reference: 2008 National Electrical Code (NEC) (including article 630)

- 1 If a circuit breaker is used in place of a fuse, choose a circuit breaker with time-current curves comparable to the recommended fuse.
- 2 "Time-Delay" fuses are UL class "RK5" . See UL 248.
- 3 "Normal Operating" (general purpose - no intentional delay) fuses are UL class "K5" (up to and including 60 amps), and UL class "H" (65 amps and above).
- 4 Conductor data in this section specifies conductor size (excluding flexible cord or cable) between the panelboard and the equipment per NEC Table 310.16. If a flexible cord or cable is used, minimum conductor size may increase. See NEC Table 400.5(A) for flexible cord and cable requirements.

C. Dynasty 700 Models

☞ Actual input voltage should not be 10% less than minimum (5% for 380 volt CE models) and/or 10% more than maximum input voltages listed in table. If actual input voltage is outside this range, output may not be available.

NOTICE – INCORRECT INPUT POWER can damage this welding power source. Phase to ground voltage shall not exceed +10% of rated input voltage.

⚠ Failure to follow these electrical service guide recommendations could create an electric shock or fire hazard. These recommendations are for a dedicated branch circuit sized for the rated output and duty cycle of the welding power source.

Input Voltage	Three-Phase			
	380	400	460	575
Input Amperes At Rated Output - 600 amps @ 44 volts	53	51	44	33
Max Recommended Standard Fuse Rating In Amperes ¹				
Time-Delay ²	60	60	50	40
Normal Operating ³	80	80	70	50
Min Input Conductor Size In AWG ⁴	8	8	8	10
Max Recommended Input Conductor Length In Feet (Meters)	160 (49)	177 (54)	235 (72)	240 (73)
Min Grounding Conductor Size In AWG ⁴	8	8	8	10

Reference: 2008 National Electrical Code (NEC) (including article 630)

- 1 If a circuit breaker is used in place of a fuse, choose a circuit breaker with time-current curves comparable to the recommended fuse.
- 2 "Time-Delay" fuses are UL class "RK5" . See UL 248.
- 3 "Normal Operating" (general purpose - no intentional delay) fuses are UL class "K5" (up to and including 60 amps), and UL class "H" (65 amps and above).
- 4 Conductor data in this section specifies conductor size (excluding flexible cord or cable) between the panelboard and the equipment per NEC Table 310.16. If a flexible cord or cable is used, minimum conductor size may increase. See NEC Table 400.5(A) for flexible cord and cable requirements.

D. Maxstar 700 Models

☞ Actual input voltage should not be 10% less than minimum (5% for 380 volt CE models) and/or 10% more than maximum input voltages listed in table. If actual input voltage is outside this range, output may not be available.

NOTICE – INCORRECT INPUT POWER can damage this welding power source. Phase to ground voltage shall not exceed +10% of rated input voltage.

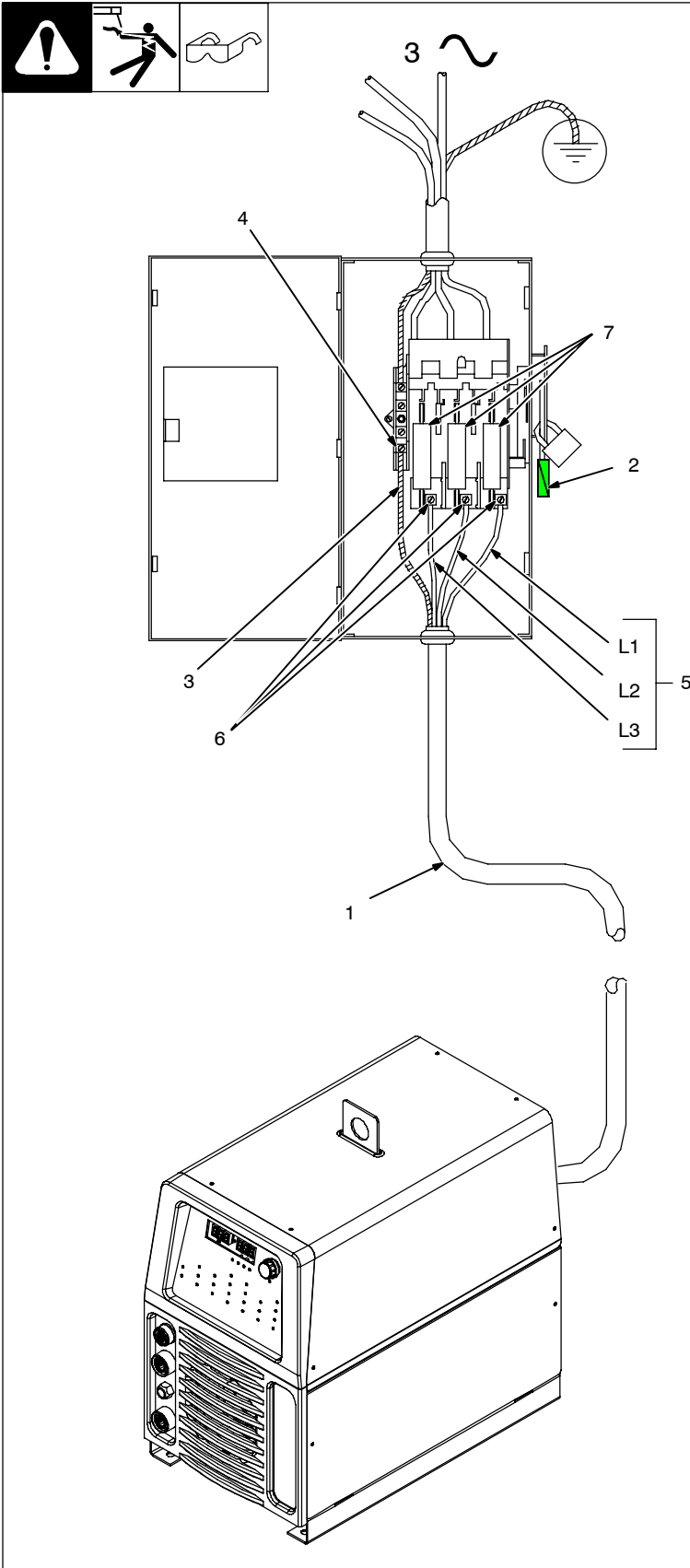
⚠ Failure to follow these electrical service guide recommendations could create an electric shock or fire hazard. These recommendations are for a dedicated branch circuit sized for the rated output and duty cycle of the welding power source.

Input Voltage	Three-Phase			
	380	400	460	575
Input Amperes At Rated Output - 600 amps @ 44 volts	49	46	40	31
Max Recommended Standard Fuse Rating In Amperes ¹				
Time-Delay ²	60	50	50	40
Normal Operating ³	70	70	60	50
Min Input Conductor Size In AWG ⁴	8	8	8	10
Max Recommended Input Conductor Length In Feet (Meters)	175 (53)	194 (59)	257 (78)	263 (80)
Min Grounding Conductor Size In AWG ⁴	8	8	10	10

Reference: 2008 National Electrical Code (NEC) (including article 630)

- 1 If a circuit breaker is used in place of a fuse, choose a circuit breaker with time-current curves comparable to the recommended fuse.
- 2 "Time-Delay" fuses are UL class "RK5" . See UL 248.
- 3 "Normal Operating" (general purpose - no intentional delay) fuses are UL class "K5" (up to and including 60 amps), and UL class "H" (65 amps and above).
- 4 Conductor data in this section specifies conductor size (excluding flexible cord or cable) between the panelboard and the equipment per NEC Table 310.16. If a flexible cord or cable is used, minimum conductor size may increase. See NEC Table 400.5(A) for flexible cord and cable requirements.

4-10. Connecting Input Power For 350 Models



⚠ Installation must meet all National and Local Codes – have only qualified persons make this installation.

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

⚠ Always connect green or green/yellow conductor to supply grounding terminal first, and never to a line terminal.

ℹ The Auto-Line circuitry in this unit automatically adapts the power source to the primary voltage being applied. Check input voltage available at site. This unit can be connected to any input power between 208 and 575 VAC without removing cover to relink the power source.

For Three-Phase Operation

- 1 Input Power Cord.
- 2 Disconnect Device (switch shown in the OFF position)
- 3 Green Or Green/Yellow Grounding Conductor
- 4 Disconnect Device Grounding Terminal
- 5 Input Conductors (L1, L2 And L3)
- 6 Disconnect Device Line Terminals

Connect green or green/yellow grounding conductor to disconnect device grounding terminal first.

Connect input conductors L1, L2, and L3 to disconnect device line terminals.

7 Over-Current Protection

Select type and size of over-current protection using Section 4-9 (fused disconnect switch shown).

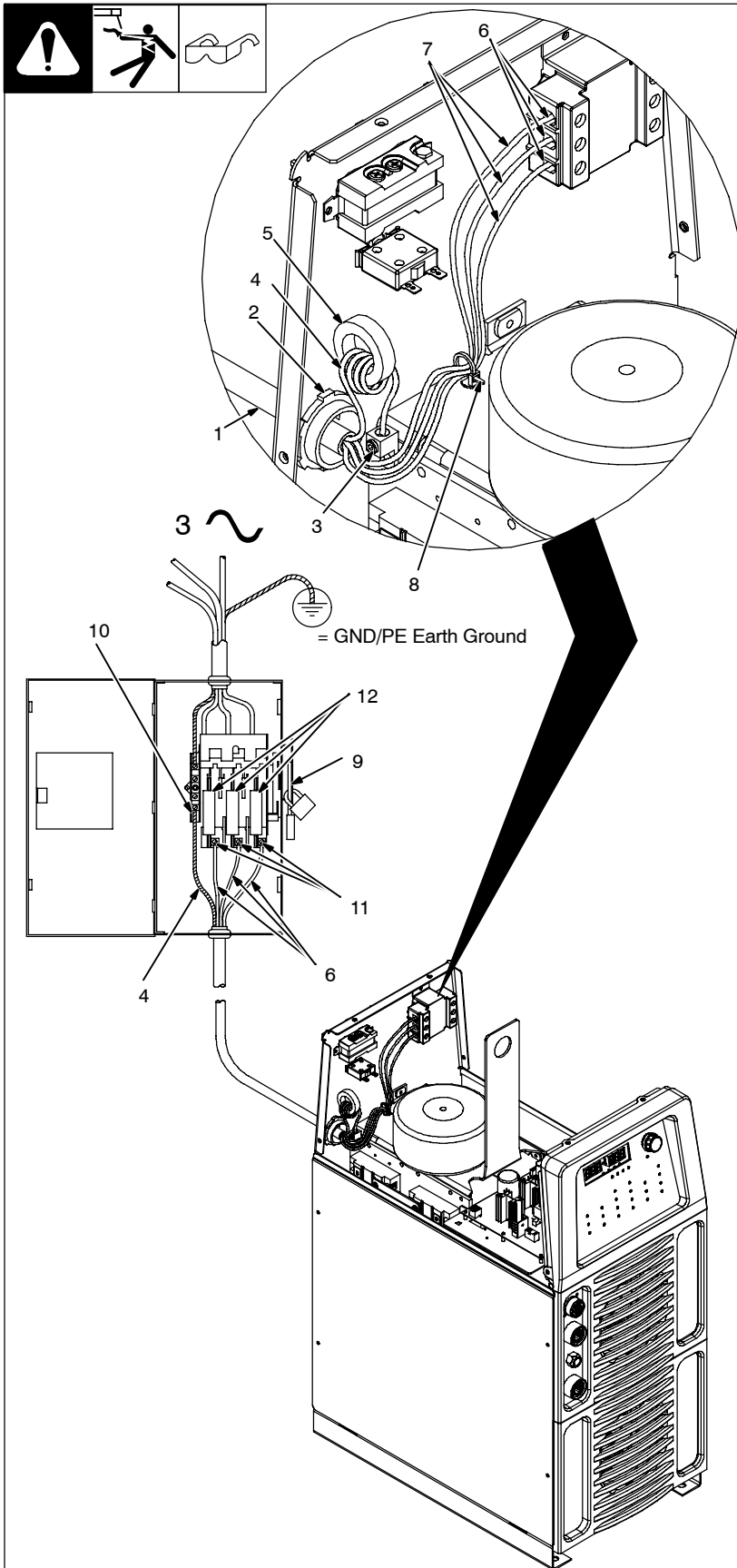
Close and secure door on disconnect device. Remove lockout/tagout device, and place switch in the On position.

Tools Needed:







Ref. 804 746-B

4-11. Connecting Input Power For Dynasty 700 Models



Tools Needed:



-  Installation must meet all National and Local Codes – have only qualified persons make this installation.
-  Disconnect and lockout/tagout input power before connecting input conductors from unit.
-  Make input power connections to the welding power source first.
-  Always connect green or green/yellow conductor to supply grounding terminal first, and never to a line terminal.

See rating label on unit and check input voltage available at site (see Section 4-6).

- 1 Input Power Conductors (Customer Supplied Cord)

Select size and length of conductors using Section 4-9. Conductors must comply with national, state, and local electrical codes. If applicable, use lugs of proper amperage capacity and correct hole size.

Welding Power Source Input Power Connections

- 2 Strain Relief


Route conductors (cord) through strain relief and tighten screws.

- 3 Machine Grounding Terminal

- 4 Green Or Green/Yellow Grounding Conductor

Connect green or green/yellow grounding conductor to welding power source grounding terminal first.

- 5 Ferrite Core F9 (Dynasty Models)

 For Dynasty models, wrap green/yellow grounding conductor through supplied ferrite F9 4 times as shown.

- 6 Welding Power Source Line Terminals (Switch S1)

- 7 Input Conductors L1 (U), L2 (V) And L3 (W)

Connect input conductors L1 (U), L2 (V) and L3 (W) to welding power source line terminals.

- 8 Cable Tie

Secure wires with supplied cable tie.

Install cover.

Disconnect Device Input Power Connections

- 9 Disconnect Device (switch shown in OFF position)

- 10 Disconnect Device (Supply) Grounding Terminal

Connect green or green/yellow grounding conductor to disconnect device grounding terminal first.

- 11 Disconnect Device Line Terminals

Connect input conductors L1 (U), L2 (V) And L3 (W) to disconnect device line terminals.

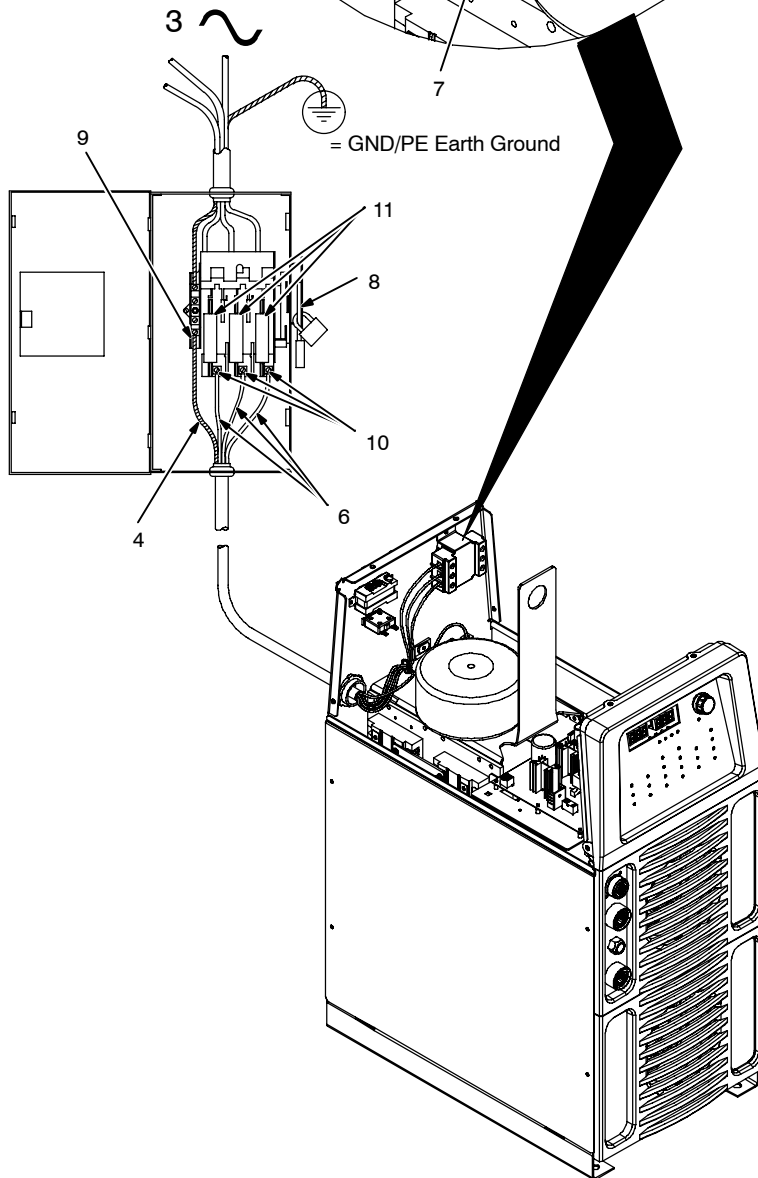
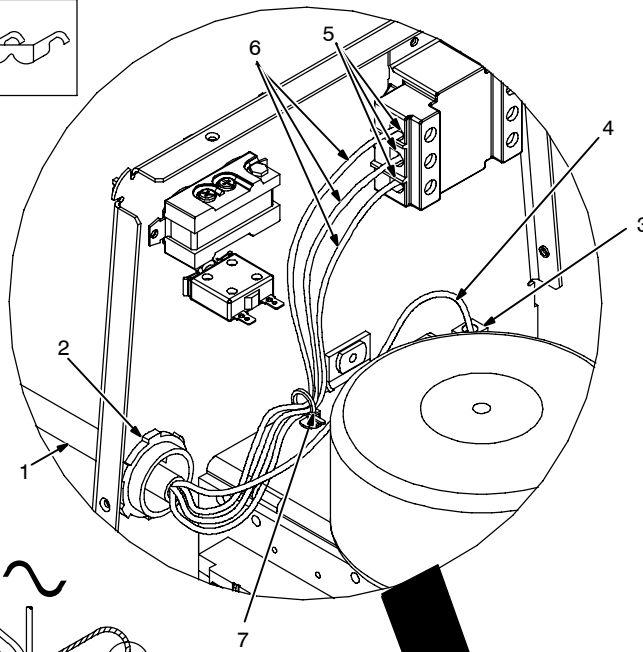
- 12 Over-Current Protection

Select type and size of over-current protection using Section 4-9 (fused disconnect switch shown).

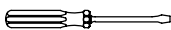
Close and secure door on line disconnect device. Remove lockout/tagout device, and place switch in the On position.

805 470-B

4-12. Connecting Input Power For Maxstar 700 Models



Tools Needed:



- ⚠** Installation must meet all National and Local Codes – have only qualified persons make this installation.
- ⚠** Disconnect and lockout/tagout input power before connecting input conductors from unit.
- ⚠** Make input power connections to the welding power source first.
- ⚠** Always connect green or green/yellow conductor to supply grounding terminal first, and never to a line terminal.

See rating label on unit and check input voltage available at site (see Section 4-6).

- 1 Input Power Conductors (Customer Supplied Cord)

Select size and length of conductors using Section 4-9. Conductors must comply with national, state, and local electrical codes. If applicable, use lugs of proper amperage capacity and correct hole size.

Welding Power Source Input Power Connections

- 2 Strain Relief

Route conductors (cord) through strain relief and tighten screws.

- 3 Machine Grounding Terminal

- 4 Green Or Green/Yellow Grounding Conductor

Connect green or green/yellow grounding conductor to welding power source grounding terminal first.

- 5 Welding Power Source Line Terminals (Switch S1)

- 6 Input Conductors L1 (U), L2 (V) And L3 (W)

Connect input conductors L1 (U), L2 (V) and L3 (W) to welding power source line terminals.

- 7 Cable Tie

Secure wires with supplied cable tie.

Install cover.

Disconnect Device Input Power Connections

- 8 Disconnect Device (switch shown in OFF position)

- 9 Disconnect Device (Supply) Grounding Terminal

Connect green or green/yellow grounding conductor to disconnect device grounding terminal first.

- 10 Disconnect Device Line Terminals

Connect input conductors L1 (U), L2 (V) And L3 (W) to disconnect device line terminals.


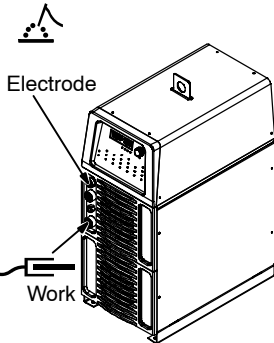
- 11 Over-Current Protection

Select type and size of over-current protection using Section 4-9 (fused disconnect switch shown).

Close and secure door on line disconnect device. Remove lockout/tagout device, and place switch in the On position.

4-13. Weld Output Terminals And Selecting Cable Sizes*

NOTICE – The Total Cable Length in Weld Circuit (see table below) is the combined length of both weld cables. For example, if the power source is 100 ft (30 m) from the workpiece, the total cable length in the weld circuit is 200 ft (2 cables x 100 ft). Use the 200 ft (60 m) column to determine cable size.

 <p>Weld Output Terminals</p> <p>⚠ Turn off power before connecting to weld output terminals.</p> <p>⚠ Do not use worn, damaged, undersized, or poorly spliced cables.</p>	Weld Cable Size** and Total Cable (Copper) Length in Weld Circuit Not Exceeding***				
	Welding Amps***	100 ft (30 m) or Less		150 ft (45 m)	200 ft (60 m)
		10 – 60% Duty Cycle	60 – 100% Duty Cycle	10 – 100% Duty Cycle	
	100	4 (20)	4 (20)	4 (20)	3 (30)
	150	3 (30)	3 (30)	2 (35)	1 (50)
	200	3 (30)	2 (35)	1 (50)	1/0 (60)
	250	2 (35)	1 (50)	1/0 (60)	2/0 (70)
	300	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)
	350	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)
	400	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)
	500	2/0 (70)	3/0 (95)	4/0 (120)	2 ea. 2/0 (2x70)
	600	3/0 (95)	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 3/0 (2x95)
	700	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 3/0 (2x95)	2 ea. 4/0 (2x120)
	800	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 3/0 (2x95)	2 ea. 4/0 (2x120)
900	2 ea. 2/0 (2x70)	2 ea. 3/0 (2x95)	2 ea. 4/0 (2x120)	3 ea. 3/0 (3x95)	

* This chart is a general guideline and may not suit all applications. If cable overheats, use next size larger cable.

**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.
() = mm² for metric use

S-0007-E-

***Select weld cable size for pulsing application at peak amperage value.

***For distances longer than those shown in this guide, call a factory applications representative at 1-800-332-3281.

☞ Proceed to Section 4-14 For Additional Installation Instructions. A Dynasty 700 is illustrated in Sections 4-14 through 7-4. Location of controls and components is similar for all models covered in this manual.

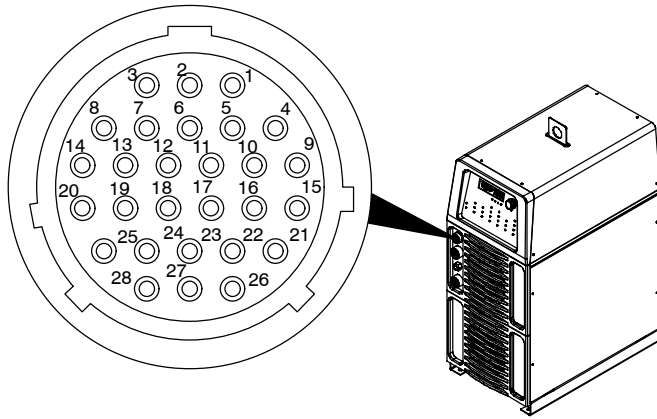
4-14. Remote 14 Receptacle Information (Used Without Automation Connection)

	REMOTE 14	Socket*	Socket Information
	15 VOLTS DC OUTPUT (CONTACTOR)	A	Contact control, 15 volts DC.
		B	Contact closure to A completes 15 volts DC contactor control circuit, and enables output.
	REMOTE OUTPUT CONTROL	C	+10 volts DC.
		D	Remote control circuit common.
		E	0 to +10 volts DC input command signal from remote control.
	A/V AMPERAGE VOLTAGE	F	Current feedback; +1 volt DC per 100 amperes.
		H	Voltage feedback; +1 volt DC per 10 output receptacle volts.
CHASSIS	K	Chassis common.	
GND	G	+15 volts DC (A) common.	

* The remaining socketes are not used.

If a remote hand control, like the RHC-14, is connected to the Remote 14 receptacle, some current value above min. must be set on the remote control before the Panel or Remote contactor is turned on. Failure to do so will cause current to be controlled by the panel control, and the remote hand control will not function.

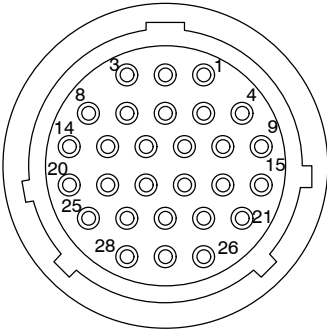
4-15. Automation Connection (For 28-Pin Receptacle If Present)



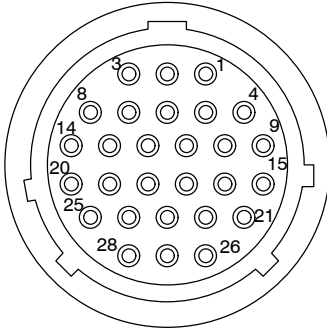
803 900-A / 218 716-A

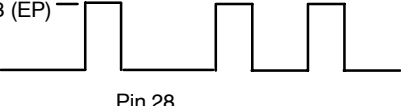
Pin	Pin Information For 28-Pin Receptacle RC28
1	Start/Stop - Closure to pin 8 starts the weld cycle. Opening closure stops weld cycle. During 2T operation, a momentary closure (greater than 100 ms, but less than 3/4 seconds) starts and stops weld output.
2	Output enable - functional only in automation modes - Closure to pin 8 must be maintained at all times. If the closure between pins 2 and 8 is broken, an output disable occurs, Postflow begins to time out, and AUTO STOP will be displayed on the meters.
3	Gas - Closure to pin 8 turns on gas. This input will override Postflow, but if a Prewflow time is entered, the Prewflow cycle will time out before arc initiation.
4	Valid arc, collector - Output is on when the contactor is on and there is less than 50 load volts (see Section 4-18).
5	Voltage feedback - +1 volt DC per 10 volts w/reference to pin 11.
6	Current feedback - +1 volt DC per 100 amperes w/reference to pin 11.
7	Not used
8	IGND isolation common
9	Valid arc, emitter - Output is on when the contactor is on and there is less than 50 load volts (see Section 4-18).
10	Memory Select 2 - See Section 4-16.
11	Remote control circuit common for pins 17 and 18
12	Chassis common
13	Pulse lockout, collector - Output is on when in Initial Amperage, Initial Slope, Final Slope, Final Amperage, and Pulsed Background time when the pulse frequency is less than 10 Hz (see Section 4-18).
14	Pulse lockout, emitter - Output is on when in Initial Amperage, Initial Slope, Final Slope, Final Amperage, and Pulse Background time, when the pulse frequency is less than 10 Hz (see Section 4-18).
15	Memory select 0 - See Section 4-16.
16	Memory select 1 - See Section 4-16.
17	Command signal from remote control - 0 to +10 volts DC input (do not use if pulse output is controlled by an external source).
18	+10 volts DC for use with an external potentiometer
19	HF disable - Disables high frequency when connected to pin 8.
20	Automation enable 1 - See Section 4-17.
21	Amperage EN common - See Section 4-17.
22	Amperage EN command - See Section 4-17.
23	Final slope, collector - Output is on when in Final Slope (see Section 4-18).
24	Final slope, emitter - Output is on when in Final Slope (see Section 4-18).
25	Automation enable 2 - See Section 4-17.
26	Amperage EP command (Dynasty models only) - See Section 4-17.
27	Amperage EP common (Dynasty models only) - See Section 4-17.
28	Polarity (Dynasty models only) - See Section 4-17.

4-16. Remote Memory Select Inputs (For 28-Pin Receptacle If Present)

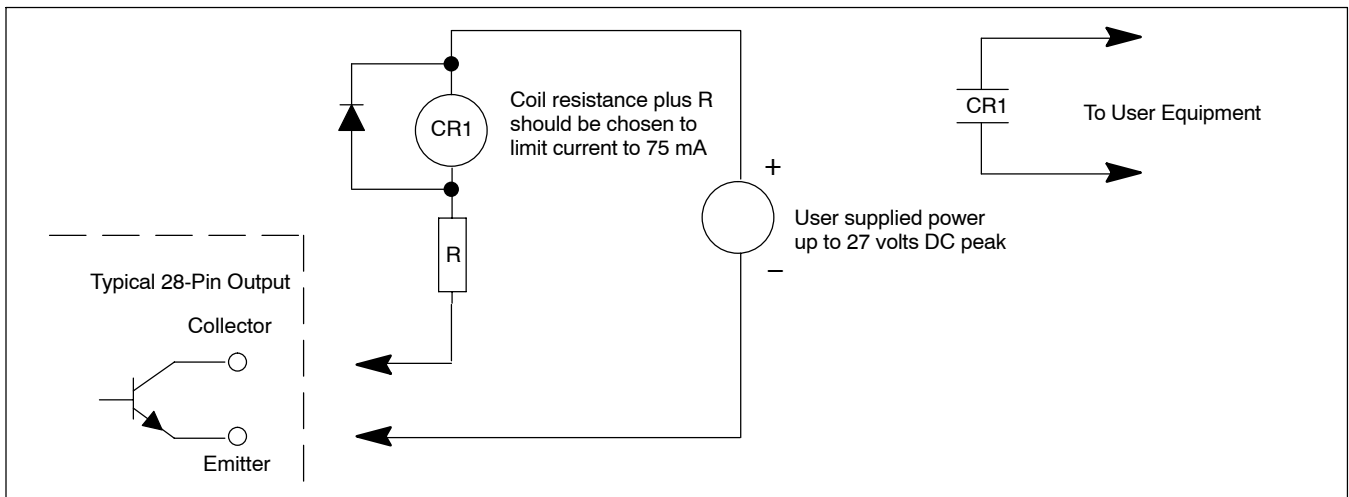
	28-Pin Receptacle RC28			
	Socket Designations 0 = No Connection / 1 = Connected To Ground (Pin 8)			
	Function	15	16	10
	Off	0	0	0
	Memory 1	1	0	0
	Memory 2	0	1	0
	Memory 3	1	1	0
	Memory 4	0	0	1
	Memory 5	1	0	1
	Memory 6	0	1	1
Memory 7	1	1	1	

4-17. Automation Selections (For 28-Pin Receptacle If Present)

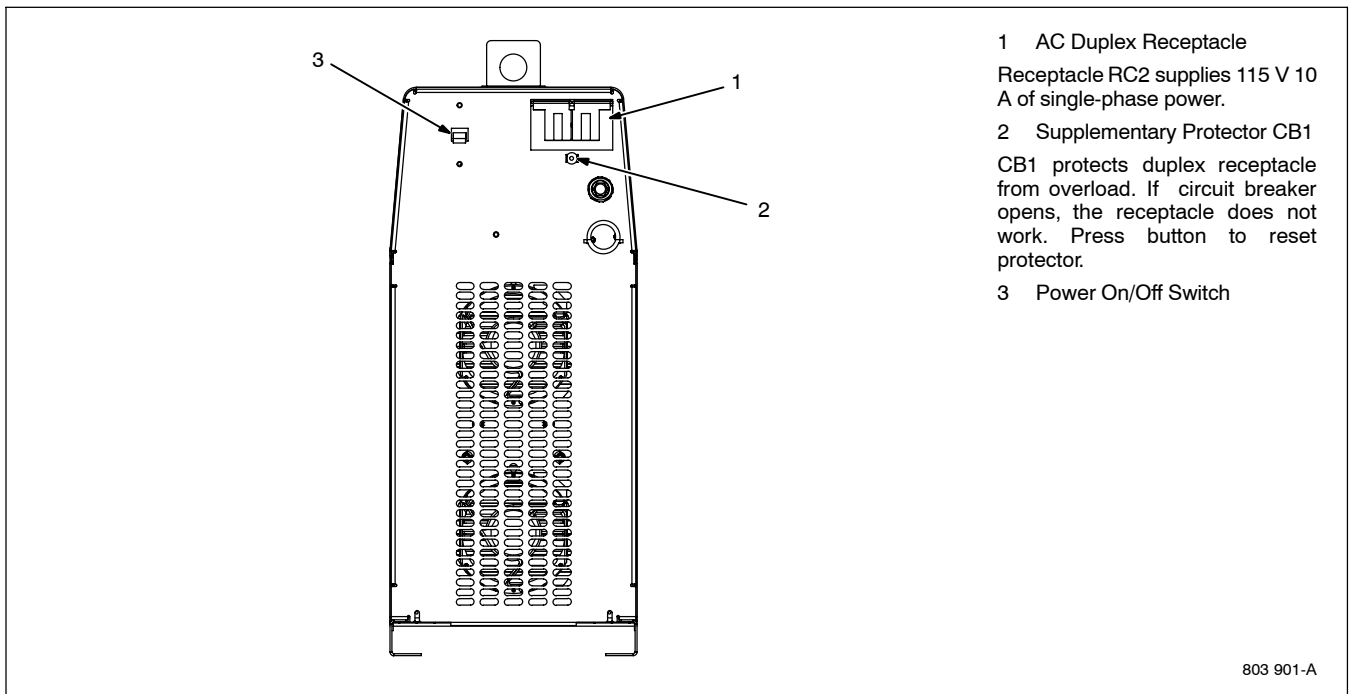
	28-Pin Receptacle RC28		
	Socket Designation 0 = No Connection / 1 = Connected To Ground (Pin 8) X= Do Not Care		
	Function	Pin	
		20	25
	No automation functions selected	0	0
Automation 1 Enables pin 2 function, Sequencer and weld timers	1	0	
Automation 2 Enables pin 2 functions Pin 22 to pin 21 - 0 to +10 volts DC EN amplitude Pin 26 to pin 27 - 0 to +10 volts DC EP amplitude Pin 28 to pin 8 - EP polarity (Frequency and Balance) Pin 28 not connected to pin 8 - EN polarity (Frequency and Balance)	X	1	

<p>Connected to pin 8 (EP)</p>  <p>Open (EN)</p> <p>Pin 28</p>

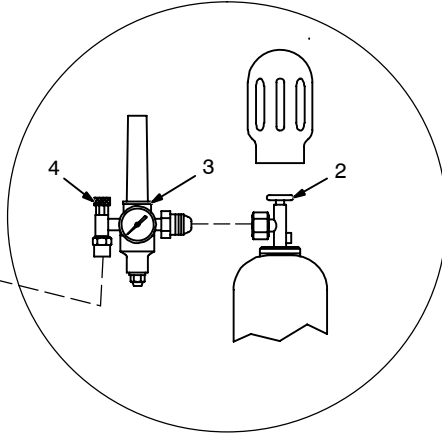
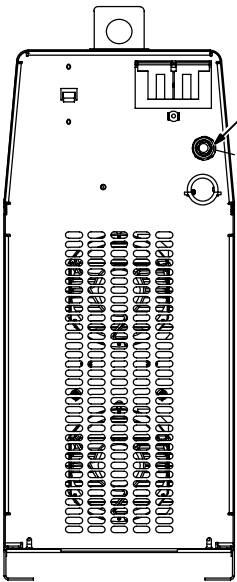
4-18. Typical Automation Application



4-19. 115 Volts AC Duplex Receptacle, Supplementary Protector CB1, And Power Switch



4-20. Gas Connections



1 Gas Fitting

Fittings have 5/8-18 right-hand threads.

2 Cylinder Valve

Open valve slightly so gas flow blows dirt from valve. Close valve.

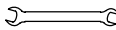
3 Regulator/Flowmeter

4 Flow Adjust

Typical flow rate is 15 cfh (cubic feet per hour).

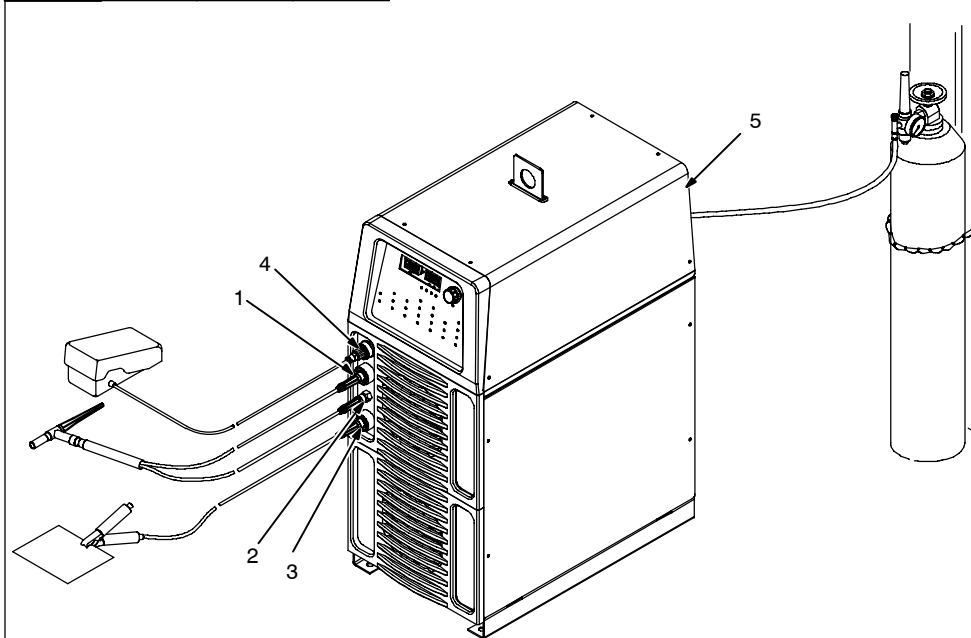
Connect customer supplied gas hose between regulator/flowmeter and gas fitting on rear of unit.

Tools Needed:

 11/16, 1-1/8 in.

803 901-A

4-21. TIG HF Impulse/ Lift-Arc™ Connections



Turn off power before making connections.

1 Electrode Weld Output Terminal

Connect TIG torch to electrode weld output terminal.

2 Gas Out Connection

Connect torch gas hose to gas out fitting.

3 Work Weld Output Terminal

Connect work lead to work weld output terminal.

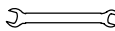
4 Remote 14 Receptacle

If desired, connect remote control to Remote 14 receptacle (see Section 4-14).

5 Gas In Connection

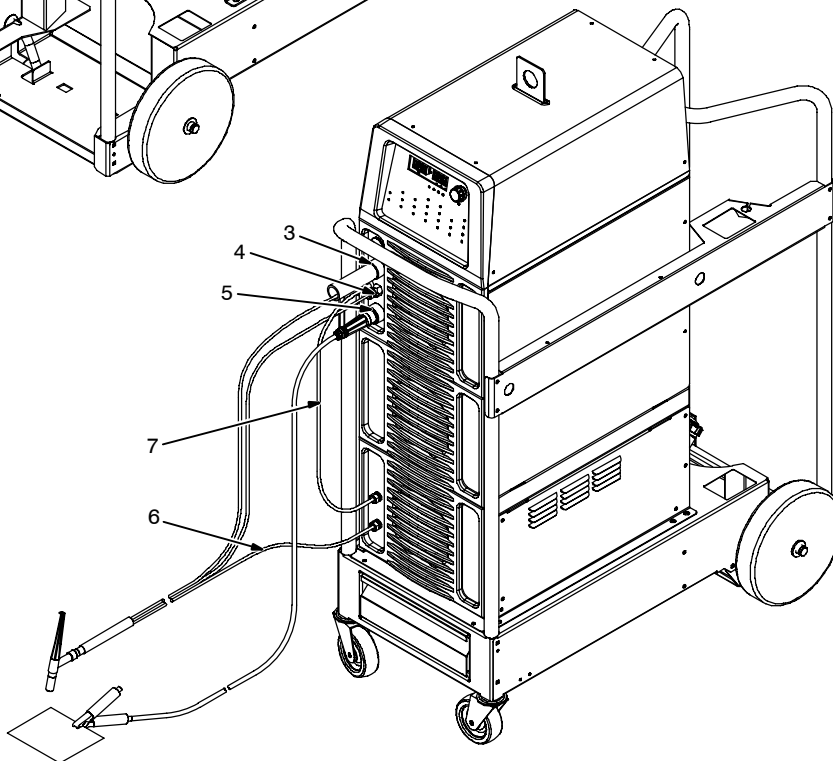
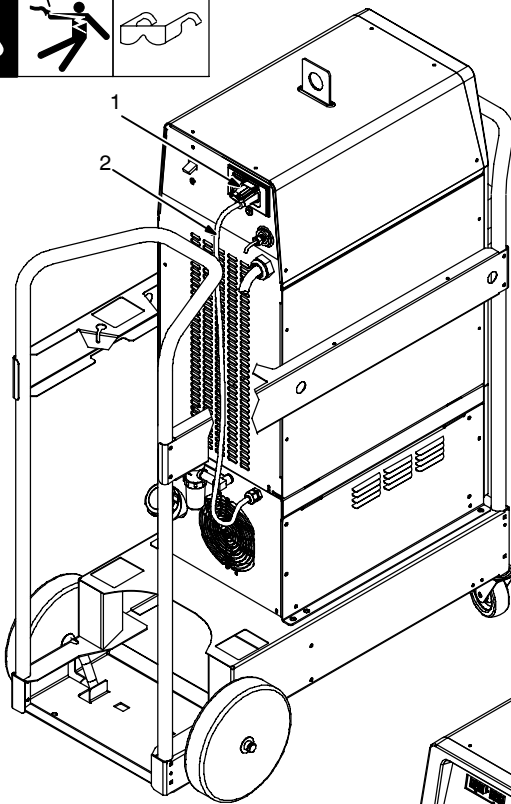
Connect gas hose from gas supply to gas in fitting (see Section 4-20).

Tools Needed:

 11/16 in., (21 mm for CE units)

803 915-B

4-22. Cooler Connections



Cart and cooler are optional equipment.

1 AC Duplex Receptacle

2 115 VAC Cord

Provides 115 vac to power cooler.

3 Electrode Weld Output Terminal (-Weld Output Terminal On Maxstar Models)

Connect TIG torch to electrode weld output terminal.

4 Gas Out Connection

Connect TIG torch gas hose to gas out fitting.

5 Work Weld Output Terminal (+Weld Output Terminal On Maxstar Models)

Connect work lead to work weld output terminal.


6 Water-Out (To Torch) Connection

Connect torch water-in (blue) hose to welding power source water-out connection.

7 Water-In (From Torch) Connection

Connect torch water-out (red) hose to welding power source water-in connection.

804 753-B

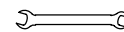
Application	GTAW Or Where HF* Is Used
 3-1/2 Gal Coolant	Low Conductivity Coolant No. 043 810**; Distilled Or Deionized Water OK Above 32° F (0° C)

*HF: High Frequency Current

**Coolant 043 810, a 50/50 solution, protect to -37° F (-38° C) and resist algae growth.

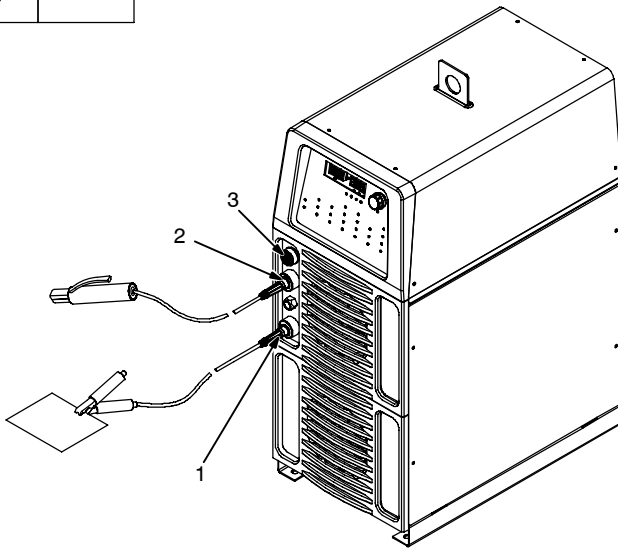
NOTICE - Use of any coolant other than those listed in the table voids the warranty on any parts that come in contact with the coolant (pump, radiator, etc.).

Tools Needed:



11/16 in., (21 mm for CE units)

4-23. Dynasty Stick Connections



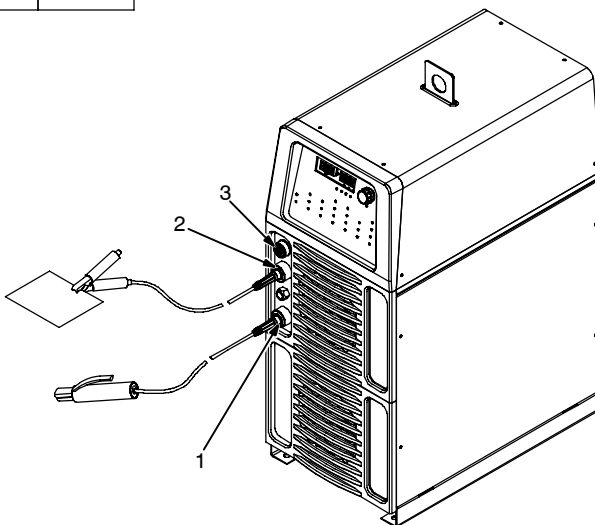
⚠ Turn off power before making connections.

☞ Connections shown are for Dynasty models.

- 1 Work Weld Output Terminal
Connect work lead to work weld output terminal.
- 2 Electrode Weld Output Terminal
Connect electrode holder to electrode weld output terminal.
- 3 Remote 14 Receptacle
If desired, connect remote control to Remote 14 receptacle (see Section 4-14).

803 916-C

4-24. Maxstar Stick Connections



⚠ Turn off power before making connections.

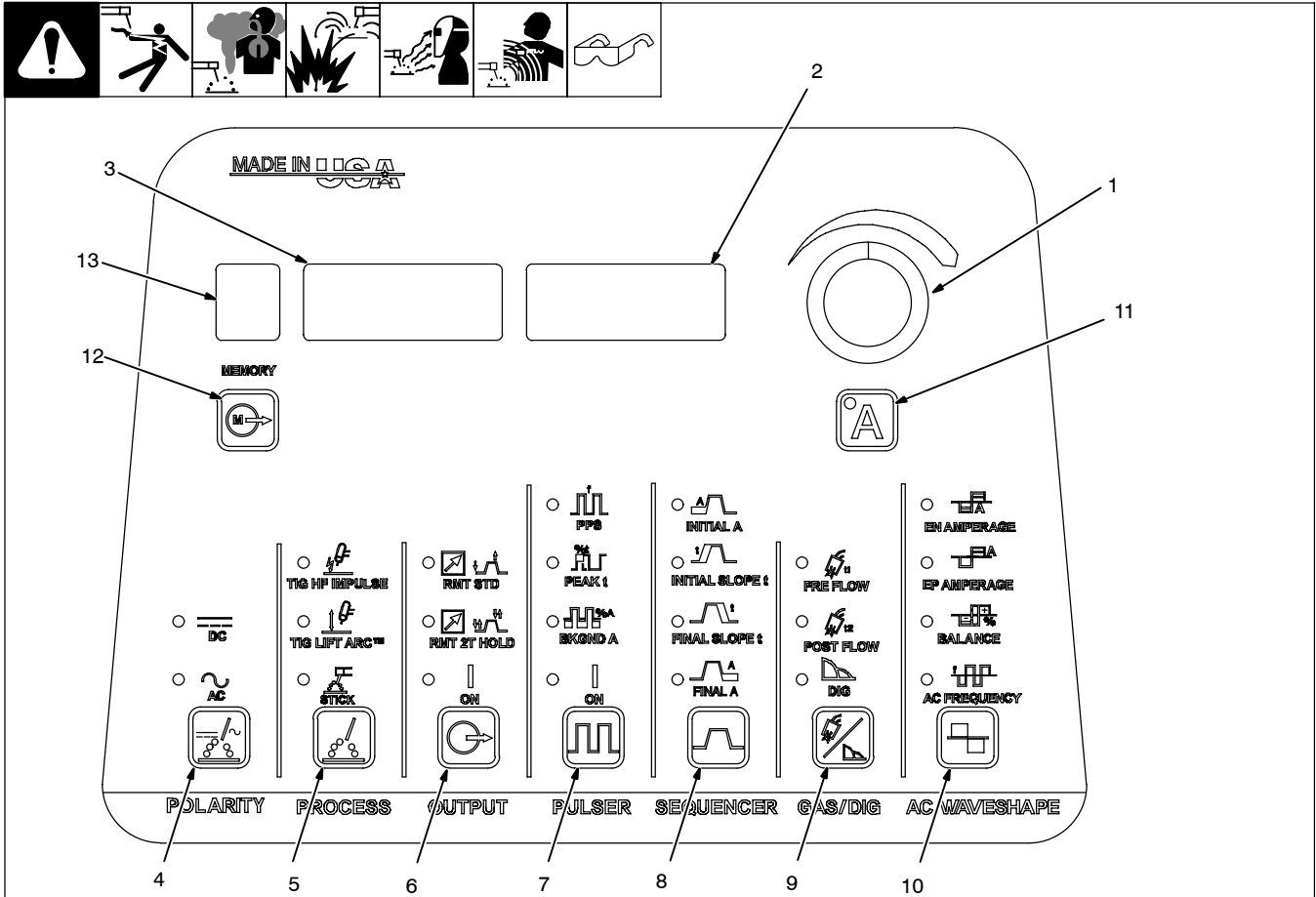
☞ Connections shown are for Maxstar models.

