



OM-4410

206 933

October 2001

Processes



MIG (GMAW) Welding

Flux Cored (FCAW)



Stick (SMAW) Welding



TIG (GTAW) Welding



Air Plasma Cutting and Gouging
with Spectrum® Unit

Air Carbon Arc (CAC-A) Cutting
and Gouging

Description



Engine Driven Welding Generator

Trailblazer® 301 D

- For use with field test units only.
- Follow this manual and labels on unit to safely install and operate unit.
- Manual is and remains the property of MILLER Electric Mfg. Co. Return manual with unit.
- Additional information on field test units available from Factory Reliability Dept.



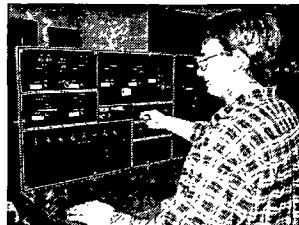
Visit our website at
www.MillerWelds.com

OWNER'S MANUAL

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.



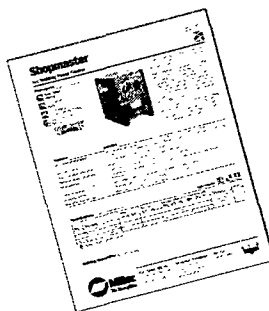
Today, the people that build and sell Miller products continue the tradition. They're just as committed to providing equipment and service that meets the high standards of quality and value established in 1929.

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.

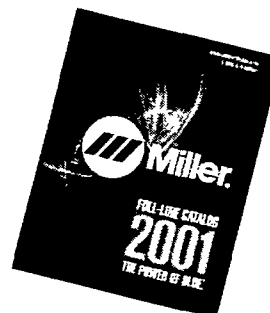


Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001 Quality System Standard.

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 which exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.



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



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

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



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WARNING

This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)

WARNING

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.

WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

The following terms are used interchangeably throughout this manual:
MIG = GMAW, Wire Welding
TIG = GTAW
Stick = SMAW

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SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

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1-1. Symbol Usage



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

▲ Marks a special safety message.

☞ Means "Note"; not safety related.



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

1-2. Arc Welding Hazards

▲ The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-5. 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.

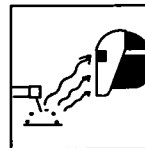
Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, 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.
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground – check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first – double-check connections.
- Frequently inspect input power cord for damage or bare wiring – replace cord immediately if damaged – bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.

- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal.

SIGNIFICANT DC VOLTAGE exists after stopping engine on inverters.

- Stop engine on inverter and discharge input capacitors according to instructions in Maintenance Section before touching any parts.



ARC RAYS can burn eyes and skin.

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

- Wear a welding helmet fitted with a proper shade of filter to protect your face and eyes 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 and glare; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (wool and leather) and foot protection.



FUMES AND GASES can be hazardous.

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

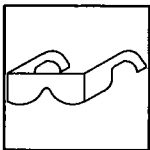
- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
- If ventilation is poor, use an approved air-supplied respirator.
- Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions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



WELDING can cause fire or explosion.

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

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



FLYING METAL can injure eyes.

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



BUILDUP OF GAS can injure or kill.

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

1-3. Engine Hazards



FUEL can cause fire or explosion.

- Stop engine and let it cool off before checking or adding fuel.
- Do not add fuel while smoking or if unit is near any sparks or open flames.
- Do not overfill tank – allow room for fuel to expand.
- Do not spill fuel. If fuel is spilled, clean up before starting engine.
- Dispose of rags in a fireproof container.



HOT PARTS can cause severe burns.

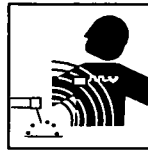
- Allow cooling period before maintaining.
- Wear protective gloves and clothing when working on a hot engine.
- Do not touch hot engine parts or just-welded parts bare-handed.



NOISE can damage hearing.

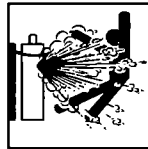
Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.



MAGNETIC FIELDS can affect pacemakers.

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



CYLINDERS can explode if damaged.

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

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

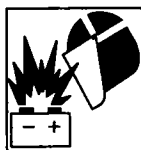


STEAM AND HOT COOLANT can burn.

- If possible, check coolant level when engine is cold to avoid scalding.
- Always check coolant level at overflow tank, if present on unit, instead of radiator (unless told otherwise in maintenance section or engine manual).
- If the engine is warm, checking is needed, and there is no overflow tank, follow the next two statements.
- Wear safety glasses and gloves and put a rag over radiator cap.
- Turn cap slightly and let pressure escape slowly before completely removing cap.

**MOVING PARTS can cause injury.**

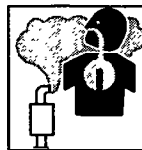
- Keep away from fans, belts, and rotors.
- Keep all doors, panels, covers, and guards closed and securely in place.
- Stop engine before installing or connecting unit.
- Have only qualified people remove guards or covers for maintenance and troubleshooting as necessary.
- To prevent accidental starting during servicing, disconnect negative (-) battery cable from battery.
- Keep hands, hair, loose clothing, and tools away from moving parts.
- Reinstall panels or guards and close doors when servicing is finished and before starting engine.
- Before working on generator, remove spark plugs or injectors to keep engine from kicking back or starting.
- Block flywheel so that it will not turn while working on generator components.

**BATTERY EXPLOSION can BLIND.**

- Always wear a face shield, rubber gloves, and protective clothing when working on a battery.
- Stop engine before disconnecting or connecting battery cables or servicing battery.
- Do not allow tools to cause sparks when working on a battery.
- Do not use welder to charge batteries or jump start vehicles.
- Observe correct polarity (+ and -) on batteries.
- Disconnect negative (-) cable first and connect it last.

**BATTERY ACID can BURN SKIN and EYES.**

- Do not tip battery.
- Replace damaged battery.
- Flush eyes and skin immediately with water.

**ENGINE EXHAUST GASES can kill.**

- Use equipment outside in open, well-ventilated areas.
- If used in a closed area, vent engine exhaust outside and away from any building air intakes.

**ENGINE HEAT can cause fire.**

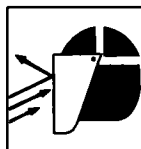
- Do not locate unit on, over, or near combustible surfaces or flammables.
- Keep exhaust and exhaust pipes way from flammables.

**EXHAUST SPARKS can cause fire.**

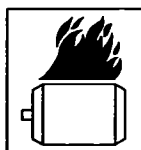
- Do not let engine exhaust sparks cause fire.
- Use approved engine exhaust spark arrestor in required areas – see applicable codes.

1-4. Additional Symbols For Installation, Operation, And Maintenance**FALLING UNIT can cause injury.**

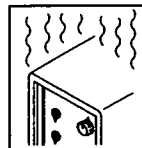
- Use lifting eye to lift unit only, NOT running gear, gas cylinders, trailer, or any other accessories.
- Use equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.

**FLYING SPARKS can cause injury.**

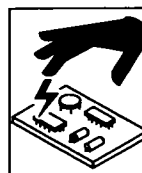
- Wear a face shield to protect eyes and face.
- Shape tungsten electrode only on grinder with proper guards in a safe location wearing proper face, hand, and body protection.
- Sparks can cause fires — keep flammables away.

**OVERHEATING can damage motors.**

- Turn off or unplug equipment before starting or stopping engine.
- Do not let low voltage and frequency caused by low engine speed damage electric motors.
- Do not connect 50 or 60 Hertz motors to the 100 Hertz receptacle where applicable.