- 1 + Weld Output Terminal
Connect electrode lead to positive (+) weld output terminal.
- 2 - Weld Output Terminal
Connect work lead to negative (-) weld output terminal.
- 3 Remote 14 Receptacle
If desired, connect remote control to Remote 14 receptacle (see Section 4-14).

803 916-C

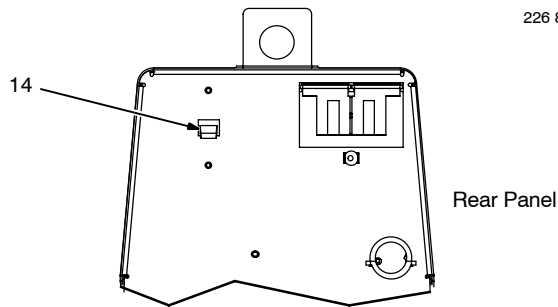
SECTION 5 – OPERATION

5-1. Controls



☞ Polarity And AC Waveshape Controls Are Available On Dynasty Models Only.

226 868-B / Ref. 803 901-A



Rear Panel

☞ For all front panel switch pad controls: press switch pad to turn on light and enable normal function.

☞ Green on nameplate indicates a TIG function, Gray indicates a normal Stick function.

1 Encoder Control

2 Ammeter And Parameter Display

See Section 5-4.

3 Voltmeter And Selected Parameter Display

See Section 5-5.

4 Polarity Control (Dynasty Only)

See Section 5-6.

5 Process Controls

See Section 5-7.

6 Output Controls

See Section 5-9.

7 Pulsar Controls

See Section 5-10.

8 Sequencer Controls

See Section 5-11.

9 Gas/DIG Controls

See Section 5-12.

10 AC Waveshape (Dynasty Only)

See Section 5-13.

11 Amperage And Spot Time Control

For Amperage Control see Section 5-3.

For Spot Time Control see Section 6-6.

12 Memory

See Section 5-14.

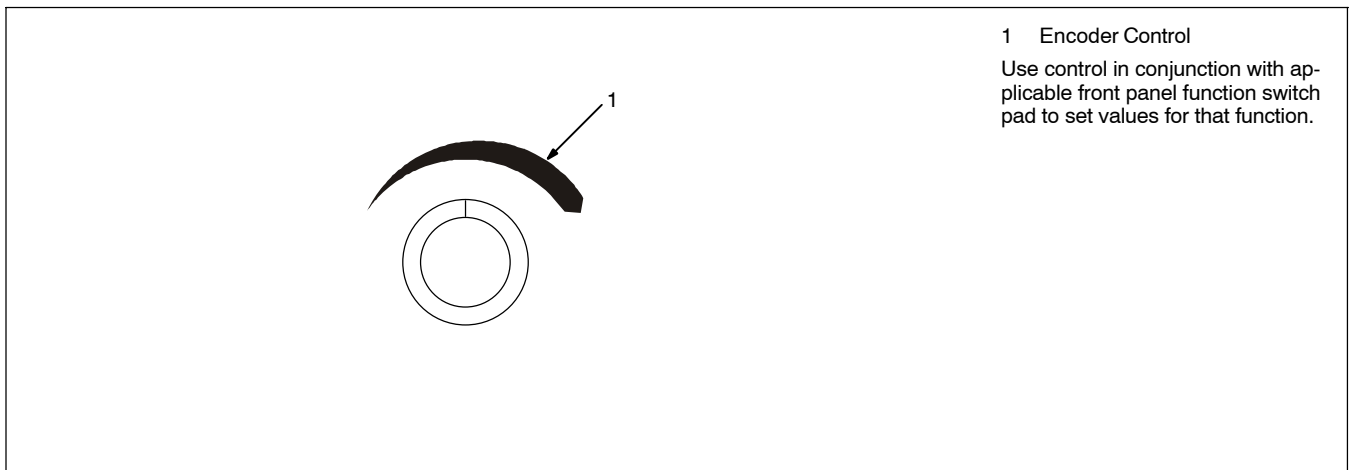
13 Memory Display

Displays active memory.

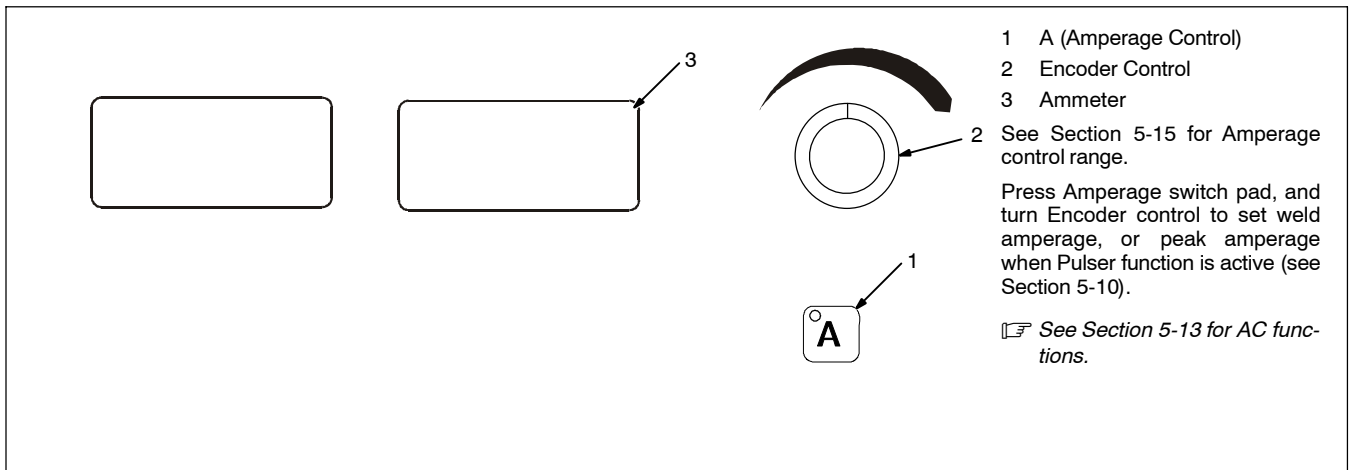
14 Power Switch

Use switch to turn unit On/Off.

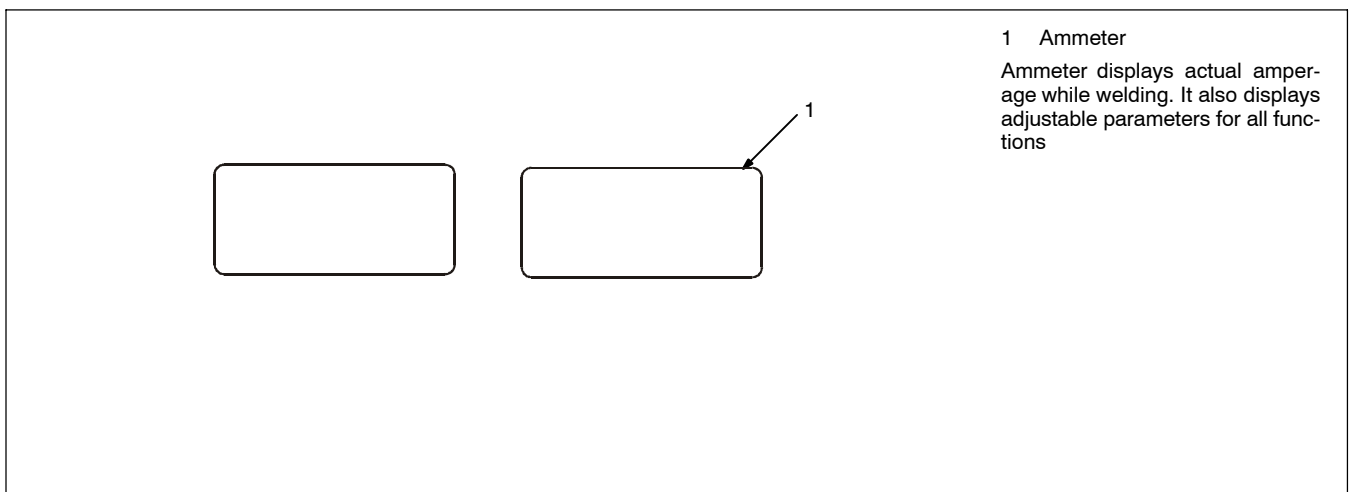
5-2. Encoder Control



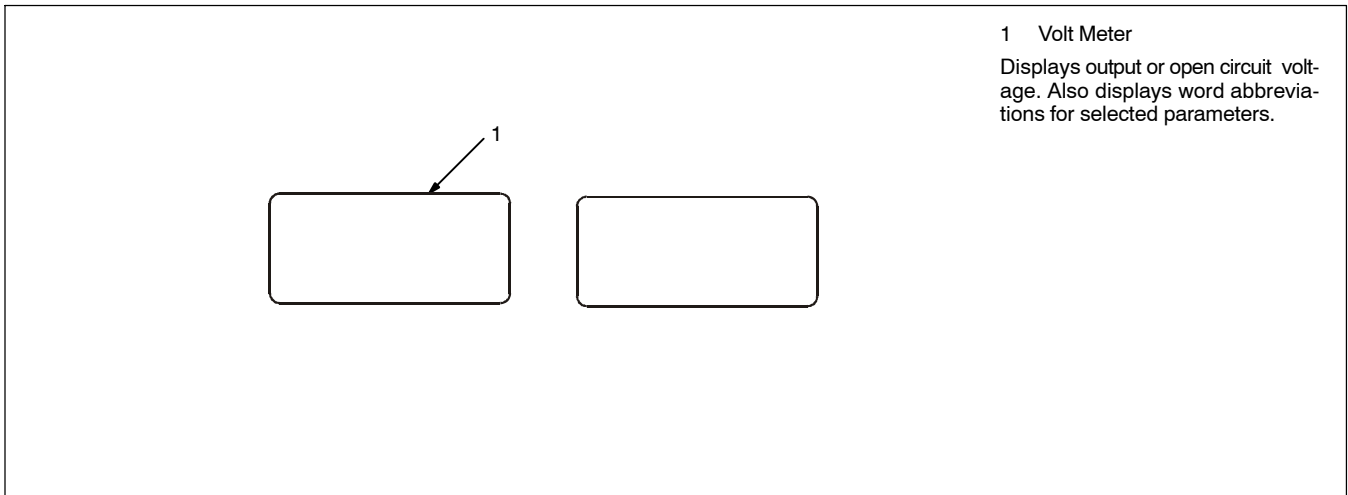
5-3. Amperage Control



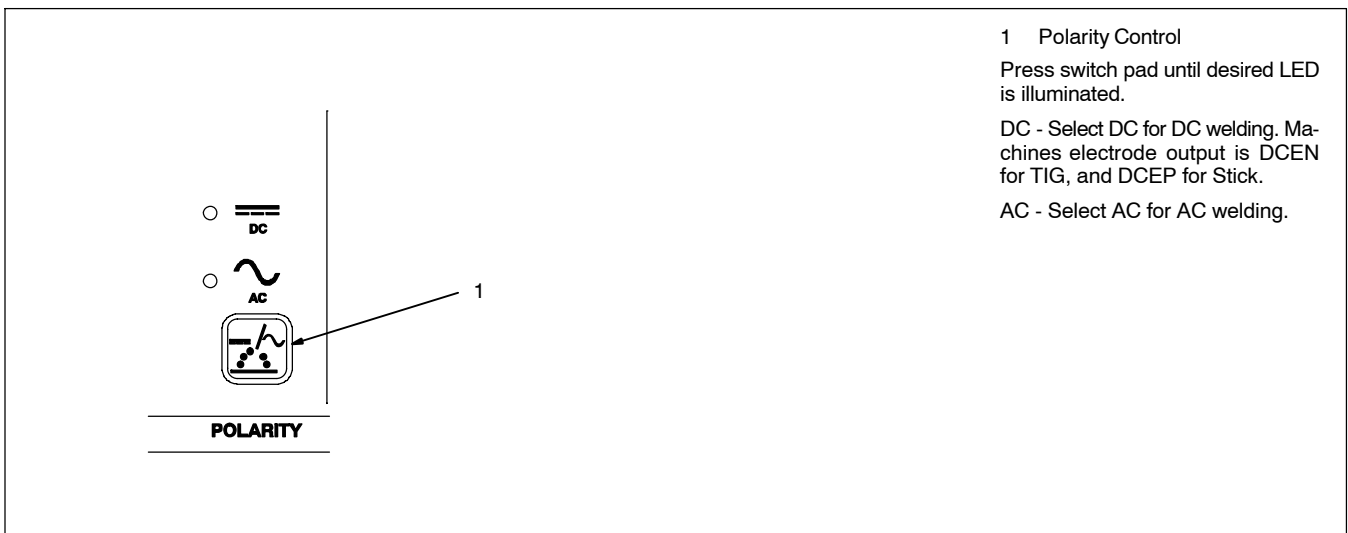
5-4. Ammeter And Parameter Display



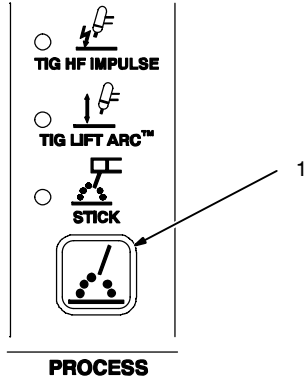
5-5. Voltmeter And Selected Parameter Display



5-6. Polarity Control (Dynasty™ Models Only)



5-7. Process Control



1 Process Control

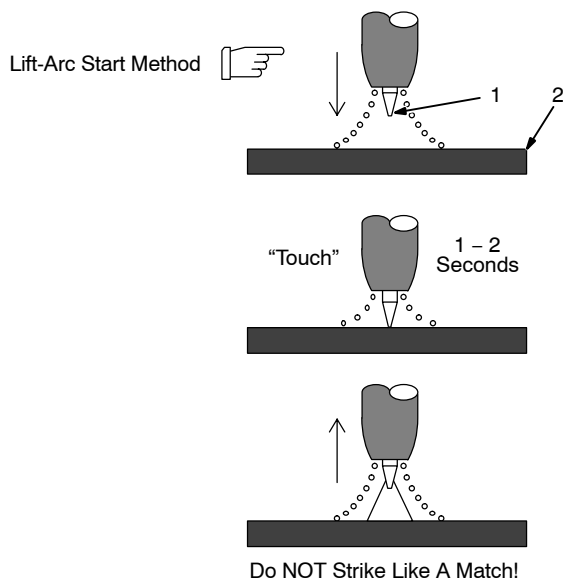
Press switch pad until desired process LED is illuminated:

TIG HF Impulse - is a pulsed HF (see Section 5-8) arc starting method that can be used with either AC or DC TIG welding. Make connections according to Section 4-21.

TIG Lift-Arc™ - is an arc starting method in which the electrode must come in contact with the workpiece (see Section 5-8). This method can be used with either AC or DC TIG welding. Make connections according to Section 4-21.

Stick (SMAW) - This method can be used with either AC or DC Stick welding. Make connections according to Section 4-23.

5-8. Lift-Arc™ And HF TIG Start Procedures



Lift-Arc Start

When Lift-Arc™ button light is On, start arc as follows:

- 1 TIG Electrode
- 2 Workpiece

Touch tungsten electrode to workpiece at weld start point, enable output and shielding gas with torch trigger, foot control, or hand control. **Hold electrode to workpiece for 1-2 seconds**, and slowly lift electrode. Arc is formed when electrode is lifted.

Normal open-circuit voltage is not present before tungsten electrode touches workpiece; only a low sensing voltage is present between electrode and workpiece. The solid-state output contactor does not energize until after electrode is touching workpiece. This allows a properly prepared electrode (see Section 11-2) to touch workpiece without overheating, sticking, or getting contaminated.

Application:

Lift-Arc is used for the DCEN or AC GTAW process when HF Start method is not permitted, or to replace the scratch method.

HF Start

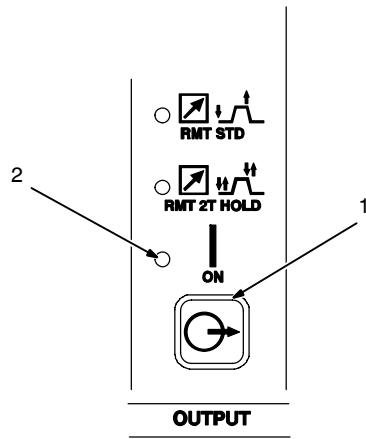
When HF Start button light is On, start arc as follows:

High frequency turns on to start arc when output is enabled. High frequency turns off when arc is started, and turns on whenever arc is broken to help restart arc.

Application:

HF start is used for the DCEN GTAW, or the AC GTAW process when a non-contact arc starting method is required.

5-9. Output Control



1 Output Control

Press switch pad until desired parameter LED is illuminated.

RMT STD (Remote Standard)

Application: Use Remote Trigger (Standard) with a foot pedal or finger amperage control (see Section 6-3A).

☞ When a foot or finger remote current control is connected, initial amps, initial slope, final slope, and final amps are controlled by the remote control.

NOTE: If an On/Off type trigger is used, it must be a maintained switch. All Sequencer functions become active, and must be set by the operator.

RMT 2T HOLD

Application: Use Remote Trigger Hold (2T) for long extended welds.

If a foot or finger current control is connected to the welding power source, only trigger input is functional (see Section 6-3B).

☞ This switch function can be reconfigured for 3T, 4T, 4T Momentary, or

Mini Logic control See Sections 6-3C, D, E, or F)

ON

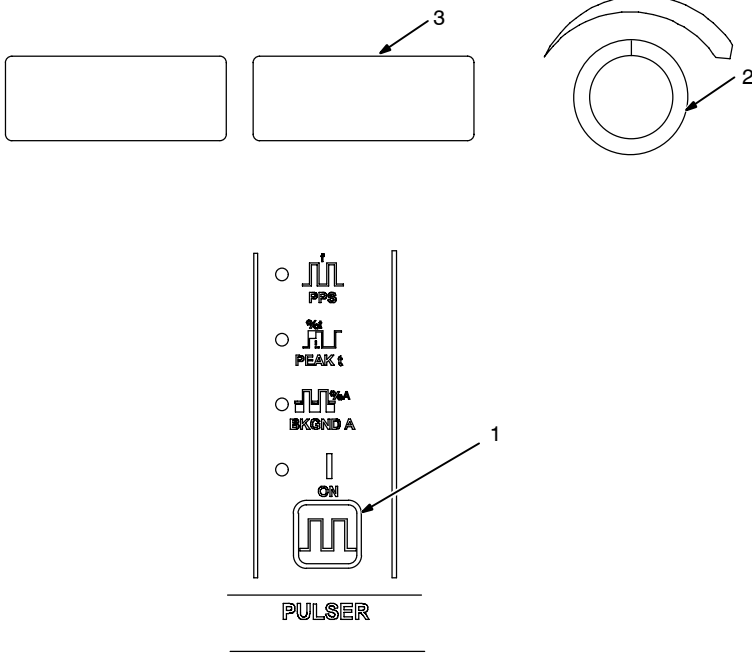
Output will energize two seconds after being selected.

Application: Use Output On for Stick (SMAW) welding, or for Lift-Arc without the use of a remote control (see Section 6-3G).

2 On LED

Blue On LED is lit whenever Output is on.

5-10. Pulsar Control



1 Pulsar Control

Pulsing is available while using the TIG process. Controls can be adjusted while welding.

Press switch pad to enable pulser.

ON - When illuminated, this LED indicates the pulser is on.

Press switch pad until desired parameter LED is illuminated.

To turn Pulsar off, press and release switch pad until the On LED turns off.

2 Encoder Control (Set Value)

3 Ammeter (Displays Value)

See Section 5-15 for all Pulsar parameter ranges.

PPS - Pulse frequency or pulses per second, is the number of pulse cycles per second. Pulse frequency helps reduce heat input, part warpage, and helps weld bead cosmetics. The higher the PPS setting, the smoother the ripple effect, the narrower the weld bead, and the more cooling you get. By setting PPS on the lower end, the pulse is slower, and the weld bead wider. This slow pulsing helps agitate the weld puddle to help release gas trapped in the weldment, and help reduce porosity (very useful in aluminum welding). Some beginners use a slower pulse rate (2-4 pps) to help them with their timing on adding filler material. An experienced welder may have the PPS setting much higher, depending on their personal preferences, and on what they are trying to accomplish.

PEAK t - (PEAK t) is the percentage of time in each cycle, spent at peak amperage (main amperage). Peak amperage is set with the Amperage control (see Section 5-3). If one pulse per second is being used, and peak time is set at 50%, one-half second is spent at peak amperage, and the other 50%, or one-half second, is spent at the background amperage. Increasing peak time increases time spent at peak amperage, which increases heat input into the part. A good starting point for peak time is about 50-60%. To find a good ratio, you will have to experiment a bit, but the idea is to decrease heat input into the part, and increase the cosmetics of the weld.

BKGD A - (Background amps) is set as a percentage of the peak amps setting. If peak amps is set at 200, and background amps at 50%, your background amps is 100 amps when the machine pulses on the background side of the cycle. The lower background amperage helps reduce heat input. Increasing or decreasing background amps increases or decreases the overall average amperage, which helps determine how fluid your puddle is on the background side of the pulse cycle. Overall, you want your puddle to shrink to about one-half the size, but still remain fluid. To start with, set background amps at about 20-30% for stainless/carbon steel, or at about 35-50% for aluminum alloys.

4 Pulsed Output Waveforms

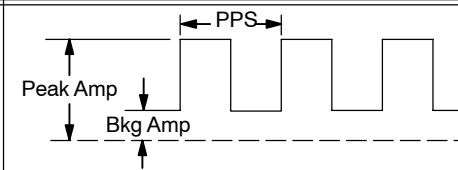
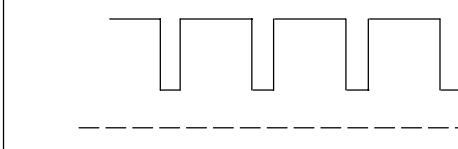
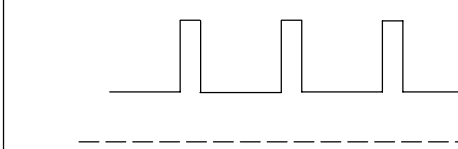
Example shows affect changing the Peak Time control has on the pulsed output waveform.

Application:

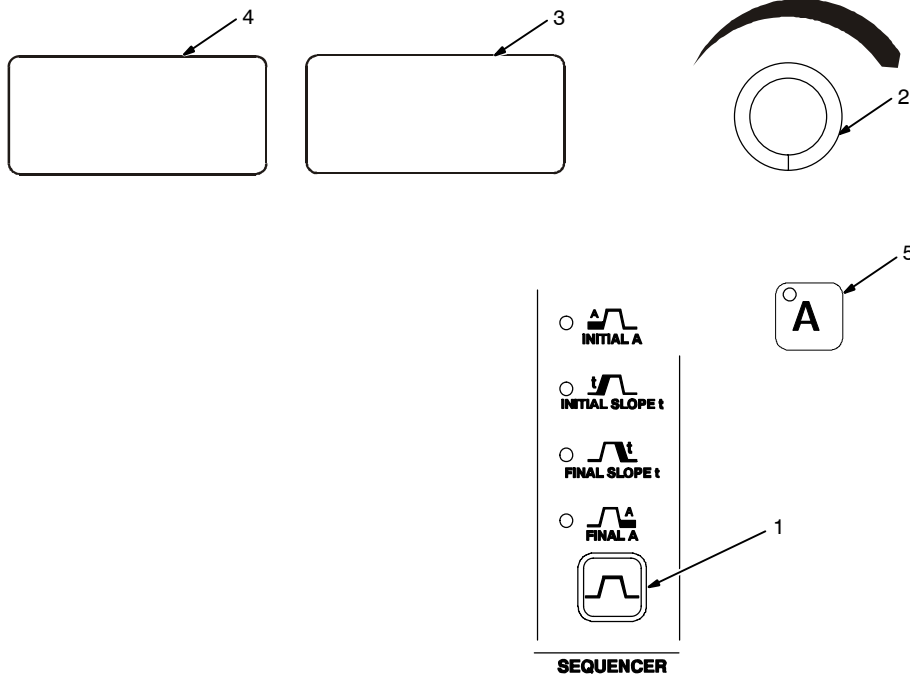
Pulsing refers to the alternating raising and lowering of the weld output at a specific rate. The raised portions of the weld output are controlled in width, height, and frequency, forming pulses of weld output. These pulses and the lower amperage level between them (called the background amperage) alternately heat and cool the molten weld puddle. The combined effect gives the operator better control of penetration, bead width, crowning, undercutting, and heat input. Controls can be adjusted while welding.

Pulsing can also be used for filler material addition technique training.

 Function is enabled, when LED is lit

Percent (%) Peak Time Control Setting	Pulsed Output Waveforms
Peak 50%/Background 50% Balanced 50%	
More Time At Peak Amperage (80%)	
More Time At Background Amperage (20%)	

5-11. Sequencer Controls



1 Sequencer Control

Sequencing is available while using the TIG process, but is disabled if a remote foot or finger current control is connected to the Remote receptacle while in the RMT STD mode.

Press switch pad until desired parameter LED is illuminated.

2 Encoder Control (Set Value)

Turn control to set values for the sequencer parameters.

3 Ammeter (Displays Value)

See Section 5-15 for all Sequencer parameter ranges.

4 Voltmeter

Displays word abbreviations of selected parameters.

INITIAL A (Initial Amperage) [INTL] - Use control to select a starting amperage that is different from the weld amperage.

Application:

Initial Amperage can be used to assist in preheating cold material prior to depositing filler material, or to ensure a soft start.

INITIAL t (Initial Time) [INTL] (**Available with Automation option Only**) - Press control again and turn Encoder to set amount of time needed at the beginning of the weld.

INITIAL SLOPE t (Initial Slope Time) [ISLP] Use control to set amount of time that it takes to slope from initial amperage to weld amperage. To disable, set to 0.

5 Amperage Switch Pad

Weld Time (Available with Automation option Only) - Press Amperage switch pad twice. Set desired weld time.

Spot Time - Press amperage switch twice. Set desired spot time.

FINAL SLOPE t (Final Slope Time) [FSLP] - Use control to set amount of time it takes to slope from weld amperage to final amperage. To disable, set to 0.

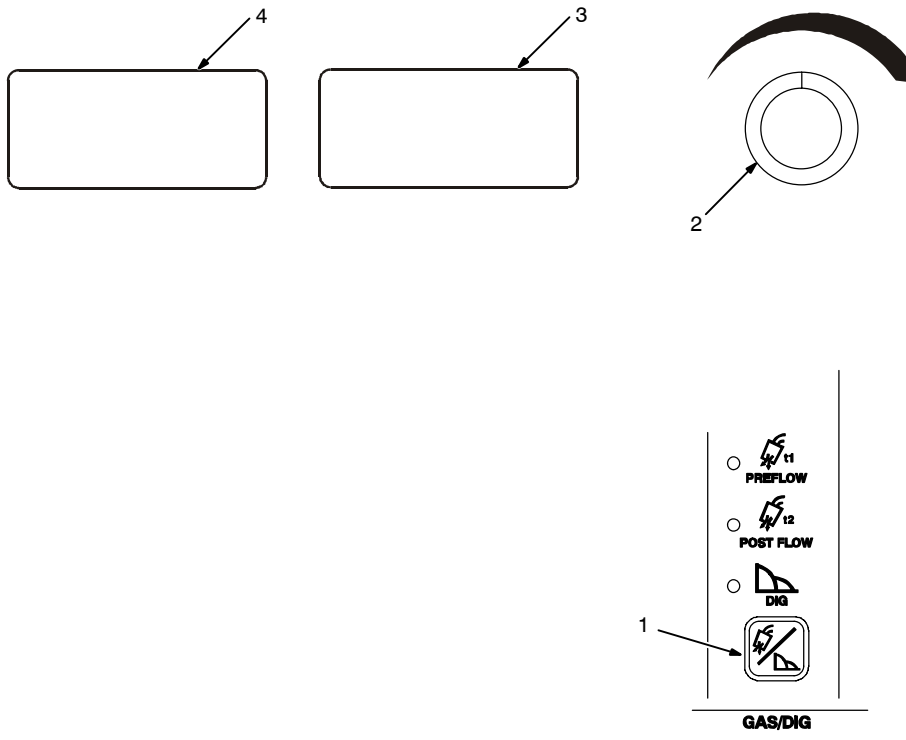
Application:

Final Slope should be used while welding materials that are crack sensitive, and/or to eliminate the crater at the end of the weld.

FINAL A (Final Amperage) [FNL] - Used to set amperage to which weld amperage slopes to.

FINAL t (Final Time) [FNL] (**Available with Automation option Only**) - Press control again and turn Encoder to set Final Amperage time.

5-12. Gas/DIG Controls (Prewflow/Post Flow/DIG/Purge)



1 Gas/DIG Controls

Press switch pad until desired function LED is illuminated.

2 Encoder Control (Set Value)

3 Ammeter (Displays Value)

See Section 5-15 for all Adjust parameter ranges.

4 Voltmeter

Displays word abbreviations of selected parameters.

PREFLOW [PRE] - If the TIG HF process is active (see Section 5-7) and Prewflow is shown on the control panel, use control to set length of time gas flows before arc initiation.

Application: Prewflow is used to purge the weld area and aids in arc starts.

POST FLOW [POST] - If the TIG process is active (see Section 5-7), use control to set length of time gas flows after welding stops.

AUTO POST FLOW - Creates a post flow time scaled at 1 second per 10 amps of the peak weld amperage for a given weld cycle. Auto post flow is limited to a 8 second minimum, or to the maximum preset post flow time.

Application:

Postflow is required to cool tungsten and weld, and to prevent contamination of tungsten and weld. Increase postflow time if tungsten or weld are dark in appearance.

DIG - If Stick process is active (see Section 5-7), use control to set amount of DIG. When set at 0, short-circuit amperage at low arc voltage is the same as normal welding amperage.

When setting is increased, short-circuit amperage at low arc voltage increases.

Application:

Control helps arc starting or making vertical or overhead welds by increasing amperage at low arc voltage, and reduces electrode sticking while welding.

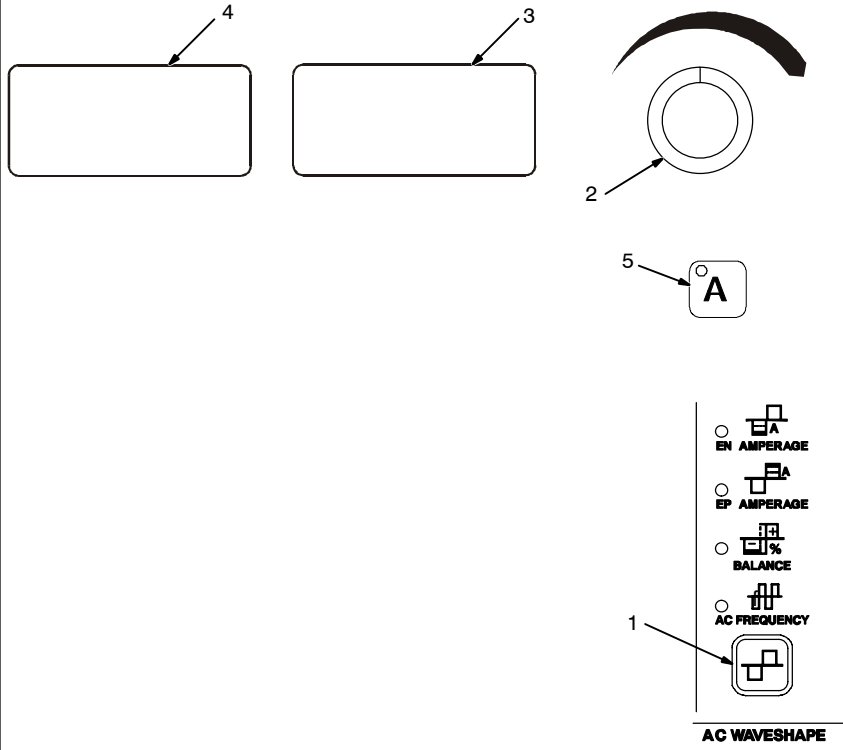
PURGE [PURG] - To activate the gas valve and start the purge function, push and hold the Gas/DIG switch pad for the desired amount of time. To set from 1 to 50 seconds of purge time, hold the Gas/DIG switch pad while turning the encoder control. Default is 0.

While Purge is active, [PURG] is shown in the left display, and purge time is shown in the right display.

Pressing any switch pad will end the purge display, but gas will continue to flow until the preset time has timed out.

Application: Purge is used to clear the gas lines.

5-13. AC Waveshape (Dynasty Models Only)



1 AC Waveshape Control

Press switch pad until desired function LED is illuminated.

2 Encoder Control (Set Value)

3 Ammeter (Displays Value)

See Section 5-15 for all AC Waveshape parameter ranges.

EN Amperage [EN] - Use with AC TIG only to select electrode negative amperage value.

EP Amperage [EP] - Use with AC TIG only to select electrode positive amperage value.

Note: See Section 6-1 to set same Amplitude control [ENEP].

EN Amperage and EP Amperage allow the operator the ability to control the amount of amperage in the negative and positive half cycles independently. A 1.5 to 1 ratio of EN to EP is a good starting point. This provides cleaning action, but directs more energy into the workpiece and provides faster travel speeds and deeper penetration.

4 Amperage Control

Average Amperage Control: Setting EN Amperage, EP Amperage, Balance, and Frequency values creates an average amperage. The operator can change the average amperage value while maintaining the same EN amperage to EP amperage ratio at the existing balance and frequency. To change the average amperage value, press the Amperage switch pad and turn the Encoder control. The changing average value is displayed on the ammeter. Example: If EN Amperage is 300, EP Amperage is 150, Balance is 60%, and Frequency is 120, the average amperage is 240 amps. If you press the Amperage switch pad and turn the Encoder control until 480 amps is displayed, the EN amperage is now 600 and EP amperage is now 300. The balance remains 60%, and the frequency is still 120, and the 2 to 1 EN amperage to EP amperage is maintained.

Balance [BAL] - AC Balance control is enabled only in AC TIG to set percentage of time polarity is electrode negative. Set control at about 75%, and fine tune from there.

5 Voltmeter

Displays word abbreviations of selected parameters.

Application:

When welding on oxide forming materials such as aluminum or magnesium, excess cleaning is not necessary. To produce a good weld, only 0.10 in (2.5mm) of etched zone along the weld toes is required.

Use AC Balance to control the etch zone width.

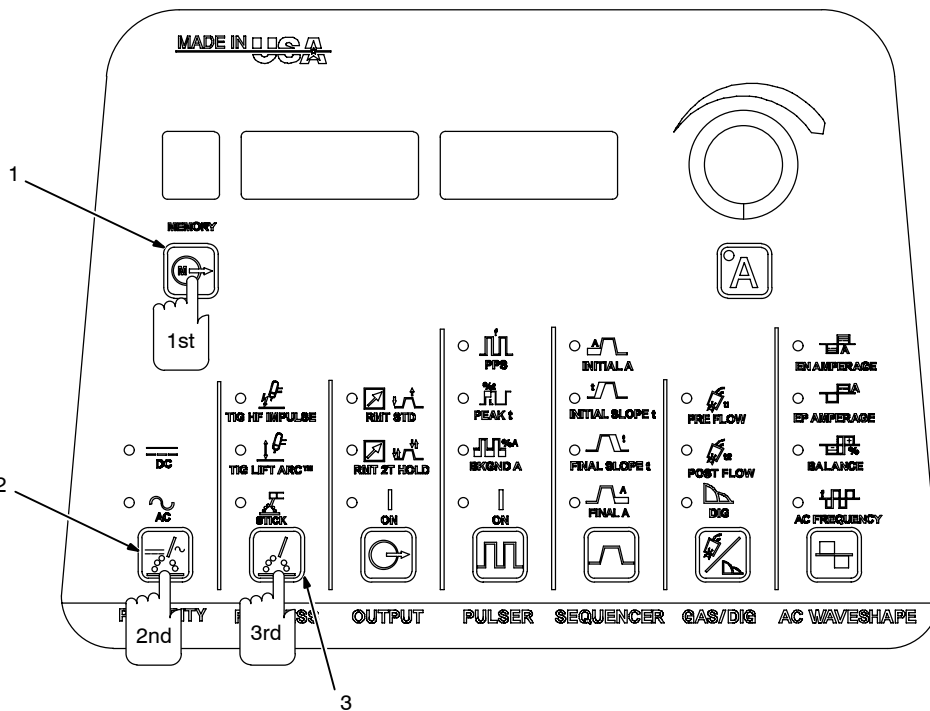
Joint configuration, set-up, process variables, and oxide thickness may affect setting.

AC Frequency [FREQ] - Use control to set AC frequency (cycles per second).

Application:

AC Frequency controls arc width and directional control. As AC frequency decreases, the arc becomes wider and less focused, limiting directional control. As AC frequency increases, the arc becomes narrower and more focused, increasing directional control. Travel speed can increase as AC frequency increases.

5-14. Memory (Program Storage Locations 1-9)



- 1 Memory (Program Storage 1-9) Switch Pad
- 2 Polarity Switch Pad (Dynasty Only)
- 3 Process Switch Pad

To create, change, or recall a welding parameters program, proceed as follows:

First, press Memory switch pad until the desired program storage location (1-9) is displayed.

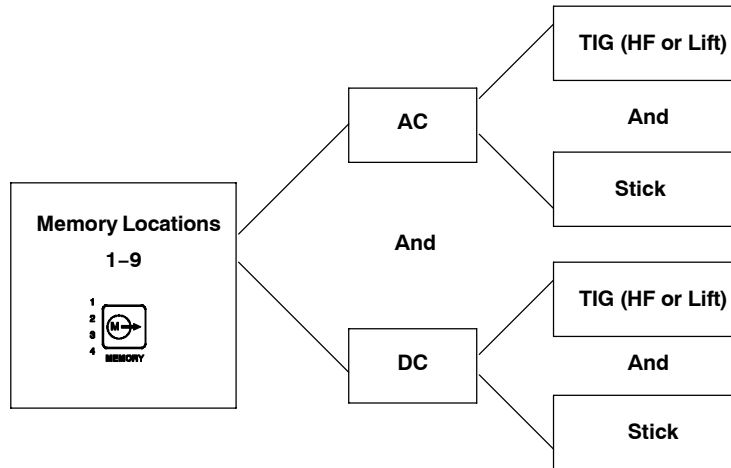
Second, press Polarity switch pad until the desired polarity, AC or DC, LED is illuminated

Third, press Process switch pad until desired process, TIG HF Impulse, TIG Lift Arc, or Stick, LED is illuminated.

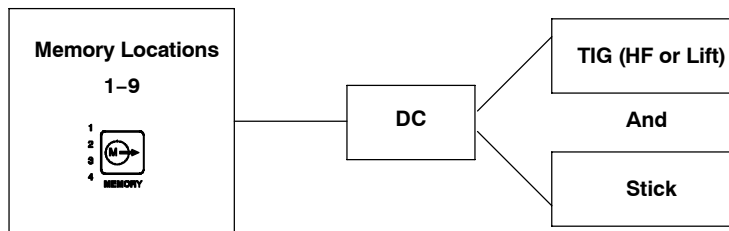
The program at the chosen location, for the desired polarity and process, is now the active program.

Fourth, change or set all desired parameters (see Section 5-15 for parameters).

Polarity And AC Waveshape Controls Are Available On Dynasty Models Only.



For Dynasty Models, each memory location (1 thru 9) can store parameters for both polarities (AC and DC), and each polarity can store parameters for both process (TIG and Stick) for a total of 36 programs.



For Maxstar Models, each memory location (1 thru 9) can store parameters for both process (TIG and Stick) for a total of 18 programs.

5-15. Factory Parameter Defaults And Range And Resolution For 350 Models

Parameter	Default	Range And Resolution
MEMORY	1	1-9
(DYNASTY ONLY) POLARITY	AC	AC / DC
PROCESS	TIG HF Impulse	TIG HF Impulse / TIG Lift / Stick
OUTPUT	RMT STD	RMT STD / RMT 2T / ON
**RMT 2T	2T	RMT 2T can be reconfigured for: 2T / 3T / 4T / Mini Logic / 4T Momentary (see Section 6-3)
A MAIN / PEAK		
(DYNASTY ONLY) AC TIG	150 A	5 - 350 Amps
(DYNASTY ONLY) AC STICK	110 A	5 - 350 Amps
DC TIG	150 A	5 - 350 Amps
DC STICK	110 A	5 - 350 Amps
*Spot	OFF	ON/OFF
*Spot Time	0 T	0 - 999 Seconds
**Weld Time	0T	0 - 999 Seconds
PULSER	Off	ON / OFF
PPS	100 Hz	DC: 0.1 - 5000 PPS AC: 0.1 - 500 PPS
PEAK t	40%	5 - 95 Percent
BKGND A	25%	5 - 95 Percent
SEQUENCER		
INITIAL A	20 A	5 - 350 Amps
**Initial Time	0 T	0.0 - 25.0 Seconds
INITIAL SLOPE t	0 T	0.0 - 50.0 Seconds
FINAL SLOPE t	0 T	0.0 - 50.0 Seconds
FINAL A	5 A	5 - 350 Amps
**Final Time	0 T	0.0 - 25.0 Seconds
ADJUST		
PREFLOW	0.2 T	0.0 - 25.0 Seconds
POST FLOW	Auto	Auto 1 - 50 Seconds
DIG	30%	0 - 100 Percent
(DYNASTY ONLY) AC WAVESHape		
*Waveform	Soft Square	Soft Square, Advanced Square, Sine, Triangle
EN Amps	150A	5 - 350 Amps
EP Amps	150A	5 - 350 Amps
BALANCE	75%	30 - 99 Percent
FREQUENCY	120 Hz	20 - 400 Hertz
EN/EP	Independent	Same/Independent

Factory Parameter Defaults And Range And Resolution For 350 Models (Continued)

*TIG Start parameters for each program (1-9)		
DC:		
*Tungsten	.094	GEN, .020, .040, .062, .094, .125, .156, .187
***Polarity (DYNASTY ONLY)	EN	EP / EN
***Amperage	60 A	5 – 200 Amps
***Time	25 ms	1 – 200 Milliseconds
***Start Slope Time	7 ms	0 – 250 Milliseconds
***Preset Amperage Minimum	5 A	5 – 25 Amps
AC: (DYNASTY ONLY)		
*Tungsten	.094	GEN, .020, .040, .062, .094, .125, .156, .187
***Polarity	EP	EP / EN
***Amperage	130 A	5 – 200 Amps
***Time	20 ms	1 – 200 Milliseconds
***Start Slope Time	2 ms	0 – 250 Milliseconds
***Preset Amperage Minimum	5 A	5 – 25 Amps
* Parameter adjusted using an Advanced Function configuration only (See Section 6).		
** Parameter used with the automation option only.		
*** Parameter adjust in GEN setting only (see Section 6-2).		

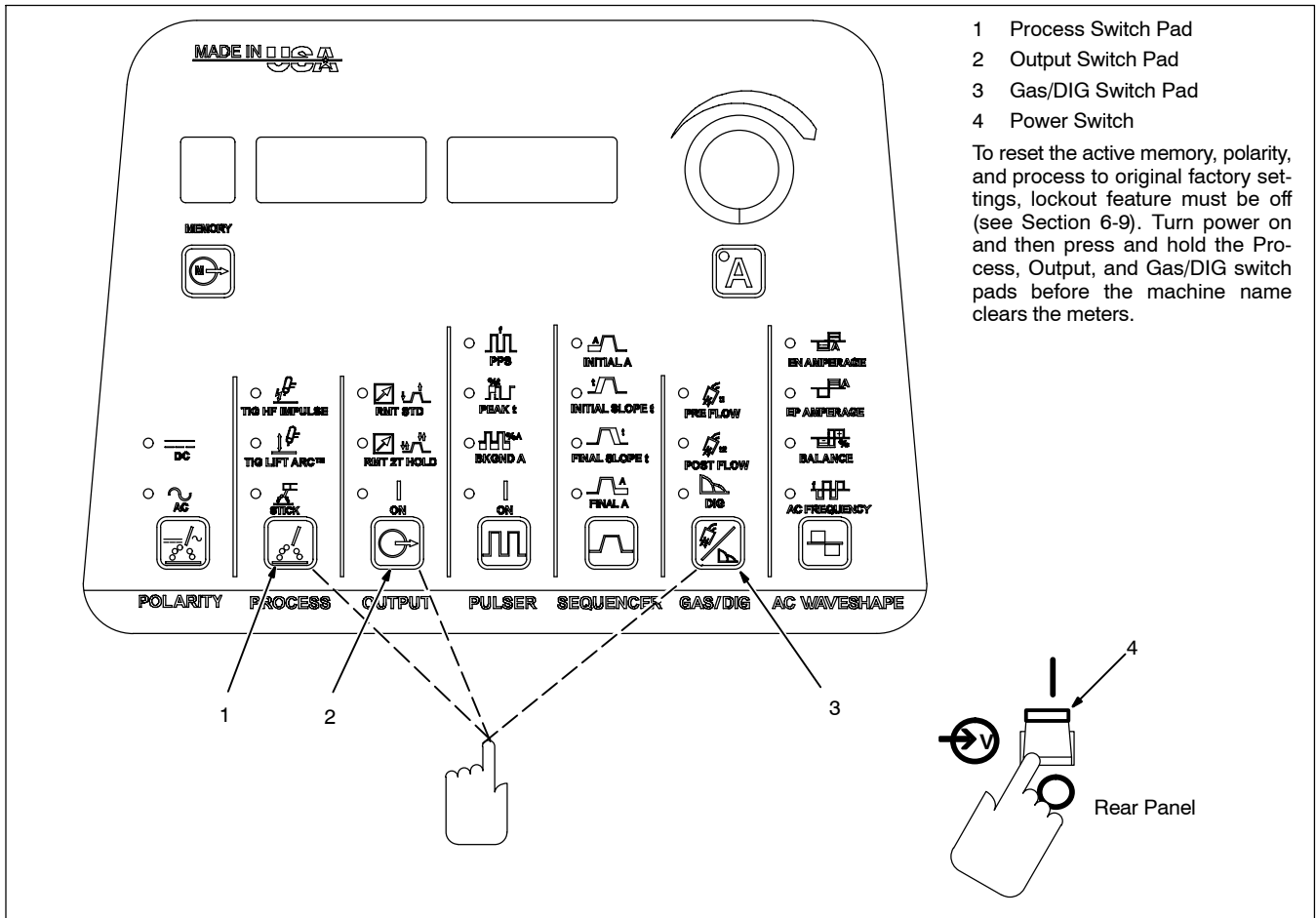
5-16. Factory Parameter Defaults And Range And Resolution For 700 Models

Parameter	Default	Range And Resolution
MEMORY	1	1-9
(DYNASTY ONLY) POLARITY	AC	AC / DC
PROCESS	TIG HF Impulse	TIG HF Impulse / TIG Lift / Stick
OUTPUT	RMT STD	RMT STD / RMT 2T / ON
**RMT 2T	2T	RMT 2T can be reconfigured for: 2T / 3T / 4T / Mini Logic / 4T Momentary / Spot (see Section 6-3)
(DYNASTY ONLY) A MAIN / PEAK		
(DYNASTY ONLY) AC TIG	500 A	5 – 700 Amps
(DYNASTY ONLY) AC STICK	110 A	5 – 700 Amps
DC TIG	500 A	5 – 700 Amps
DC STICK	110 A	5 – 700 Amps
*Spot	Off	On/Off
Spot Time	0 T	0.0 – 999 Seconds
**Weld Time	0T	0.0 – 999 Seconds
PULSER	Off	ON / OFF
PPS	100 Hz	DC: 0.1 – 5000 PPS AC: 0.1 – 500 PPS
PEAK t	40%	5 – 95 Percent
BKGND A	25%	5 – 95 Percent
SEQUENCER		
INITIAL A	20 A	5 – 700 Amps
**Initial Time	0 T	0.0 – 25.0 Seconds
INITIAL SLOPE t	0 T	0.0 – 50.0 Seconds
FINAL SLOPE t	0 T	0.0 – 50.0 Seconds
FINAL A	5 A	5 – 700 Amps
**Final Time	0 T	0.0 – 25.0 Seconds

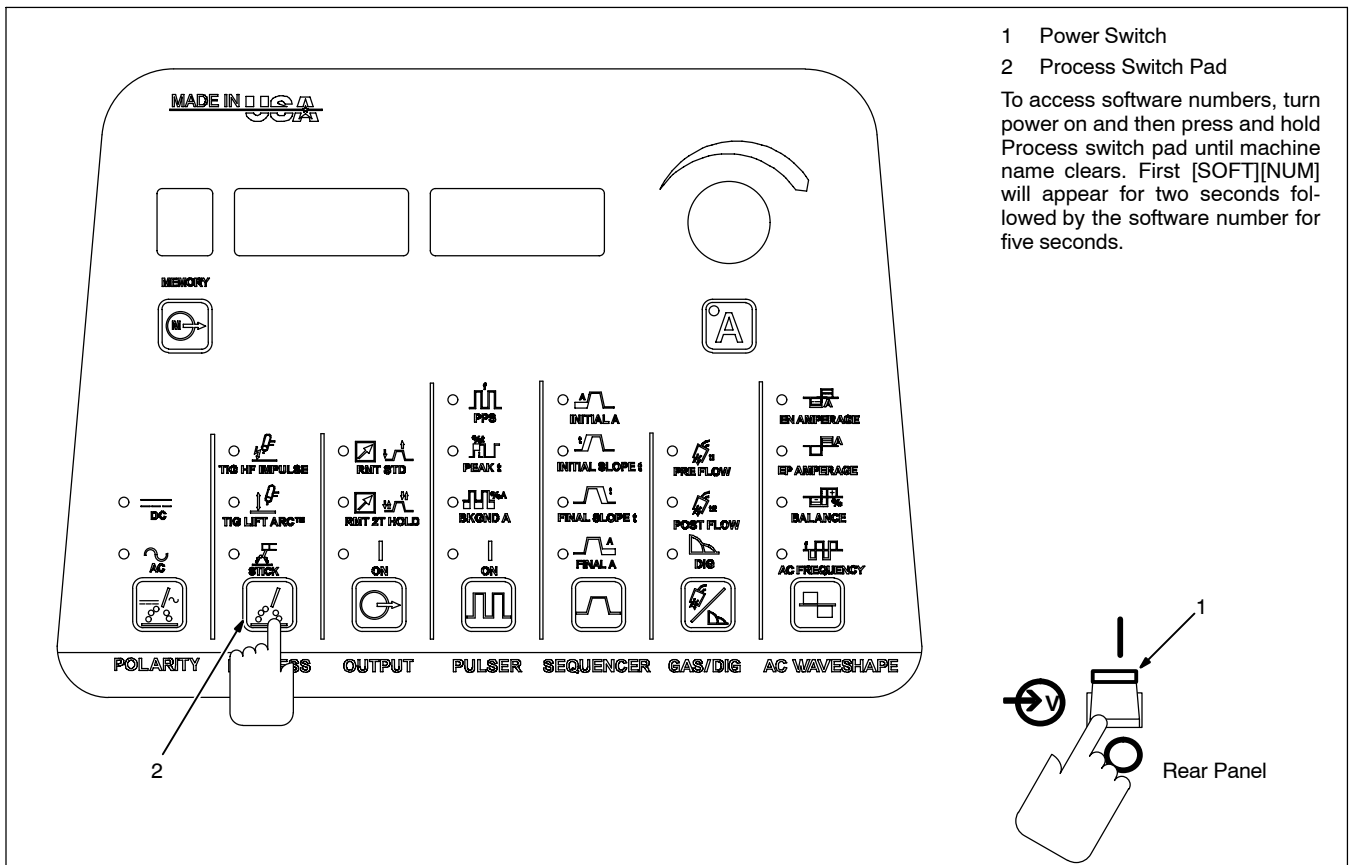
Factory Parameter Defaults And Range And Resolution For 700 Models (Continued)

ADJUST PREFLOW POST FLOW DIG	0.2 T Auto 30%	0.0 – 25.0 Seconds Auto 1 – 50.0 Seconds @ 1 Second Resolution 0 – 100 Percent
(DYNASTY ONLY) AC WAVESHAPE *Waveform EN Amps EP Amps BALANCE FREQUENCY *EN/EP	Soft Square 500A 500A 75% 120 Hz Independent	Soft Square, Advanced Square, Sine, Triangle 5 - 700 Amps 5 - 700 Amps 30 – 99 Percent 20 – 400 Hertz Same/Independent
*TIG Start parameters for each program (1-9) DC: *Tungsten ***Polarity (DYNASTY ONLY) ***Amperage ***Time **Start Slope Time ***Preset Amperage Minimum AC: (DYNASTY ONLY) *Tungsten ***Polarity ***Amperage ***Time ***Start Slope Time ***Preset Amperage Minimum	.094 EN 60 A 25 ms 7 ms 5 A .094 EP 130 A 20 ms 2 ms 5 A	GEN, .020, .040, .062, .094, .125, .156, .187, .250 EP / EN 5 – 200 Amps 1 – 200 Milliseconds 0 – 250 Milliseconds 5 – 25 Amps GEN, .020, .040, .062, .094, .125, .156, .187, .250 EP / EN 5 – 200 Amps 1 – 200 Milliseconds 0 – 250 Milliseconds 5 – 25 Amps
* Parameter adjusted using an Advanced Function configuration only (See Section 6). ** Parameter used with the automation option only *** Parameter adjust in GEN setting only (see Section 6-2).		

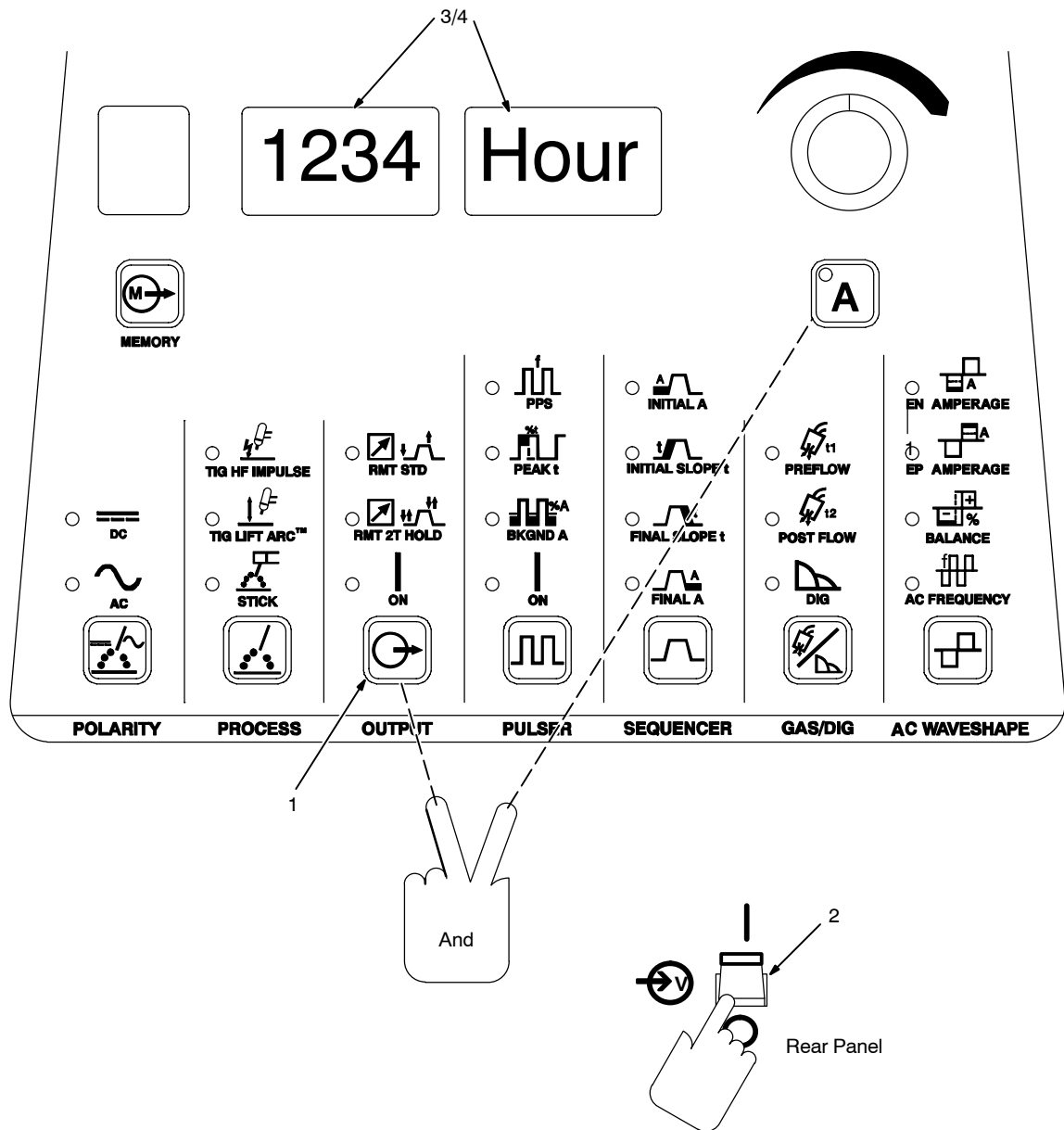
5-17. Resetting Unit To Factory Default Settings



5-18. Software And Revision Viewing



5-19. Arc Timer/Counter Display



1 Output And Amperage Controls

2 Power Switch

To display the arc timer/counter, turn power switch on, press and hold the Amperage Control and Output switch pads until the machine name clears the meters.

3 Arc Timer Display

The arc time will be displayed for 5 seconds as [0-9999][Hours] then [0-59][Mins].

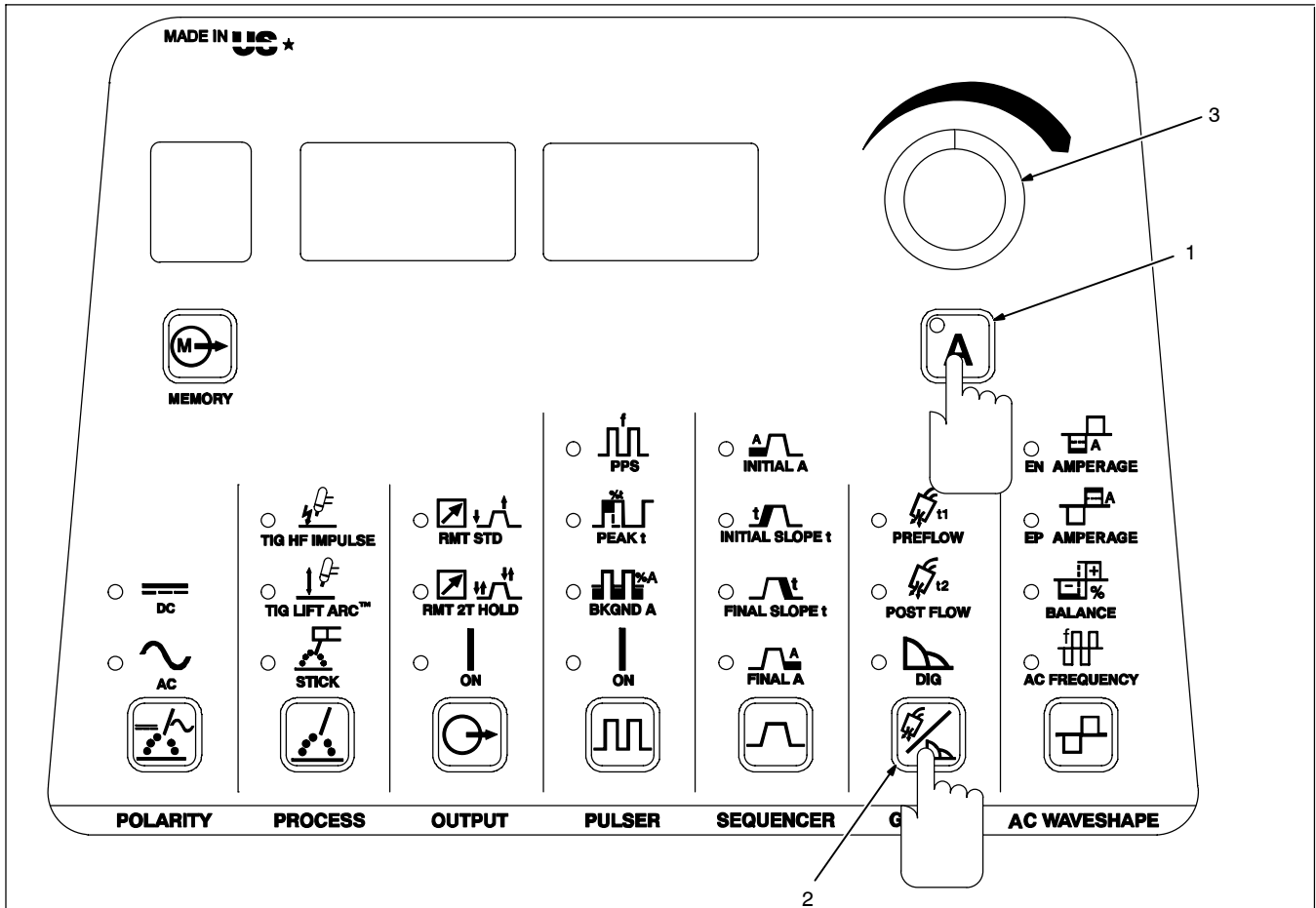
4 Arc Counter

After 5 seconds, the arc count will be displayed for the next 5 seconds as [0cy] to [9999][99cy].

SECTION 6 – ADVANCED FUNCTIONS



6-1. Accessing Advanced Functions



- 1 Amperage Switch Pad
- 2 Gas/Dig
- 3 Encoder Control

To access the advanced functions, press and hold the Amperage (A) switch pad and then press the Gas/Dig switch pad. To scroll through the advanced functions, press and release the Gas/Dig switch pad. Use the Encoder control to change parameters for each function.

Advanced Functions:

- Programmable TIG Start Parameters (see Section 6-2) – Allows you to set tungsten size, amps, time, polarity, and preset amperage minimum to customize arc starts for different tungstens.
- Output Remote Hold And Trigger Functions (see Section 6-3) – For reconfiguring RMT 2T Hold for 3T, 4T Momentary,

or Mini Logic

- AC Waveshape Selection with Dynasty models only (see Section 6-4) – Allows you to set a soft, sine, triangle, or advanced AC waveshape for each memory location if desired.
- Independent Amplitude Selection with Dynasty models only (see Section 6-5) – Allows you to set the amplitude of the AC waveshape equal for both the positive and negative half of the weld cycle, or have independent settings.
- Spot Enable (see Section 6-6) – Allows you to turn the spot function on and be available for all programs.
- Stick OCV Selection (see Section 6-7) – Allows you to select either low or normal OCV (open circuit voltage).

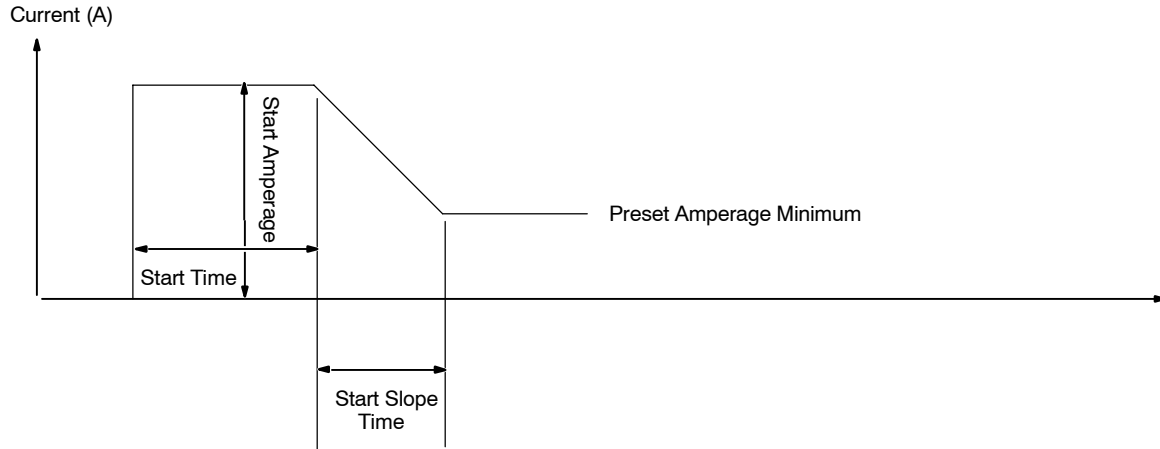
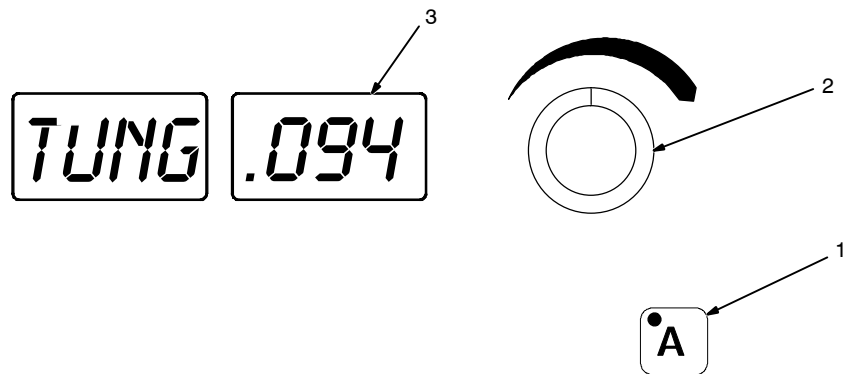
- Stick Stuck Check Selection (See Section 6-8) – With Stick Stuck Check on and the welding electrode (rod) stuck, output is turned off in an attempt to save the rod for reuse.
- Lockout Functions (see Section 6-9) – Allows you to turn the lockout function on and off and adjust the lockout levels.
- Meter Displays (see Section 6-10) – Allows you to set meters to display weld voltage and amperage, or blank meters while pulse welding. Also allows you to select amperage preset of peak or average amperage for DC TIG pulse.
- DC Meter Calibration (See Section 6-11) – Allows voltage/amperage calibration of DC meter.

To exit advanced functions, press and hold the Amperage (A) switch pad and then press the Gas/Dig switch pad.

6-2. Programmable TIG Start Parameters

☞ Each memory and polarity selection has their own programmable parameters.

A. Tungsten Selection



- 1 Amperage Switch Pad
- 2 Encoder Control
- 3 Amps Meter

Preset TIG Start Parameters

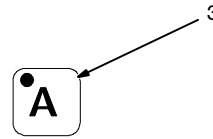
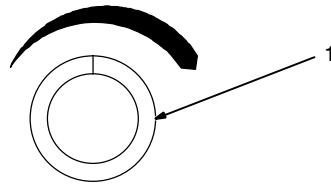
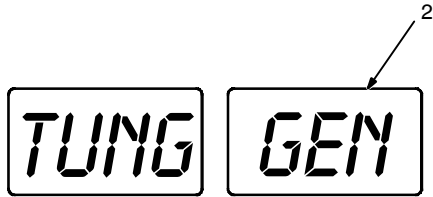
Use Encoder control to select a tungsten size from the following: .020, .040, .062

(1/16 in.), .094 (3/32 in.), or .125 (1/8 in.), .156 (5/32 in.), .187 (3/16 in.), [.250 (1/4 in.) 700 Models only], (.094 is the default). When one of the listed tungsten sizes is selected, the following TIG starting parameters are preset: Amperage, Start Time, Start Slope Time, and Preset Amperage Minimum.

um. There are a separate set of parameters for AC and DC (to select polarity see Section C).

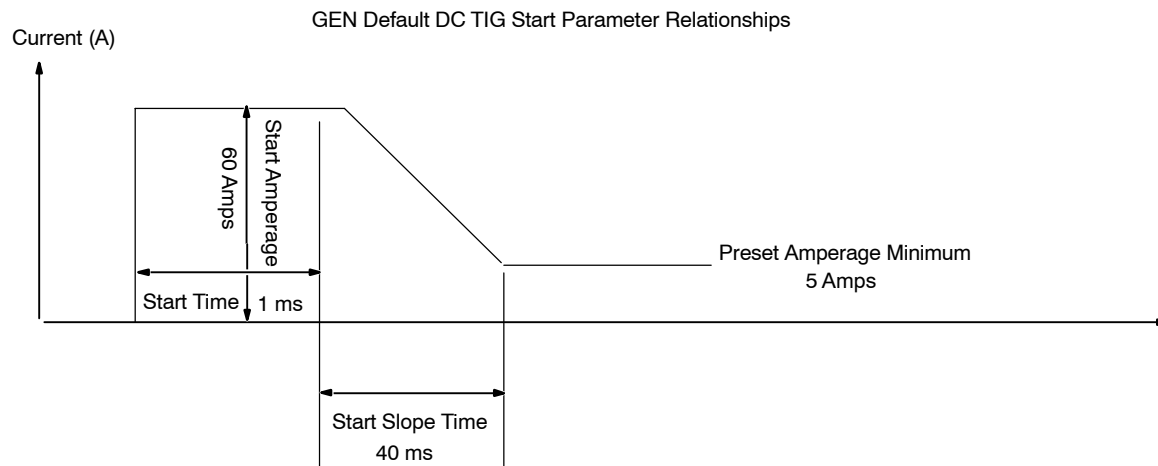
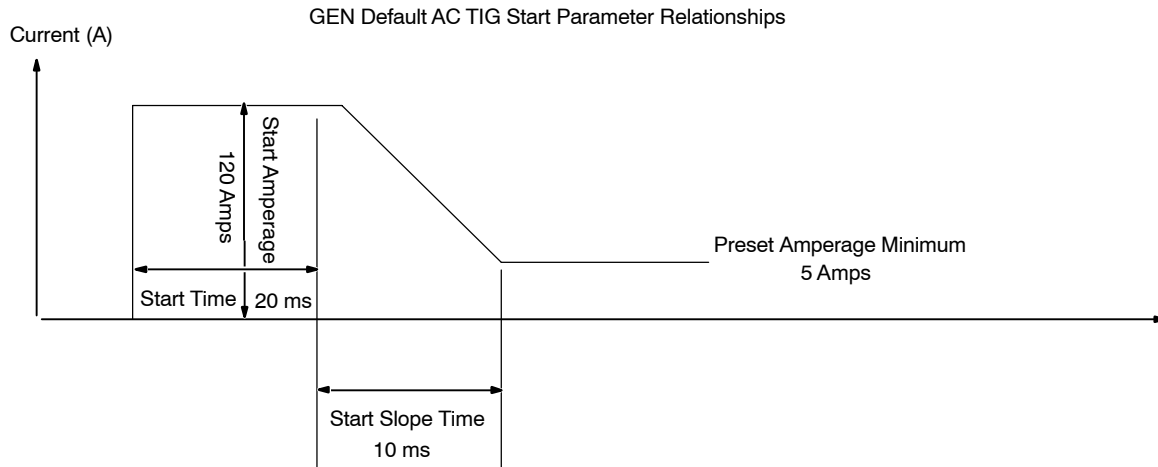
If it is necessary or desired to manually set the TIG starting parameters, turn the encoder until *GEN* is displayed on the amps meter (see Section B).

B. Selecting GEN



- 1 Encoder Control
- 2 Amps Meter
- 3 Amperage Switch Pad

If *GEN* is selected and displayed on the amps meter, the TIG starting parameters for a .094 tungsten are the default, and for AC polarity they are: Start Polarity = EP, Start Amperage = 120 A, Start Time = 20 ms, Start Slope Time = 10 ms, Preset Minimum Amps = 5 A. For DC polarity they are: Start Polarity = EN, Start Amperage = 60 A, Start Time = 1 ms, Start Slope Time = 40 ms, Preset Minimum Amps = 5 A. These parameters can be manually changed by pressing the Amperage switch pad to step through each adjustable parameter. To change parameters, see Sections C, D, E, F, and G.



C. Changing Programmable TIG Start Polarity (Dynasty Models Only)

1 Amperage Switch Pad

2 Encoder Control

3 Amps Meter

To adjust TIG Start Polarity proceed as follows:
 Press Amperage switch pad. Switch pad LED turns on, and meter % LED turns on. The current Start Polarity, *[SEL] [E-]* or *[SEL]*

[EP] is displayed on meters, and can be adjusted (see Section 5-15) by turning the Encoder control.
 To change Start Amperage, proceed to Section D.

D. Changing Programmable TIG Start Amperage

1 Amperage Switch Pad

2 Encoder Control

3 Amps Meter

To adjust TIG Start Amperage proceed as follows:
 Press Amperage switch pad. Switch pad LED turns on, and meter A LED turns on. The current Start Amperage is displayed on

the amps meter, and can be adjusted (see Section 5-15) by turning the Encoder control.
 To change Start Time, proceed to Section E.

E. Changing Programmable Start Time

The diagram for Section E includes the following elements:

- Two digital displays: the left one shows "TIME" and the right one shows "10m". An arrow labeled "3" points to the right display.
- An encoder control knob with a curved arrow indicating rotation, labeled "2".
- An Amperage Switch Pad (ASP) with a small dot and the letter "A", labeled "1".
- A graph of Current (A) vs. time. The current rises to a plateau, then decays linearly. A horizontal double-headed arrow labeled "Start Time" indicates the duration of the plateau.

1 Amperage Switch Pad
 2 Encoder Control
 3 Amps Meter

To adjust Programmable Start Time proceed as follows:

Press Amperage switch pad, and meter S LED turns on. The current Start Time is displayed in milliseconds on the amps meter, and can be adjusted by turning the Encoder control (see Section 5-15).

To change Start Slope Time, proceed to Section F.

F. Changing Start Slope Time

The diagram for Section F includes the following elements:

- Two digital displays: the left one shows "SSLP" and the right one shows "20m". An arrow labeled "3" points to the right display.
- An encoder control knob with a curved arrow indicating rotation, labeled "2".
- An Amperage Switch Pad (ASP) with a small dot and the letter "A", labeled "1".
- A graph of Current (A) vs. time. The current rises to a plateau, then decays linearly. A horizontal double-headed arrow labeled "Start Slope Time" indicates the duration of the linear decay phase.

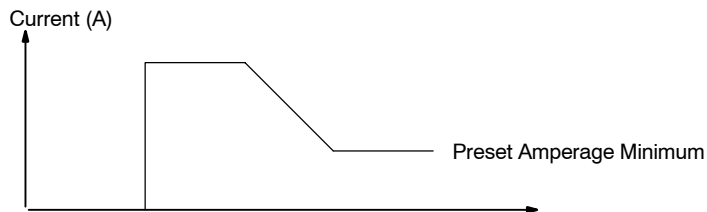
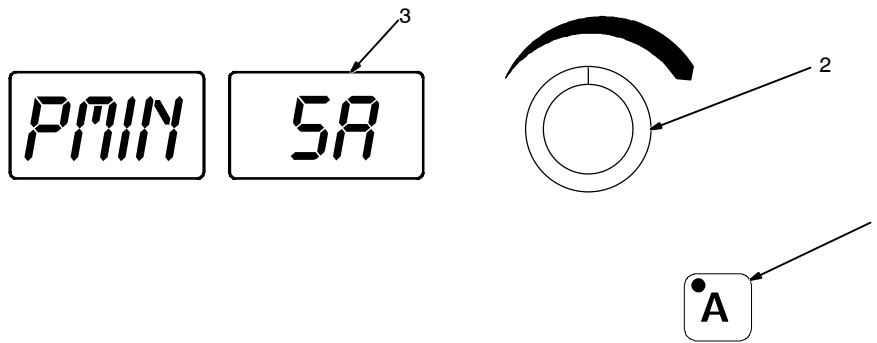
1 Amperage Switch Pad
 2 Encoder Control
 3 Amps Meter

To adjust Start Slope Time proceed as follows:

Press Amperage switch pad. Switch pad LED turns on, and meter S LED turns on. The Start Slope Time is displayed in milliseconds on the amps meter, and can be adjusted (see Section 5-15) by turning the Encoder control.

To change Preset Amperage Minimum, proceed to Section G.

G. Changing Preset Amperage Minimum



- 1 Amperage Switch Pad
- 2 Encoder Control
- 3 Amps Meter

To adjust Preset Amperage Minimum proceed as follows:

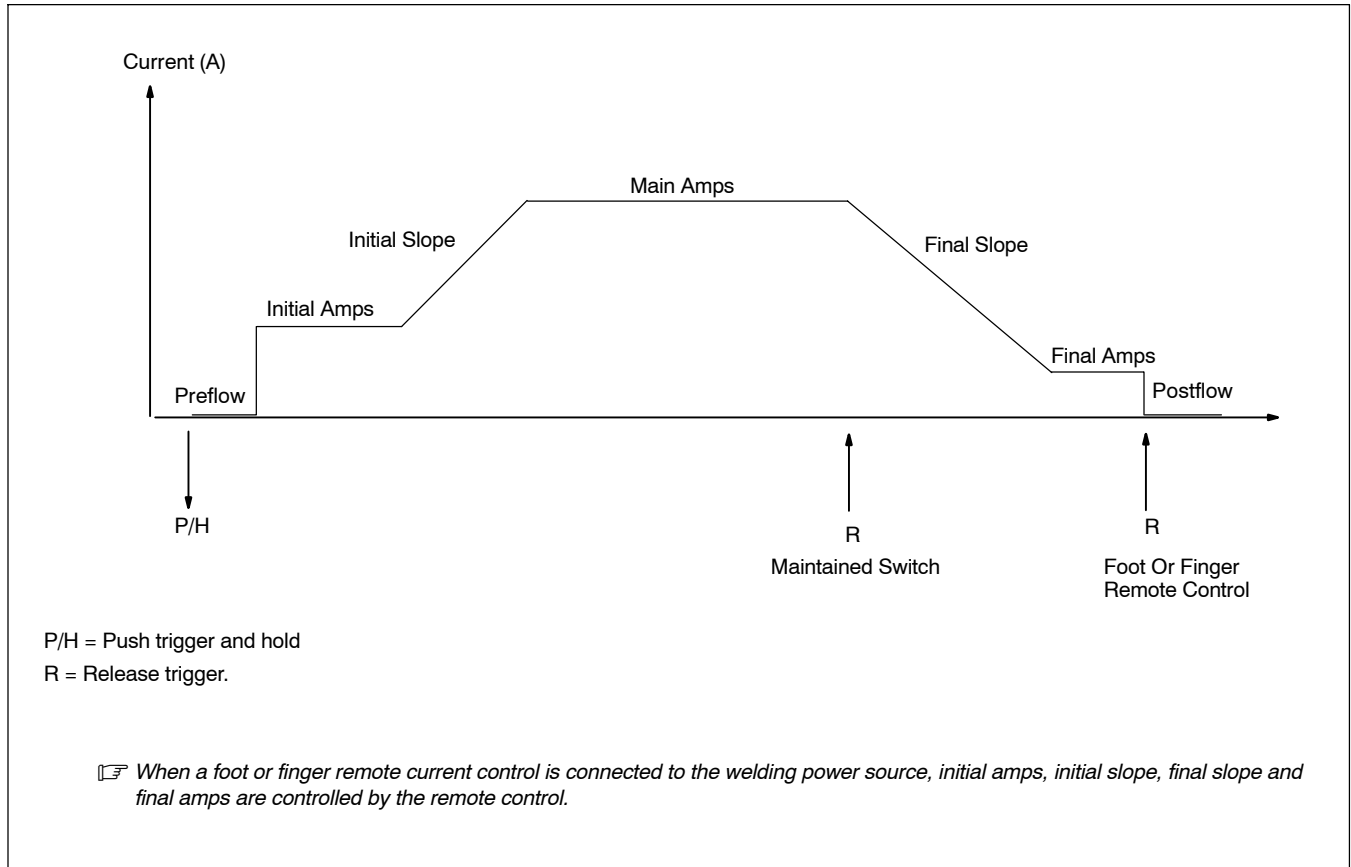
Press Amperage switch pad. Switch pad LED turns on, and meter A LED turns on. The Preset Minimum Amperage is displayed on the amps meter, and can be adjusted (see Section 5-15) by turning the Encoder control. The preset amperage minimum can be independently set for AC

and DC.

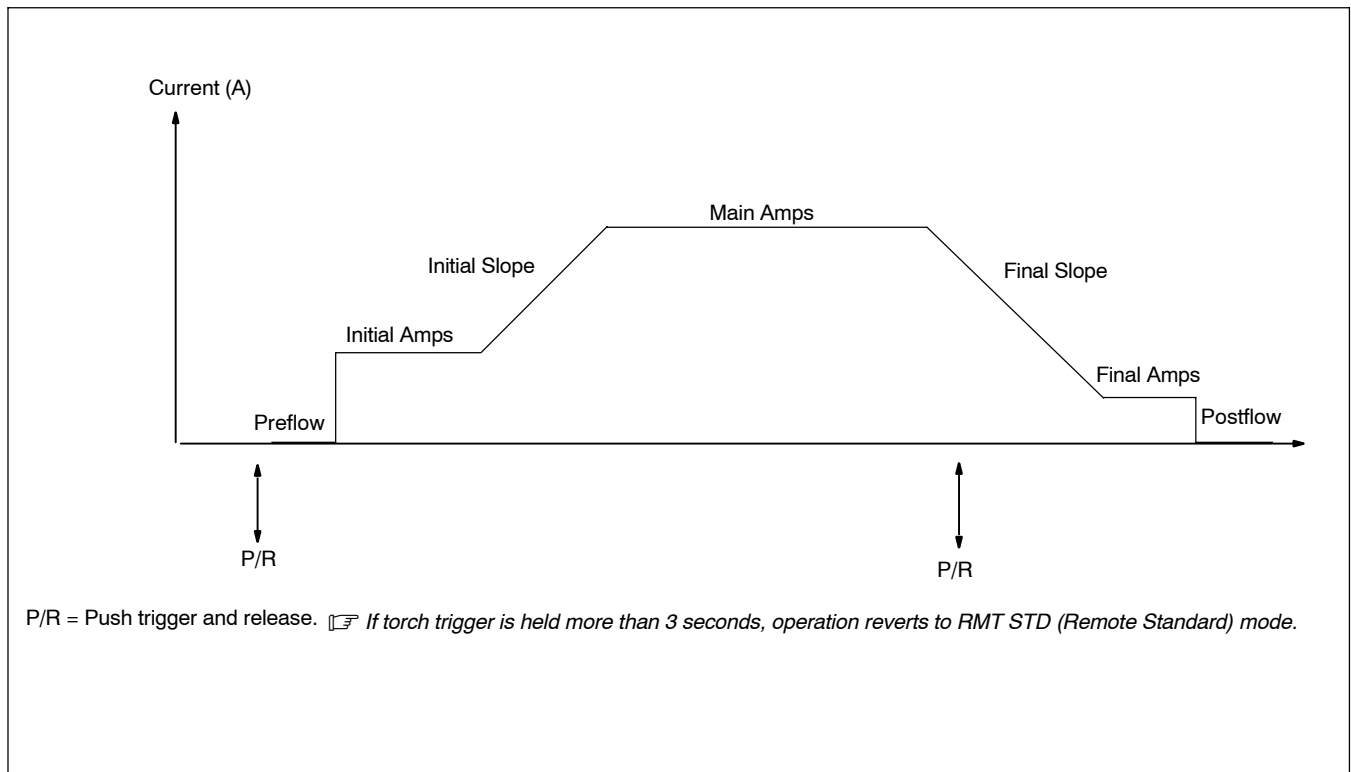
☞ *Whatever amperage is selected as the preset amperage minimum, is the minimum amperage that the machine will provide in either AC or DC.*

6-3. Output Control And Trigger Functions

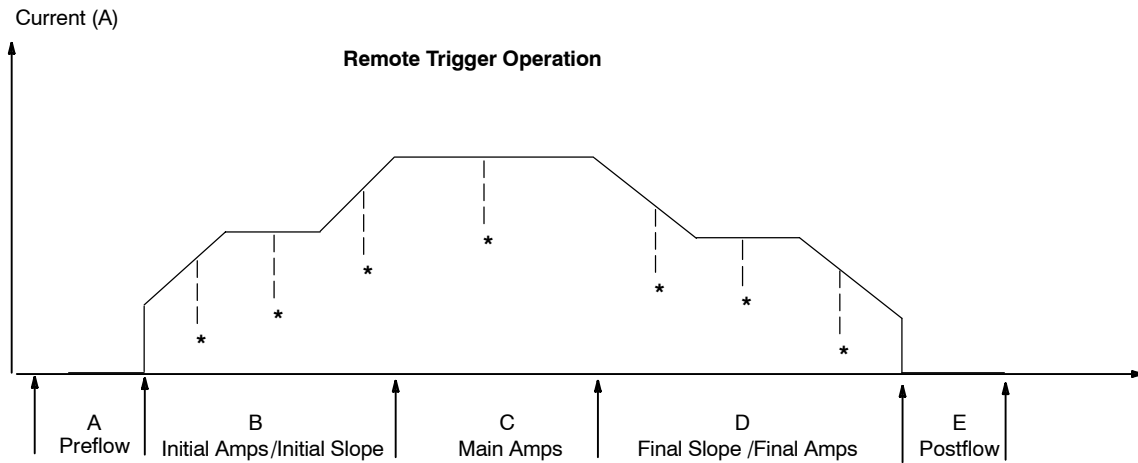
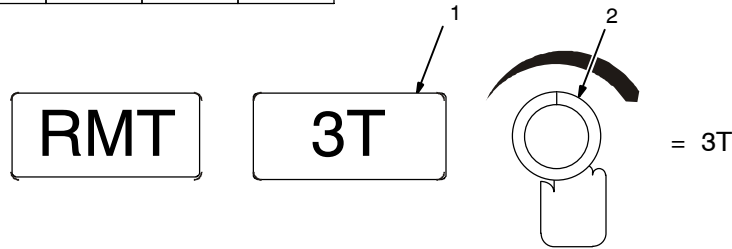
A. Remote (Standard) Torch Trigger Operation



B. Remote 2T Torch Trigger Operation



C. 3T Specific Trigger Method



* Arc can be extinguished at any time by pressing and releasing both initial and final switches, or by lifting the torch and breaking the arc.

1 3T (Specific Trigger Operation)

Sequencer is required to reconfigure for 3T.

3T requires a specific type of remote control with two independent momentary-contact switches. One will be designated initial switch, and it must be connected between Remote 14 receptacle pins A and B. The second will be designated as the final switch, and it must be connected between Remote 14 receptacle pins D and E.

2 Encoder Control

To select 3T, turn Encoder control.

Definitions:

Initial slope rate is the rate of amperage change determined by the initial amperage, initial slope time, and main amperage.

Final slope rate is the rate of amperage change determined by the main amperage, final slope time, and final amperage.

Operation:

A. Press and release initial switch within 3/4 second to start shielding gas flow. To stop the preflow sequence before preflow time elapses (25 seconds), press and release final switch. The preflow timer will reset and the weld sequence can be started again.

If an initial switch closure is not made again before preflow time ends, gas flow stops, the timer resets, and an initial switch press and release is necessary to start the weld sequence again.

B. Press initial switch to start arc at initial amps. Holding switch will change amperage at initial slope rate (release switch to weld at desired amperage level).

C. When main amperage level is reached, initial switch can be released.

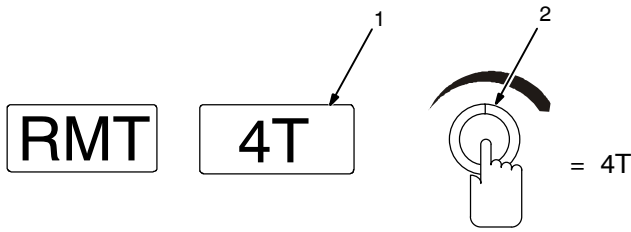
D. Press and hold the final switch to decrease amperage at final slope rate (release switch to weld at desired amperage level).

E. When final amperage has been reached, the arc extinguishes and shielding gas flows for the time set on the Postflow control.

Application:

With the use of two remote switches instead of potentiometers, 3T gives the operator the ability to infinitely increase, decrease, or pause and hold amperage within the range determined by the initial, main, and final amperages.

D. 4T Specific Trigger Method



- 1 4T (Specific Trigger Operation)
- 2 Encoder Control

To select 4T, turn Encoder control.

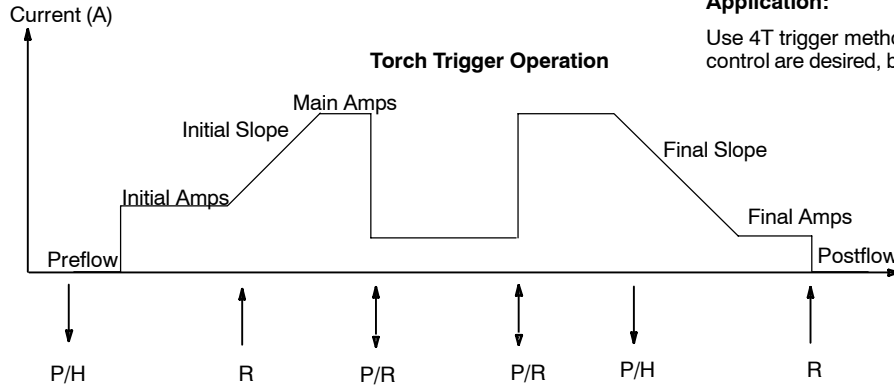
Torch trigger operation is as shown.

4T allows the operator to toggle between weld current and final current.

☞ When a remote switch is connected to the welding power source, use the remote switch to control the weld cycle. Amperage is controlled by the welding power source.

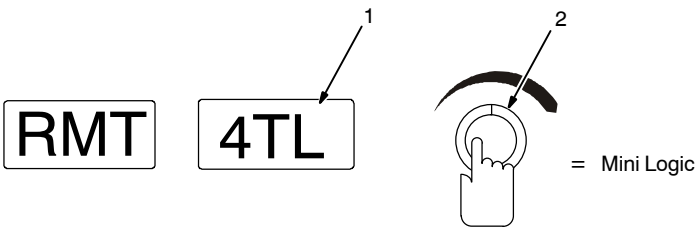
Application:

Use 4T trigger method when the functions of a remote current control are desired, but only a remote on/off control is available.



P/H = Push and hold trigger; R = Release trigger; P/R = Push trigger and release in less than 3/4 seconds

E. Mini Logic Operation



- 1 Mini Logic Meter Display
- 2 Encoder Control

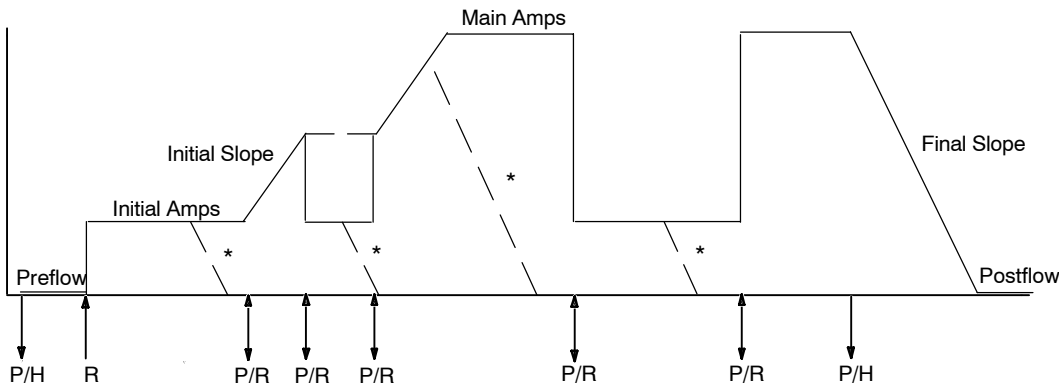
To select Mini Logic, turn Encoder control.

Torch trigger operation is as shown.

Mini logic allows the operator to toggle between initial slope or main amps and initial amps. Final Amperage is not available. Final slope will always slope to minimum amperage and end the cycle.

☞ When a remote switch is connected to the welding power source, use the remote switch to control the weld cycle. Amperage is controlled by the welding power source.

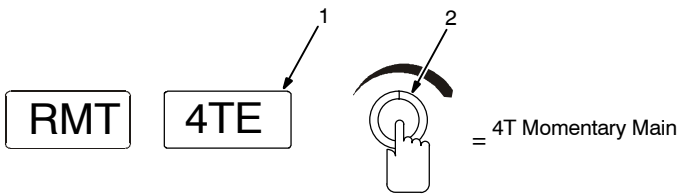
Application: This ability to change current levels without either initial slope or final slope, gives the operator the opportunity to adjust filler metal without breaking the arc.



P/H = Push and hold trigger; R = Release trigger; P/R = Push trigger and release in less than 3/4 seconds

* = Arc can be extinguished at final slope rate at any time by pushing and holding trigger

F. 4T Momentary Operation



1 4T Momentary Meter Display

2 Encoder Control

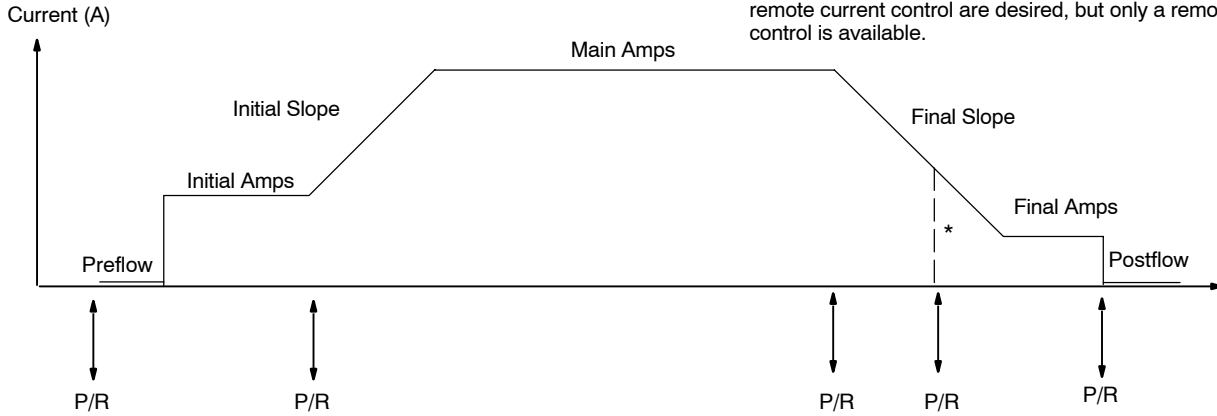
To select 4T Momentary, turn Encoder control.