**OVERUSE can cause OVERHEATING.**

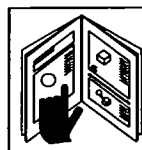
- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.

**STATIC (ESD) can damage PC boards.**

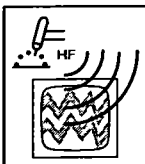
- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.

**TILTING OF TRAILER can cause injury.**

- Use tongue jack or blocks to support weight.
- Properly install welding generator onto trailer according to instructions supplied with trailer.

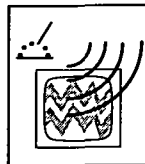
**READ INSTRUCTIONS.**

- Use only genuine MILLER replacement parts.
- Perform engine maintenance and service according to this manual and the engine manual.



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.

1-5. Principal Safety Standards

Safety in Welding and Cutting, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami FL 33126

Safety and Health Standards, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting And Welding Processes, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

1-6. EMF Information

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

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

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

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

About Pacemakers:

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

SECTION 1 – CONSIGNES DE SÉCURITÉ – LIRE AVANT UTILISATION

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1-1. Signification des symboles



Signifie Mise en garde ! Soyez vigilant ! Cette procédure présente des risques de danger ! Ceux-ci sont identifiés par des symboles adjacents aux directives.

▲ Identifie un message de sécurité particulier.

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

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

▲ Les symboles présentés ci-après sont utilisés tout au long du présent manuel pour attirer votre attention et identifier les risques de danger. Lorsque vous voyez un symbole, soyez vigilant et suivez les directives mentionnées afin d'éviter tout danger. Les consignes de sécurité présentées ci-après ne font que résumer l'information contenue dans les normes de sécurité énumérées à la section 1-5. Veuillez lire et respecter toutes ces normes de sécurité.

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

▲ Au cours de l'utilisation, tenir toute personne à l'écart et plus particulièrement les enfants.



UN CHOC ÉLECTRIQUE peut tuer.

Un simple contact avec des pièces électriques peut provoquer une électrocution ou des blessures graves. L'électrode et le circuit de soudage sont sous tension dès que l'appareil est sur ON. Le circuit d'entrée et les circuits internes de l'appareil sont également sous tension à ce moment-là. En soudage semi-automatique ou automatique, le fil, le dévidoir, le logement des galets d'entraînement et les pièces métalliques en contact avec le fil de soudage sont sous tension. Des matériels mal installés ou mal mis à la terre présentent un danger.

- Ne jamais toucher les pièces électriques sous tension.
- Porter des gants et des vêtements de protection secs ne comportant pas de trous.
- S'isoler de la pièce et de la terre au moyen de tapis ou d'autres moyens isolants suffisamment grands pour empêcher le contact physique éventuel avec la pièce ou la terre.
- 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.
- 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 et mettre à la terre correctement cet appareil conformément à son manuel d'utilisation et aux codes nationaux, provinciaux et municipaux.
- Toujours vérifier la terre du cordon d'alimentation – Vérifier et s'assurer que le fil de terre du cordon d'alimentation est bien raccordé à la borne de terre du sectionneur ou que la fiche du cordon est raccordée à une prise correctement mise à la terre.
- En effectuant les raccordements d'entrée fixer d'abord le conducteur de mise à la terre approprié et contre-vérifier les connexions.
- Vérifier fréquemment le cordon d'alimentation pour voir s'il n'est pas endommagé ou dénudé – remplacer le cordon immédiatement s'il est endommagé – un câble dénudé peut provoquer une électrocution.
- Mettre l'appareil hors tension quand on ne l'utilise pas.
- 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 utiliser le connecteur de pièce ou le câble de retour.
- Ne pas toucher l'électrode quand on est en contact avec la pièce, la terre ou une électrode provenant d'une autre machine.

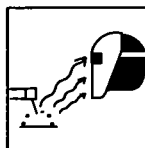


Ce groupe de symboles signifie Mise en garde ! Soyez vigilant ! Il y a des risques de danger reliés aux CHOCS ÉLECTRIQUES, aux PIÈCES EN MOUVEMENT et aux PIÈCES CHAUDES. Reportez-vous aux symboles et aux directives ci-dessous afin de connaître les mesures à prendre pour éviter tout danger.

- 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 quand on travaille en hauteur.
- Maintenir solidement en place tous les panneaux et capots.
- Fixer le câble de retour de façon à obtenir un bon contact métal-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.

Une tension DC importante subsiste à l'intérieur des onduleurs après avoir coupé l'alimentation.

- Couper l'alimentation du poste et décharger les condensateurs d'entrée comme indiqué dans la Section Maintenance avant de toucher des composants.



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 muni d'un écran de filtre approprié 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 protections approuvés pour les oreilles si le niveau sonore est trop élevé.
- Utiliser des écrans ou des barrières pour protéger des tiers de l'éclair et de l'éblouissement; demander aux autres personnes de ne pas regarder l'arc.
- Porter des vêtements de protection constitué dans une matière durable, résistant au feu (laine ou cuir) et une protection des pieds.



LES FUMÉES ET LES GAZ peuvent être dangereux.

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

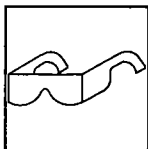
- Eloigner votre tête des fumées. Ne pas respirer les fumées.
- À l'intérieur, ventiler la zone et/ou utiliser un échappement au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage.
- Si la ventilation est insuffisante, utiliser un respirateur à alimentation d'air homologué.
- Lire les spécifications de sécurité des matériaux (MSDSs) 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 si nécessaire, 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.



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 soudure. 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.

- Se protéger et d'autres personnes de la projection d'étincelles et de métal chaud.
- Ne pas souder dans un endroit où des étincelles peuvent tomber sur des substances inflammables.
- 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 homologuées.
- 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).
- Brancher le câble 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 et d'incendie.
- Ne pas utiliser le poste de soudage pour dégeler des conduites gelées.
- En cas de non utilisation, enlever la baguette d'électrode du porte-électrode ou couper le fil 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.



DES PARTICULES VOLANTES peuvent blesser 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.

1-3. Dangers existant en relation avec le moteur



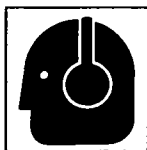
LE CARBURANT MOTEUR peut provoquer un incendie ou une explosion.

- Arrêter le moteur avant de vérifier le niveau de carburant ou de faire le plein.
- Ne pas faire le plein en fumant ou proche d'une source d'étincelles ou d'une flamme nue.
- Ne pas faire le plein de carburant à ras bord; prévoir de l'espace pour son expansion.
- Faire attention de ne pas renverser de carburant. Nettoyer tout carburant renversé avant de faire démarrer le moteur.
- Jeter les chiffons dans un récipient ignifuge.



DES PIÈCES CHAUDES peuvent provoquer des brûlures graves.

- Prévoir une période de refroidissement avant d'effectuer des travaux d'entretien.
- Porter des gants et des vêtements de protection pour travailler sur un moteur chaud.
- Ne pas toucher à mains nues les parties chaudes du moteur ni les pièces récemment soudées.



LE BRUIT peut affecter l'ouïe.

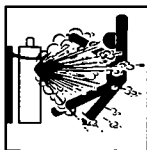
Le bruit des processus et des équipements peut affecter l'ouïe.