4T Momentary torch trigger operation is as shown.

☞ When a remote switch is connected to the welding power source, use the remote switch to control the weld cycle. Amperage is controlled by the welding power source.

Application:

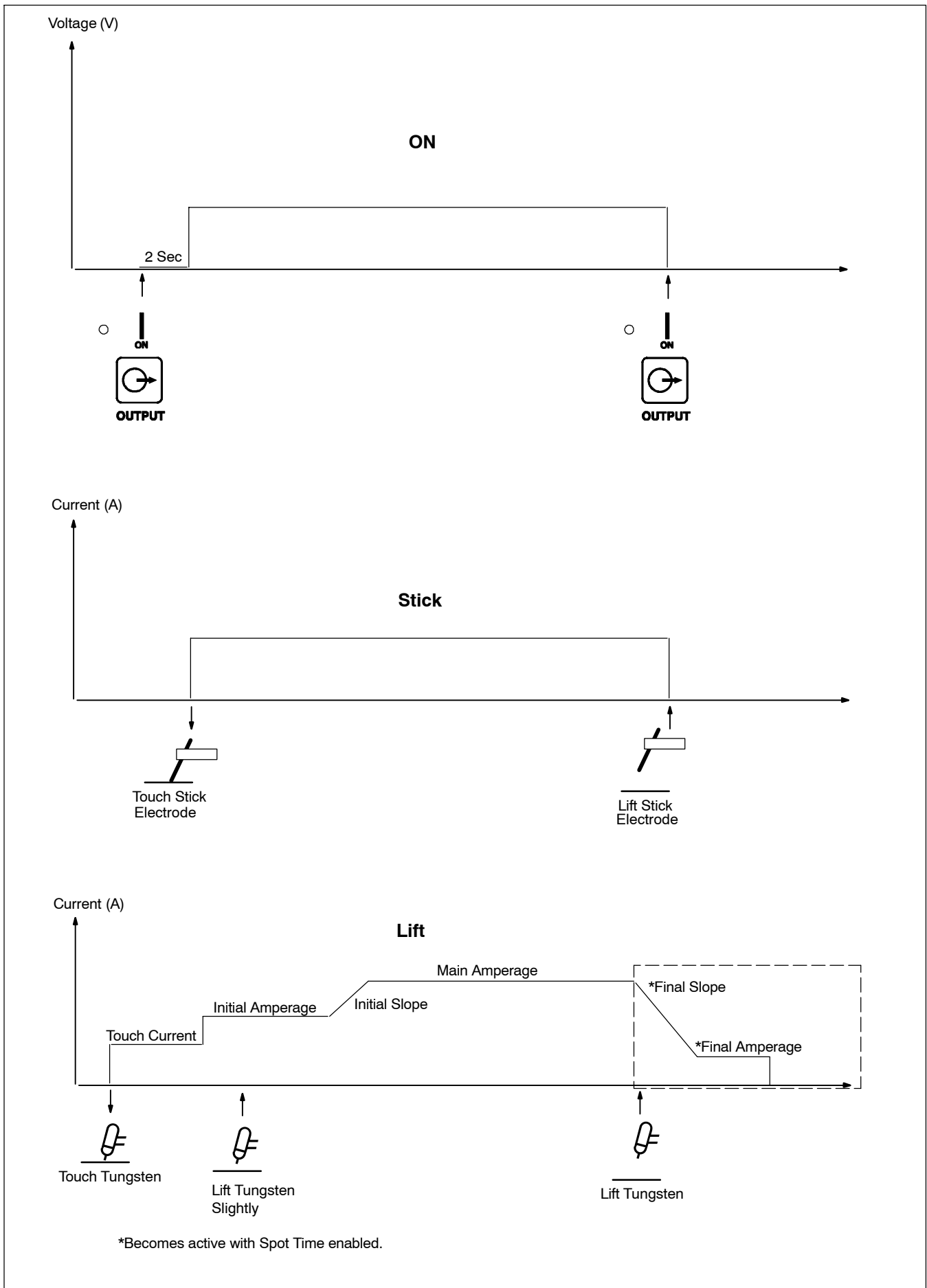
Use 4T Momentary trigger method when the functions of a remote current control are desired, but only a remote on/off control is available.



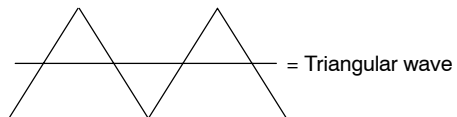
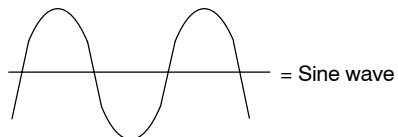
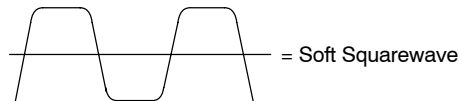
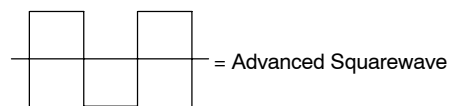
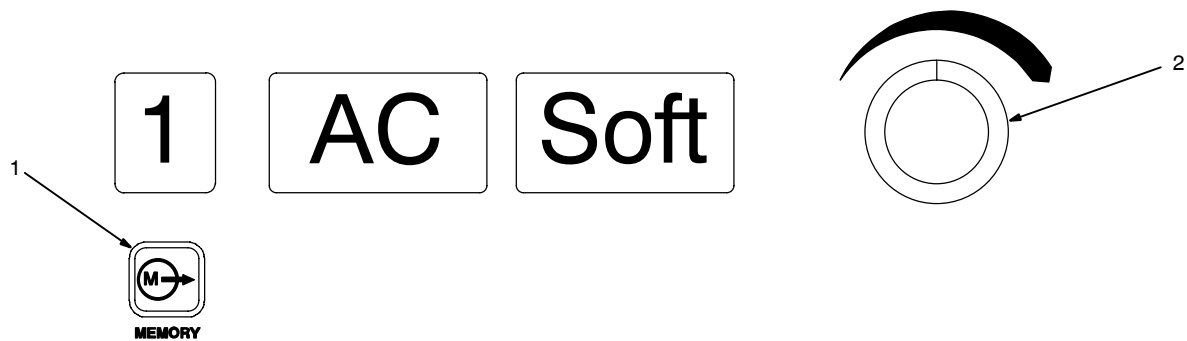
P/R = Push and release trigger; * = Push and releasing during final slope will break the arc and go to postflow

☞ For first torch trigger push & release, if trigger is held more than 3 seconds, trigger cycle ends.

G. On Trigger Operation



6-4. AC Waveshape Selection (Dynasty Models Only)



1 Memory Switch Pad

Each memory location can select any of four wave shapes.

2 Encoder

Use the Encoder, at any of the nine memory locations, to select between advanced squarewave [ADV], soft squarewave [SOFT] (default), sine wave [Sine], or

triangle wave [TRI].

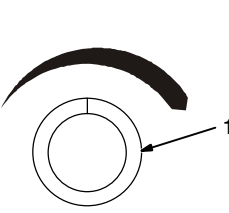
During normal operation, when EN or EP Amperage is selected, the left parameter screen will display the active waveshape [ADV], [Soft], [Sine], or [TRI] and the independent amplitude selection (see Section 6-5) as a reminder.

Application: Use advance squarewave when a more focused arc is required for better directional control. Use soft squarewave when a softer arc with a more fluid puddle is desired. Use sine wave to simulate a conventional power source. Use triangular waveshape when the effects of peak amperage with reduced overall heat input is required to help control distortion on thin materials.

6-5. Independent Amplitude Selection

ENEP

Same



1 Encoder Control
2 Ammeter Parameter Selection

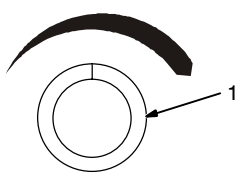

To change between same [Same] and independent [INDP] amplitude adjustment, turn encoder control.

Application: Use same if it is desired to have the same amperage set for both the electrode negative (EN) and electrode positive (EP) halves of the cycle. Use independent if you wish to set a different amperage for each half of the weld cycle for more control of the cleaning action and longer tungsten life (see Section 5-13).

6-6. Spot Enable

Spot

Off

1 Encoder
2 Ammeter Parameter Selection
3 Amperage Switch Pad

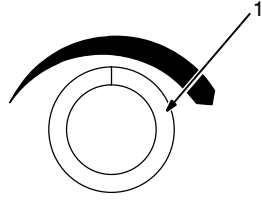
Turn Encoder control to turn Spot on and off. Once on, exit set-up and press Amperage control switch pad twice and turn Encoder control to set spot time. The spot time default is zero for each program. Spot Enable works in RMT STD and RMT 2T Hold only. When a foot control is connected, amperage is controlled at the machine, not by a remote control.

Application: Used for tacking and thin sheet joining.

6-7. Stick Open-Circuit Voltage (OCV) Selection

OCV

LOW



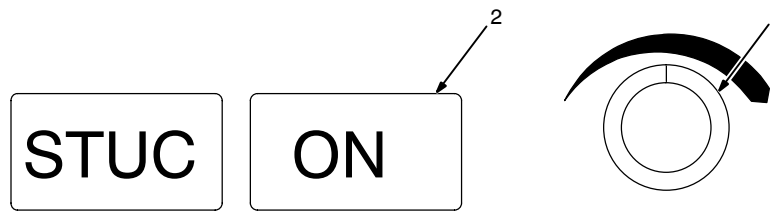
1 Encoder Control
2 Meter Display

Turn Encoder to change between low OCV and normal OCV. Active selection is displayed on the meters.

When Stick low OCV is selected, open-circuit voltage is between 9 and 14 volts. When Stick normal OCV is selected, open-circuit voltage is approximately 72 volts.

Application: For most Stick applications use low open-circuit voltage. Use normal open-circuit voltage for hard to start Stick electrodes, or if required for your particular application.

6-8. Stick Stuck Check Selection



1 Encoder Control

2 Ammeter Parameters Select Display

Turn Encoder to change between Stick Stuck Check [ON and [OFF] meter display.

When Stick Stuck Check is on and the welding electrode (rod) is stuck, output is turned off.

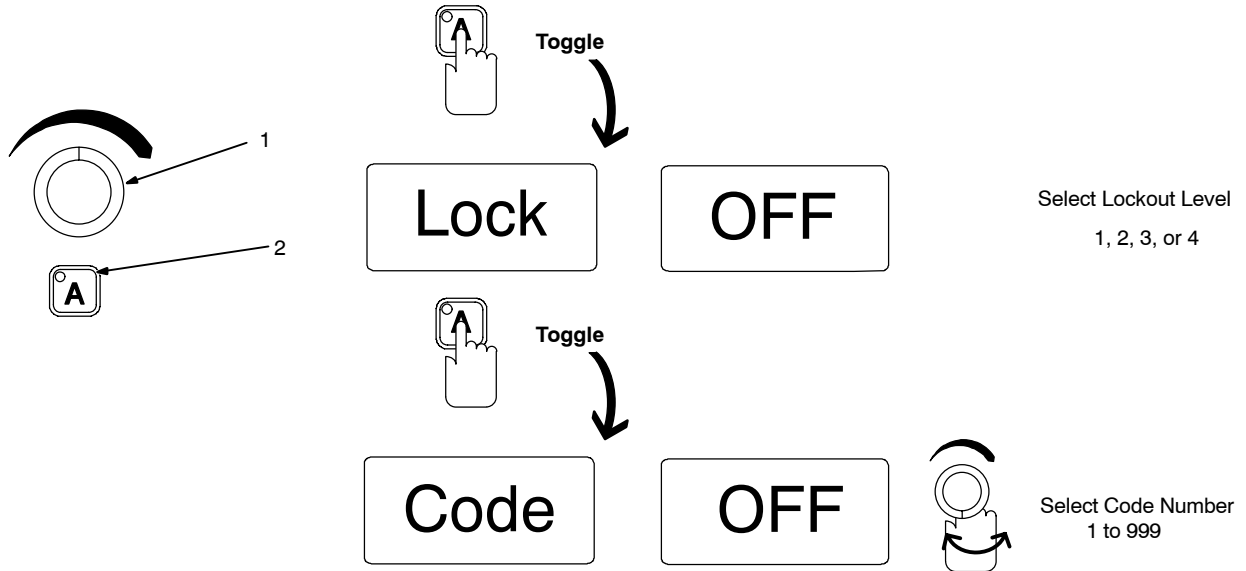
Application: For most Stick applications, use Stick Stuck Check off. With Stick Stuck Check on and the welding electrode (rod) stuck, output is turned off in an attempt to save the rod for reuse. This allows the operator time to un-stick the rod, or disconnect the rod holder from the rod without arc occurring. Turn Stick Stuck Check on

when this function is desired.

Some applications may require Stick Stuck Check to be turned off. For example: Large stick electrodes operating at high amperages would require Stick Stuck Check to be turned off.

6-9. Lockout Functions

A. Accessing Lockout Capability



See Section 5-1 for explanation of controls referred to in all of Section 6-9.

There are four (1–4) different lockout levels. Each successive level allows the operator more flexibility.

Before activating lockout levels, be sure that all procedures and parameters are established. Parameter adjustment is limited while lockout levels are active.

To turn On the lockout feature, proceed as follows:

- 1 Encoder Control
- 2 Amperage (A) Switch Pad

Press Amperage (A) switch pad to toggle between the lock and code displays. Toggle switch pad until code is displayed.

Turn Encoder control to select a lockout code number. The code number will appear on the amp meter. Select any number from [1

thru [999]. **IMPORTANT:** remember this code number, as you will need it to turn the lockout feature off.

Toggle Amperage (A) switch pad until lock is displayed. You may now select a lockout level.

There are four lockout levels available. Turn Encoder control to select a lockout level (see Sections 6-9B for lockout level descriptions).

Once the desired three digits have been entered and a lockout level selected, exit advanced functions mode (see Section 6-1).

To turn Off the lockout feature, proceed as follows:

Use Encoder control to enter the same code number that was used to turn on the lockout feature.

Press the Amperage (A) switch pad. The amperage (right) meter display will change to [OFF]. The lockout feature is now off.

B. Lockout Levels

Levels 1, 2, And 3

Level 1

Includes all the functions of level 1 plus Memory, Polarity and Process Selection (see Sections 5-6 and 5-7).

When parameter change or selection is limited by lock level 2, [LOCK][LEV2] is displayed as a reminder.

Level 3

Includes all the functions of levels 1 and 2 plus the following:

±10% adjustment of preset TIG or Stick Weld Amps

Select desired process, TIG or Stick, and use Encoder control to adjust amperage +/-

10% of preset amperage value, up to the limits of the machine. If operator tries to go beyond the ±10%, the amperage (right) meter will display [LOCK][LEV3] as a reminder.

Pulser ON/Off Control

Gives operator the ability to turn on/off the Pulser control.

When parameter change or selection is limited by lock level 3, [LOCK][LEV3] is displayed as a reminder.

Level 4

Includes all the functions of levels 1, 2, and 3 plus the following:

Remote Amperage Control

Allows operator to use remote amperage control if desired. Remote control operates from minimum to maximum of preset amperage value. Connect remote control device according to Section 4-14.

When parameter change or selection is limited by lock level 4, [LOCK][LEV4] is displayed as a reminder.

Level 4

Before activating lockout levels, be sure that all procedures and parameters are established. Parameter adjustment is limited while lockout levels are active.

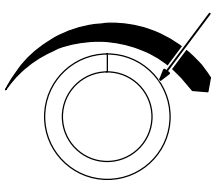
Use Encoder Control To Adjust Amperage ±10% Of Preset Value.

Indicates which functions are available for the corresponding lockout level.

6-10. Pulse Welding Display Options

METR

V/A



1 Encoder Control

2 Ammeter Parameters Select Display

Turn Encoder to change between [V/A], [OFF], and [AVG] pulse welding display options.

[V/A]

Amperage preset displays peak amperage for both AC and DC TIG pulser. While pulse welding at one pulse per second and above in DC TIG, meters display average voltage and amperage. While pulse welding in AC TIG, meter display may not be stable, and are for reference only.

[OFF]

Amperage preset displays peak amperage for both AC and DC TIG pulser. Meters display [PULS] [WELD] while pulse welding. Meter Hold function is disabled. While in a non-pulse welding mode, weld voltage and amperage display and meter hold capabilities are not effected.

[AVG]

Amperage preset displays average amperage for DC TIG pulser, and peak amperage for AC TIG pulser. While pulse welding at one pulse per second and above in DC TIG, meters display average voltage and amperage. While pulse welding in AC TIG, meter display may not be stable, and are for reference only.

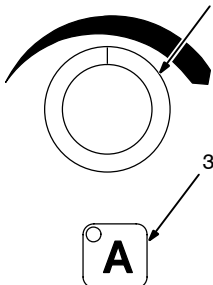
6-11. DC Meter Calibration

MCAL

OA

MCAL

OV



1 Encoder Control

2 Ammeter Parameters Select Display

3 Amperage Switch Pad

4 Voltage Parameters Select Display

Amperage Calibration:

The amperage calibration range is ± 10 amps.

To calibrate the machine's amperage meter to a load bank's amperage meter, add or subtract the difference between the amperage found on the machine's amperage meter and the amperage meter on the load bank. For example:

MachineMeter	LoadBankMeter	SetMCAL Amps
100 A	105 A	+5 A
100 A	95 A	-5 A

Voltage Calibration:

The voltage calibration range is ± 9.9 volts.

To calibrate voltage, press the Amperage switch pad and [MCAL] [OV] will be displayed.

To calibrate the machine's voltage meter to a load bank's voltage meter, add or subtract the difference between the voltage found on the machine's voltage meter and the voltage meter on the load bank. For example:

MachineMeter	LoadBankMeter	SetMCAL Volts
10.0 V	10.5 V	+0.5 V
10.0 V	9.5 V	-0.5 V

SECTION 7 – MAINTENANCE AND TROUBLESHOOTING

7-1. Routine Maintenance

			Disconnect power before maintaining.
--	--	--	---------------------------------------------

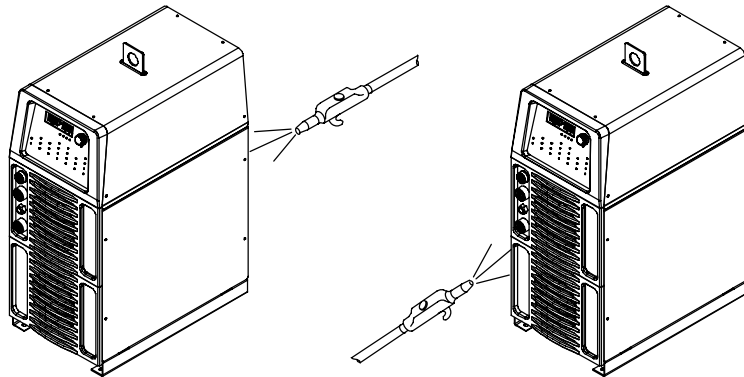
A. Welding Power Source

	✔ = Check * To be done by Factory Authorized Service Agent	◇ = Change	● = Clean	△ = Repair	☆ = Replace
Every 3 Months	 ✔☆ Labels	 ✔☆ Gas Hoses	 ● Weld Terminals		
Every 3 Months	 ✔△ ☆ Cables And Cords				
Every 6 Months	 ●: During heavy service, clean monthly.	 * Adjust or clean spark gap			

B. Cooler

	✔ = Check * To be done by Factory Authorized Service Agent	◇ = Change	● = Clean	△ = Repair	☆ = Replace
Every 3 Months	 ● Coolant Strainer, during heavy service, clean more frequently.			 ● Blow out heat exchanger fins. ✔ Check coolant level. Top off with distilled or deionized water if necessary.	
Every 6 Months	 ✔☆ Hoses			 ✔☆ Labels	
Every 12 Months	 ◇ Replace coolant.				

7-2. Blowing Out Inside of Unit

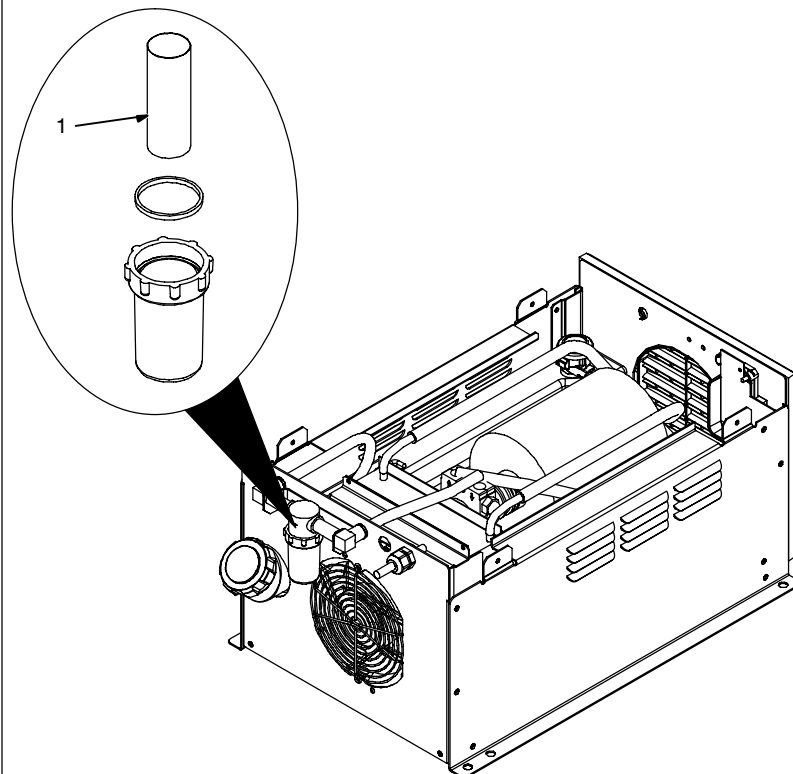
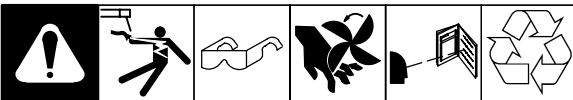


⚠ Do not remove case when blowing out inside of unit.

To blow out unit, direct airflow through front and back louvers as shown.

803 900-B

7-3. Coolant Maintenance And Oiling Motor



⚠ Disconnect input power before maintaining.

1 Coolant Filter

Unscrew housing to clean filter.

Changing coolant: Drain coolant by tipping unit to rear, or use suction pump. Fill with clean water and run for 10 minutes. Drain and refill with coolant (see section 4-22).

ℹ *If replacing hoses, use hoses compatible with ethylene glycol, such as Buna-n, Neoprene, or Hypalon. NOTE: Oxy-acetylene hoses are not compatible with any product containing ethylene glycol.*

Tools Needed:




m30 Torx

804 649-A / Ref. 801 194

7-4. Troubleshooting

A. Voltmeter/Ammeter And Cooler Help Displays



 All directions are in reference to the front of the unit. All circuitry referred to is located inside the unit.

1 Typical Voltmeter/Ammeter Numbered Help Displays - 30 Numbers are for 350 Models Or Top Engine Of 700 Models. 40 Numbers Are For Bottom Engine Of 700 Models.

• Help 30 Display

Indicates a short or open in the thermal protection circuitry located in the input inductor of the unit. Contact a Factory Authorized Service Agent if this display is shown.

• Help 31 Display

Indicates a malfunction in the primary power circuit caused by an overcurrent condition in the primary IGBT switching circuit. Contact a Factory Authorized Service Agent if this display is shown.

• Help 32 Display

Indicates a short or open in the thermal protection circuitry located on the left side of the unit. Contact a Factory Authorized Service Agent if this display is shown.

• Help 34 Display

Indicates a short or open in the thermal protection circuitry located on the right side of the unit. Contact a Factory Authorized Service Agent if this display is shown.

• Help 8 Display

Indicates a malfunction in the secondary power circuit of the unit. There is a high open circuit condition. Contact a Factory Authorized Service Agent if this display is shown.

• Help 14 Display

Unit not ready. Primary circuit bus not up to full power.

• Help 16 Display

Secondary clamp voltage too high. Straighten out or shorten weld cables. If this does not correct the problem, contact a Factory Authorized Service Agent.

• Help 20 Display

Indicates that the power supplies for the primary drives have failed. Contact a Factory Authorized Service Agent if this display is shown.

• Help 21 Display

Indicates voltage or current feedback has been detected with contactor off. Contact a Factory Authorized Service Agent if this display is shown.

• Help 22 Display

Voltage and current not present with contactor on. Contact a Factory Authorized Service Agent if this display is shown.

• Help 24 Display

Indicates a power supply to the control and interface board PC6 failure. Possible cause is a short in Pin A or Pin B of the remote control.

2 Typical Voltmeter/Ammeter Worded Help Displays. [TOP] or [BOT] will display after the message to identify the affected engine on 700 models.

• [Over][Temp]

On for two seconds then flashes:

[Sec] – Indicates the left side of the unit has overheated. The unit has shut down to allow the fan to cool it (see Section 4-4). Operation will continue when the unit has cooled.

[PRI] – Indicates the right side of the unit has overheated. The unit has shut down to allow the fan to cool it (see Section 4-4). Operation will continue when the unit has cooled.

[InD] – Indicates that the input inductor has overheated. The unit has shut down to allow the fans to cool it (see Section 4-4). Operation will continue when the unit has cooled.

• [LOW][LINE]

Indicates that the input voltage is too low, and the unit has automatically shut down. Operation will continue when the voltage is within the operating range ($\pm 10\%$). Have an electrician check the input voltage if this display is shown.

• [HIGH][LINE]

Indicates that the input voltage is too high, and the unit has automatically shut down. Operation will continue when the voltage is within the operating range ($\pm 10\%$). Have an electrician check the input voltage if this display is shown.

• [REL][RMT]

Indicates that the torch trigger is depressed. Release trigger to continue.

• [not][VALD]

Indicates a non-allowable set-up on the front panel.

• [AUTO][STop]

Output disable open causing weld output to stop, but gas continues to flow.

• [Out][LIMT]

Indicates a primary overpower condition. Output current is decreased to limit primary power draw. Depress any switch pad and turn encoder or strike an arc to clear the last help condition.

• [ADV][AUTO]

Indicates a non-allowable setup on the front panel due to an Advanced Automation selection being active (see Section 6).

• [LOCK][LEV 1] 2, 3, or 4

Indicates a non-allowable setup on the front panel due to the current lockout selection (see Section 6-9).

• [ERR][GND]

Turn Off input power and have qualified person inspect unit. To clear error, turn power Off and back On.

Error is displayed only if option is installed and error occurs.

Err GND indicates current is present on green or green/yellow grounding conductor. As a result, machine weld output is disabled.

ERR GND may be caused by a live conductor contacting the chassis.

ERR GND may be caused by work clamp not connected to work piece.

B. Troubleshooting Table



Trouble	Remedy
No weld output; unit completely inoperative.	Place line disconnect switch in On position (see Section 4-10).
	Check and replace line fuse(s), if necessary, or reset circuit breaker (see Section 4-10).
	Check for proper input power connections (see Section 4-10).
No weld output; meter display On.	If using remote control, be sure correct process is enabled to provide output control at Remote 14 receptacle (see Sections 5-1 and 4-14).
	Input voltage outside acceptable range of variation (see Section 4-9).
	Check, repair, or replace remote control.
	Unit overheated and [Over][Temp] is displayed. Allow unit to cool with fan On (see Section 4-4).
Erratic or improper weld output.	Use proper size and type of weld cable (see Section 4-13).
	Clean and tighten all weld and gas connections.
No 115 volts ac output at duplex receptacle.	Reset circuit breaker CB1 (see Section 4-19).
Fan not operating. Fan only runs when cooling is necessary.	Check for and remove anything blocking fan movement.
	Have Factory Authorized Service Agent check fan motor.
Wandering arc	Use proper size tungsten (see Section 11-1).
	Use properly prepared tungsten (see Section 11-2).
	Reduce gas flow rate.
Tungsten electrode oxidizing and not remaining bright after conclusion of weld.	Shield weld zone from drafts.
	Increase postflow time (see Section 5-12).
	Check and tighten all gas fittings.
	Water in torch. Refer to torch manual.

SECTION 8 - ELECTRICAL DIAGRAM

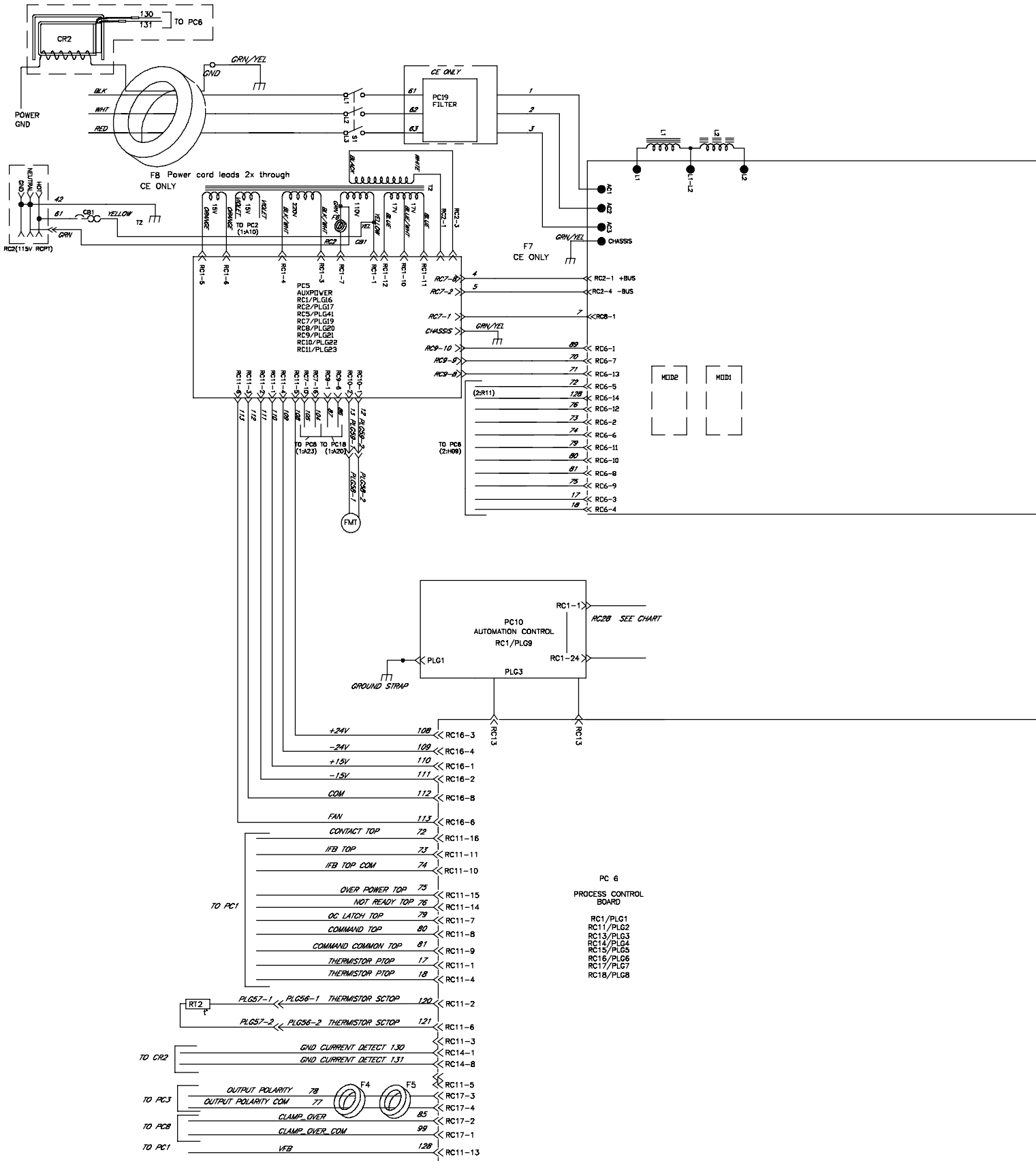



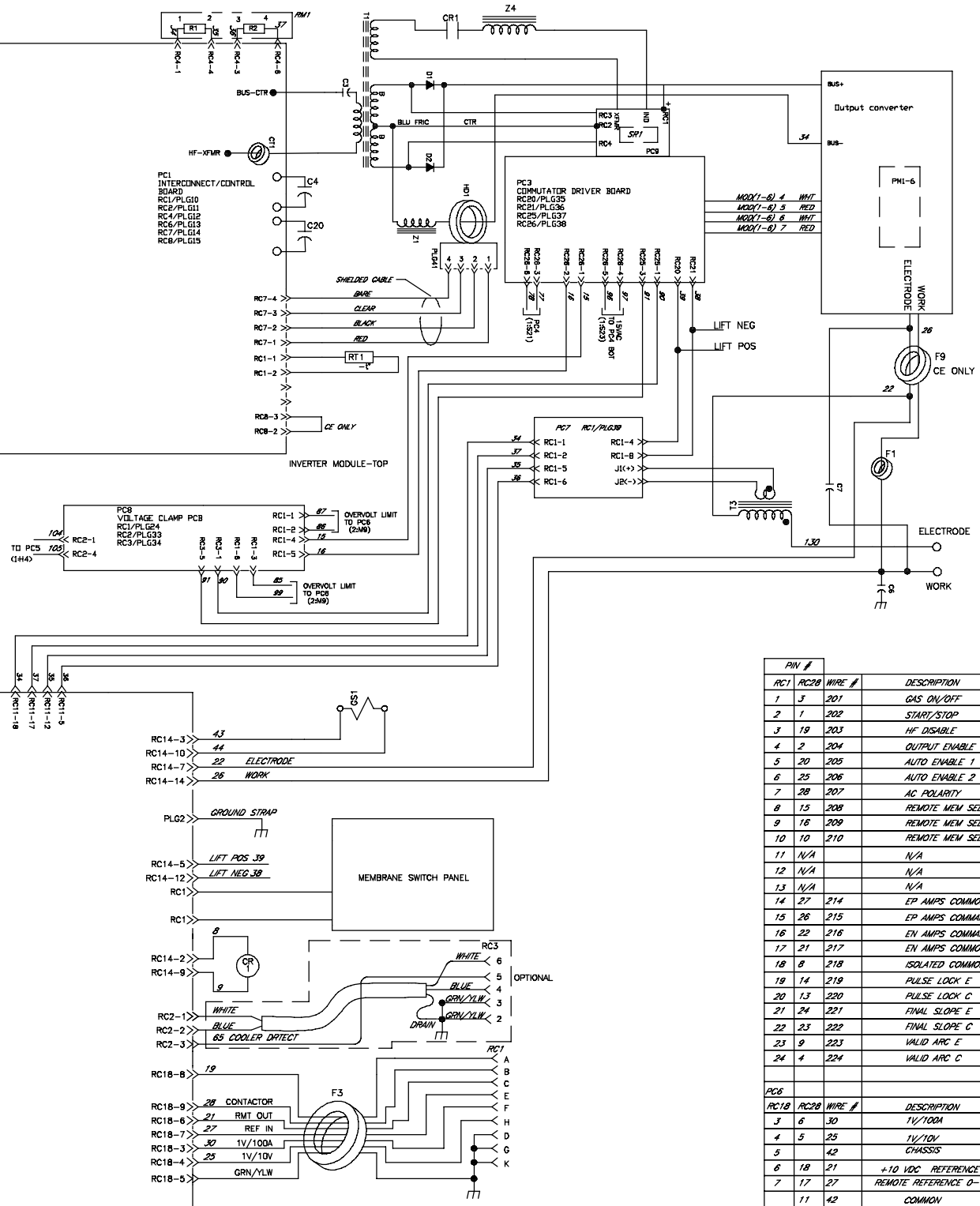
Figure 8-1. Circuit Diagram For Dynasty 350 Models

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



PIN #	RC1	RC2B	WIRE #	DESCRIPTION
1	3	201		GAS ON/OFF
2	1	202		START/STOP
3	19	203		HF DISABLE
4	2	204		OUTPUT ENABLE
5	20	205		AUTO ENABLE 1
6	25	206		AUTO ENABLE 2
7	28	207		AC POLARITY
8	15	208		REMOTE MEM SEL0
9	18	209		REMOTE MEM SEL1
10	10	210		REMOTE MEM SEL2
11	N/A			N/A
12	N/A			N/A
13	N/A			N/A
14	27	214		EP AMPS COMMON
15	26	215		EP AMPS COMMAND
16	22	216		EN AMPS COMMAND
17	21	217		EN AMPS COMMON
18	8	218		ISOLATED COMMON
19	14	219		PULSE LOCK E
20	13	220		PULSE LOCK C
21	24	221		FINAL SLOPE E
22	23	222		FINAL SLOPE C
23	9	223		VALID ARC E
24	4	224		VALID ARC C
PCB				
PIN #	RC1B	RC2B	WIRE #	DESCRIPTION
3	6	30		1V/100A
4	5	25		1V/10V
5		42		CHASSIS
6	18	21		+10 VDC REFERENCE OUT
7	17	27		REMOTE REFERENCE 0-10VDC
11		42		COMMON
12		42		CHASSIS
7				N/A

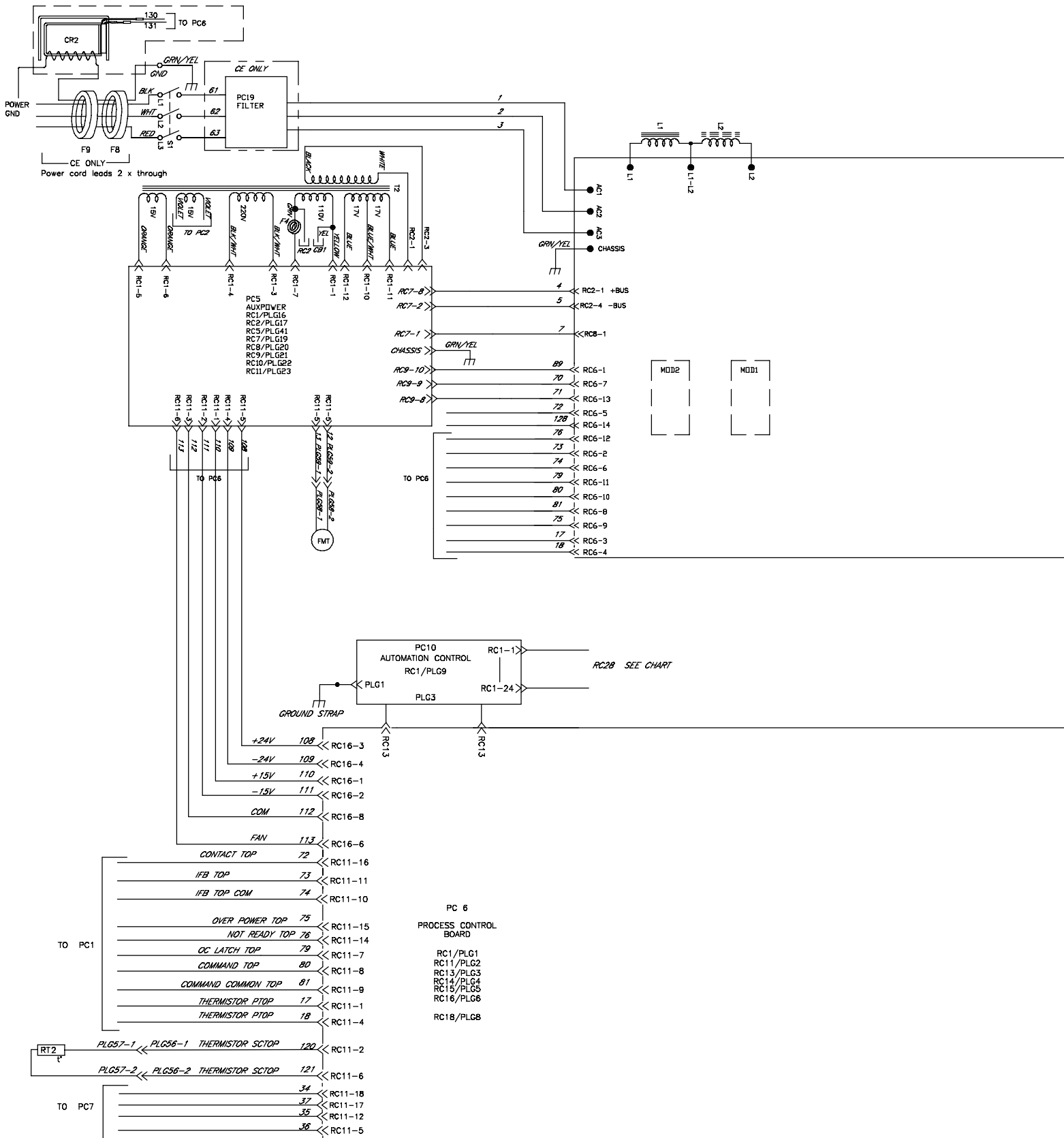


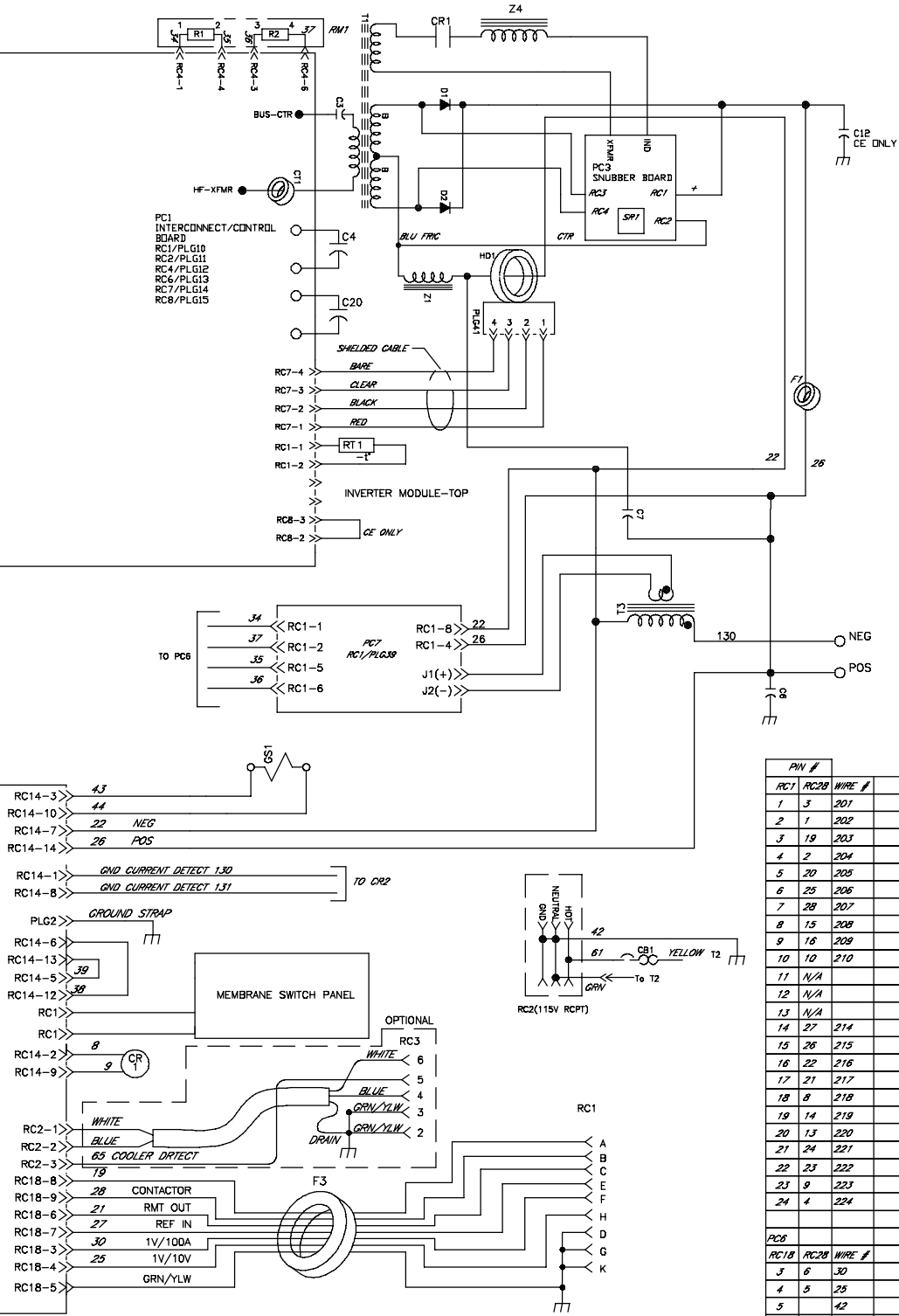
Figure 8-2. Circuit Diagram For Maxstar 350 Models

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.



PW #	RC2B	WIRE #	DESCRIPTION
RC1	RC2B		
1	3	201	GAS ON/OFF
2	1	202	START/STOP
3	19	203	HF DISABLE
4	2	204	OUTPUT ENABLE
5	20	205	AUTO ENABLE 1
6	25	206	AUTO ENABLE 2
7	28	207	AC POLARITY
8	15	208	REMOTE MEM SEL0
9	16	209	REMOTE MEM SEL1
10	10	210	REMOTE MEM SEL2
11	N/A		N/A
12	N/A		N/A
13	N/A		N/A
14	27	214	EP AMPS COMMON
15	26	215	EP AMPS COMMAND
16	22	216	EN AMPS COMMAND
17	21	217	EN AMPS COMMON
18	8	218	ISOLATED COMMON
19	14	219	PULSE LOCK E
20	13	220	PULSE LOCK C
21	24	221	FINAL SLOPE E
22	23	222	FINAL SLOPE C
23	9	223	VALID ARC E
24	4	224	VALID ARC C
PC18	RC2B		
3	6	30	1V/100A
4	5	29	1V/10V
5	42		CHASSIS
6	18	21	+10 VDC REFERENCE OUT
7	17	27	REMOTE REFERENCE 0-10VDC
		11	COMMON
		12	CHASSIS
		7	N/A

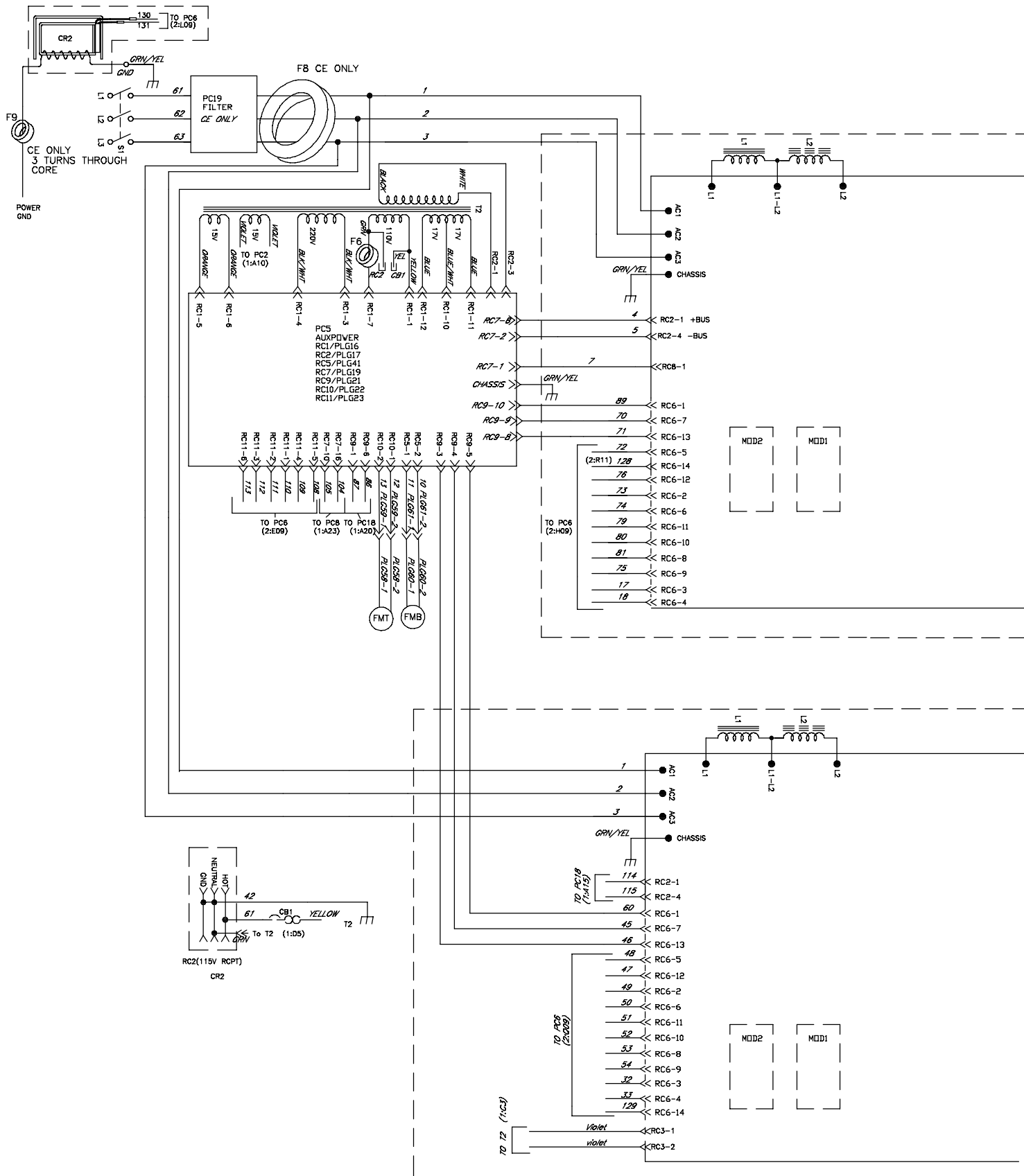
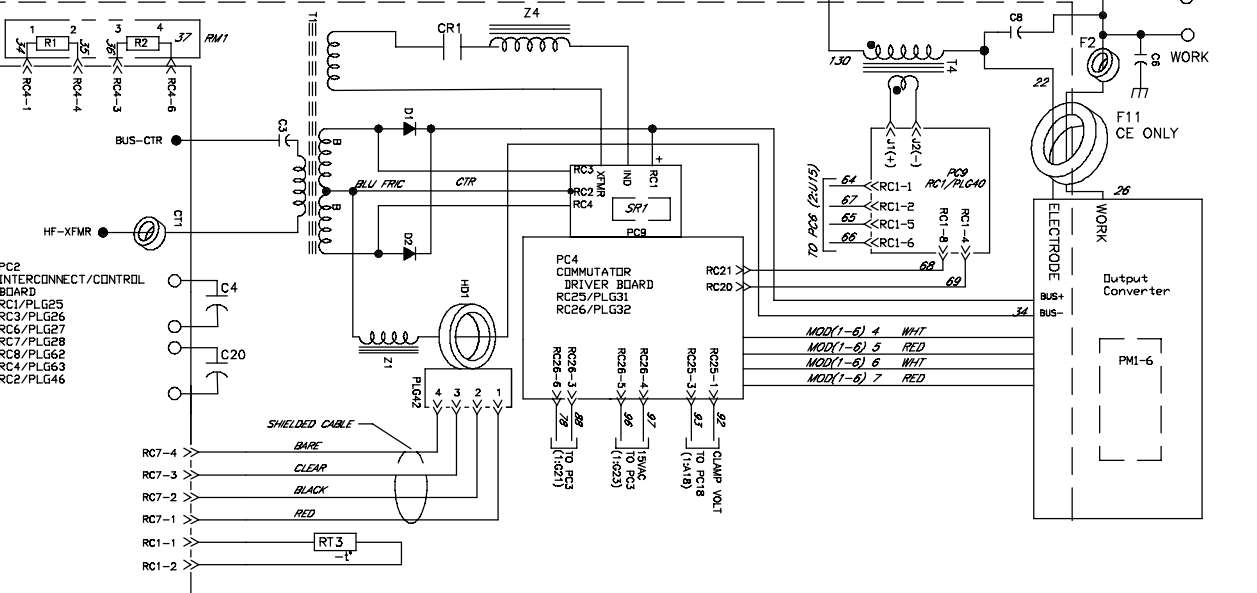
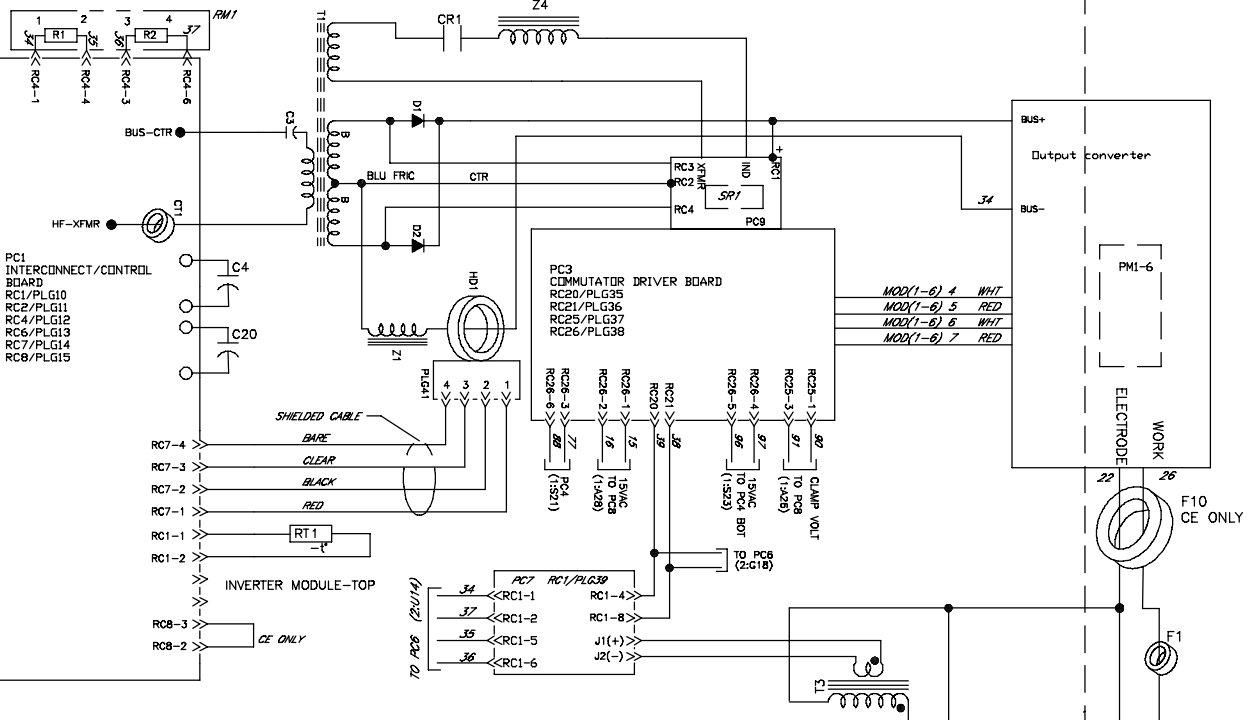
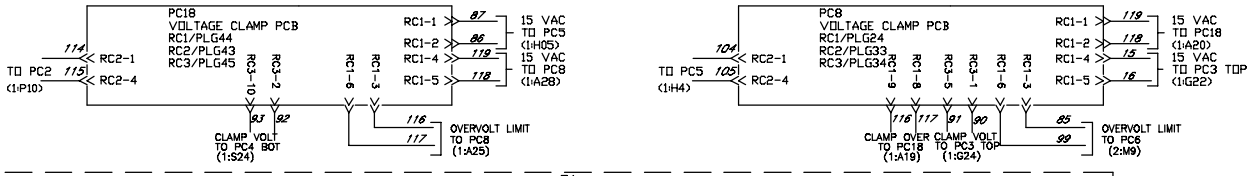


Figure 8-3. Circuit Diagram For Dynasty 700 Models (Part 1 of 2)



 WARNING ELECTRIC SHOCK HAZARD	<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.
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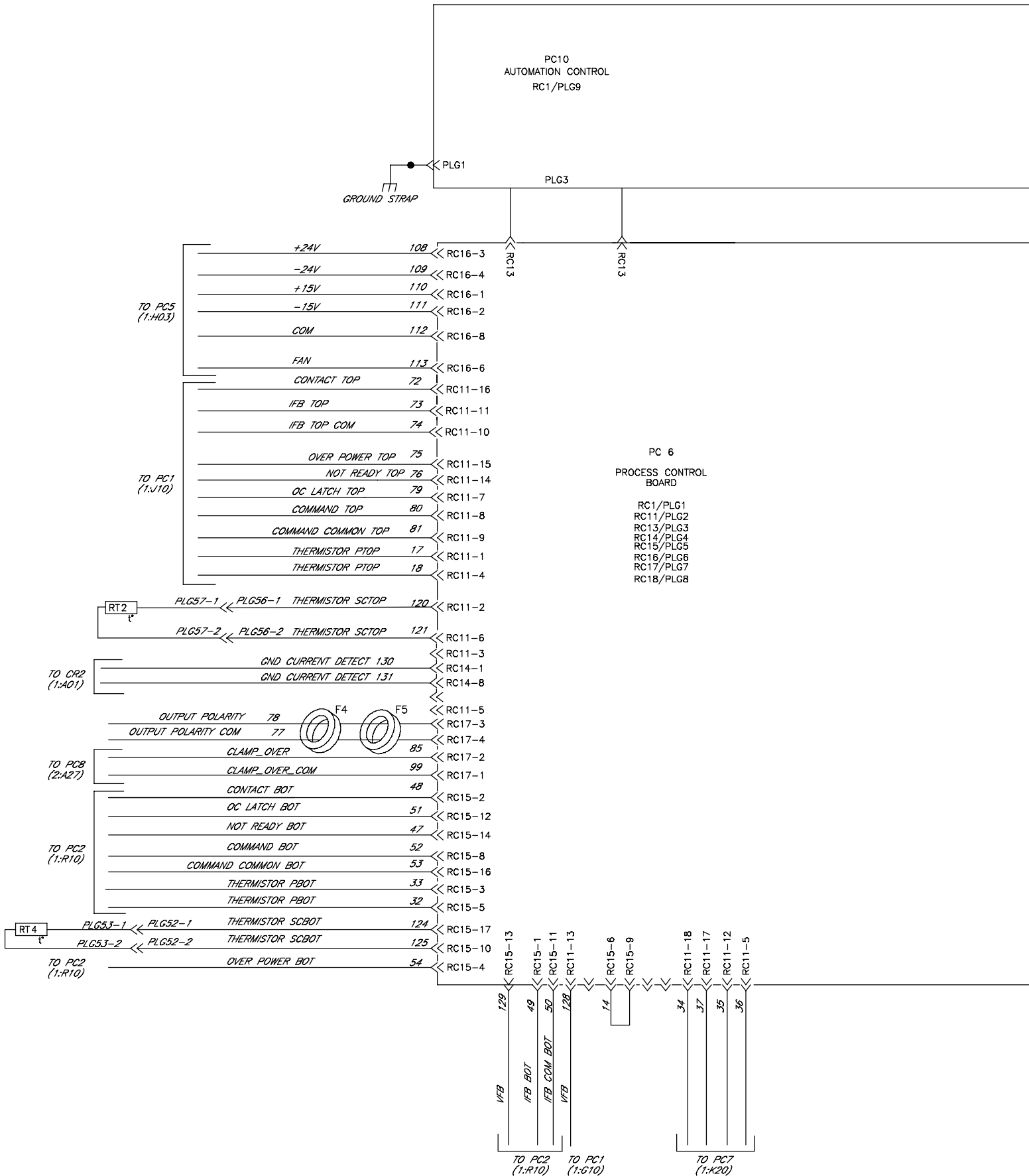
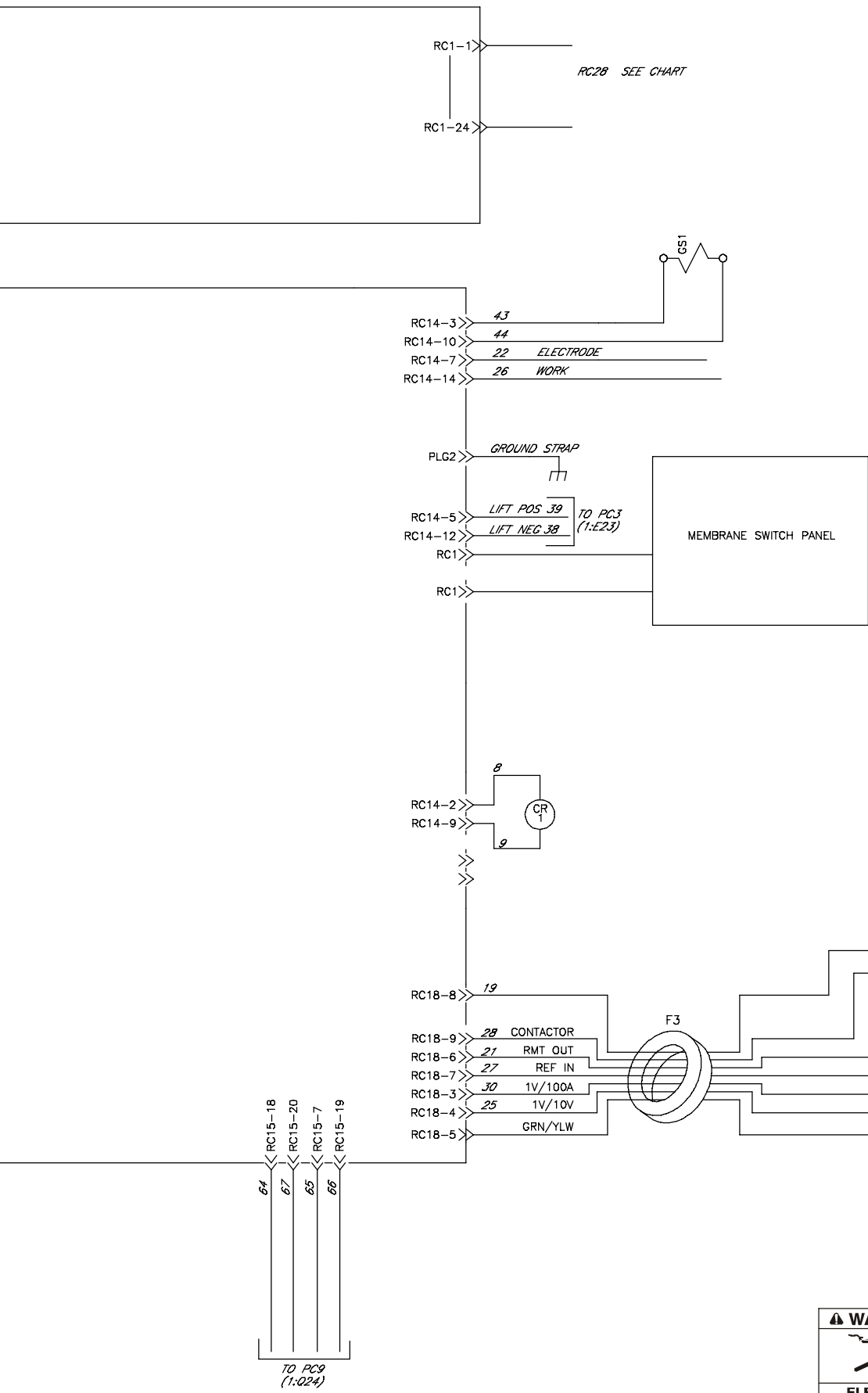


Figure 8-4. Circuit Diagram For Dynasty 700 Models (Part 2 of 2)



PIN #	RC1	RC28	WIRE #	DESCRIPTION
1	3	201		GAS ON/OFF
2	1	202		START/STOP
3	19	203		HF DISABLE
4	2	204		OUTPUT ENABLE
5	20	205		AUTO ENABLE 1
6	25	206		AUTO ENABLE 2
7	28	207		AC POLARITY
8	15	208		REMOTE MEM SELO
9	16	209		REMOTE MEM SEL1
10	10	210		REMOTE MEM ENABLE
11	N/A			N/A
12	N/A			N/A
13	N/A			N/A
14	27	214		EP AMPS COMMON
15	26	215		EP AMPS COMMAND
16	22	216		EN AMPS COMMAND
17	21	217		EN AMPS COMMON
18	8	218		ISOLATED COMMON
19	14	219		PULSE LOCK E
20	13	220		PULSE LOCK C
21	24	221		FINAL SLOPE E
22	23	222		FINAL SLOPE C
23	9	223		VALID ARC E
24	4	224		VALID ARC C
PIN #	RC18	RC28	WIRE #	DESCRIPTION
3	6	30		1V/100A
4	5	25		1V/10V
5		42		CHASSIS
6	18	21		+10 VDC REFERENCE OUT
7	17	27		REMOTE REFERENCE 0-10VDC
11		42		COMMON
12		42		CHASSIS
7				N/A

 WARNING ELECTRIC SHOCK HAZARD	<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.
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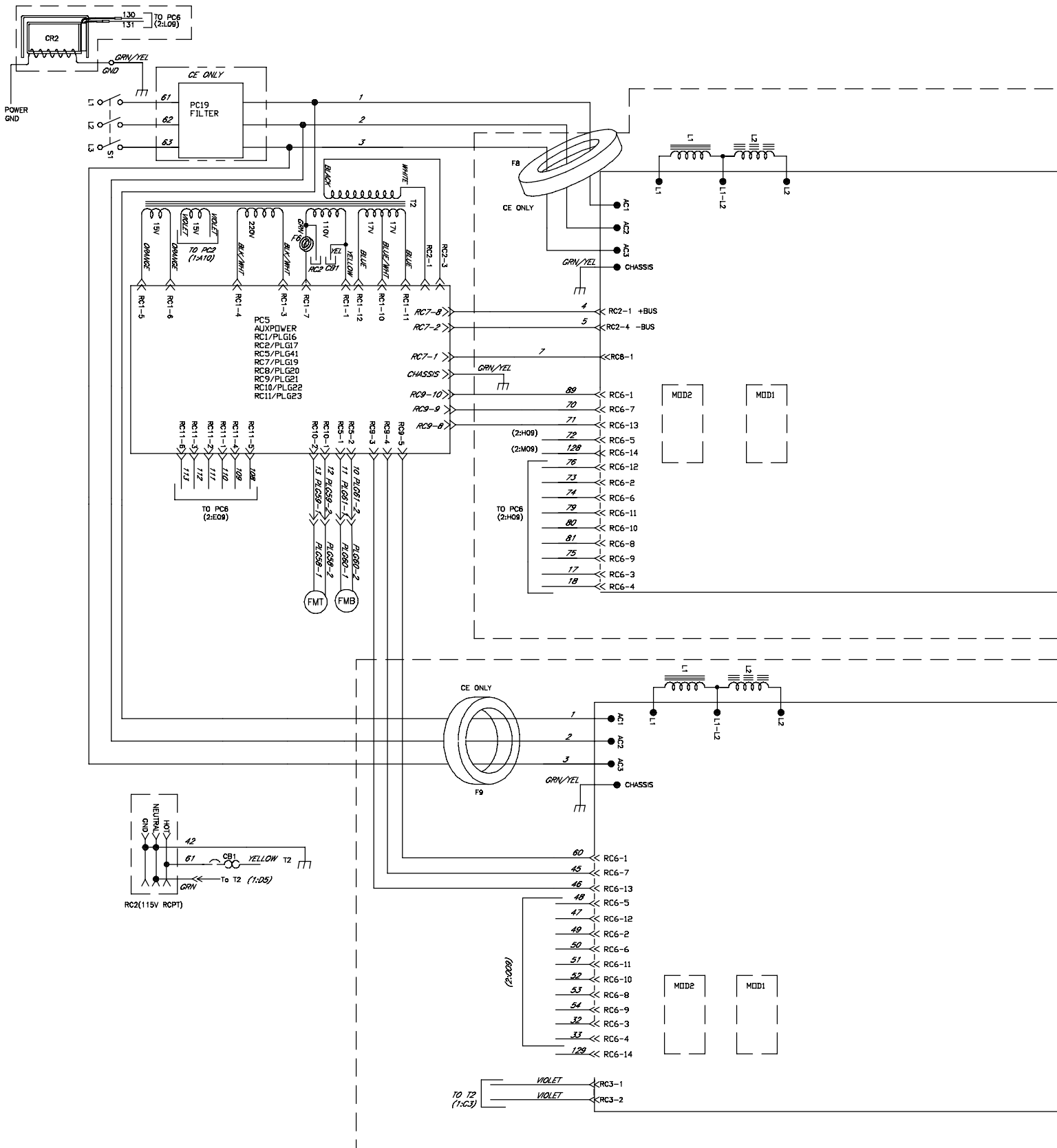
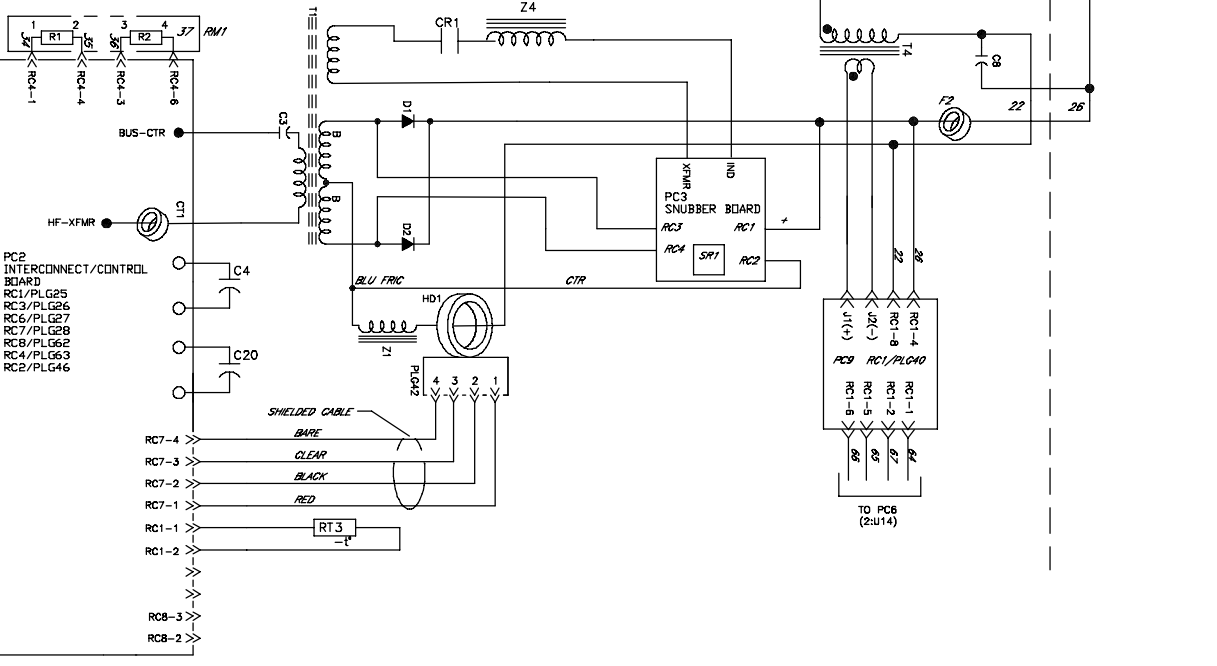
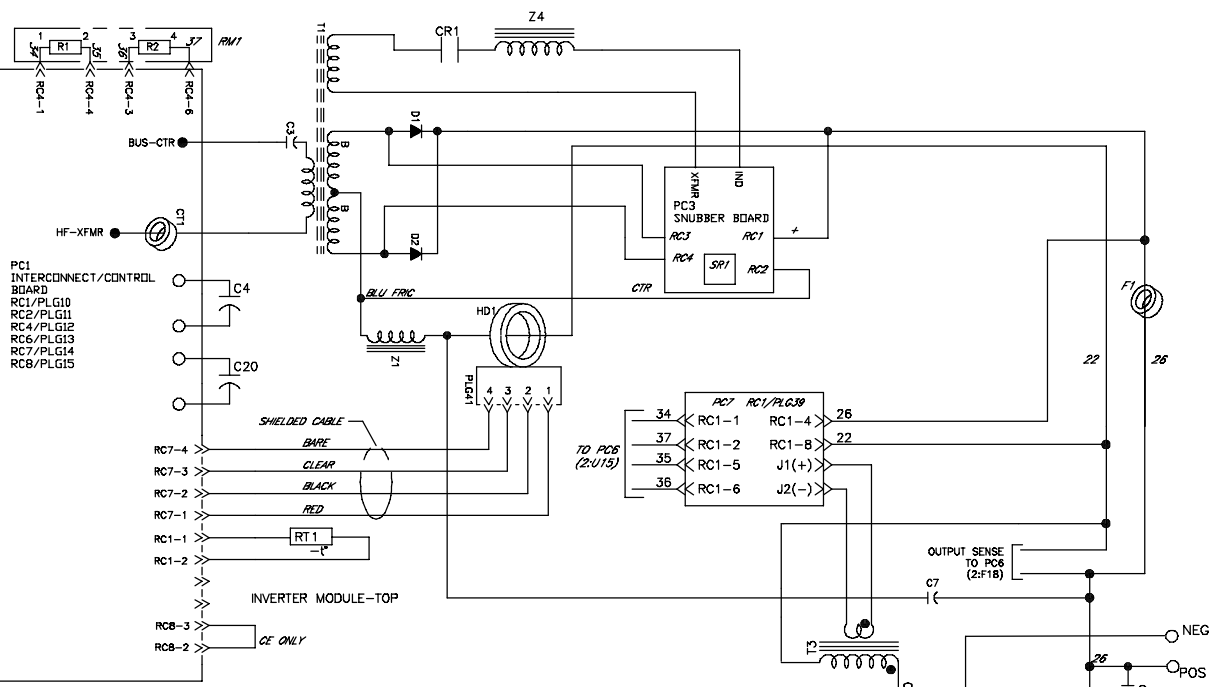


Figure 8-5. Circuit Diagram For Maxstar 700 Models (Part 1 of 2)



⚠ 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.

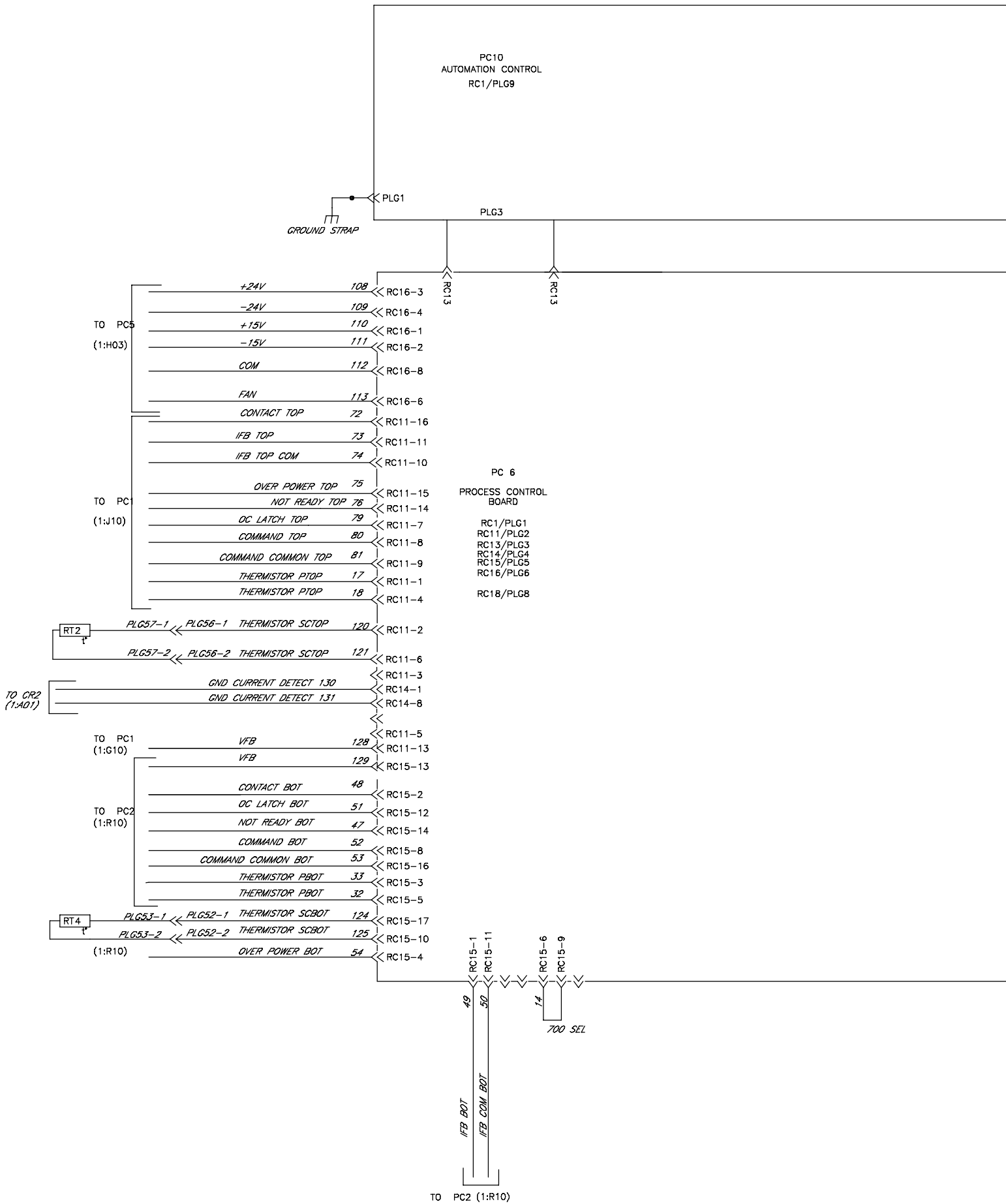
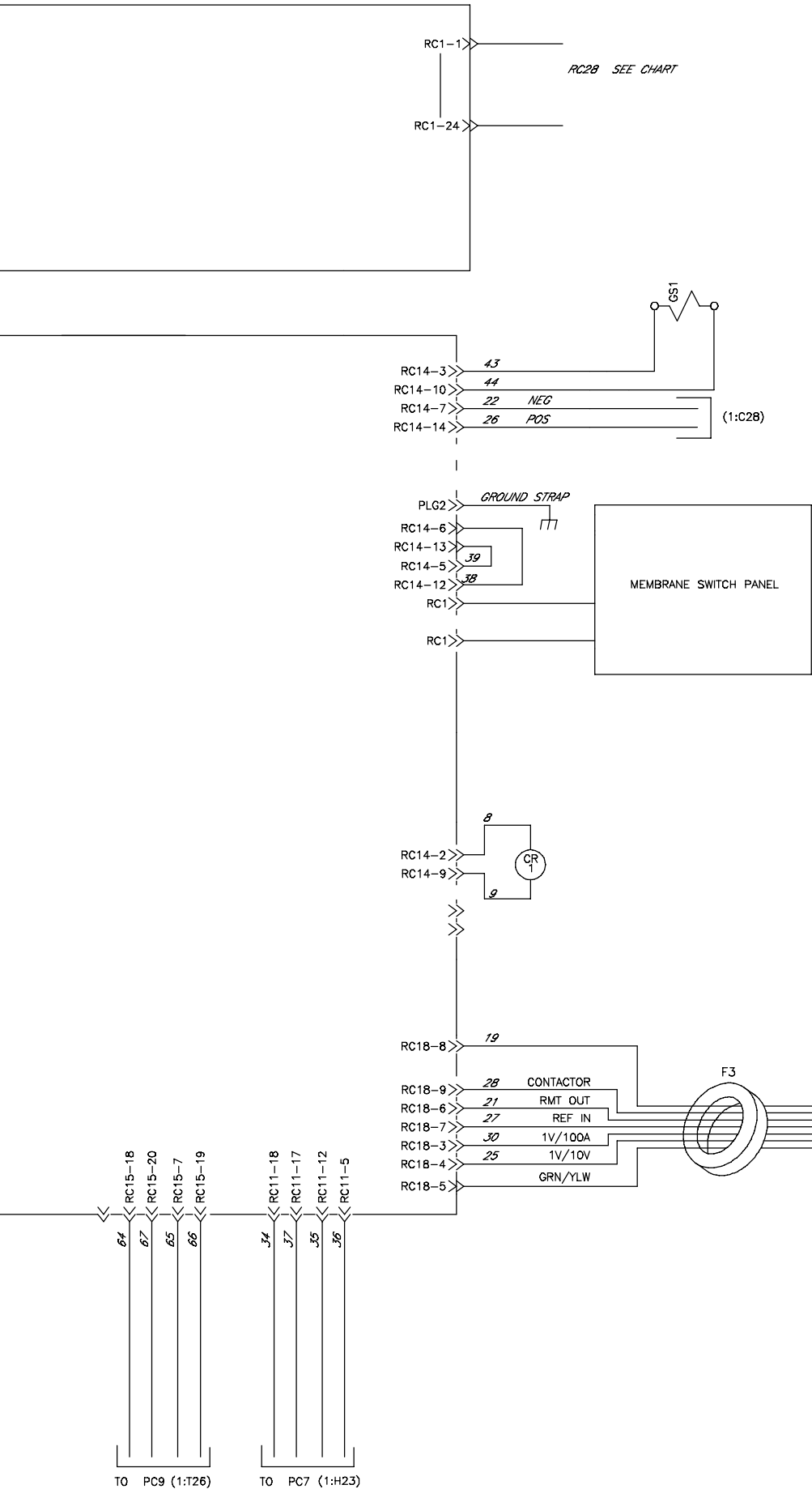


Figure 8-6. Circuit Diagram For Maxstar 700 Models (Part 2 of 2)




PIN #	RC1	RC28	WIRE #	DESCRIPTION
1	3	201		GAS ON/OFF
2	1	202		START/STOP
3	19	203		HF DISABLE
4	2	204		OUTPUT ENABLE
5	20	205		AUTO ENABLE 1
6	25	206		AUTO ENABLE 2
7	28	207		AC POLARITY
8	15	208		REMOTE MEM SEL0
9	16	209		REMOTE MEM SEL1
10	10	210		REMOTE MEM ENABLE
11	N/A			N/A
12	N/A			N/A
13	N/A			N/A
14	27	214		EP AMPS COMMON
15	26	215		EP AMPS COMMAND
16	22	216		EN AMPS COMMAND
17	21	217		EN AMPS COMMON
18	8	218		ISOLATED COMMON
19	14	219		PULSE LOCK E
20	13	220		PULSE LOCK C
21	24	221		FINAL SLOPE E
22	23	222		FINAL SLOPE C
23	9	223		VALID ARC E
24	4	224		VALID ARC C
PC6				
RC18	RC28	WIRE #	DESCRIPTION	
3	6	30	1V/100A	
4	5	25	1V/10V	
5		42	CHASSIS	
6	18	21	+10 VDC REFERENCE OUT	
7	17	27	REMOTE REFERENCE 0-10VDC	
	11	42	COMMON	
	12	42	CHASSIS	
	7		N/A	

⚠ 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.

	<p>WARNING</p> <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.
<p>ELECTRIC SHOCK HAZARD</p>	

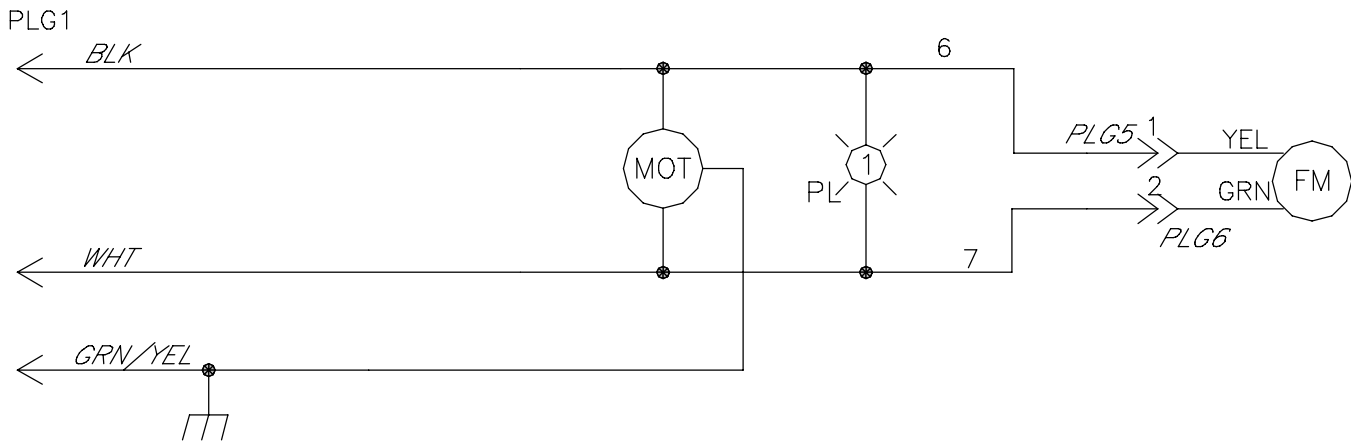

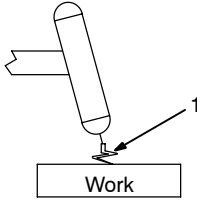


Figure 8-7. Circuit Diagram For Cooler

SECTION 9 – HIGH FREQUENCY

9-1. Welding Processes Requiring High Frequency






TIG

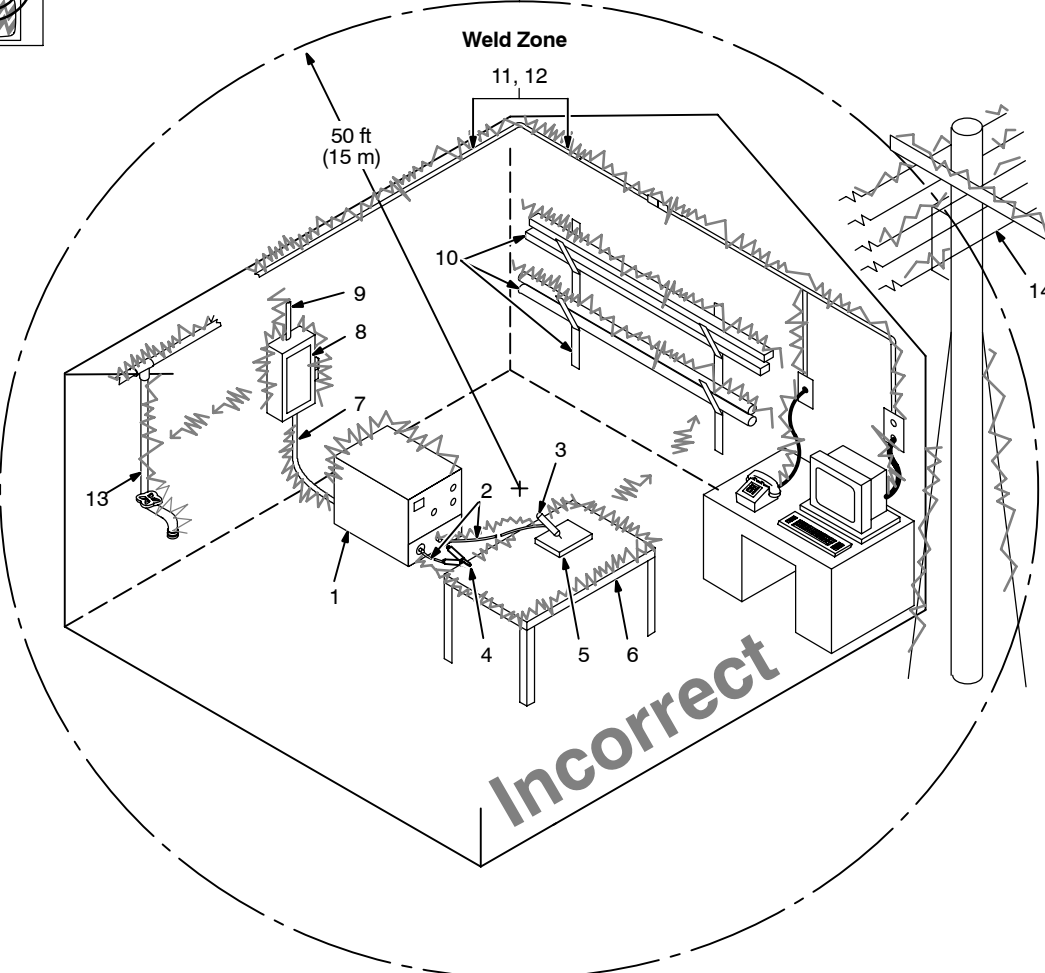
1 High-Frequency Voltage

TIG – helps arc jump air gap between torch and workpiece and/or stabilize the arc.

high_freq 12/96 – S-0693

9-2. Incorrect Installation





Sources of Direct High-Frequency Radiation

- 1 High-Frequency Source (welding power source with built-in HF or separate HF unit)
- 2 Weld Cables
- 3 Torch
- 4 Work Clamp
- 5 Workpiece
- 6 Work Table

Sources of Conduction of High Frequency

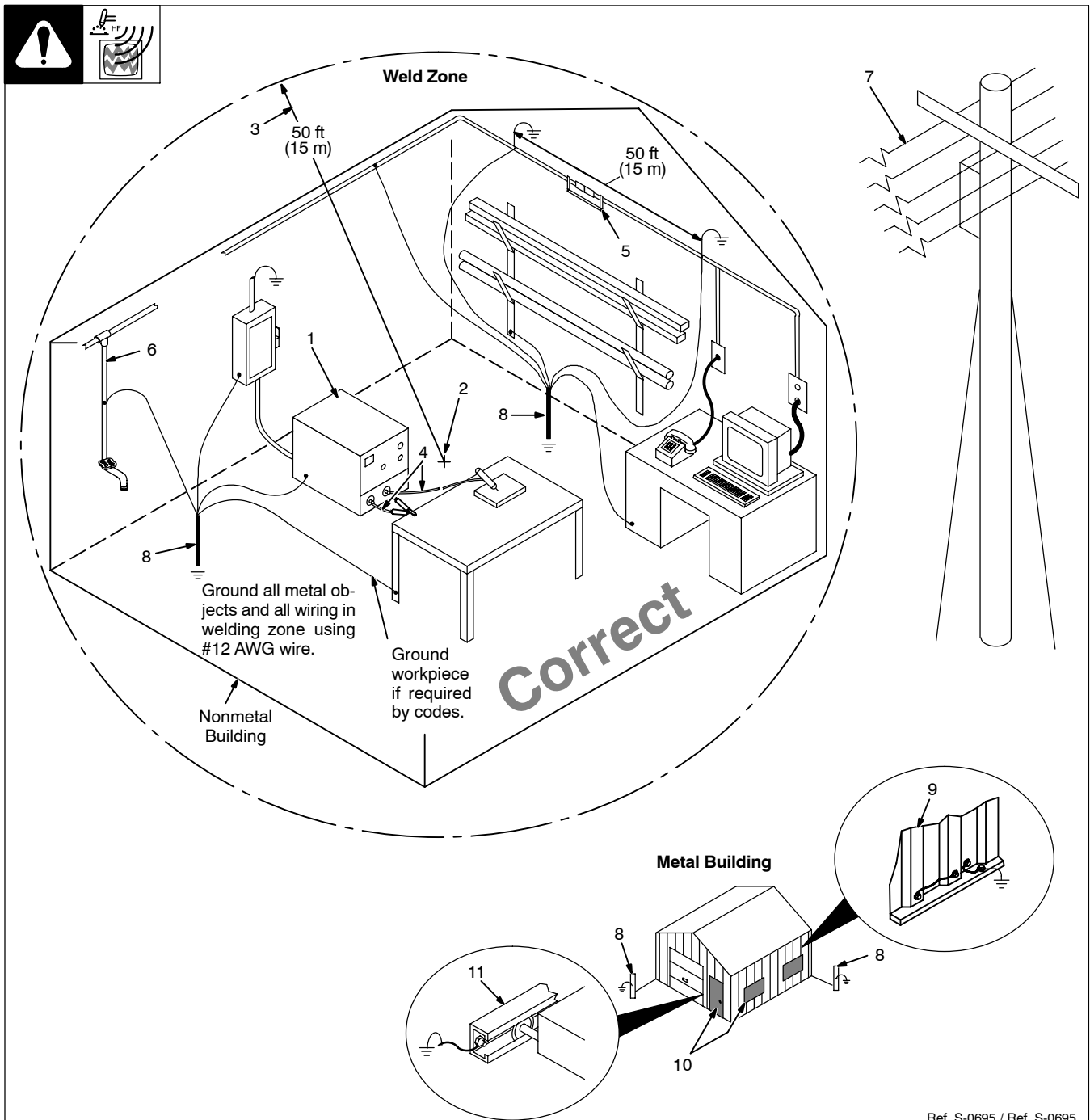
- 7 Input Power Cable
- 8 Line Disconnect Device
- 9 Input Supply Wiring

Sources of Reradiation of High Frequency

- 10 Ungrounded Metal Objects
- 11 Lighting
- 12 Wiring
- 13 Water Pipes and Fixtures
- 14 External Phone and Power Lines

S-0694

9-3. Correct Installation



Ref. S-0695 / Ref. S-0695

- 1 High-Frequency Source (welding power source with built-in HF or separate HF unit)

Ground metal machine case, work output terminal, line disconnect device, input supply, and worktable.

- 2 Center Point of Welding Zone
Midpoint between high-frequency source and welding torch.

- 3 Welding Zone
A circle 50 ft (15 m) from center point in all directions.

- 4 Weld Output Cables
Keep cables short and close together.

- 5 Conduit Joint Bonding and Grounding

Electrically join (bond) all conduit sections using copper straps or braided wire. Ground conduit every 50 ft (15 m).

- 6 Water Pipes and Fixtures

Ground water pipes every 50 ft (15 m).

- 7 External Power or Telephone Lines

Locate high-frequency source at least 50 ft (15 m) away from power and phone lines.

- 8 Grounding Rod

Consult the National Electrical Code for specifications.

Metal Building Requirements

- 9 Metal Building Panel Bonding Methods
Bolt or weld building panels together, install copper straps or braided wire across seams, and ground frame.

- 10 Windows and Doorways

Cover all windows and doorways with grounded copper screen of not more than 1/4 in (6.4 mm) mesh.