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



LES CHAMPS MAGNÉTIQUES peuvent affecter les stimulateurs cardiaques.

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



Si des BOUTEILLES sont endommagées, elles pourront exploser.

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, 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.
- Ne pas tenir la tête en face de la sortie en ouvrant la soupape de la bouteille.
- Maintenir le chapeau de protection sur la soupape, sauf en cas d'utilisation ou de branchement de la bouteille.
- Lire et suivre les instructions concernant les bouteilles de gaz comprimé, les équipements associés et les publication P-1 CGA énumérées dans les normes de sécurité.



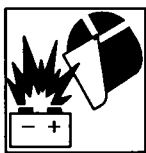
LA VAPEUR ET LE LIQUIDE DE REFROIDISSEMENT CHAUD peuvent provoquer des brûlures.

- Il est préférable de vérifier le liquide de refroidissement une fois le moteur refroidi pour éviter de se brûler.
- Toujours vérifier le niveau de liquide de refroidissement dans le vase d'expansion (si présent), et non dans le radiateur (sauf si précisé autrement dans la section maintenance du manuel du moteur).
- Si le moteur est chaud et que le liquide doit être vérifié, opérer comme suivant :
- Mettre des lunettes de sécurité et des gants, placer un torchon sur le bouchon du radiateur.
- Dévisser le bouchon légèrement et laisser la vapeur s'échapper avant d'enlever le bouchon.



DES ORGANES MOBILES peuvent provoquer des blessures.

- Ne pas approcher les mains des ventilateurs, courroies et autres pièces en mouvement.
- Maintenir fermés et fixement en place les portes, panneaux, recouvrements et dispositifs de protection.
- Arrêter le moteur avant d'installer ou brancher l'appareil.
- Demander seulement à un personnel qualifié d'enlever les dispositifs de sécurité ou les recouvrements pour effectuer, s'il y a lieu, des travaux d'entretien et de dépannage.
- Pour empêcher tout démarrage accidentel pendant les travaux d'entretien, débrancher le câble négatif (-) de batterie de la borne.
- Ne pas approcher les mains, cheveux, vêtements lâches et outils des organes mobiles.
- Remettre en place les panneaux ou les dispositifs de protection et fermer les portes à la fin des travaux d'entretien et avant de faire démarrer le moteur.
- Avant d'intervenir, déposer les bougies ou injecteurs pour éviter la mise en route accidentelle du moteur.
- Bloquer le volant moteur pour éviter sa rotation lors d'une intervention sur le générateur.



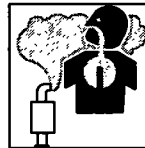
L'EXPLOSION DE LA BATTERIE peut RENDRE AVEUGLE.

- Toujours porter une protection faciale, des gants en caoutchouc et vêtements de protection lors d'une intervention sur la batterie.
- Arrêter le moteur avant de débrancher ou de brancher les câbles de batterie.
- Éviter de provoquer des étincelles avec les outils en travaillant sur la batterie.
- Ne pas utiliser le poste de soudage pour charger les batteries ou des véhicules de démarrage rapide.
- Observer la polarité correcte (+ et -) sur les batteries.
- Débrancher le câble négatif (-) en premier lieu. Le rebrancher en dernier lieu.



L'ACIDE DE LA BATTERIE peut provoquer des brûlures dans les YEUX et sur la PEAU.

- Ne pas renverser la batterie.
- Remplacer une batterie endommagée.
- Rincer immédiatement les yeux et la peau à l'eau.



LES GAZ D'ÉCHAPPEMENT DU MOTEUR peuvent provoquer des accidents mortels.

- Utiliser l'équipement à l'extérieur dans des zones ouvertes et bien ventilées.
- En cas d'utilisation dans un endroit fermé évacuer les gaz d'échappement du moteur vers l'extérieur à distance des entrées d'air dans les bâtiments.



LA CHALEUR DU MOTEUR peut provoquer un incendie.

- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces inflammables.
- Tenir à distance les produits inflammables de l'échappement.



LES ÉTINCELLES À L'ÉCHAPPEMENT peuvent provoquer un incendie.

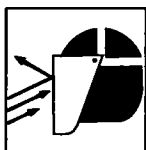
- Empêcher les étincelles d'échappement du moteur de provoquer un incendie.
- Utiliser uniquement un pare-étincelles approuvé – voir codes en vigueur.

1-4. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance



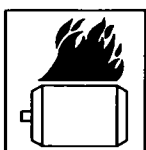
LA CHUTE DE L'APPAREIL peut blesser.

- Utiliser l'anneau de levage uniquement pour soulever l'appareil lui-même ; sans chariot, de bouteilles de gaz, remorque, ou autres accessoires.
- 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.



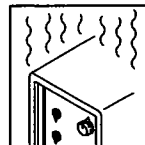
LES ÉTINCELLES VOLANTES risquent de provoquer des blessures.

- 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.



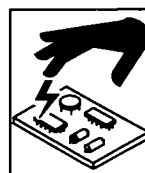
LE SURCHAUFFEMENT peut endommager le moteur électrique.

- Arrêter ou déconnecter l'équipement avant de démarrer ou d'arrêter le moteur.
- Ne pas laisser tourner le moteur trop lentement sous risque d'endommager le moteur électrique à cause d'une tension et d'une fréquence trop faibles.
- Ne pas brancher de moteur de 50 ou de 60 Hz à la prise de 100 Hz, s'il y a lieu.



L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

- Laisser l'équipement refroidir ; respecter le facteur de marche nominal.
- Réduire le courant ou le facteur de marche avant de poursuivre le soudage.
- Ne pas obstruer les passages d'air du poste.



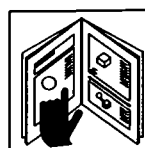
LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

- 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.



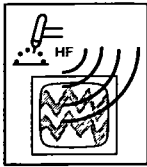
UNE REMORQUE QUI BASCULE peut entraîner des blessures.

- Utiliser les supports de la remorque ou des blocs pour soutenir le poids.
- Installer convenablement le poste sur la remorque comme indiqué dans le manuel s'y rapportant.



LIRE LES INSTRUCTIONS.

- Utiliser seulement les pièces de rechange d'origine.
- Effectuer la maintenance et la mise en service d'après le manuel et celui du moteur.



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.

1-5. Principales normes de sécurité

Safety in Welding and Cutting, norme ANSI Z49.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

Safety and Health Standards, OSHA 29 CFR 1910, du Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

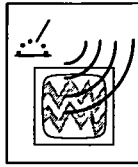
Recommended Safe Practice for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, norme AWS F4.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

National Electrical Code, NFPA Standard 70, de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

1-6. Information sur les champs électromagnétiques

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

Le courant de soudage, pendant son passage dans les câbles de soudage, causera des champs électromagnétiques. Il y a eu et il y a encore un certain souci à propos de tels champs. Cependant, après avoir examiné plus de 500 études qui ont été faites pendant une période de recherche de 17 ans, un comité spécial ruban bleu du National Research Council a conclu: "L'accumulation de preuves, suivant le jugement du comité, n'a pas démontré que l'exposition aux champs magnétiques et champs électriques à haute fréquence représente un risque à la santé humaine". Toutefois, des études sont toujours en cours et les preuves continuent à être examinées. En attendant que les conclusions finales de la recherche soient établies, il vous serait souhaitable de réduire votre exposition aux champs électromagnétiques pendant le soudage ou le coupage.