- 11 Overhead Door Track

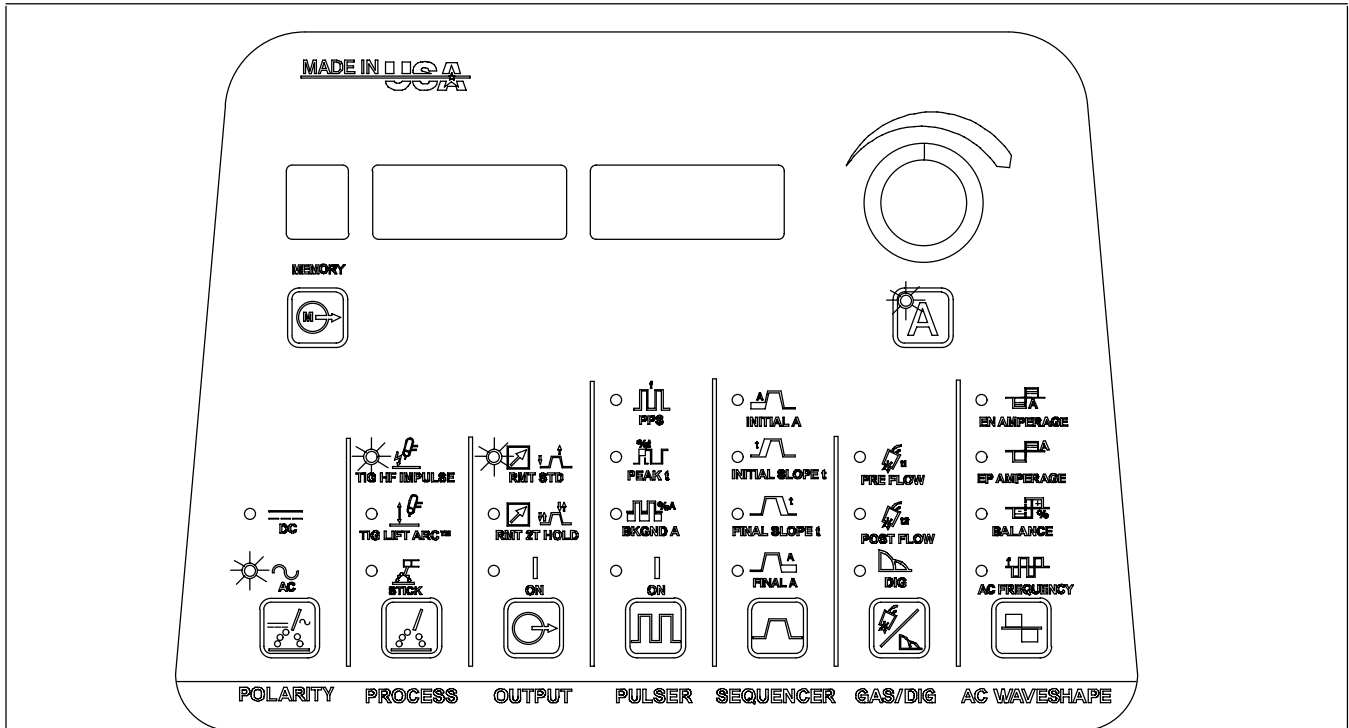
Ground the track.

SECTION 10 – SETUP GUIDES FOR (GTAW) TIG WELDING



10-1. Typical GTAW Setups

A. AC – GTAW 1/8 in. Aluminum Setup (Dynasty Models Only)



This symbol indicates which functions should be active for aluminum welding.

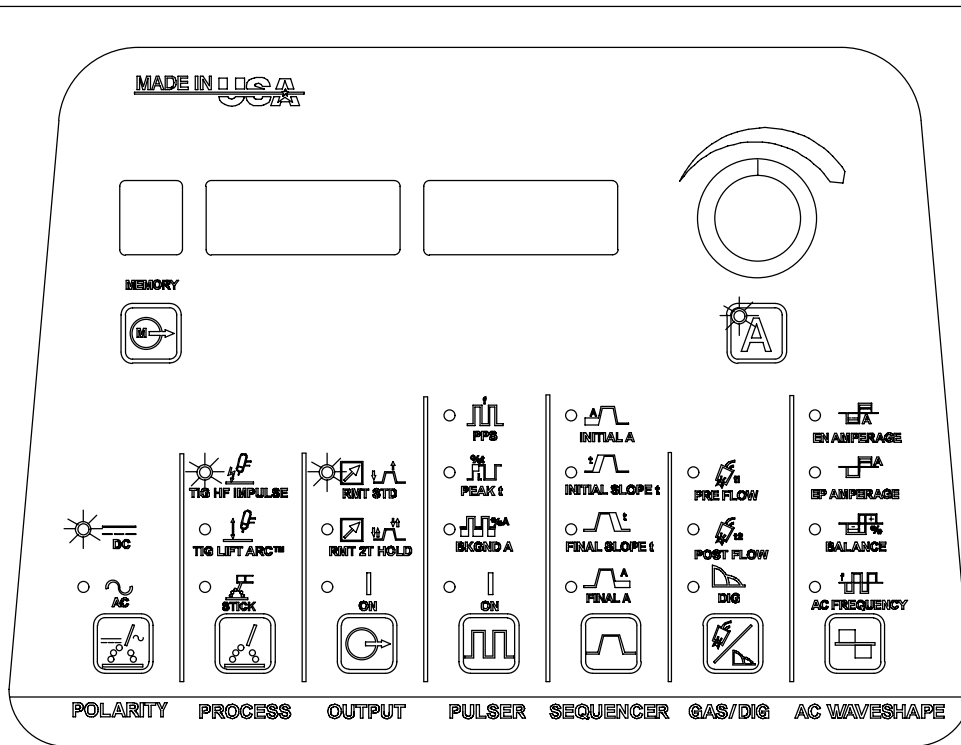
226 868-B

Some of the controls shown above may not be on your machine (Dynasty 350/700 illustrated).


- Turn power on (switch located on rear panel).
- Press Polarity switch pad until AC LED is lit.
- Press Process switch pad until TIG HF Impulse LED is lit.
- Press Output switch pad until RMT STD LED is lit.
- Press Adjust switch pad until Post Flow LED is lit.
- Turn Encoder control to set 15 seconds of Post Flow time.
- Press AC Waveshape switch pad until Balance LED is lit.
- Turn Encoder control to set desired Balance (65 - 80%).
- Press AC Waveshape switch pad until AC Frequency LED is lit.
- Turn Encoder control to set desired AC Frequency (100 - 150 Hz).
- Press AC Waveshape switch pad until EN Amperage or EP Amperage LED is lit.
- Turn Encoder control to set desired ratio: typically in the range of (75A EP / 100A EN) to (50A EP / 100A EN).
- Press Amperage A switch pad until LED is lit.
- Turn Encoder control to set desired amperage (125 - 160 amps).
- Pulser Controls (if applicable, see Section 5-10).


The ammeter displays the parameter for any of the following units of measure when they are active: amperage, time, percentage, or frequency. The corresponding LED, located directly below the ammeter, will also light up. The ammeter also displays actual amperage while welding.

B. DC - GTAW 16 Gauge Mild Steel* And Stainless Steel Setup





226 868-B


 This symbol indicates which functions should be active for stainless or mild steel welding.


 Some of the controls shown above may not be on your machine (Dynasty 350/700 illustrated).


- Turn power on (switch located on rear panel)

 • Press Polarity switch pad until DC LED is lit (Dynasty Models Only)


 • Press Process switch pad until TIG HF Impulse LED is lit


 • Press Output switch pad until RMT STD LED is lit


 • Press Adjust switch pad until Post Flow LED is lit

 • Turn Encoder control to set 8 seconds of Post Flow time

 • Press Amperage A switch pad until LED is lit

 • Turn Encoder control to set desired amperage (50 - 80 amps for stainless steel) or (55 to 88 amps for mild steel*).

 • Pulser Controls (if applicable, see Section 5-10).

 The ammeter displays the parameter for any of the following units of measure when they are active: amperage, time, percentage, or frequency. The corresponding LED, located directly below the ammeter, will also light up. The ammeter also displays actual amperage while welding.

SECTION 11 – SELECTING AND PREPARING A TUNGSTEN FOR DC OR AC WELDING WITH INVERTER MACHINES

gtaw_Inverter_2007-05



Whenever possible and practical, use DC weld output instead of AC weld output.

11-1. Selecting Tungsten Electrode (Wear Clean gloves To Prevent Contamination Of Tungsten)

Electrode Diameter	Amperage Range - Gas Type ♦ - Polarity	
	(DCEN) – Argon Direct Current Electrode Negative (For Use With Mild Or Stainless Steel)	AC – Argon Balance Control @ 65% Electrode Negative (For Use With Aluminum)
2% Ceria (Orange Band), 1.5% Lanthanum (Gray Band), Or 2% Thorium (Red Band) Alloy Tungstens		
.010" (1 mm)	Up to 25	Up to 20
.020" (1 mm)	15-40	15-35
.040" (1 mm)	25-85	20-80
1/16" (1.6 mm)	50-160	50-150
3/32" (2.4 mm)	135-235	130-250
1/8" (3.2 mm)	250-400	225-360
5/32" (4.0 mm)	400-500	300-450
3/16" (4.8 mm)	500-750	400-500
1/4" (6.4 mm)	750-1000	600-800

♦ Typical argon shielding gas flow rates are 11 to 35 cfh (cubic feet per hour).

Figures listed are a guide and are a composite of recommendations from American Welding Society (AWS) and electrode manufacturers.

11-2. Preparing Tungsten Electrode For DC Electrode Negative (DCEN) Welding Or AC Welding With Inverter Machines



Grinding the tungsten electrode produces dust and flying sparks which can cause injury and start fires. Use local exhaust (forced ventilation) at the grinder or wear an approved respirator. Read MSDS for safety information. Consider using tungsten containing ceria, lanthana, or yttria instead of thoria. Grinding dust from thoriated electrodes contains low-level radioactive material. Properly dispose of grinder dust in an environmentally safe way. Wear proper face, hand, and body protection. Keep flammables away.

Radial Grinding Causes Wandering Arc

Wrong Tungsten Preparation

2-1/2 Times Electrode Diameter

1 Grinding Wheel

2 Tungsten Electrode

3 Flat

4 Straight Ground

Ideal Tungsten Preparation – Stable Arc

1 Grinding Wheel
Grind end of tungsten on fine grit, hard abrasive wheel before welding. Do not use wheel for other jobs or tungsten can become contaminated causing lower weld quality.

2 Tungsten Electrode
A 2% ceriated tungsten is recommended.

3 Flat
Diameter of this flat determines amperage capacity.

4 Straight Ground
Grind lengthwise, **not radial**.

SECTION 12 – GUIDELINES FOR TIG WELDING (GTAW)

12-1. Positioning The Torch

⚠ Grinding the tungsten electrode produces dust and flying sparks which can cause injury and start fires. Use local exhaust (forced ventilation) at the grinder or wear an approved respirator. Read MSDS for safety information. Consider using cerium or lanthanum based tungsten instead of thoriated. Thorium dust contains low-level radioactive material. Properly dispose of grinder dust in an environmentally safe way. Wear proper face, hand, and body protection. Keep flammables away.

- 1 Workpiece
Make sure workpiece is clean before welding.
- 2 Work Clamp
Place as close to the weld as possible.
- 3 Torch
- 4 Filler Rod (If Applicable)
- 5 Gas Cup
- 6 Tungsten Electrode

Select and prepare tungsten according to Section 11.

Guidelines:

The inside diameter of the gas cup should be at least three times the tungsten diameter to provide adequate shielding gas coverage. (For example, if tungsten is 1/16 in diameter, gas cup should be a minimum of 3/16 in diameter.)

Tungsten extension is the distance the tungsten extends out gas cup of torch.

The tungsten extension should be no greater than the inside diameter of the gas cup.

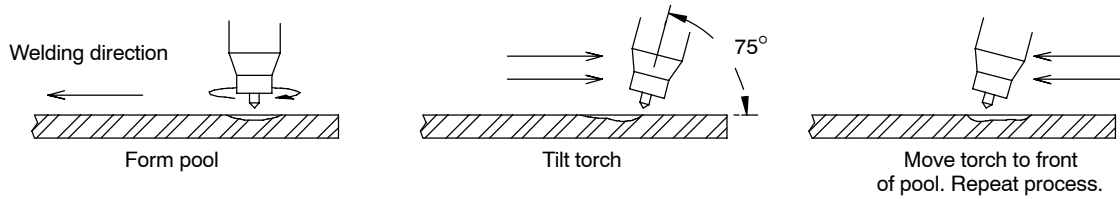
Arc length is the distance from the tungsten to the workpiece.

Bottom View Of Gas Cup

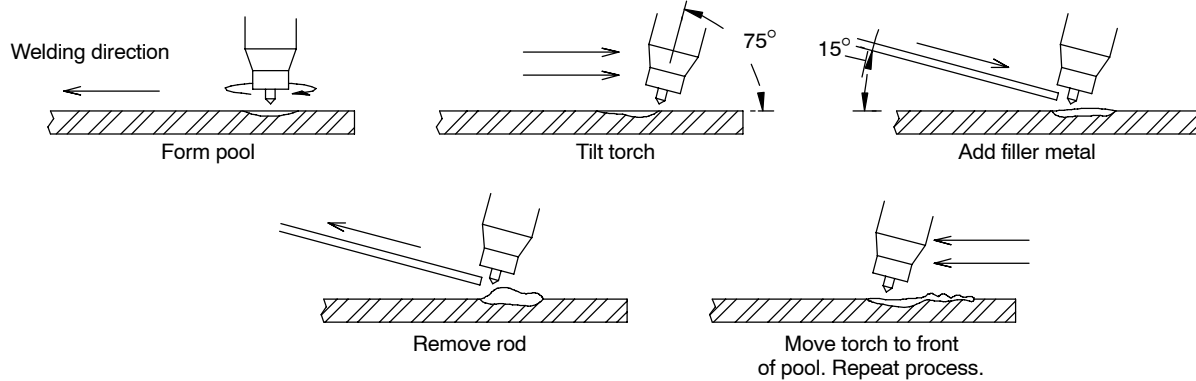
Ref. ST-161 892

12-2. Torch Movement During Welding

Tungsten Without Filler Rod



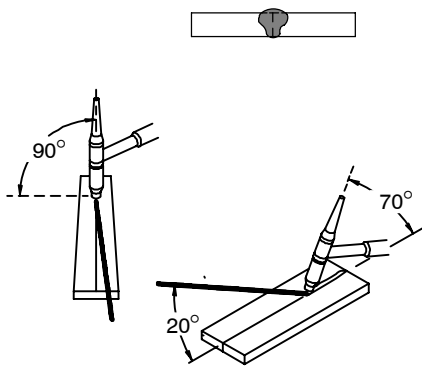
Tungsten With Filler Rod



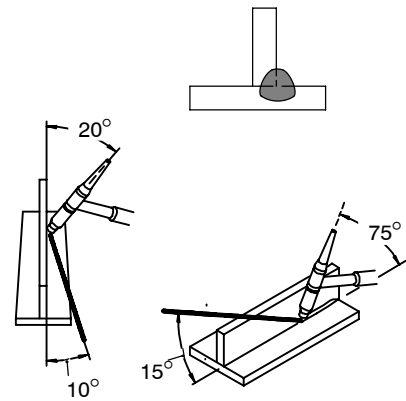
ST-162 002-B

12-3. Positioning Torch Tungsten For Various Weld Joints

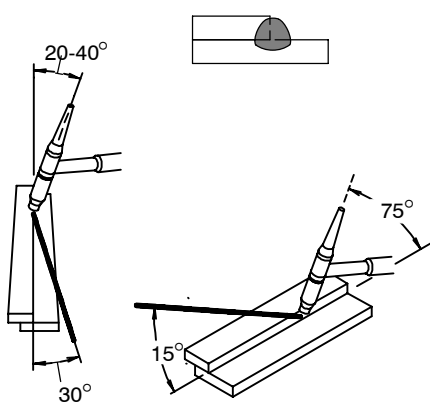
Butt Weld And Stringer Bead



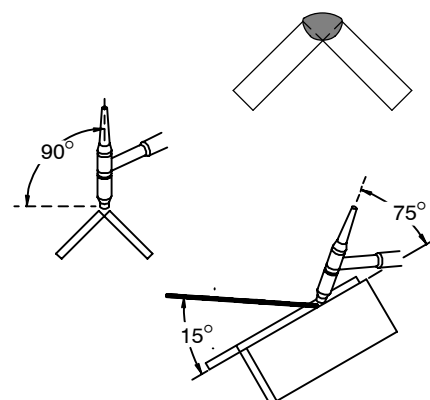
"T" Joint



Lap Joint



Corner Joint



ST-162 003 / S-0792

SECTION 13 – SETUP GUIDES FOR (SMAW) STICK WELDING



13-1. Front Panel Display For Stick DCEP (Direct Current Electrode Positive)

MADE IN U.S.A.

MEMORY

POLARITY PROCESS OUTPUT PULSER SEQUENCER GAS/DIG AC WAVESHAVE

☐ Some of the controls shown above may not be on your machine (Dynasty 350/700 illustrated).

☐ Gray on nameplate indicates a Stick function (see Section 5-1 for description of controls).

☀ This symbol indicates which functions should be active for Stick DCEP (Direct Current Electrode Positive) welding.

- ☑ Turn power on (switch located on rear panel)
- ☑ Press Polarity switch pad until DC LED is lit (Dynasty Models Only)
- ☑ Press Process switch pad until STICK LED is lit
- ☑ Press Output switch pad until ON LED is lit
- ☑ Press Amperage **A** switch pad until LED is lit
- ☑ Turn Encoder control to set desired amperage.

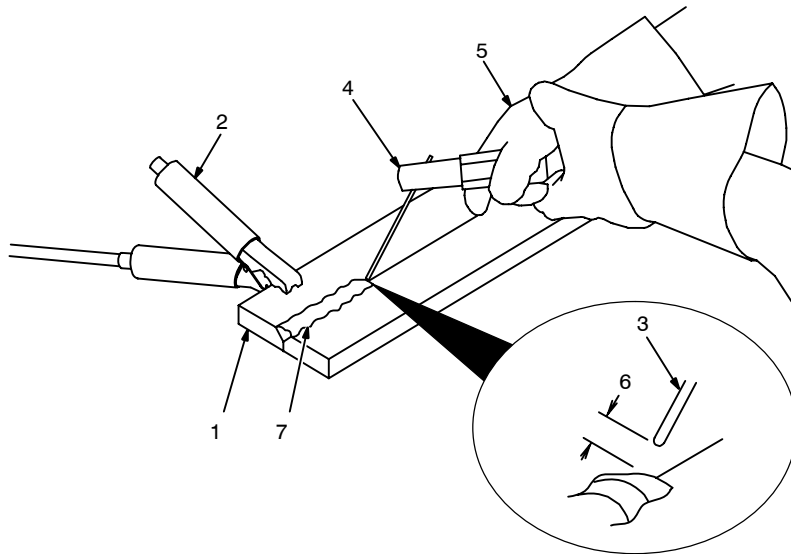
☐ The ammeter displays the parameter for any of the following units of measure when they are active: amperage, time, percentage, or frequency. The corresponding LED, located directly below the ammeter, will also light up. The ammeter also displays actual amperage while welding.

216 869-B

SECTION 14 – STICK WELDING (SMAW) GUIDELINES



14-1. Stick Welding Procedure



⚠ Weld current starts when electrode touches workpiece.

⚠ Weld current can damage electronic parts in vehicles. Disconnect both battery cables before welding on a vehicle. Place work clamp as close to the weld as possible.

1 Workpiece

Make sure workpiece is clean before welding.

2 Work Clamp

3 Electrode

A small diameter electrode requires less current than a large one. Follow electrode manufacturer's instructions when setting weld amperage (see Section 14-2).

4 Insulated Electrode Holder

5 Electrode Holder Position

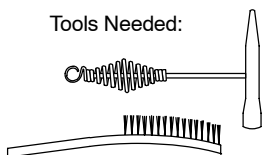
6 Arc Length

Arc length is the distance from the electrode to the workpiece. A short arc with correct amperage will give a sharp, crackling sound.

7 Slag

Use a chipping hammer and wire brush to remove slag. Remove slag and check weld bead before making another weld pass.

Tools Needed:



14-2. Electrode and Amperage Selection Chart

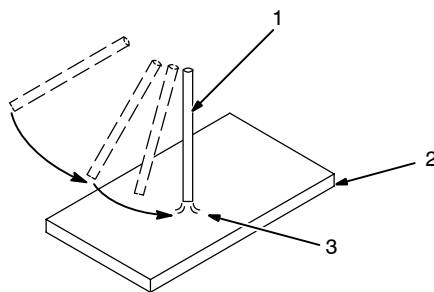
ELECTRODE	DIAMETER	AMPERAGE RANGE								
		50	100	150	200	250	300	350	400	450
6010 & 6011	3/32									
	1/8									
	5/32									
	3/16									
	7/32									
6013	1/4									
	1/16									
	5/64									
	3/32									
	1/8									
	5/32									
	3/16									
7014	7/32									
	1/4									
	3/32									
	1/8									
	5/32									
7018	3/16									
	7/32									
	1/4									
	3/32									
	1/8									
7024	5/32									
	3/16									
	7/32									
	1/4									
	3/32									
Ni-CI	1/8									
	5/32									
	3/16									
308L	3/32									
	1/8									
	5/32									

ELECTRODE	DC*	AC	POSITION	PENETRATION	USAGE
6010	EP		ALL	DEEP	MIN. PREP, ROUGH
6011	EP	✓	ALL	DEEP	HIGH SPATTER
6013	EP,EN	✓	ALL	LOW	GENERAL
7014	EP,EN	✓	ALL	MED	SMOOTH, EASY, FAST
7018	EP	✓	ALL	LOW	LOW HYDROGEN, STRONG
7024	EP,EN	✓	FLAT HORIZ FILLET	LOW	SMOOTH, EASY, FASTER
NI-CL	EP	✓	ALL	LOW	CAST IRON
308L	EP	✓	ALL	LOW	STAINLESS

*EP = ELECTRODE POSITIVE (REVERSE POLARITY)
EN = ELECTRODE NEGATIVE (STRAIGHT POLARITY)

Ref. S-087 985-A

14-3. Striking an Arc – Scratch Start Technique

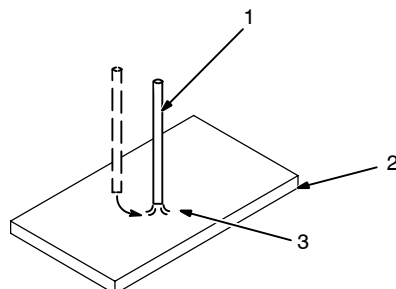


- 1 Electrode
- 2 Workpiece
- 3 Arc

Drag electrode across workpiece like striking a match; lift electrode slightly after touching work. If arc goes out electrode was lifted too high. If electrode sticks to workpiece, use a quick twist to free it.

S-0049

14-4. Striking an Arc – Tapping Technique

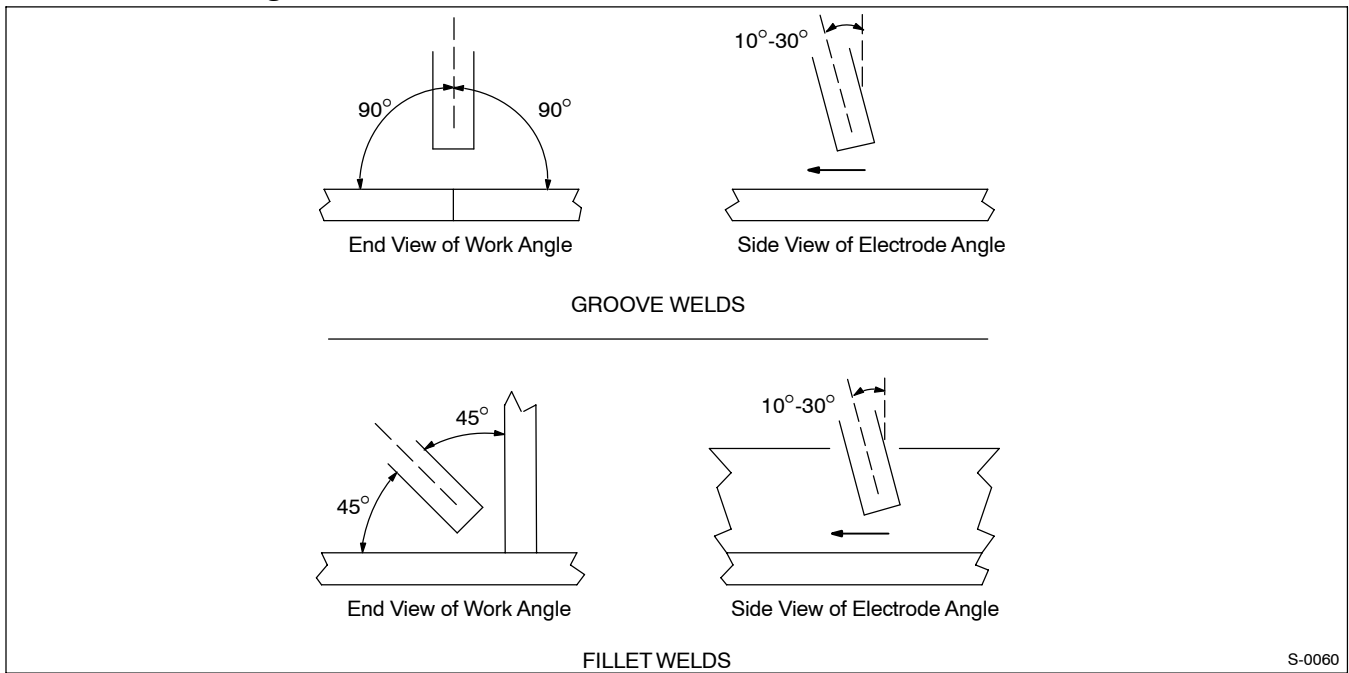


- 1 Electrode
- 2 Workpiece
- 3 Arc

Bring electrode straight down to workpiece; then lift slightly to start arc. If arc goes out, electrode was lifted too high. If electrode sticks to workpiece, use a quick twist to free it.

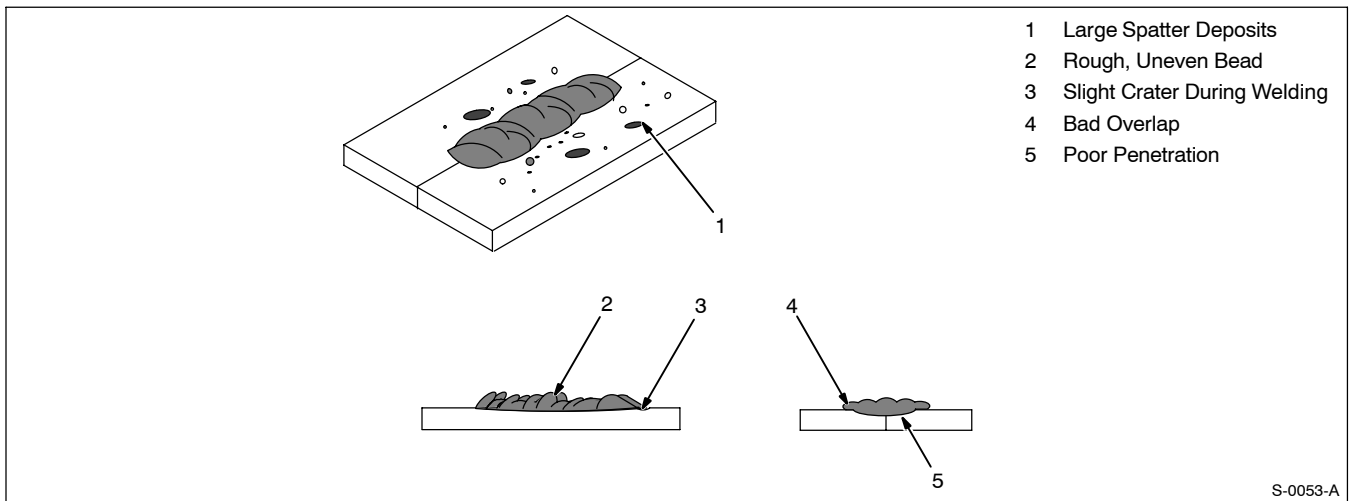
S-0050

14-5. Positioning Electrode Holder



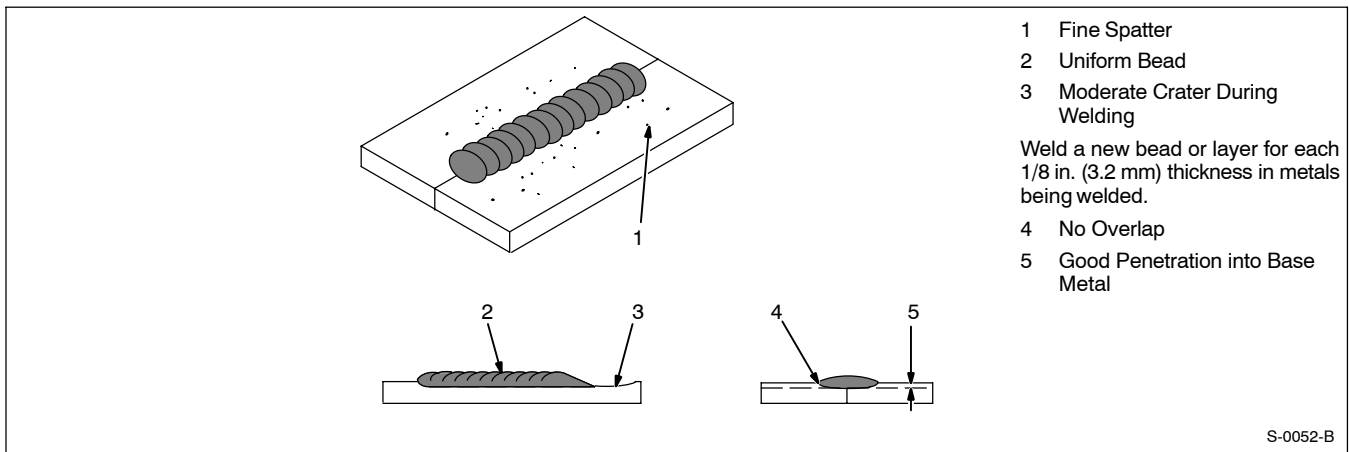
S-0060

14-6. Poor Weld Bead Characteristics



S-0053-A

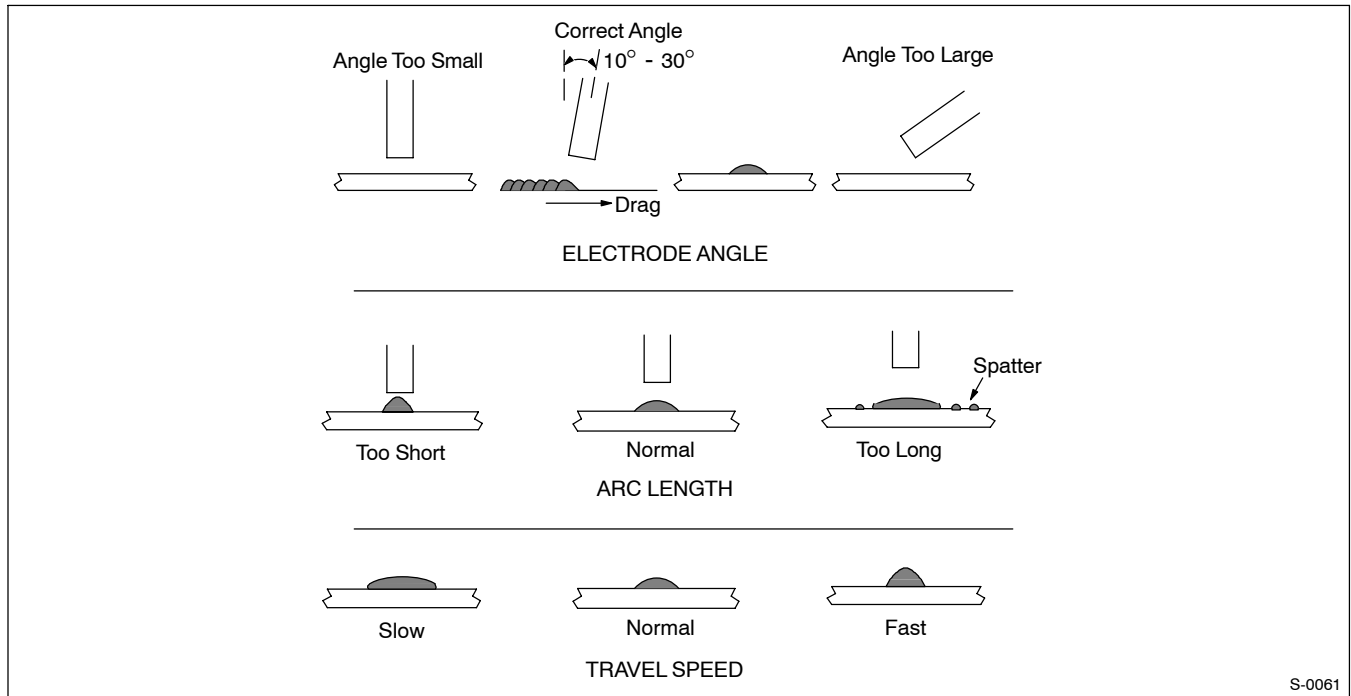
14-7. Good Weld Bead Characteristics



S-0052-B

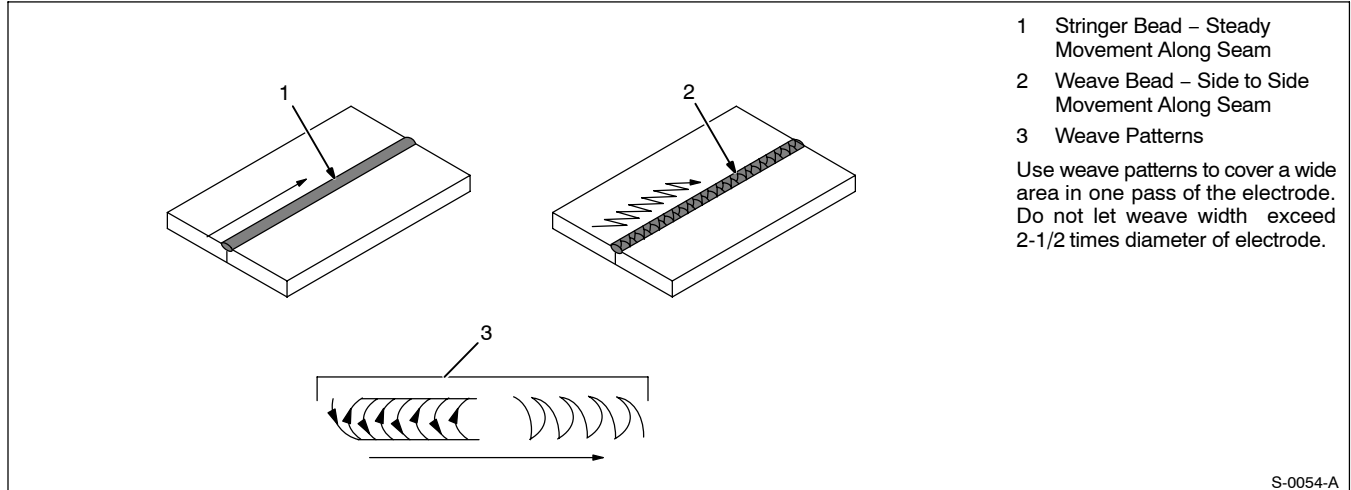
14-8. Conditions That Affect Weld Bead Shape

☞ Weld bead shape is affected by electrode angle, arc length, travel speed, and thickness of base metal.

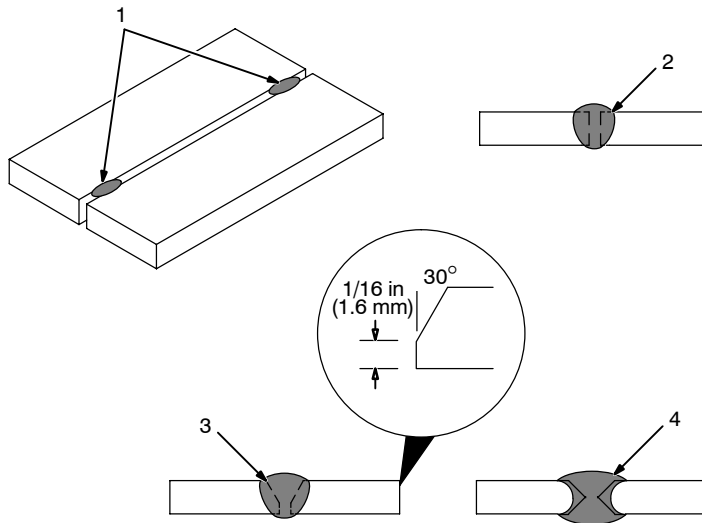


14-9. Electrode Movement During Welding

☞ Normally, a single stringer bead is satisfactory for most narrow groove weld joints; however, for wide groove weld joints or bridging across gaps, a weave bead or multiple stringer beads work better.



14-10. Butt Joints



1 Tack Welds

Prevent edges of joint from drawing together ahead of electrode by tack welding the materials in position before final weld.

2 Square Groove Weld

Good for materials up to 3/16 in (5 mm) thick.

3 Single V-Groove Weld

Good for materials 3/16 – 3/4 in (5-19 mm) thick. Cut bevel with oxy-acetylene or plasma cutting equipment. Remove scale from material after cutting. A grinder can also be used to prepare bevels.

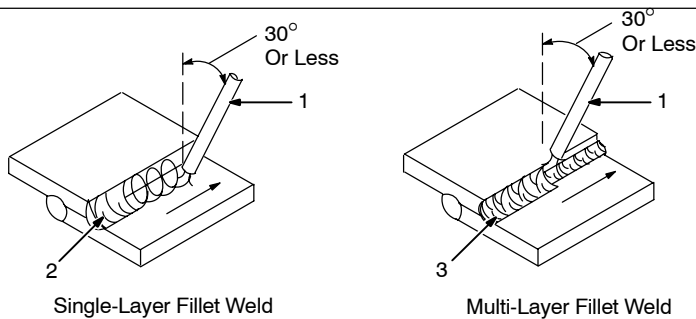
Create 30 degree angle of bevel on materials in V-groove welding.

4 Double V-Groove Weld

Good for materials thicker than 3/16 in (5 mm).

S-0662

14-11. Lap Joint



Single-Layer Fillet Weld

Multi-Layer Fillet Weld

1 Electrode

2 Single-Layer Fillet Weld

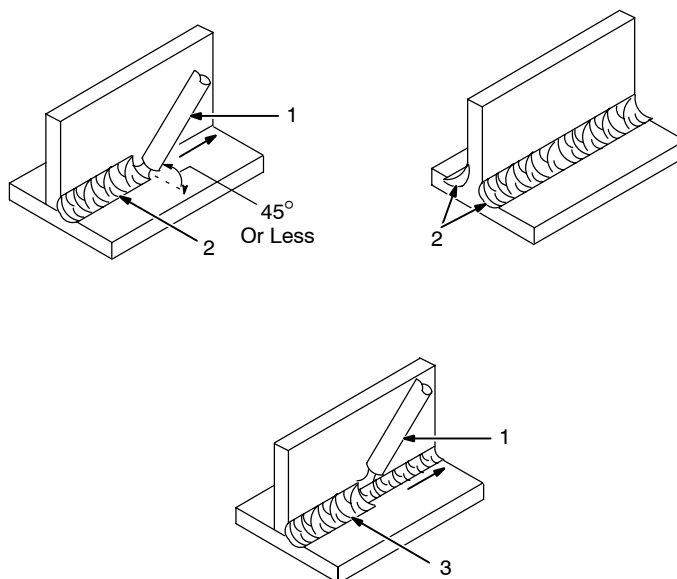
Move electrode in circular motion.

3 Multi-Layer Fillet Weld

Weld a second layer when a heavier fillet is needed. Remove slag before making another weld pass. Weld both sides of joint for maximum strength.

S-0063 / S-0064

14-12. Tee Joint



1 Electrode

2 Fillet Weld

Keep arc short and move at definite rate of speed. Hold electrode as shown to provide fusion into the corner. Square edge of the weld surface.

For maximum strength weld both sides of upright section.

3 Multi-Layer Deposits

Weld a second layer when a heavier fillet is needed. Use any of the weaving patterns shown in Section 14-9. Remove slag before making another weld pass.

S-0060 / S-0058-A / S-0061

14-13. Weld Test

1 Vise
2 Weld Joint
3 Hammer

Strike weld joint in direction shown. A good weld bends over but does not break.

S-0057-B

14-14. Troubleshooting – Porosity

Porosity – small cavities or holes resulting from gas pockets in weld metal.

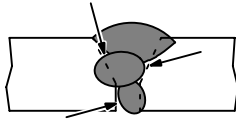
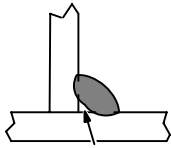
Possible Causes	Corrective Actions
Arc length too long.	Reduce arc length.
Damp electrode.	Use dry electrode.
Workpiece dirty.	Remove all grease, oil, moisture, rust, paint, coatings, slag, and dirt from work surface before welding.

14-15. Troubleshooting – Excessive Spatter

Excessive Spatter – scattering of molten metal particles that cool to solid form near weld bead.

Possible Causes	Corrective Actions
Amperage too high for electrode.	Decrease amperage or select larger electrode.
Arc length too long or voltage too high.	Reduce arc length or voltage.

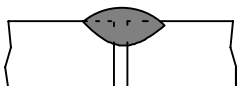
14-16. Troubleshooting – Incomplete Fusion



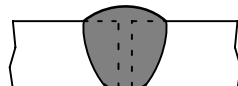
Incomplete Fusion – failure of weld metal to fuse completely with base metal or a preceding weld bead.

Possible Causes	Corrective Actions
Insufficient heat input.	Increase amperage. Select larger electrode and increase amperage.
Improper welding technique.	Place stringer bead in proper location(s) at joint during welding.
	Adjust work angle or widen groove to access bottom during welding.
	Momentarily hold arc on groove side walls when using weaving technique.
	Keep arc on leading edge of weld puddle.
Workpiece dirty.	Remove all grease, oil, moisture, rust, paint, coatings, slag, and dirt from work surface before welding.

14-17. Troubleshooting – Lack Of Penetration



Lack of Penetration

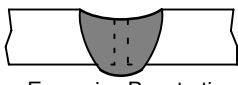


Good Penetration

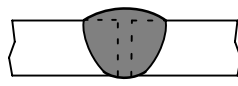
Lack Of Penetration – shallow fusion between weld metal and base metal.

Possible Causes	Corrective Actions
Improper joint preparation.	Material too thick. Joint preparation and design must provide access to bottom of groove.
Improper weld technique.	Keep arc on leading edge of weld puddle.
Insufficient heat input.	Increase amperage. Select larger electrode and increase amperage.
	Reduce travel speed.

14-18. Troubleshooting – Excessive Penetration



Excessive Penetration

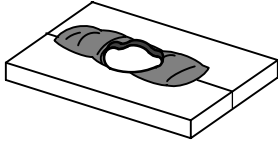


Good Penetration

Excessive Penetration – weld metal melting through base metal and hanging underneath weld.

Possible Causes	Corrective Actions
Excessive heat input.	Select lower amperage. Use smaller electrode.
	Increase and/or maintain steady travel speed.

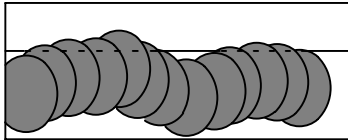
14-19. Troubleshooting – Burn-Through



Burn-Through – weld metal melting completely through base metal resulting in holes where no metal remains.

Possible Causes	Corrective Actions
Excessive heat input.	Select lower amperage. Use smaller electrode.
	Increase and/or maintain steady travel speed.

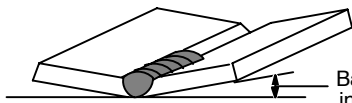
14-20. Troubleshooting – Waviness Of Bead



Waviness Of Bead – weld metal that is not parallel and does not cover joint formed by base metal.

Possible Causes	Corrective Actions
Unsteady hand.	Use two hands. Practice technique.

14-21. Troubleshooting – Distortion




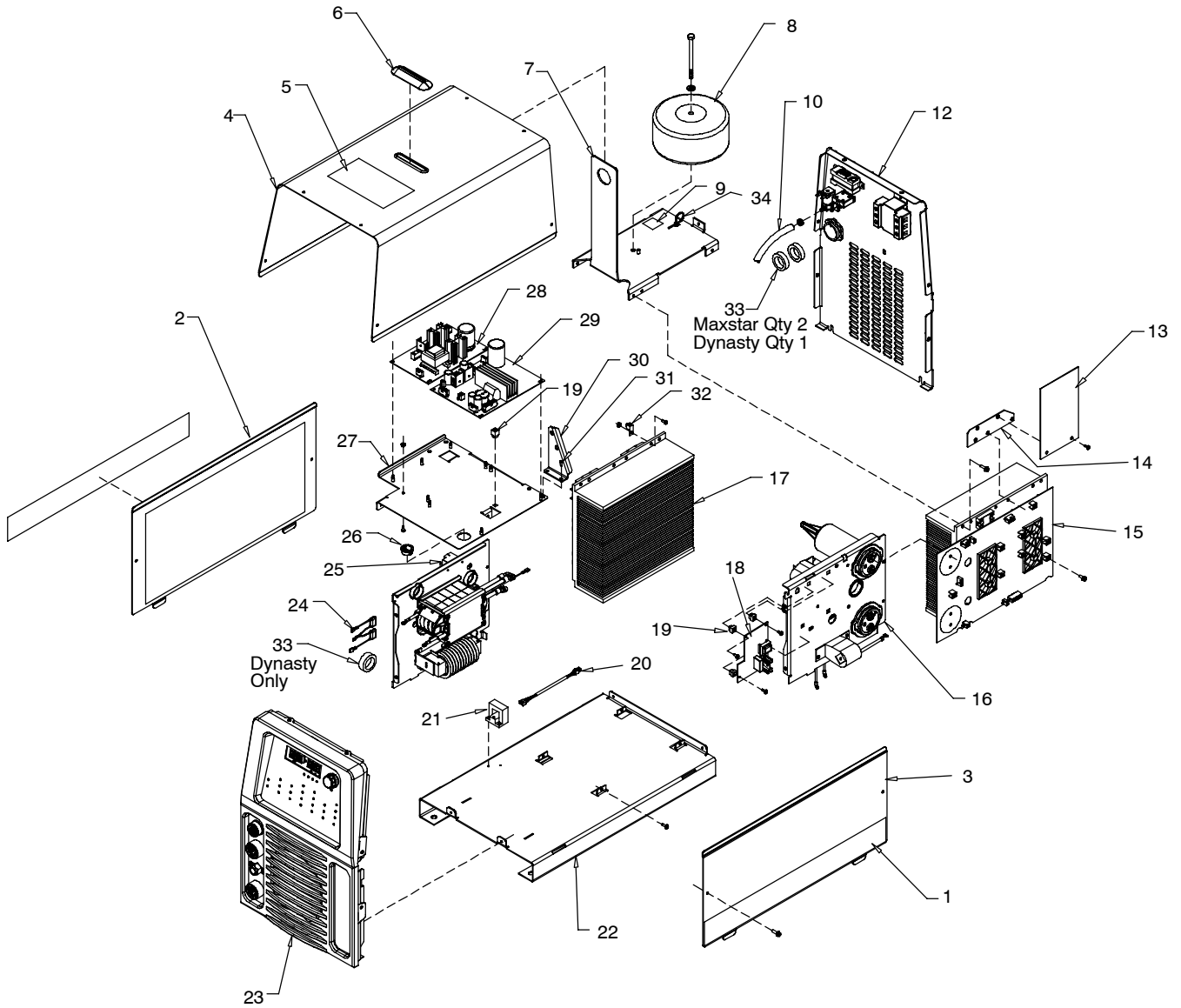
Base metal moves in the direction of the weld bead.

Distortion – contraction of weld metal during welding that forces base metal to move.

Possible Causes	Corrective Actions
Excessive heat input.	Use restraint (clamp) to hold base metal in position.
	Make tack welds along joint before starting welding operation.
	Select lower amperage for electrode.
	Increase travel speed.
	Weld in small segments and allow cooling between welds.

SECTION 15 – PARTS LIST FOR 350 MODELS

 Hardware is common and not available unless listed.