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.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, de la Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Règles de sécurité en soudage, coupage et procédés connexes, norme CSA W117.2, de l'Association canadienne de normalisation, vente de normes, 178 Rexdale Boulevard, Rexdale (Ontario) Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, norme ANSI Z87.1, de l'American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting and Welding Processes, norme NFPA 51B, de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Afin de réduire les champs électromagnétiques dans l'environnement de travail, respecter les consignes suivantes :

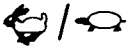
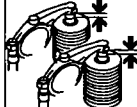
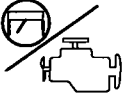
- 1 Garder les câbles ensemble en les torsadant ou en les attachant avec du ruban adhésif.
- 2 Mettre tous les câbles du côté opposé de l'opérateur.
- 3 Ne pas courber pas et ne pas entourer pas les câbles autour de votre corps.
- 4 Garder le poste de soudage et les câbles le plus loin possible de vous.
- 5 Relier la pince de masse le plus près possible de la zone de soudure.

Consignes relatives aux stimulateurs cardiaques :

Les personnes qui portent un stimulateur cardiaque doivent avant tout consulter leur docteur. Si vous êtes déclaré apte par votre docteur, il est alors recommandé de respecter les consignes ci-dessus.

SECTION 2 – DEFINITIONS

2-1. Symbol Definitions

	Stop Engine		Fast (Run, Weld/Power)		Fast/Slow (Run/Idle)		Slow (Idle)
	Start Engine		Panel/Local		Temperature		Fuel
	Engine Oil		Glow Plug		Check Valve Clearance		Battery (Engine)
	Engine		High Temperature	A	Amperes	V	Volts
	MIG (GMAW), Wire		Stick (SMAW)		TIG (GTAW)		Circuit Breaker
+	Positive	—	Negative		Alternating Current (AC)		Output
	Time	h	Hours	s	Seconds		Protective Earth (Ground)
	Do not switch while welding		Remote Receptacle		Work Connection	CC	Constant Current
	Wire Feed		Electrode Positive		Electrode Negative	CV	Constant Voltage
	Read Operator's Manual						

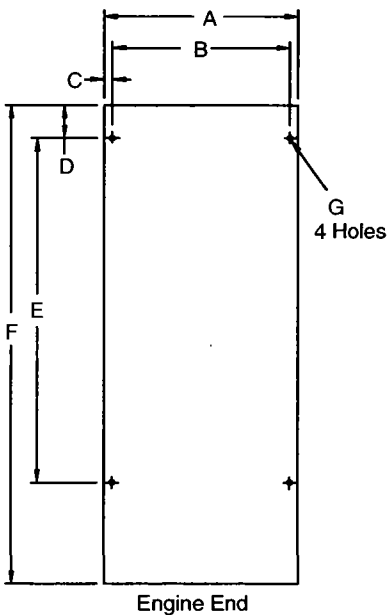
SECTION 3 – SPECIFICATIONS

3-1. Weld, Power, And Engine Specifications

Welding Mode	Rated Welding Output	Maximum Open-Circuit Voltage	Amperage Range In CC Mode	Voltage Range In CV Mode	Auxiliary Power Rating	Fuel Capacity	Engine
CC/AC	225 A, 25 V, 60% Duty Cycle	70	35 – 225 A	10 – 33 V	Continuous: 9.5 kVA/kW, 80/40 A, 120/240 V AC, 60 Hz, Single-Phase, Peak: 10 kVA/kW (w/Weld Contactor Off)	10 gal (38 L) Tank	Kubota D722 Water-Cooled, Three-Cylinder, Four-Cycle, 18.8 HP Diesel Engine
CC/DC	300 A, 25 V, 100% Duty Cycle	80	20 – 300 A				
CV/DC	300 A, 25 V, 100% Duty Cycle	50	—				

3-2. Dimensions, Weights, and Operating Angles

Dimensions	
Height	33 in (838 mm)
Width	18-3/4 in (476 mm)
Depth	45-1/2 in (1156 mm)
A	18 in (457 mm)
B	16-1/2 in (419 mm)
C	3/4 in (19 mm)
D	3-1/8 in (79 mm)
E	32-3/4 in (832 mm)
F	45-1/2 in (1156 mm)
G	13/32 in (10 mm) Dia.
Weight	
___ lb (___ kg)	

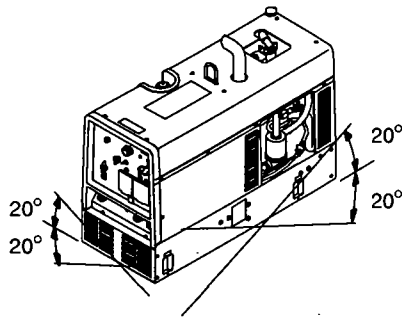


Engine End



▲ Do not exceed tilt angles or engine could be damaged or unit could tip.

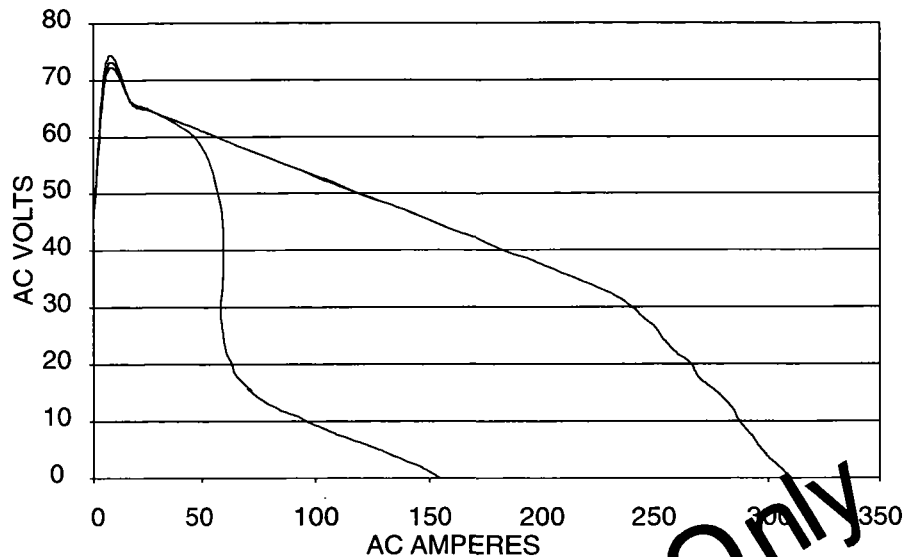
▲ Do not move or operate unit where it could tip.