Dynasty 350 illustrated

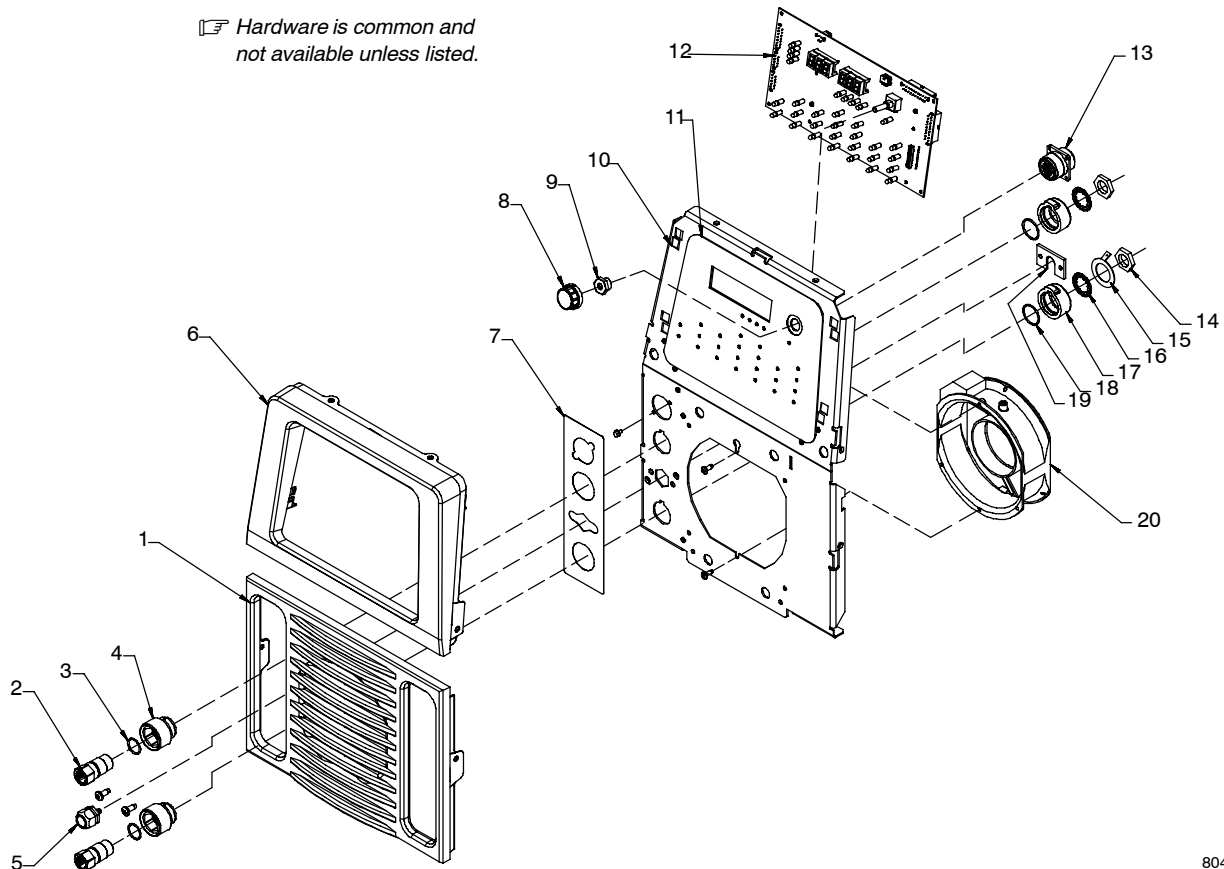
Figure 15-1. Main Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
Figure 15-1. Main Assembly				
1		224 519	LABEL, SIDE DYNASTY 350	2
1		224 525	LABEL, SIDE MAXSTAR 350	2
2		224 516	INSULATOR, SIDE	2
3		216 878	PANEL, SIDE	2
4		+213 056	WRAPPER, TOP	1
5		245 694	LABEL, WARNING GENERAL PRECAUTIONARY WORDLESS, EMF	1
6		213 073	SEAL, LIFT EYE	1
7		213 058	LIFT EYE,	1
8	T2	226 917	XFMR, 665 115/24 18/18 220	1
9		155 436	LABEL, GROUND/PROTECTIVE EARTH	1
10		218 170	HOSE, NPRN BRD NO 1 X .250 ID X 25.000	1
12		Figure 15-3	PANEL, REAR W/COMPONENTS	1
13		222 760	BRACKET, FILTER BOARD	1
14	PC19	233 152	CIRCUIT CARD ASSY, FILTER	1
15		Figure 15-5	HEAT SINK, PRIMARY ASSY	1
16		Figure 15-4	WINDTUNNEL, RIGHT HAND W/COMPONENTS	1
17		Figure 15-7	HEAT SINK, SECONDARY - DYNASTY 350	1
17		Figure 15-8	HEAT SINK, SECONDARY - MAXSTAR 350	1
18	PC7	235 476	CIRCUIT CARD ASSY, HF	1
	PLG39	115 092	HOUSING PLUG+SKTS, (SERVICE KIT)	2
19		080 509	GROMMET, SCR NO 8/10 PANEL HOLE .312 SQ .375 HIGH	9
20		213 074	CABLE, LEM 23 IN	1
21	HD1	182 918	TRANSDUCER,CURRENT 400A MODULE SUPPLY V +/- 15V	1
22		213 055	BASE,	1
23		Figure 15-2	PANEL, FRONT W/CMPNTS	1
		215 120	CONNECTION KIT, DINSE	1
24	C6,C7	222 752	CAPACITOR ASSY,	1
25		Figure 15-6	WINDTUNNEL, LEFT HAND W/COMPONENTS	1
26		057 357	BUSHING,SNAP-IN NYL .937 ID X 1.125 MTG HOLE	1
27		215 402	PANEL, TOP WINDTUNNEL	1
28	PC8	233 142	CIRCUIT CARD ASSY, CLAMP (DYNASTY ONLY)	1
	PLG24	163 467	HOUSING PLUG+SKTS, (SERVICE KIT)	1
	PLG33	201 665	HOUSING PLUG+SKTS, (SERVICE KIT)	1
	PLG34	148 439	HOUSING PLUG PINS+SKTS, (SERVICE KIT)	1
29	PC5	233 139	CIRCUIT CARD ASSY, AUX POWER W/PROGRAM	1
	PLG19	131 052	HOUSING RCPT+SKTS, (SERVICE KIT)	1
	PLG20	164 900	HOUSING PLUG+SKTS, (SERVICE KIT)	1
	PLG21	115 091	HOUSING PLUG+SKTS, (SERVICE KIT)	1
	PLG22	131 054	HOUSING RCPT+SKTS, (SERVICE KIT)	1
	PLG23	115 093	HOUSING PLUG+SKTS, (SERVICE KIT)	1
30		226 878	BRACKET, HARNESS SUPPORT (MAXSTAR 700)	1
31		195 666	SCREW, 010-32X .50 TORX PANHD W/GNDRNG STL PLD	2
32		213 248	LUG, UNIV W/SCREW 2/0-14 WIRE .266STD	1
33	F8, F9	131 447	CORE, TOROIDAL 1.332 ID X 1.932 OD X .625 THK	2
34		235496	CABLE TIE, 0.06-2.000 BUNDLE DIA TREE STYLE PUSH MOUNT MTG HOLE DIA .246-.276	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.



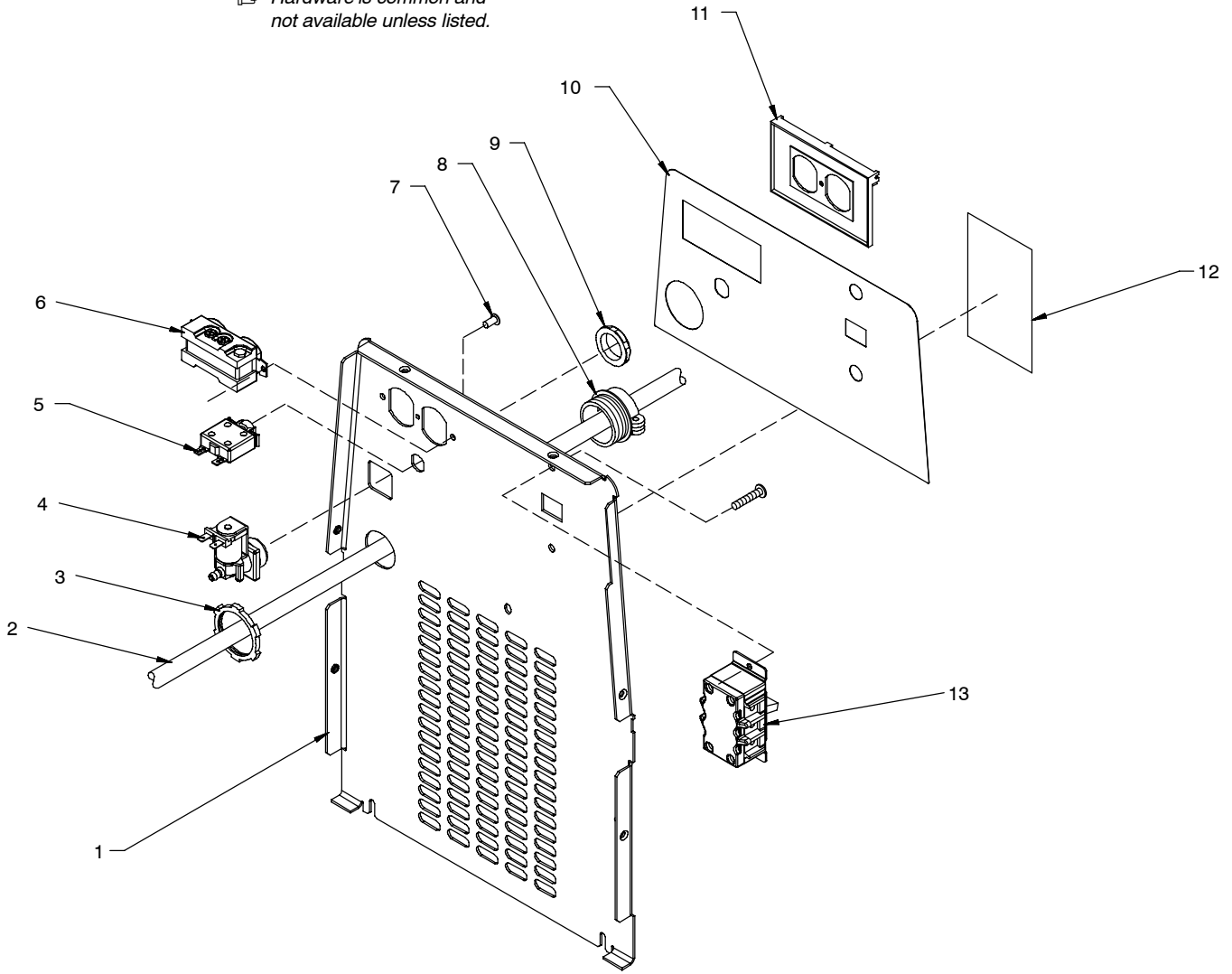
804 758-B

Figure 15-2. Panel, Front w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
213 339 Figure 15-2. Panel, Front w/Components				
1		213 053	PANEL, LOUVER COVER (ORDER SERIAL NO. CARD ALSO)	1
2		202 553	RECEPTACLE, TWIST LOCK BRASS POWER (FEMALE)	2
3		186 228	O-RING, 0.739 ID X 0.070 H	2
4		185 712	INSULATOR, BULKHEAD FRONT	2
5		231 279	FITTING, GAS-CLIP MOUNT	1
6		213 051	PANEL, FRONT TOP	1
7		233 115	PLATE, INDICATOR FRONT - DYNASTY 350	1
7		233 116	PLATE, INDICATOR FRONT - MAXSTAR 350	1
8		228 546	KNOB, POINTER 1.250 DIA X 6MM ID W/SPRING CLIP- 4.5MM FLAT	1
9		242 388	BUSHING, FLG 375-32X.511	1
10		233 114	PANEL, FRONT	1
11		226 868	NAMEPLATE/SWITCH MEMBRANE, DYNASTY 350/700 STH/FF	1
11		226 869	NAMEPLATE/SWITCH MEMBRANE, MAXSTAR 350/700 STH/FF	1
12	PC6	241 061	CIRCUIT CARD ASSY, CONTROL&INTERFACE W/PROGRAM	1
	PLG2	203 800	HOUSING PLUG+SKTS, (SERVICE KIT)	1
	PLG4	131 056	HOUSING RCPT+SKTS, (SERVICE KIT)	1
	PLG6	115 092	HOUSING PLUG+SKTS, (SERVICE KIT)	1
	PLG7	115 094	HOUSING PLUG+SKTS, (SERVICE KIT) (Dynasty 350)	1
13	RC1	213 327	RECEPTACLE, W/LEADS & PLUG 14PIN	1
14		185 717	NUT, M20-1.5 1.00HEX .19H BRS LOCKING	2
15		178 548	TERMINAL, CONNECTOR FRICTION	1
16		229 338	WASHER, DOMED LOAD .812 ID X 1.450 OD X .070 THK	2
17		185 713	INSULATOR, BULKHEAD REAR	2
18		185 718	O-RING, 0.989 ID X 0.070 H	2
19		230 155	BRACKET, VALVE MTG	1
20	FMT	213 072	FAN, MUFFIN	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.

☞ Hardware is common and not available unless listed.



804 759-A

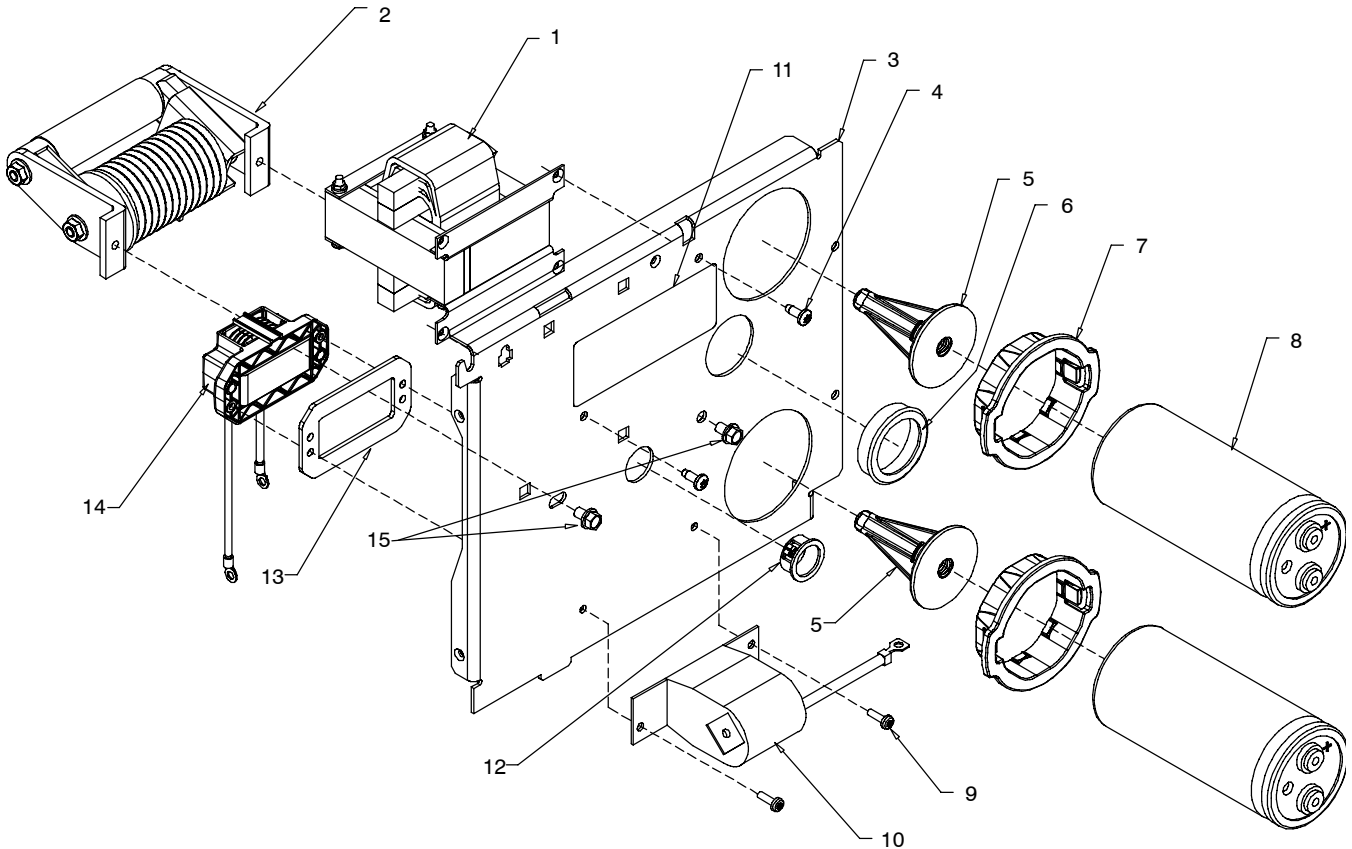
Figure 15-3. Panel, Rear w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
215 128 Figure 15-3. Panel, Rear w/Components				
... 1	...	+215 129	.. PANEL, REAR	1
... 2	...	246 180	.. CABLE, POWER	1
... 3	...	182 445	.. NUT	1
... 4	GS1	238 805	.. VALVE, 24VDC 2WAY,125 PSI CUSTOM PORT.054 ORF W/FR	1
... 5	CB1	183 492	.. SUPPLEMENTARY PROTECTOR, MAN RESET 1P 10A 250V FRIC	1
... 6	RC2	189 033	.. RCPT, STR DX GND 2P3W 15A 125V (GRAY)	1
... 7	...	115 516	.. RIVET, AL .187 DIA X .063-.125 GRIP BLK BLIND DOME	1
... 8	...	215 980	.. BUSHING,STRAIN RELIEF .709/.984 ID X1.375 MTG HOLE	1
... 9	...	137 761	.. NUT, 750 NPT 1.31HEX .27H NYL BLK	1
... 10	...	215 117	.. NAMEPLATE, IDENT REAR	1
... 11	...	217 297	.. COVER, RECEPTACLE WEATHERPROOF DUPLEX RCPT	1
... 12	...	219 842	.. LABEL, WARNING INPUT CONNECTIONS/ELECTRIC SHOCK CE	1
... 13	S1	231 191	.. SWITCH, TGL 3PST 50A 600VAC SCR TERM WIDE TGL	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.



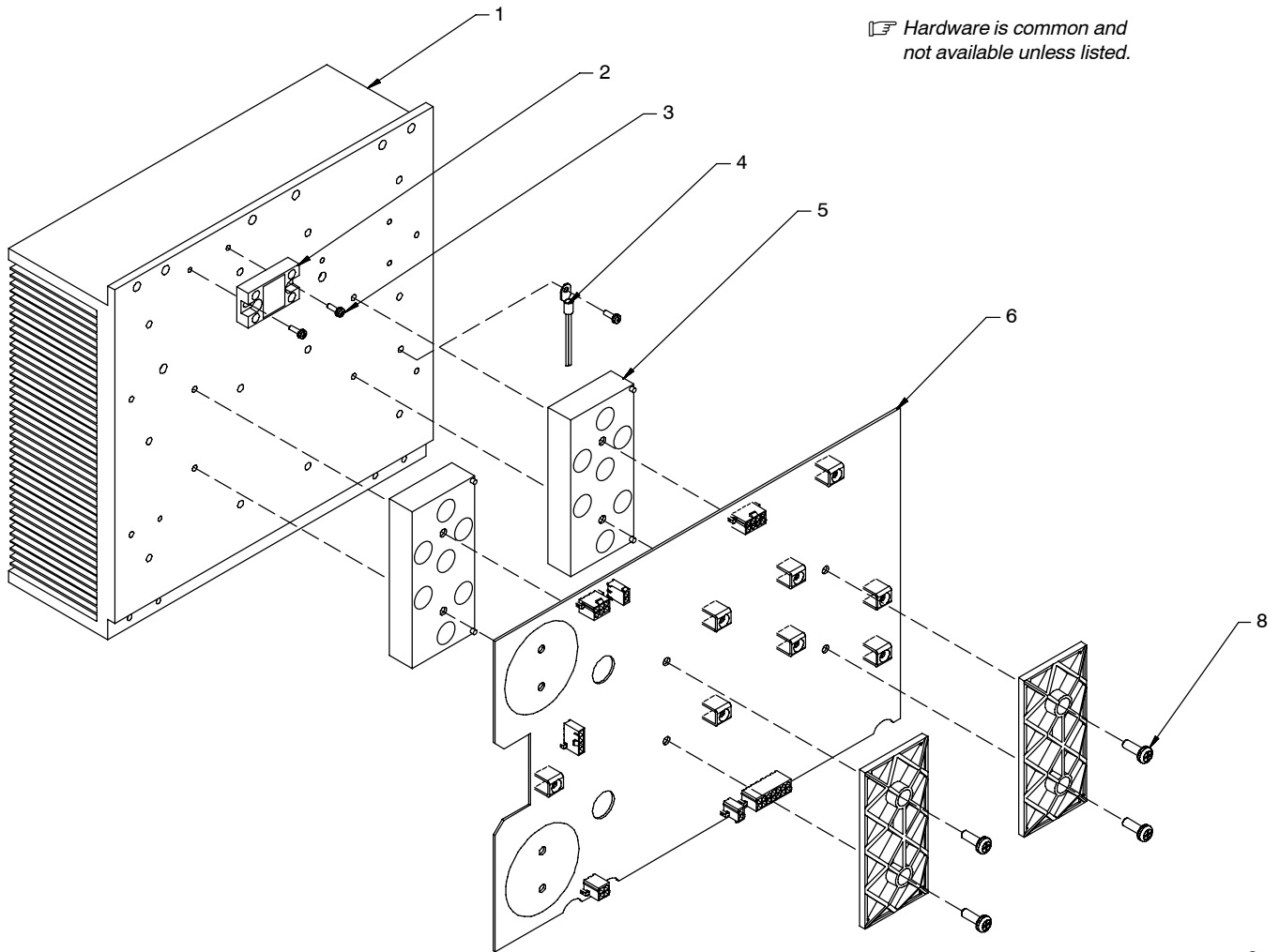
804 134-B

Figure 15-4. Wind Tunnel, Right Hand w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
231 262 Figure 15-4. Wind Tunnel, Right Hand w/Components				
1	L1	231 244	INDUCTOR, INPUT	1
2	T3	242 782	XFMR, HF COUPLING	1
3		+212 489	PANEL, RIGHT WINDTUNNEL	1
4		195 666	SCREW, 010-32X .50 TORX PANHD WGNDRNG STL PLD	3
5		216 861	STAND-OFF, CAPACITOR	2
6		170 647	BUSHING, SNAP-IN NYL 1.312 ID X 1.500 MTG HOLE	1
7		216 860	GROMMET, CAPACITOR	2
8	C4,C20	217 941	CAPACITOR, ELCTLT 1800 UF 500 VDC CAN 2.52 DIA	2
9		207 418	SCREW, K40X 20 PAN HD-PHL STL PLD PT THREAD FORMING	2
10	C3	216 700	CAPACITOR, POLYP MET FILM 16. UF 400 VAC 10%	1
11		219 844	LABEL, WARNING ELECTRIC SHOCK/EXPLODING PARTS-WDLES	1
12		010 493	BUSHING, SNAP-IN NYL .625 ID X .875 MTG HOLE	1
13		218 566	GASKET, INDUCTOR MOUNTING	1
14	L2	213 348	COIL, INDUCTOR (PRE-REGULATOR)	1
15		138 253	SCREW, 250-20X .37 HEXWHD.52D STL PLD LKG SERR	2

+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.

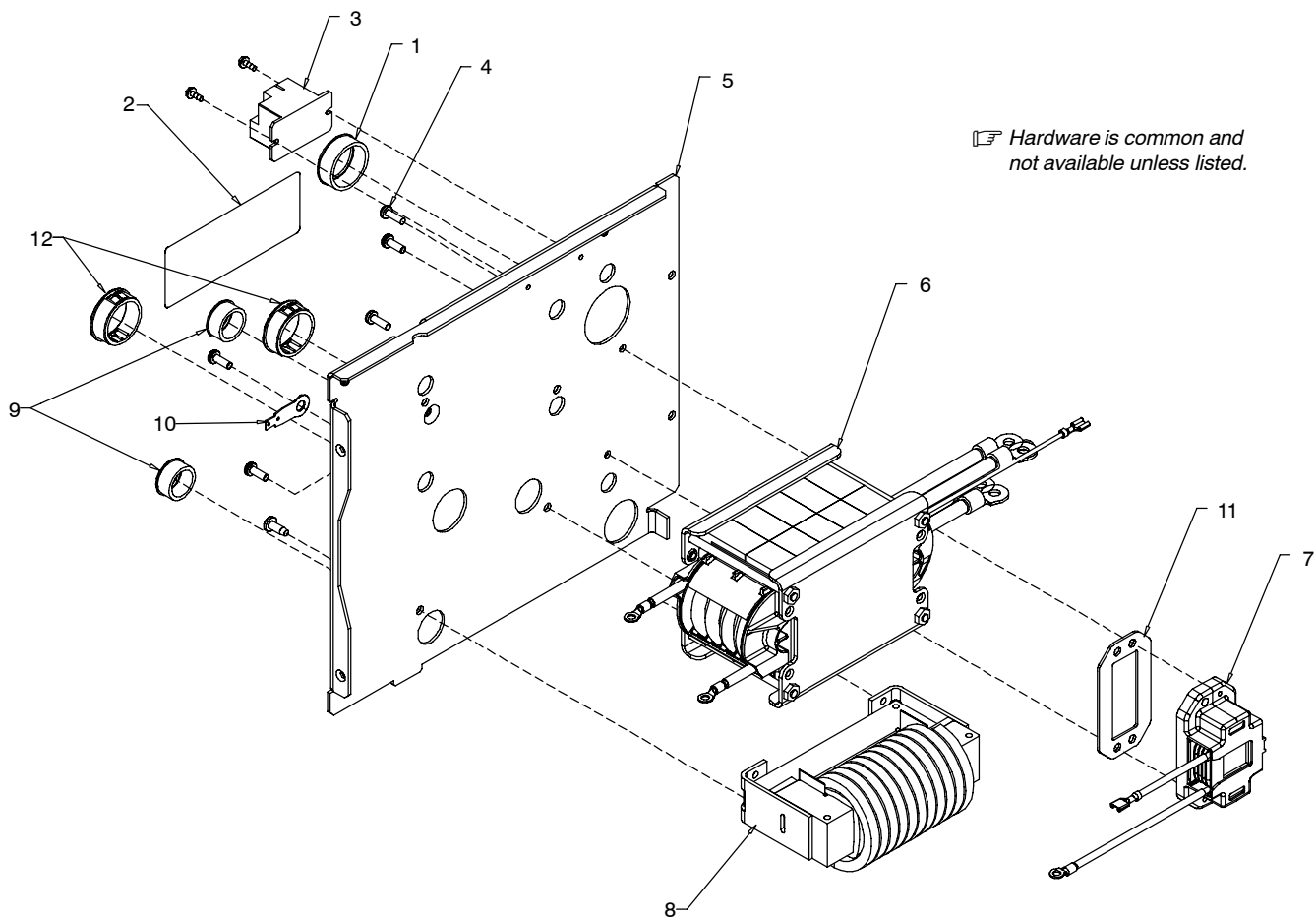


804 135-C

Figure 15-5. Heat Sink, Primary Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
219 344 Figure 15-5. Heat Sink, Primary Assembly				
1		213 346	HEAT SINK, POWER MODULE	1
2	RM1	205 751	MODULE, POWER RESISTOR W/PLUG	1
3		207 451	SCREW, 008-32X .50 PAN HD-PHL STL PLD SEMS	3
4	RT1	213 353	THERMISTOR, NTC 30K OHM @ 25 DEG C 8IN LEAD	1
5	MOD1,2	217 625	KIT, INPUT/PRE-REGULATOR AND INVERTER MODULE	1
6	PC1	233 146	CIRCUIT CARD ASSY, POWER INTERCONNECT	1
	PLG11	201 665	HOUSING PLUG+SKTS, (SERVICE KIT)	1
	PLG13	131 056	HOUSING RCPT+SKTS, (SERVICE KIT)	1
	PLG15	164 899	HOUSING PLUG PINS+SKTS, (SERVICE KIT)	1
8		200 565	SCREW, M 5- .8X 35 PAN HD-PHL STL PLD SEMS	4

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.

804 136-C

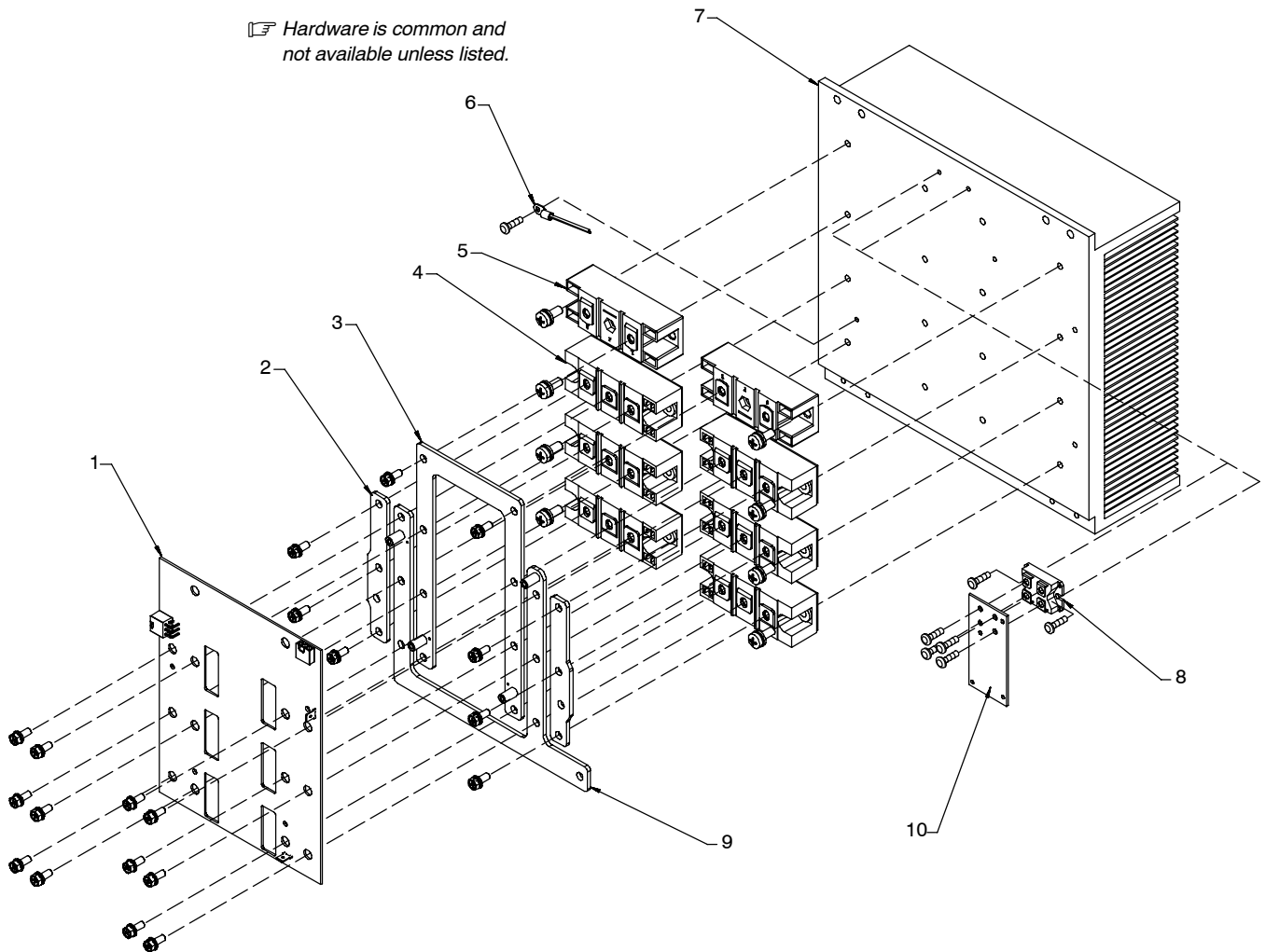
Figure 15-6. Wind Tunnel, Left Hand w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
213 354 Figure 15-6. Wind Tunnel, Left Hand w/Components				
...	1	170 647	.. BUSHING, SNAP-IN NYL 1.312 ID X 1.500 MTG HOLE	1
...	2	219 844	.. LABEL, WARNING ELECTRIC SHOCK/EXPLODING PARTS-WDLES	1
...	3	CR1 .. 206 258	.. RELAY, ENCL 24VDC SPST 30A/240VAC 4PIN FLANGE MTG	1
...	4	145 217	.. SCREW, K40X 12 PAN HD-PHL STL PLD PT THREAD FORMING	2
...	5	+212 488	.. PANEL, LEFT WINDTUNNEL	1
...	6	T1 .. 213 361	.. XFMR, HF LITZ/LITZ W/BOOST	1
...	7	Z4 .. 213 513	.. COIL, INDUCTOR (BOOST)	1
...	8	Z1 .. 213 356	.. OUTPUT INDUCTOR ASSY,	1
...	9	010 493	.. BUSHING, SNAP-IN NYL .625 ID X .875 MTG HOLE	2
...	10	010 381	.. CONNECTOR, RECTIFIER	1
...	11	227 746	.. GASKET, INDUCTOR MOUNTING E55 FERRITE CORE	1
...	12	057 357	.. BUSHING, SNAP-IN NYL .937 ID X 1.125 MTG HOLE	2

+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.

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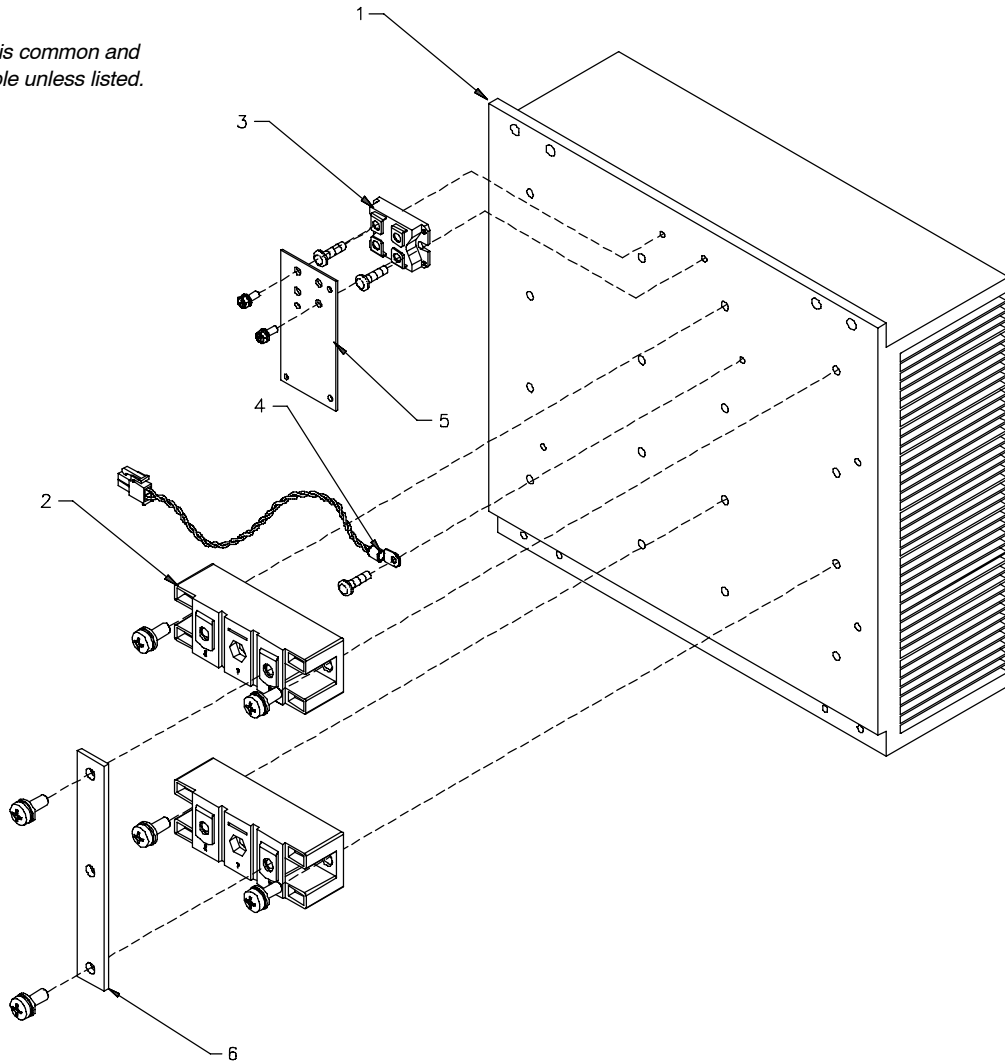
804 137-A

Figure 15-7. Heat Sink, Secondary – Dynasty 350

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
219 345 Figure 15-7. Heat Sink, Secondary – Dynasty 350				
... 1 ...	PC3 ..	233 157 ..	CIRCUIT CARD ASSY, COMMUTATOR CONTROL	1
.....	PLG37	131 204 ..	HOUSING PLUG+SKTS, (SERVICE KIT)	1
.....	PLG38	115 093 ..	HOUSING PLUG+SKTS, (SERVICE KIT)	1
... 2		213 517 ..	BUS BAR, OUTPUT	2
... 3		216 867 ..	BUS BAR, POSITIVE	1
... 4 .	PM1 – 6	213 522 ..	KIT, IGBT (CONSISTS OF 3 IGBT'S)	2
... 5 ..	D1,D2	213 521 ..	KIT, ULTRA FAST DIODE	2
... 6 ...	RT2 ..	213 353 ..	THERMISTOR, NTC 30K OHM @ 25 DEG C 8IN LEAD	1
... 7		224 470 ..	HEAT SINK, POWER MODULE	1
... 8 ...	SR1 ..	201 530 ..	KIT, DIODE FAST RECOVERY BRIDGE	1
... 9		216 868 ..	BUS BAR, NEGATIVE	1
... 10 ...	PC9 ..	241 542 ..	CIRCUIT CARD ASSEMBLY, DIODE SNUBBER	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.

☞ Hardware is common and not available unless listed.




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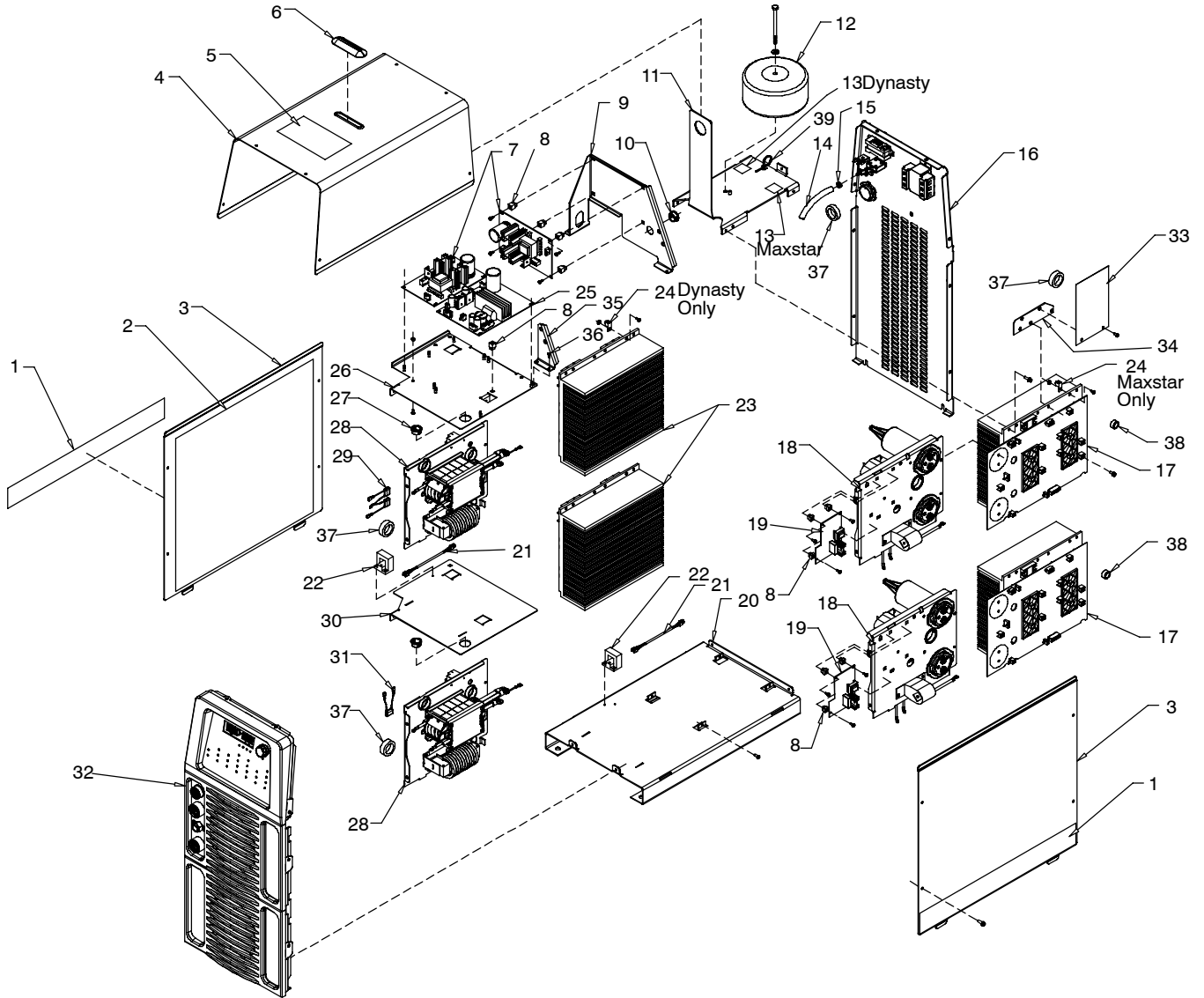
Figure 15-8. Heat Sink, Secondary – Maxstar 350

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
221 730 Figure 15-8. Heat Sink, Secondary – Maxstar 350				
1		224 470	HEAT SINK, POWER MODULE	1
2	D1, D2	213 521	KIT, ULTRA FAST DIODE	2
3	SR1	201 531	KIT, DIODE POWER MODULE	1
4	RT2	213 353	THERMISTOR, NTC 30K OHM @ 25 DEG C 8IN LEAD	1
5	PC3	241 542	CIRCUIT CARD ASSY, DIODE SNUBBER	1
6		213 519	BUS BAR	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.

SECTION 16 – PARTS LIST FOR 700 MODELS

 Hardware is common and not available unless listed.



Dynasty 700 illustrated

805 472-B

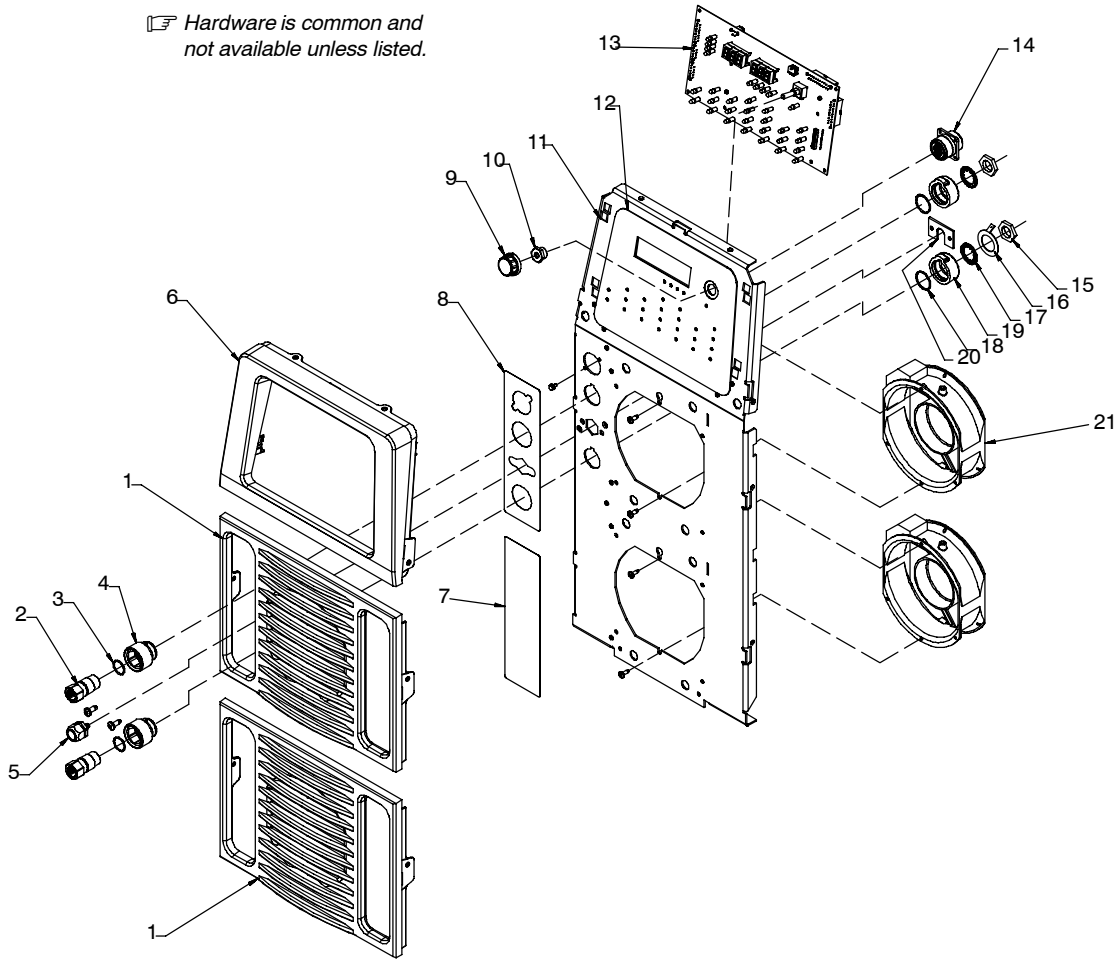
Figure 16-1. Main Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
Figure 16-1. Main Assembly				
1		223 785	LABEL, SIDE DYNASTY 700	2
1		223 784	LABEL, SIDE MAXSTAR 700	2
2		213 071	INSULATOR, SIDE	2
3		213 057	PANEL, SIDE	2
4		+213 056	WRAPPER, TOP	1
5		245 694	LABEL, GENERAL PRECAUTIONARY WORDLESS EMF	1
6		213 073	SEAL, LIFT EYE	1
7	PC8,PC18	233 142	CIRCUIT CARD ASSY, CLAMP (DYNASTY 700 MODELS ONLY)	2
	PLG24/PLG44	163 467	HOUSING PLUG+SKTS,(SERVICE KIT) (DYNASTY 700 MODELS ONLY)	1
	PLG33/PLG43	201 665	HOUSING PLUG+SKTS, (SERVICE KIT) (DYNASTY 700 MODELS ONLY)	1
	PLG34/PLG45	148 439	HOUSING PLUG PINS+SKTS, (SERVICE KIT) (DYNASTY 700 MODELS ONLY)	1
8		080 509	GROMMET, SCR NO 8/10 PANEL HOLE .312 SQ .375 HIGH	9
9		221 708	BRACKET, MTG PC BOARD (DYNASTY 700 MODELS ONLY)	1
10		010 493	BUSHING, SNAP-IN NYL .625 ID X .875 MTG HOLE	2
11		213 058	LIFT EYE,	1
12	T2	213 059	XFMR, 665 115/24 18/18 220	1
13		155 436	LABEL, GROUND/PROTECTIVE EARTH	1
14		218 170	HOSE, NPRN BRD NO 1 X .250 ID X 25.000	1
15		089 120	CLAMP, HOSE .375 - .450 CLP DIA SLFTTNG GREEN	2
16	Figure 16-3		PANEL, REAR W/COMPONENTS	1
17	Figure 16-5		HEAT SINK, PRIMARY ASSY	2
18	Figure 16-4		WINDTUNNEL, RIGHT HAND W/COMPONENTS	2
19	PC7	235 476	CIRCUIT CARD ASSY, HF	1
	PLG39	115 092	HOUSING PLUG+SKTS,(SERVICE KIT)	1
20		213 055	BASE,	1
21		213 074	CABLE, LEM 23 IN	2
22	HD1	182 918	TRANSDUCER,CURRENT 400A MODULE SUPPLY V +/- 15V	2
23	Figure 16-7		HEAT SINK, SECONDARY - DYNASTY 700	2
23	Figure 16-8		HEAT SINK, SECONDARY - MAXSTAR 700	2
24		213 248	LUG, UNIV W/SCREW 2/0-14 WIRE .266STD	1
25	PC5	233 139	CIRCUIT CARD ASSY, AUX POWER W/PROGRAM	1
	PLG19	131 052	HOUSING RCPT+SKTS, (SERVICE KIT)	1
	PLG20	164 900	HOUSING PLUG+SKTS, (SERVICE KIT)	1
	PLG21	115 091	HOUSING PLUG+SKTS, (SERVICE KIT)	1
	PLG22	131 054	HOUSING RCPT+SKTS, (SERVICE KIT)	1
	PLG23	115 093	HOUSING PLUG+SKTS, (SERVICE KIT)	1
	PLG41	131 054	HOUSING RCPT+SKTS, (SERVICE KIT)	1
26		215 402	PANEL, TOP WINDTUNNEL	1
27		057 357	BUSHING,SNAP-IN NYL .937 ID X 1.125 MTG HOLE	1
28	Figure 16-6		WINDTUNNEL, LEFT HAND W/COMPONENTS	2
29	C6,C7	222 752	CAPACITOR ASSY,	1
30		221 721	PANEL, WINDTUNNEL SEPARATOR	1
31	C8	221 707	CAPACITOR ASSY,	1
32	Figure 16-2		PANEL, FRONT W/CMPNTS	1
		215 120	CONNECTION KIT, DINSE	1
33	PC19	233 152	CIRCUIT CARD ASSY, FILTER (DYNASTY 700 ONLY)	1
33	PC19	246 265	CIRCUIT CARD ASSY, FILTER (MAXSTAR 700 ONLY)	1
34		222 760	BRACKET, FILTER BOARD	1
35		226 878	BRACKET, HARNESS SUPPORT (MAXSTAR 700 ONLY)	1
36		195 666	SCREW, 010-32X .50 TORX PANHD W/GNDRNG STL PLD	2
37	F8, F9	131 447	CORE, TOROIDAL 1.332 ID X 1.932 OD X .625 THK	4
	F10, F11		(DYNASTY 700 ONLY)	
38	F8, F9	237 542	CORE, TOROIDAL .540 ID X .875 OD X .500 THK (MAXSTAR 700 ONLY)	2
39		235496	CABLE TIE, 0.06-2.000 BUNDLE DIA TREE STYLE PUSH MOUNT	
			MTG HOLE DIA .246-.276	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.



804 138-B

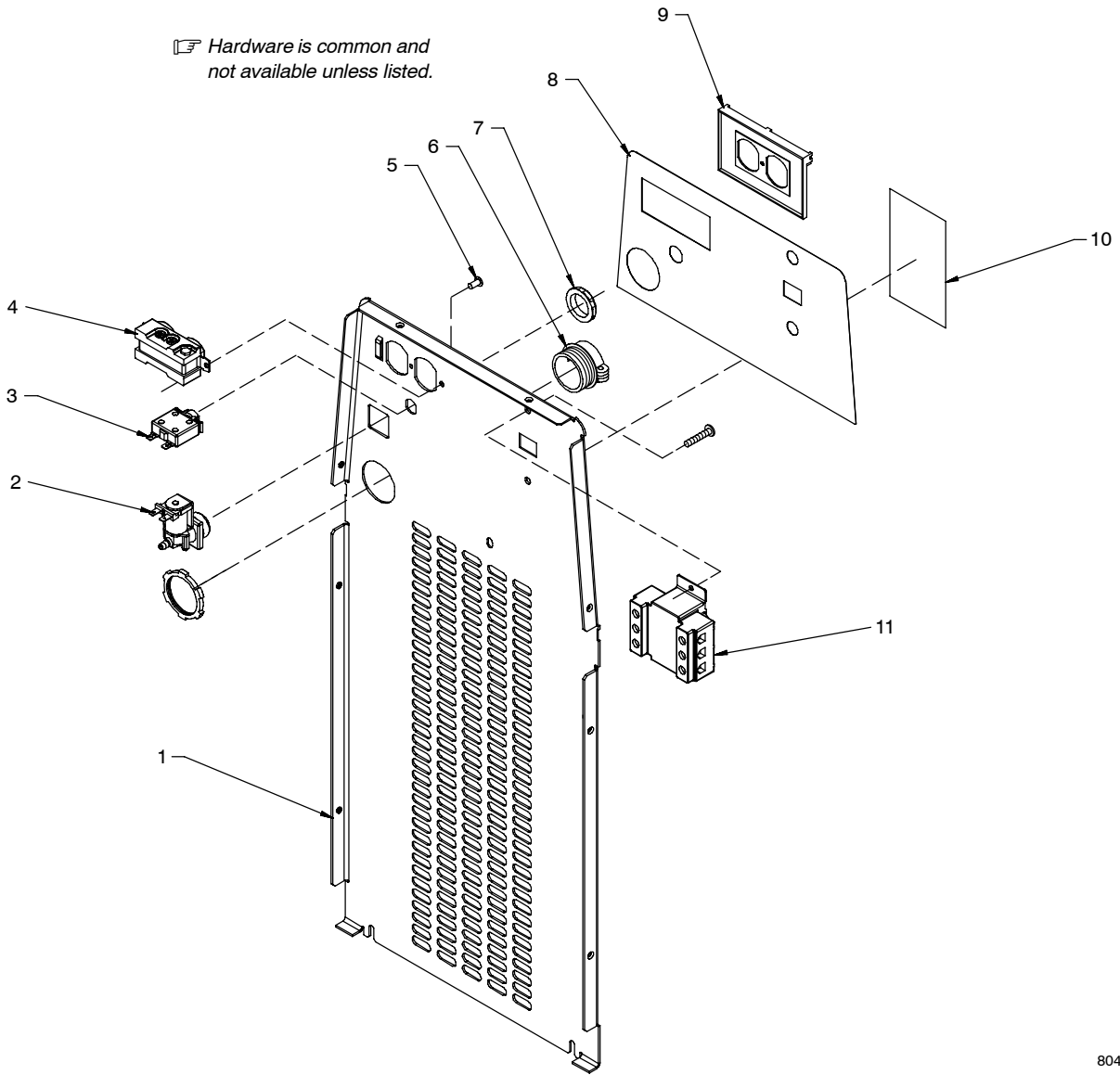
Figure 16-2. Panel, Front w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
221 408 Figure 16-2. Panel, Front w/Components				
1		213 053	PANEL, LOUVER COVER (ORDER SERIAL NO. CARD ALSO)	2
2		214 826	RECEPTACLE, THREAD LOCK	2
3		186 228	O-RING, 0.739 ID X 0.070 H	2
4		185 712	INSULATOR, BULKHEAD FRONT	2
5		231 279	FITTING,GAS-CLIP MOUNT	1
6		213 051	PANEL, FRONT TOP	1
7		216 859	PLATE, FRONT PANEL	1
8		233 115	PLATE, INDICATOR FRONT - DYNASTY 700	1
8		233 116	PLATE, INDICATOR FRONT - MAXSTAR 700	1
9		228 546	KNOB, POINTER 1.250 DIA X 6MM ID W/SPRING CLIP- 4.5MM FLAT	1
10		242 388	BUSHING, FLG 375-32X.511	1
11		233 113	PANEL, FRONT	1
12		226 868	NAMEPLATE/SWITCH MEMBRANE, DYNASTY 350/700 STH/FF	1
12		226 869	NAMEPLATE/SWITCH MEMBRANE, MAXSTAR 350/700 STH/FF	1
13	PC6	241 061	CIRCUIT CARD ASSY, CONTROL&INTERFACE W/PROGRAM	1
	PLG2	203 800	HOUSING PLUG+SKTS, (SERVICE KIT)	1
	PLG4	131 056	HOUSING RCPT+SKTS, (SERVICE KIT)	1
	PLG5	162 382	HOUSING PLUG+SKTS, (SERVICE KIT)	1
	PLG6	115 092	HOUSING PLUG+SKTS, (SERVICE KIT)	1
	PLG7	115 094	HOUSING PLUG+SKTS, (SERVICE KIT) (Dynasty 700 Models Only)	1
14	RC1	213 327	RECEPTACLE, W/LEADS & PLUG 14PIN	1
15		185 717	NUT, M20-1.5 1.00HEX .19H BRS LOCKING	2
16		178 548	TERMINAL, CONNECTOR FRICTION	1
17		229 338	WASHER, DOMED LOAD .812 ID X 1.450 OD X .070 THK	2

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
221 408 Figure 16-2. Panel, Front w/Components (continued)				
... 18	.....	185 713	.. INSULATOR, BULKHEAD REAR	2
... 19	.....	185 718	.. O-RING, 0.989 ID X 0.070 H	2
... 20	.....	230 155	.. BRACKET, VALVE MTG	1
... 21	FMB,FMT	213 072	.. FAN, MUFFIN	2

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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804 139-A

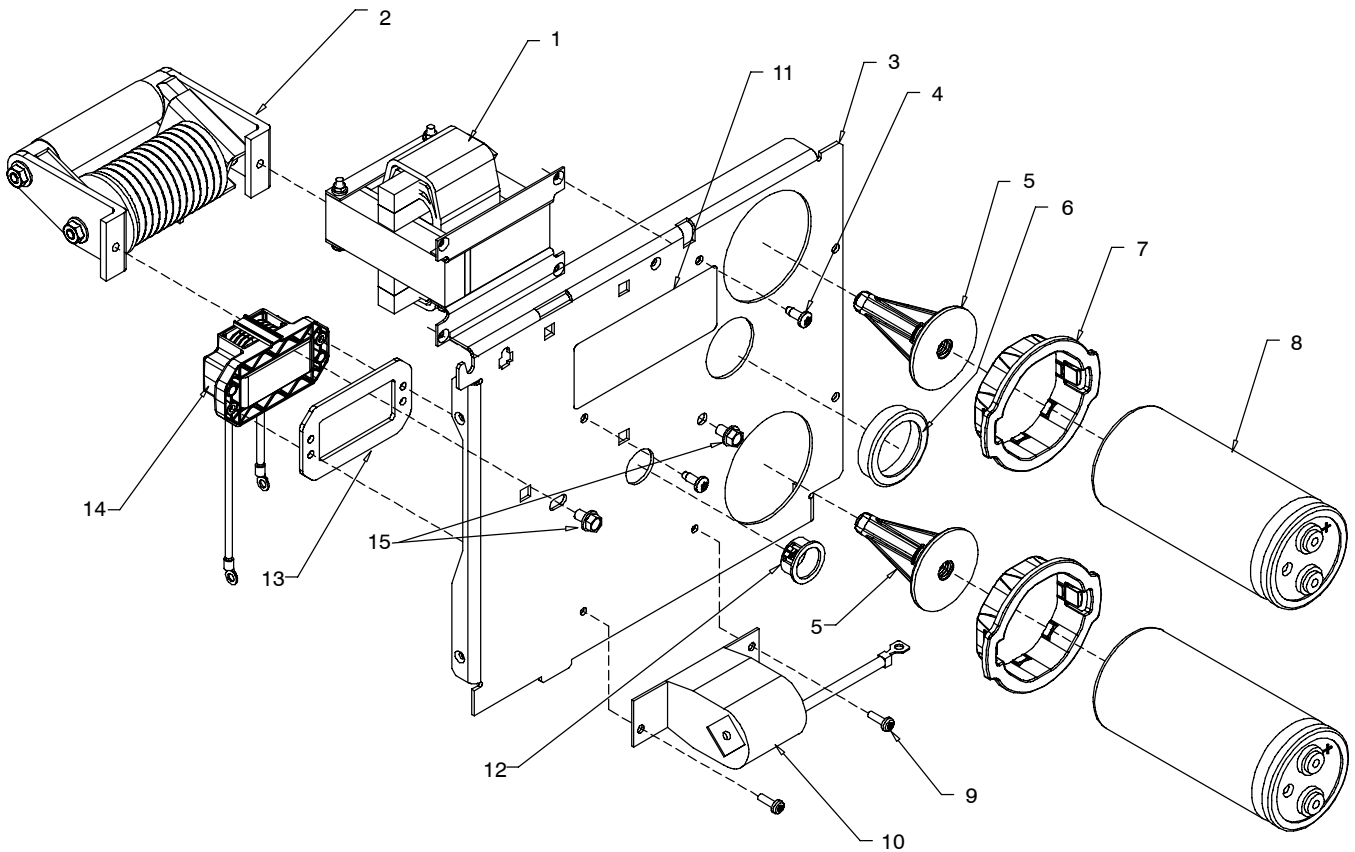
Figure 16-3. Panel, Rear w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
221 409 Figure 16-3. Panel, Rear w/Components				
1		+213 054	PANEL, REAR	1
2	GS1	238805	VALVE, 24VDC 2WAY,125 PSI CUSTOM PORT.054 ORF W/FR	1
3	CB1	183 492	SUPPLEMENTARY PROTECTOR, MAN RESET 1P 10A 250V FRIC	1
4	RC2	189 033	RCPT, STR DX GND 2P3W 15A 125V (GRAY)	1
5		115 516	RIVET, AL .187 DIA X .063-.125 GRIP BLK BLIND DOME	1
6		010 467	CONN, CLAMP CABLE 1.250	1
7		137 761	NUT, 750 NPT 1.31HEX .27H NYL BLK	1
8		215 117	NAMEPLATE, IDENT REAR	1
9		217 297	COVER, RECEPTACLE WEATHERPROOF DUPLEX RCPT	1
10		219 842	LABEL, WARNING INPUT CONNECTIONS/ELECTRIC SHOCK CE	1
11	S1	221 124	SWITCH, TGL ASSY (INCLUDES)	1
		213 060	SWITCH, TGL 3 PST	1

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

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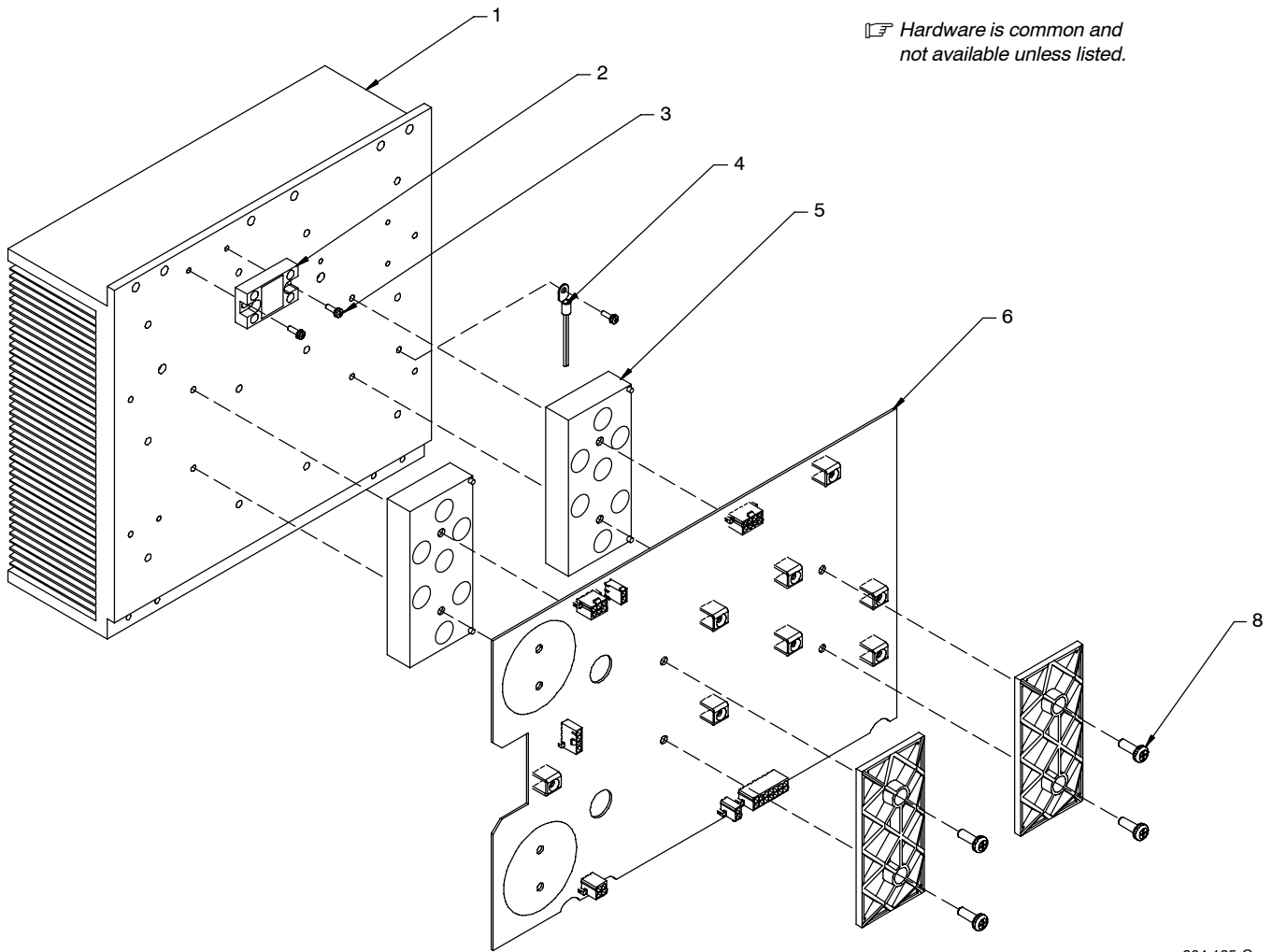
804 134-B

Figure 16-4. Wind Tunnel, Right Hand w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
213 345 Figure 16-4. Wind Tunnel, Right Hand w/Components				
1	L1	231 244	INDUCTOR, INPUT	1
2	T3, T4	242 782	XFMR, COUPLING (TOP)	1
3		+212 489	PANEL, RIGHT WINDTUNNEL	1
4		195 666	SCREW, 010-32X .50 TORX PANHD WGNDRNG STL PLD	3
5		216 861	STAND-OFF, CAPACITOR	2
6		170 647	BUSHING, SNAP-IN NYL 1.312 ID X 1.500 MTG HOLE	1
7		216 860	GROMMET, CAPACITOR	2
8	C4,C20	217 941	CAPACITOR, ELCTLT 1800 UF 500 VDC CAN 2.52 DIA	2
9		207 418	SCREW, K40X 20 PAN HD-PHL STL PLD PT THREAD FORMING	2
10	C3	216 700	CAPACITOR, POLYP MET FILM 16. UF 400 VAC 10%	1
11		219 844	LABEL, WARNING ELECTRIC SHOCK/EXPLODING PARTS-WDLES	1
12		010 493	BUSHING, SNAP-IN NYL .625 ID X .875 MTG HOLE	1
13		218 566	GASKET, INDUCTOR MOUNTING	1
14	L2	213 348	COIL, INDUCTOR (PRE-REGULATOR)	1
15		138 253	SCREW, 250-20X .37 HEXWHD.52D STL PLD LKG SERR	2

+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.

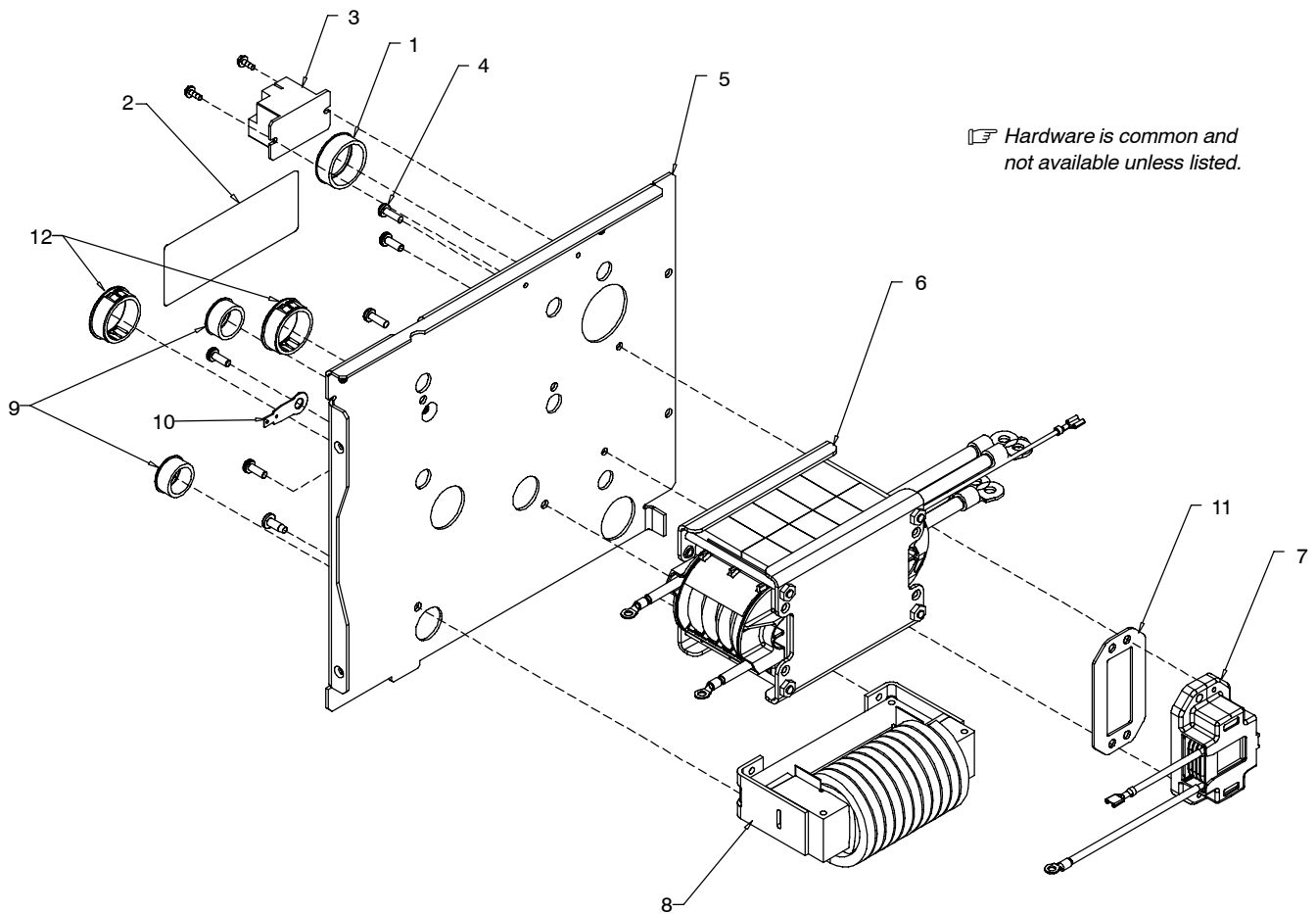


804 135-C

Figure 16-5. Heat Sink, Primary Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
219 344 Figure 16-5. Heat Sink, Primary Assembly				
1		213 346	HEAT SINK, POWER MODULE	1
2	RM1	205 751	MODULE, POWER RESISTOR W/PLUG	1
3		207 451	SCREW, 008-32X .50 PAN HD-PHL STL PLD SEMS	3
4	RT1,RT3	213 353	THERMISTOR, NTC 30K OHM @ 25 DEG C 8IN LEAD	1
5	MOD1,2	217 625	KIT, INPUT/PRE-REGULATOR AND INVERTER MODULE	1
6	PC1,PC2	233 146	CIRCUIT CARD ASSY, POWER INTERCONNECT	1
	PLG11	210 050	HOUSING PLUG+SKTS, (SERVICE KIT)	1
	PLG13	131 056	HOUSING RCPT+SKTS, (SERVICE KIT)	1
	PLG15	164 899	HOUSING PLUG PINS+SKTS, (SERVICE KIT)	1
	PLG26	158 719	HOUSING PLUG+SKTS, (SERVICE KIT)	1
	PLG27	131 056	HOUSING RCPT+SKTS, (SERVICE KIT)	1
	PLG46	210 050	HOUSING PLUG+SKTS, (SERVICE KIT) (DYNASTY 700 MODELS ONLY)	1
8		200 565	SCREW, M 5- .8X 35 PAN HD-PHL STL PLD SEMS	4

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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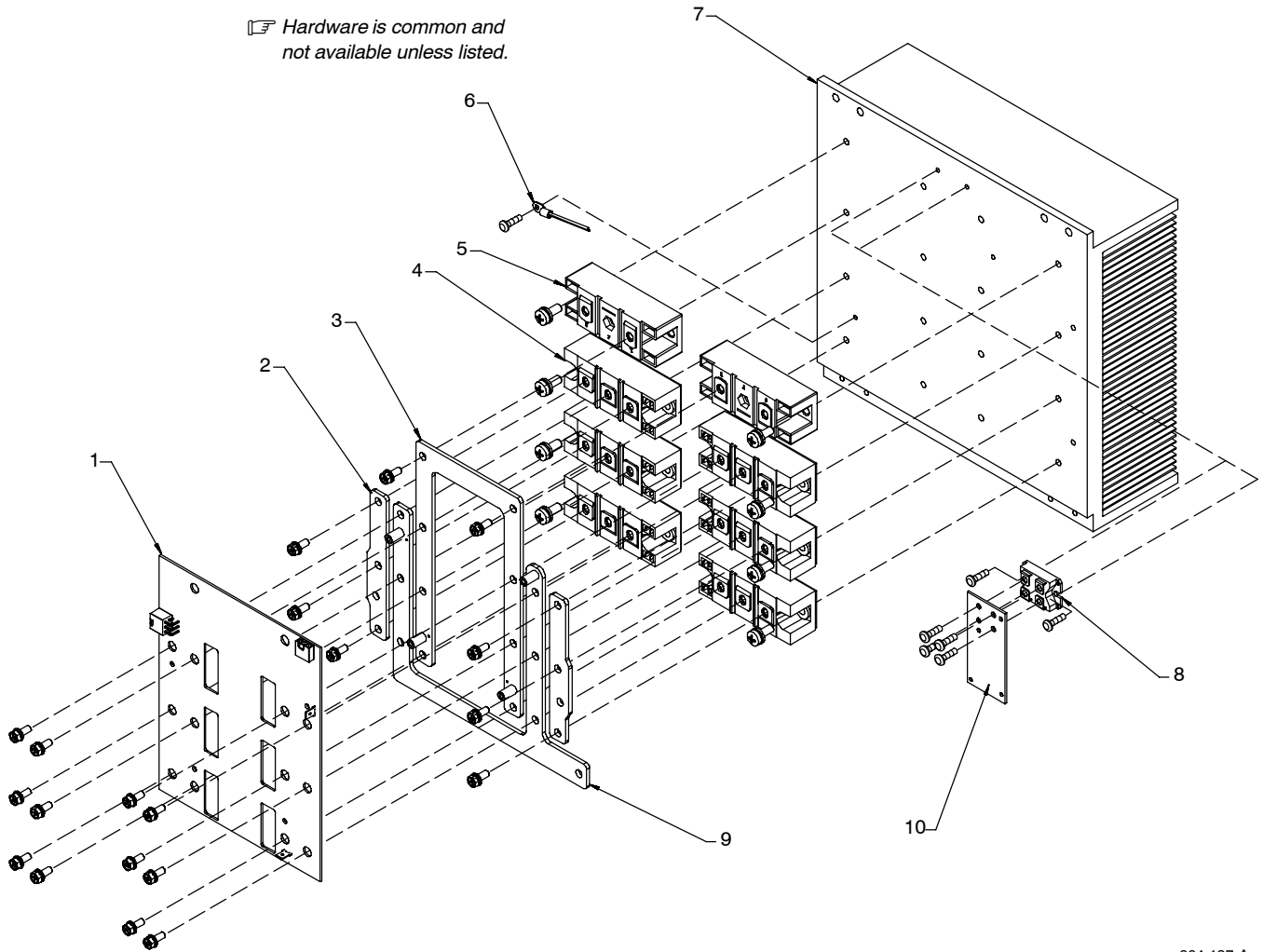
Figure 16-6. Wind Tunnel, Left Hand w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
213 354 Figure 16-6. Wind Tunnel, Left Hand w/Components				
... 1		170 647	.. BUSHING, SNAP-IN NYL 1.312 ID X 1.500 MTG HOLE	1
... 2		219 844	.. LABEL, WARNING ELECTRIC SHOCK/EXPLODING PARTS	1
... 3	CR1	206 258	.. RELAY, ENCL 24VDC SPST 30A/240VAC 4PIN FLANGE MTG	1
... 4		145 217	.. SCREW, K40X 12 PAN HD-PHL STL PLD PT THREAD FORMING	2
... 5		+212 488	.. PANEL, LEFT WINDTUNNEL	1
... 6	T1	213 361	.. XFMR, HF LITZ/LITZ W/BOOST	1
... 7	Z4	213 513	.. COIL, INDUCTOR (BOOST)	1
... 8	Z1	213 356	.. OUTPUT INDUCTOR ASSY,	1
... 9		010 493	.. BUSHING, SNAP-IN NYL .625 ID X .875 MTG HOLE	2
... 10		010 381	.. CONNECTOR, RECTIFIER	1
... 11		227 746	.. GASKET, INDUCTOR MOUNTING E55 FERRITE CORE	1
... 12		057 357	.. BUSHING, SNAP-IN NYL .937 ID X 1.125 MTG HOLE	2

+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.

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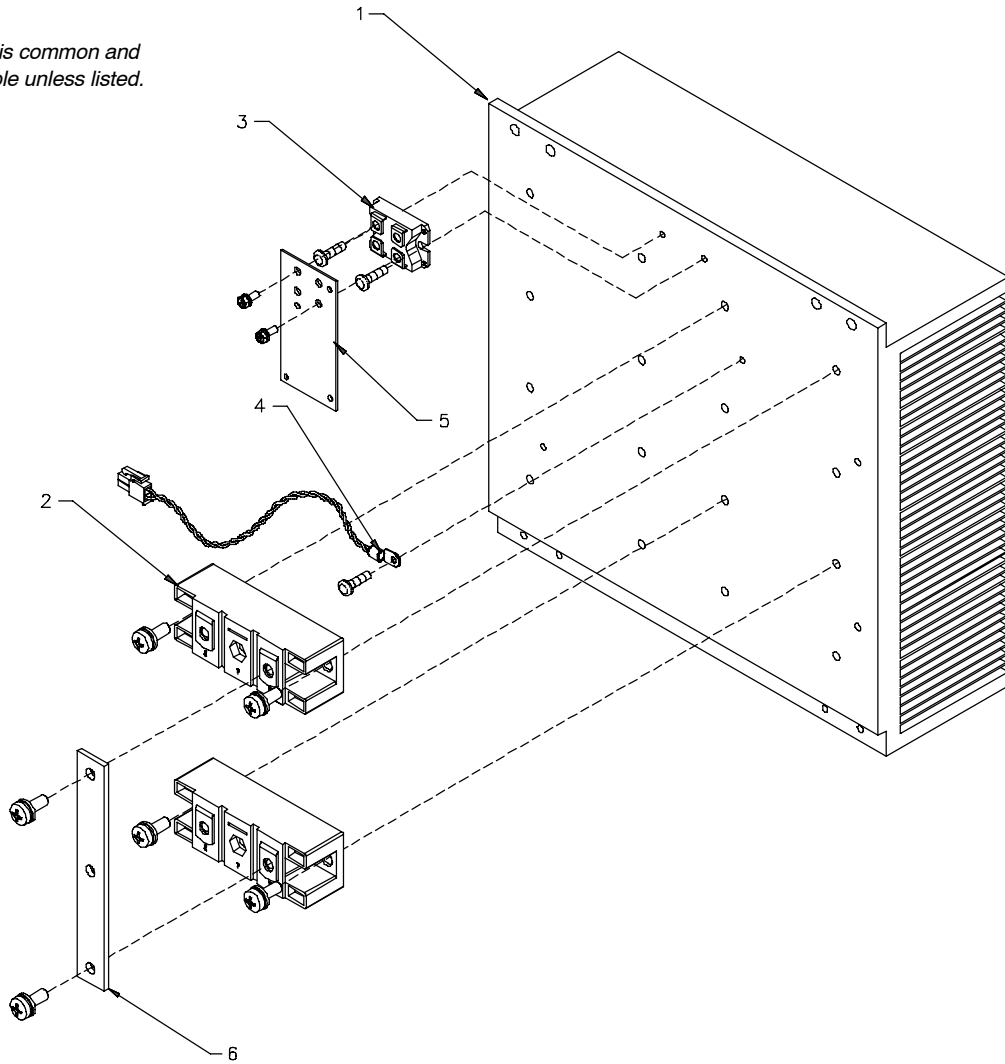
804 137-A

Figure 16-7. Heat Sink, Secondary – Dynasty 700

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
219 345 Figure 16-7. Heat Sink, Secondary – Dynasty 700				
... 1	. PC3,PC4	233 157	.. CIRCUIT CARD ASSY, COMMUTATOR CONTROL	2
....	PLG32/PLG38	115 093	.. CIRCUIT CARD ASSY, COMMUTATOR CONTROL	1
....	PLG31/PLG37	131 024	.. CIRCUIT CARD ASSY, COMMUTATOR CONTROL	1
... 2	.....	213 517	.. BUS BAR, OUTPUT	2
... 3	.....	216 867	.. BUS BAR, POSITIVE	1
... 4	. PM1 – 6	213 522	.. KIT, IGBT (CONSISTS OF 3 IGBT'S)	2
... 5	. D1,D2	213 521	.. KIT, ULTRA FAST DIODE	2
... 6	. RT2,RT4	213 353	.. THERMISTOR, NTC 30K OHM @ 25 DEG C 8IN LEAD	1
... 7	.....	224 470	.. HEAT SINK, POWER MODULE	1
... 8	... SR1	.. 201 530	.. KIT, DIODE FAST RECOVERY BRIDGE	1
... 9	.....	216 868	.. BUS BAR, NEGATIVE	1
... 10	... PC9	.. 241 542	.. CIRCUIT CARD ASSEMBLY, DIODE SNUBBER	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.

☞ Hardware is common and not available unless listed.




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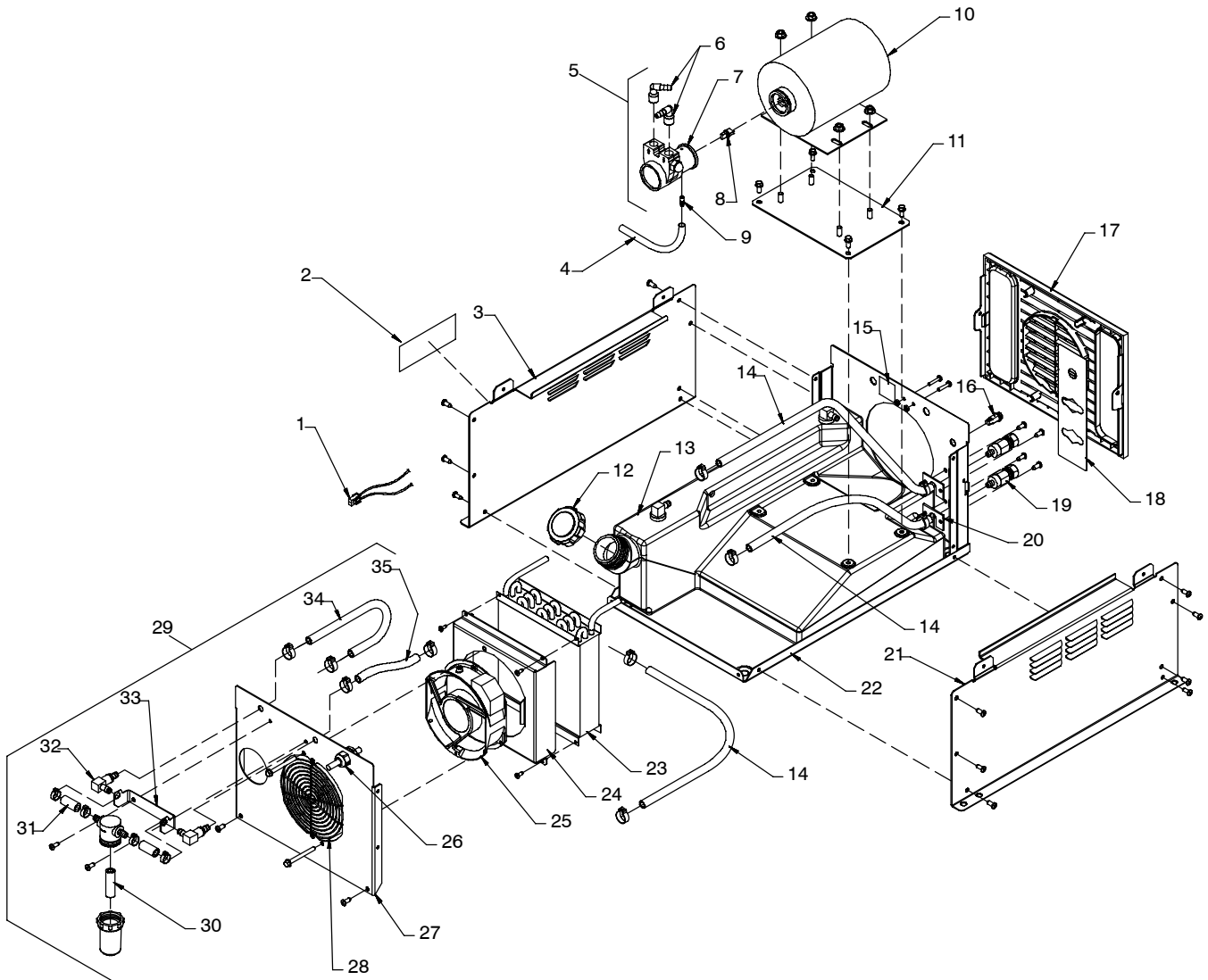
Figure 16-8. Heat Sink, Secondary – Maxstar 700

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
221 730 Figure 16-8. Heat Sink, Secondary – Maxstar 700				
...	1	224 470	HEAT SINK, POWER MODULE	1
...	2	D1, D2 213 521	KIT, ULTRA FAST DIODE	2
...	3	SR1 201 531	KIT, DIODE POWER MODULE	1
...	4	RT2, RT4 213 353	THERMISTOR, NTC 30K OHM @ 25 DEG C 8IN LEAD	1
...	5	PC3 241 542	CIRCUIT CARD ASSY, DIODE SNUBBER	1
...	6	213 519	BUS BAR	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.

SECTION 17 – PARTS LIST FOR COOLER

 Hardware is common and not available unless listed.



804 813-B

Figure 17-1. Main Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
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Figure 17-1. Main Assembly

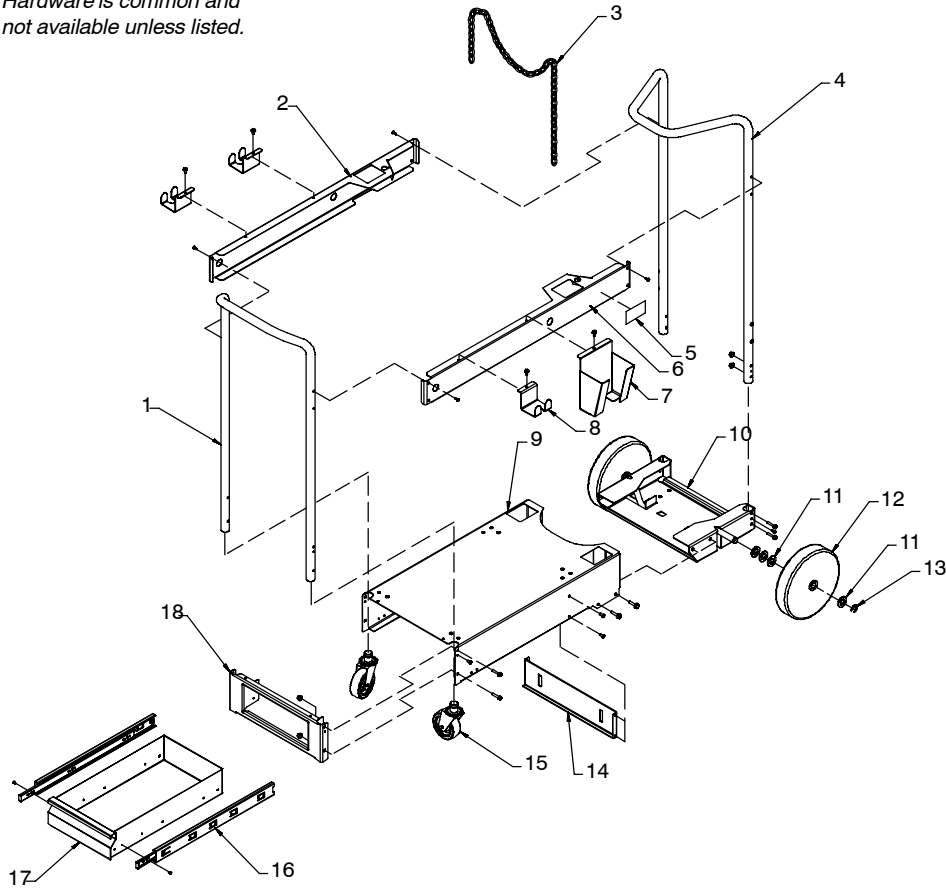
... 1	228 551	.. Plug, W/Leads Fan	1
... 2	219 178	.. Label, Caution Incorrect Coolant	1
... 3	+226 965	.. Panel, Side Rh	1
... 4	228 519	.. Hose, nprn brd no 1 X .250 ID X .455 OD X 9.000	1
... 5	228 508	.. Pump, Coolant W/Fittings (Includes)	1
... 6	5523	.. Ftg, Hose Brs Barbed Elbow M 3/8 TBG X 3/8 NPT	2
... 7	173 999	.. Pump, Coolant 100 Gph W/Clamps Cw Rotation	1
... 8	134 795	.. Coupler, Drive Pump	1
... 9	196 990	.. Ftg, Brs Barbed	1
... 10	173 263	.. Motor, 1/4hp 115vac 50/60hz 1425/1725 Rpm Dual	1
... 11	226 966	.. Bracket, Motor Mount	1
... 12	166 608	.. Cap, Tank Screw-on W/Vent	1
... 13	226 932	.. Tank, Coolant (Includes)	1
...	231 286	.. Ftg, Hose Brs Elbow Barbed M 3/8 TBG X M 3/8 TBG	2
...	231 284	.. Bushing, Tank Coolant	2
...	228 518	.. Tubing, PVC .375 ID X .500 OD X 6.125 Blk Angle	1
...	231 285	.. Tubing, PVC .375 ID X .500 OD X 1.000 Blk	1
... 14	228 529	.. Hose, .375 ID X .650 OD X 19.500	3
... 15	155 436	.. Label, Ground/Protective Earth	1
... 16	163 562	.. Light, Ind Wht Lens 125vac Snap-in Neon Non-relampa	1
... 17	213 053	.. Panel, Louver Cover	1
... 18	230 151	.. Plate, Indicator Front Cooler	1
... 19	226 940	.. Valve, Check Bidirectional Assy	2
... 20	230 155	.. Bucket, Valve Mounting	2
... 21	226 964	.. Panel, Side Lh	1
... 22	226 931	.. Base, Cooler	1
... 23	232 424	.. Radiator, Heat Exchanger	1
... 24	231 341	.. Plenum, Air	1
... 25	213 072	.. Fan, Muffin	1
... 26	204 369	.. Cable, Power 5 Ft 16ga 3c	1
... 27	228 498	.. Panel, Rear	1
... 28	196 312	.. Guard, Fan	1
... 29	228 520	.. Filter, Assy W/Fittings (Includes)	1
... 30	215 667	.. Filter	1
... 31	228 532	.. Hose, .375 ID X .650 OD X 1.415	2
... 32	231 286	.. Ftg, Hose Brs Elbow Barbed M 3/8 TBG X M 3/8 TBG	2
... 33	226 967	.. Bracket, Mtg Filter	1
... 34	236 084	.. Hose, .375 ID X .650 OD X 10.500	1
... 35	228 530	.. Hose, .375 ID X .650 OD X 8.375	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.

SECTION 18 – PARTS LIST FOR CART

 Hardware is common and not available unless listed.



804 812-A

Figure 18-1. Main Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
230 157 Figure 18-1 Complete Cart Assembly.				
...	1	226 927	Handle, Cart	1
...	2	+226 929	Panel, Side Rail LH	1
...	3	210 224	Chain, Straight Link 1/0 X 27 Bright Zinc Pld	1
...	4	226 926	Support, Bottle	1
...	5	192 236	Label, Caution Over Turning Can Cause Injury	2
...	6	+226 930	Panel, Side Rail RH	1
...	7	199 403	Holder, Foot Control	1
...	8	191 875	Hanger, Cable/Torch	3
...	9	226 919	Base, Cart	1
...	10	226 920	Tray, Bottle Assy	1
...	11	602 250	Washer, Flat .812 ID x 1.469 OD x .134t Stl Pld Ansi .750	8
...	12	209 869	Wheel, Poly-olefin 10 In Dia x 2.000 wide x .750	2
...	13	121 614	Ring, Rtnng Ext .750 Shaft X .085 Thk E Style Pld	2
...	14	226 925	Support, Base Drawer Slides	1
...	15	226 923	Caster, Swvl 4.00 In Polyolefin	2
...	16	216 594	Slide, Drawer Full Extension	2
...	17	191 884	Drawer,	1
...	18	228 585	Base, Front Panel	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.
 +When ordering a component originally displaying a precautionary label, the label should also be ordered.

TRUE BLUE[®]

WARRANTY

Effective January 1, 2009

(Equipment with a serial number preface of LK or newer)

This limited warranty supersedes all previous Miller warranties and is exclusive with no other guarantees or warranties expressed or implied.

Warranty Questions?

Call
1-800-4-A-MILLER
for your local
Miller distributor.

Your distributor also gives
you ...

Service

You always get the fast,
reliable response you
need. Most replacement
parts can be in your
hands in 24 hours.

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 delivery date of the equipment to the original end-user purchaser, and not to exceed one year after the equipment is shipped to a North American distributor or eighteen months after the equipment is shipped to an International distributor.

- 5 Years Parts — 3 Years Labor
 - * Original main power rectifiers only to include SCRs, diodes, and discrete rectifier modules
- 3 Years — Parts and Labor
 - * Transformer/Rectifier Power Sources
 - * Plasma Arc Cutting Power Sources
 - * Process Controllers
 - * Semi-Automatic and Automatic Wire Feeders
 - * Inverter Power Sources (Unless Otherwise Stated)
 - * Water Coolant Systems (Integrated)
 - * Intelligit
 - * Engine Driven Welding Generators
(NOTE: Engines are warranted separately by the engine manufacturer.)
- 1 Year — Parts and Labor Unless Specified
 - * Motor Driven Guns (w/exception of Spoolmate Spoolguns)
 - * Positioners and Controllers
 - * Automatic Motion Devices
 - * RFCS Foot Controls
 - * Induction Heating Power Sources, Coolers, and Electronic Controls/Recorders
 - * Water Coolant Systems (Non-Integrated)
 - * Flowgauge and Flowmeter Regulators (No Labor)
 - * HF Units
 - * Grids
 - * Spot Welders
 - * Load Banks
 - * Fume Extractors
 - * Arc Stud Power Sources & Arc Stud Guns
 - * Racks
 - * Running Gear/Trailers
 - * ICE Plasma Cutting Torches (No Labor)
 - * 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.)
 - * Bernard-Branded Mig Guns (No Labor)
 - * Weldcraft-Branded TIG Torches (No Labor)
 - * Subarc Wire Drive Assemblies
- 6 Months — Batteries
- 90 Days — Parts
 - * MIG Guns and Subarc (SAW) Guns

- * Induction Heating Coils and Blankets, Cables, and Non-Electronic Controls
- * APT & SAF 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:

- 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.)**
- 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.
- 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

Contact 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

To locate a Distributor or Service Agency visit www.millerwelds.com or call 1-800-4-A-Miller

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.

Miller Electric Mfg. Co.

An Illinois Tool Works Company
1635 West Spencer Street
Appleton, WI 54914 USA

International Headquarters—USA

USA Phone: 920-735-4505 Auto-Attended
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International FAX: 920-735-4125

For International Locations Visit
www.MillerWelds.com