800 426
803 111

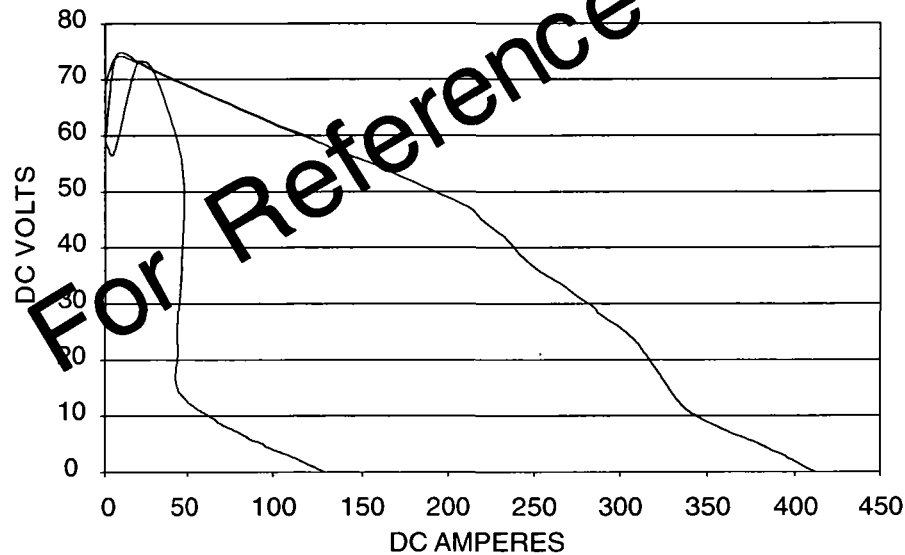
3-3. Stick And MIG Mode Volt-Ampere Curves

A. CC/AC Stick Mode

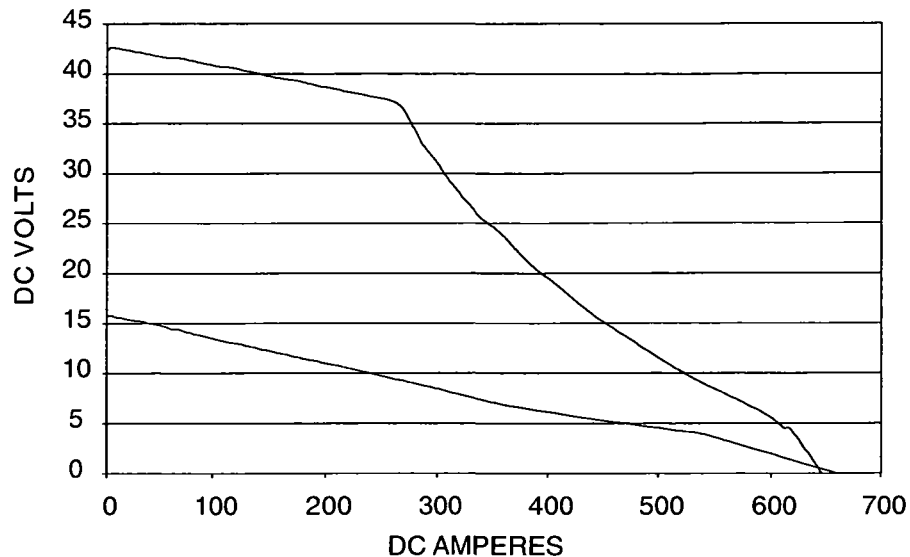


The volt-ampere curves show the minimum and maximum voltage and amperage output capabilities of the welding generator. Curves of other settings fall between the curves shown.

B. CC/DC Stick Mode

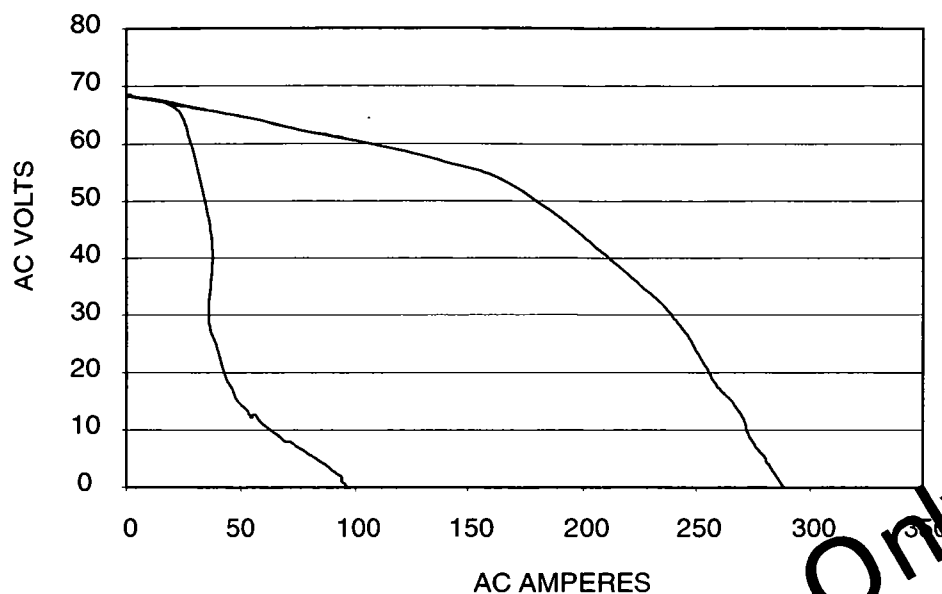


C. CV/DC MIG Mode



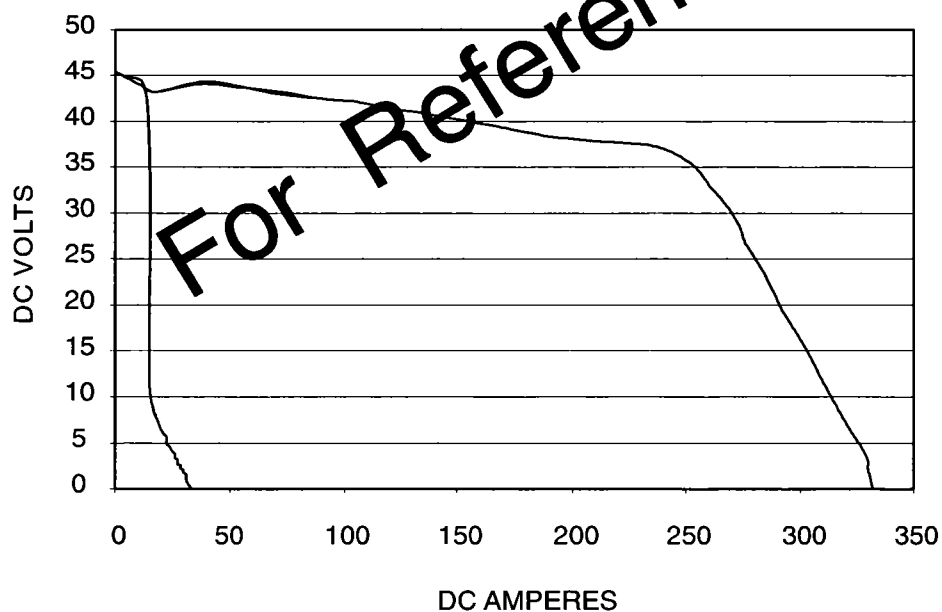
3-4. TIG Mode Volt-Ampere Curves

A. CC/AC TIG Mode

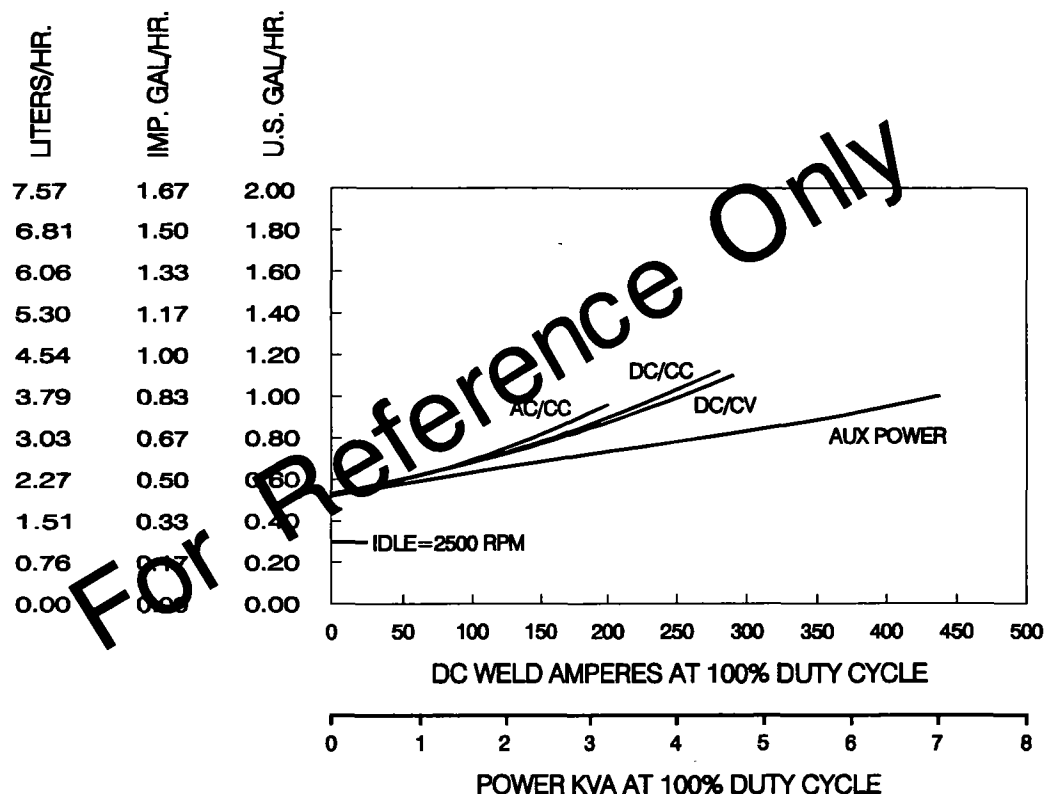


The volt-ampere curves show the minimum and maximum voltage and amperage output capabilities of the welding generator. Curves of other settings fall between the curves shown.

B. CC/DC TIG Mode

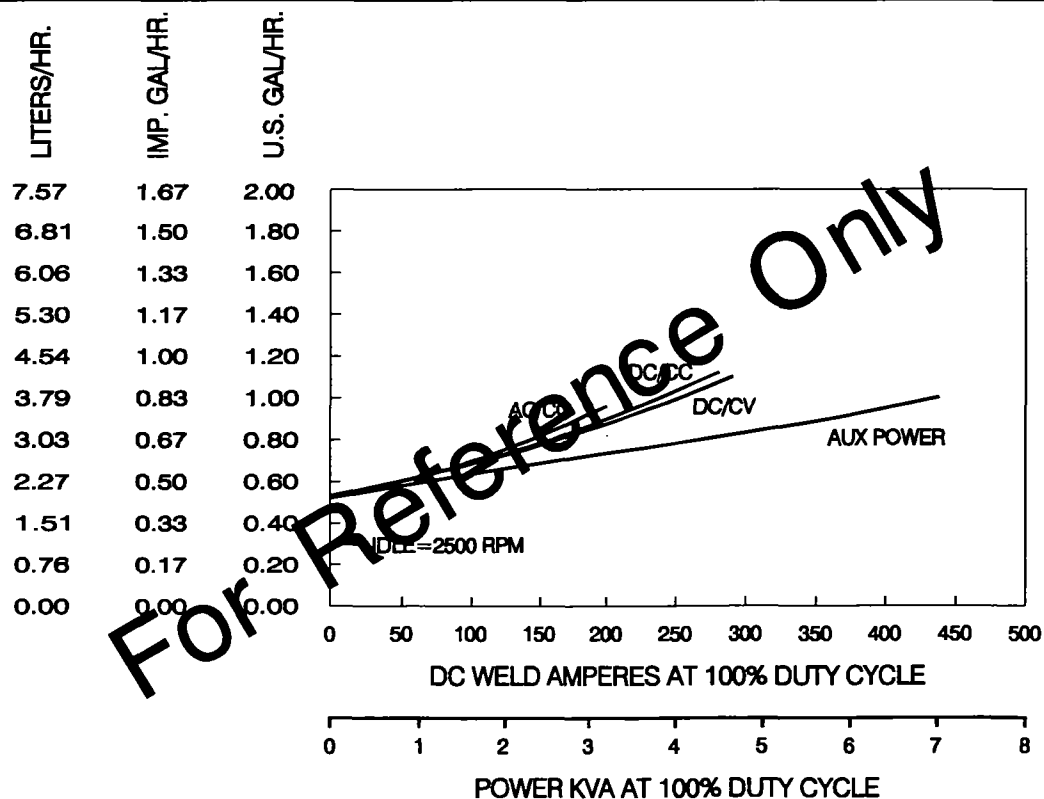


3-5. Fuel Consumption While Welding



189 283

3-6. Fuel Consumption While Using Auxiliary Power

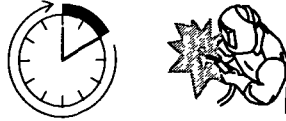


189 283

3-7. Duty Cycle



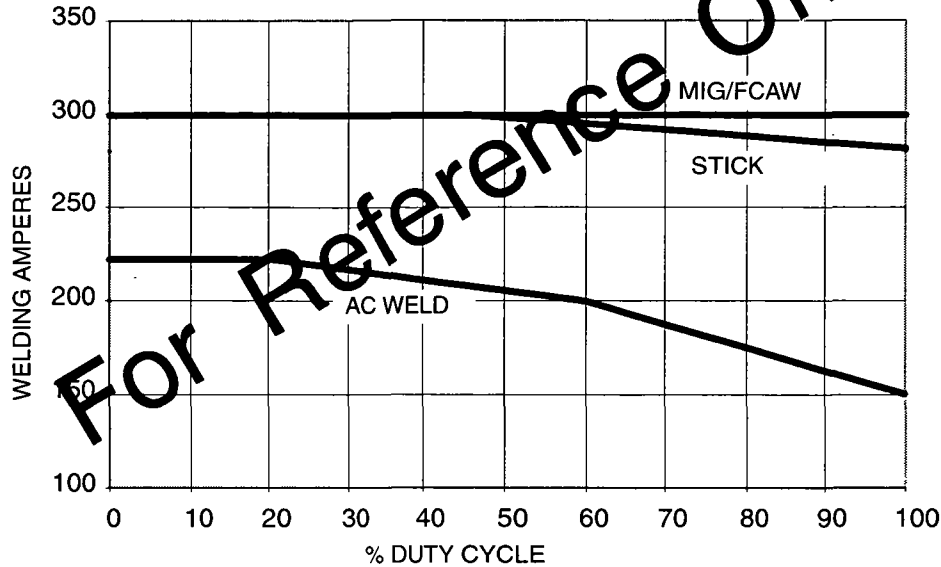
100% Duty Cycle at 280 Amperes DC



Continuous Welding

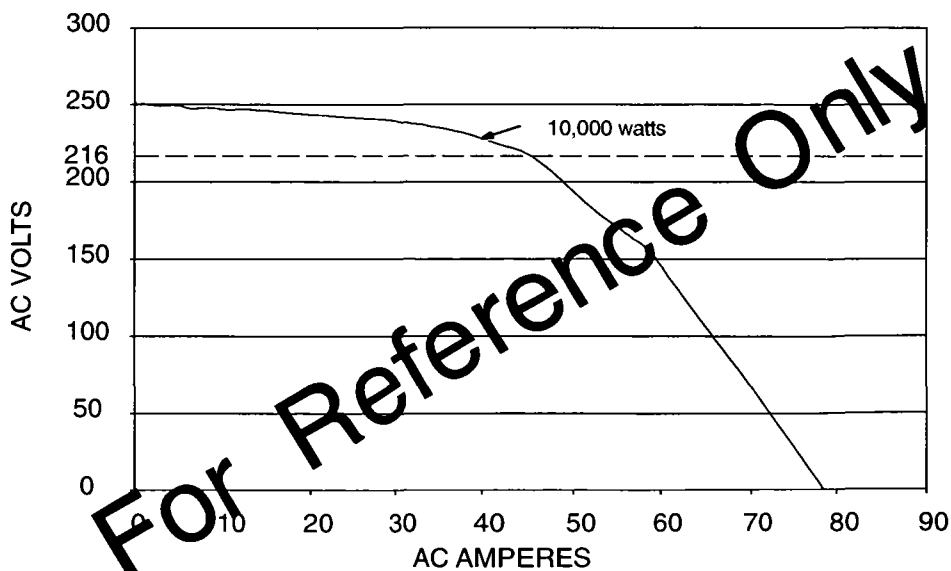
Duty cycle is the percentage of 10 minutes that unit can weld at rated load without overheating.

▲ Exceeding duty cycle can damage unit and void warranty.



3-8. Auxiliary Power Curve

The ac auxiliary power curve shows the auxiliary power available in amperes at the receptacles.



Ref. 204 922

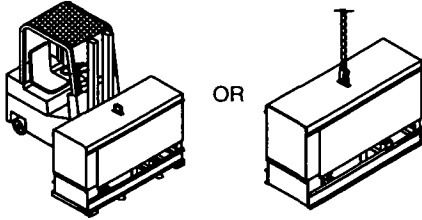
SECTION 4 – INSTALLATION

4-1. Installing Welding Generator

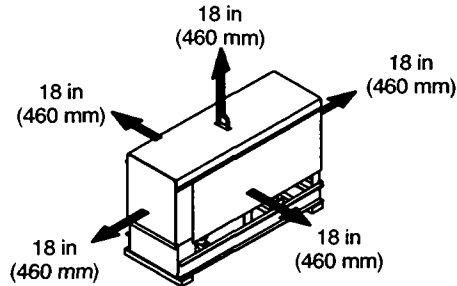


Movement

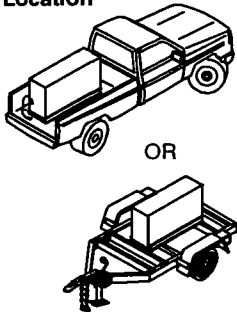
- ▲ Do not lift unit from end.



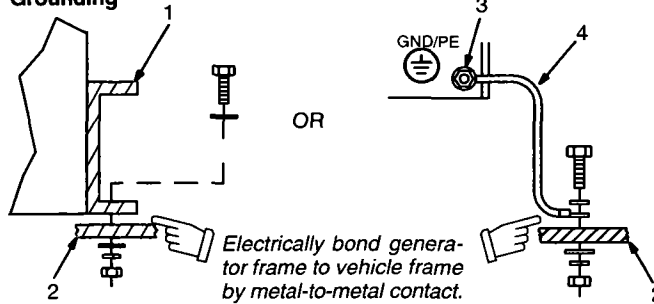
Airflow Clearance



Location



Grounding



Electrically bond generator frame to vehicle frame by metal-to-metal contact.

- ▲ Do not weld on base. Welding on base can cause fuel tank fire or explosion. Bolt unit down using holes provided in base.

- ▲ Always securely fasten welding generator onto transport vehicle or trailer and comply with all DOT and other applicable codes.

- ▲ Always ground generator frame to vehicle frame to prevent electric shock and static electricity hazards.

- 1 Generator Base
- 2 Metal Vehicle Frame
- 3 Equipment Grounding Terminal
- 4 Grounding Cable

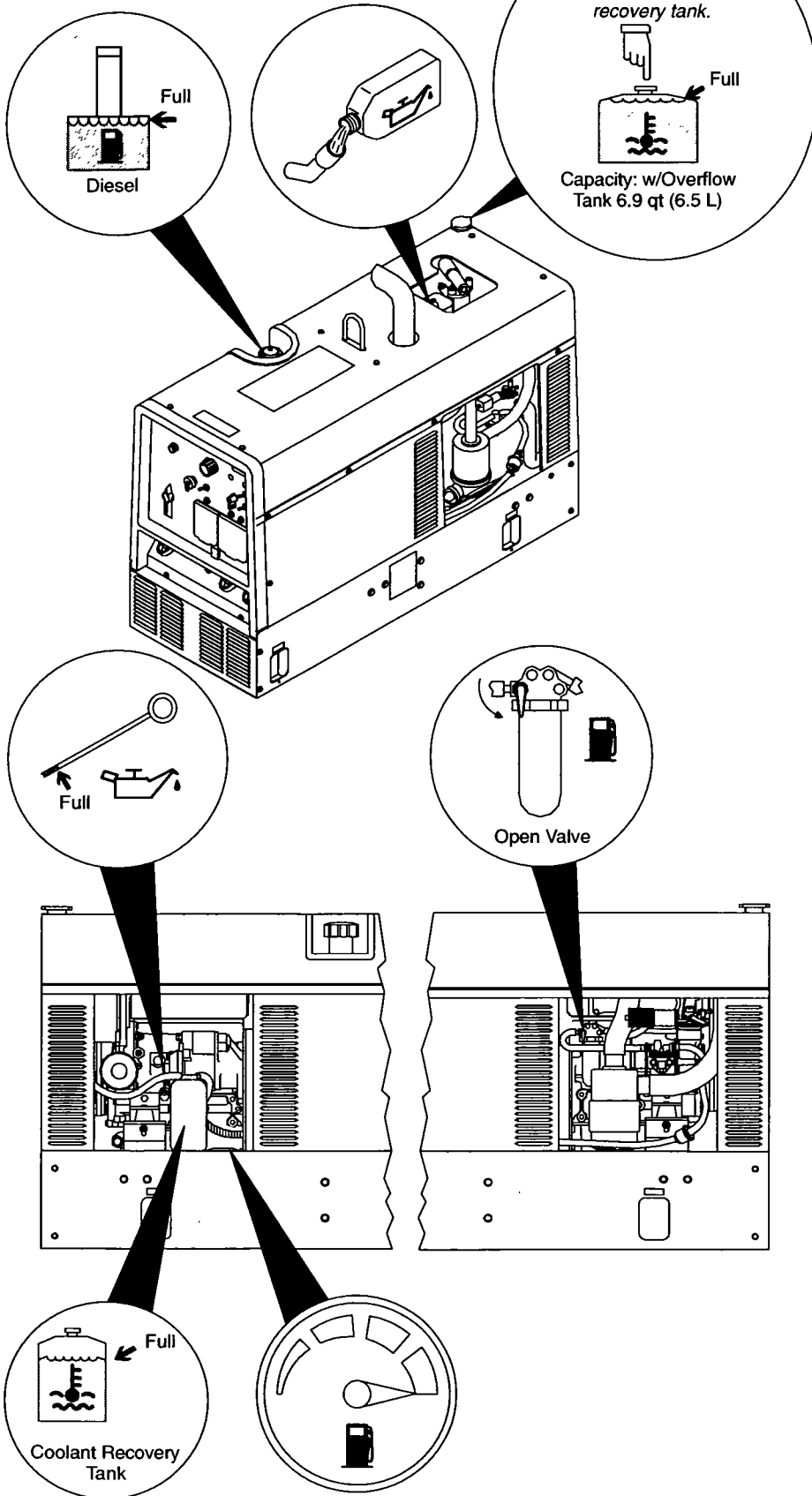
Use #10 AWG or larger insulated copper wire.

- ▲ If unit does not have GFCI receptacles, use GFCI-protected extension cord.

install1 10/00 – Ref. 800 652 / Ref. 800 477-A / 158 936-A / S-0854

Notes

4-2. Engine Prestart Checks



Check all fluids daily. Engine must be cold and on a level surface. Unit is shipped with 10W30 engine oil. Engine stops if oil pressure is low or engine temperature is high.

This unit has a low oil pressure shut-down switch. However, some conditions may cause engine damage before the engine shuts down. Check oil level often and do not use the oil pressure shutdown system to monitor oil level.

Follow run-in procedure in engine manual. If unburned fuel and oil collect in exhaust pipe during run-in, see Section 10.

Fuel

▲ **Do not use gasoline. Gasoline will damage engine.**

▲ **Do not use ether to start engine.**

Add fresh diesel fuel before starting engine the first time (see maintenance label for specifications). Leave filler neck empty to allow room for expansion. Open fuel shut-off valve.

Do not run out of fuel or air enters fuel system and causes starting problems. See engine manual to bleed air from fuel system.

Oil

After fueling, check oil with unit on level surface. If oil is not up to full mark on dipstick, add oil (see maintenance label).

▲ **Engine may use oil and wetstacking may occur during run-in. Check oil several times daily during run-in.**

Coolant

Check coolant level in radiator before starting unit the first time. Add coolant if below bottom of filler neck (see Section 4-3 for radiator filling instructions).

Check coolant level in recovery tank daily. If coolant is below Cold Full level, add coolant until level in tank is between Cold Full and Hot Full levels. If recovery tank coolant level was low, check coolant level in radiator (see Section 4-3).

Engine coolant is a mixture of water and ethylene glycol base antifreeze. A solution of 50% antifreeze and 50% water must be used in this engine. Do not use 100% antifreeze or severe damage will occur.

Keep radiator and air intake clean.

▲ **Incorrect engine temperature can damage engine. Do not run engine without a properly working thermostat and radiator cap.**

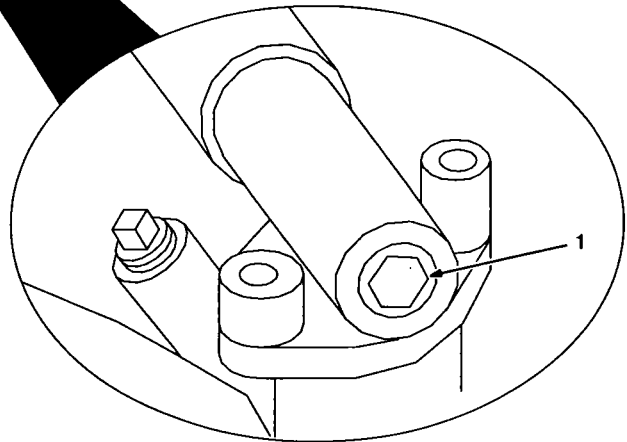
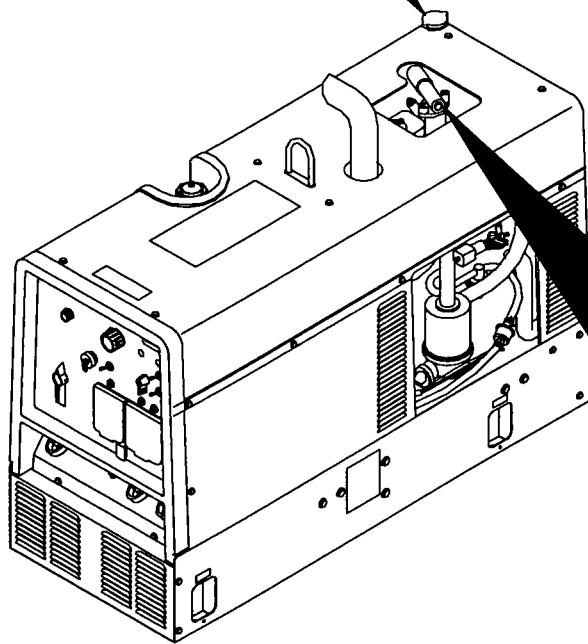
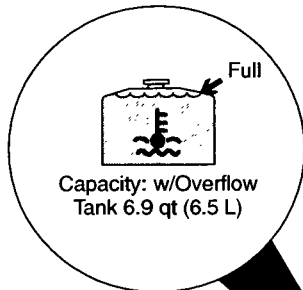
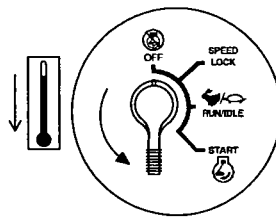
To improve cold weather starting:

Keep battery in good condition. Store battery in warm area off concrete surface.

Use fuel formulated for cold weather (diesel fuel can gel in cold weather). Contact local fuel supplier for fuel information.

Use correct grade oil for cold weather.

4-3. Adding Coolant To Radiator



▲ Stop engine and let cool.

☞ Check coolant level according to Section 4-2 before starting this procedure.

If coolant level is below bottom of radiator filler neck, add coolant as follows:

1 Thermostat Housing Plug

Remove thermostat housing plug. Add coolant to radiator until coolant is at bottom of filler neck and coolant trickles out of thermostat housing plug hole. This ensures all air is purged from the system.

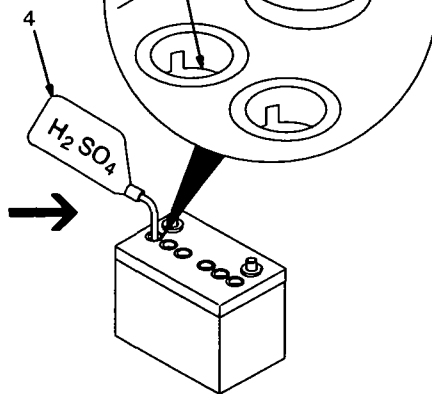
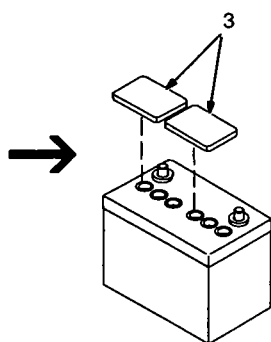
Reinstall plug and radiator cap. Check coolant level in recovery tank (see Section 4-2).

Engine coolant is a mixture of water and ethylene glycol base antifreeze. A solution of 50% antifreeze and 50% water must be used in this engine. Do not use 100% antifreeze or severe damage will occur.

Tools Needed:
8 mm

803 111 / 206 580

4-4. Activating The Dry Charge Battery (If Applicable)



Remove battery from unit.

- 1 Eye Protection – Safety Glasses Or Face Shield
- 2 Rubber Gloves
- 3 Vent Caps
- 4 Sulfuric Acid Electrolyte (1.265 Specific Gravity)
- 5 Well

Fill each cell with electrolyte to **bottom** of well (maximum).

▲ **Do not overfill battery cells.**

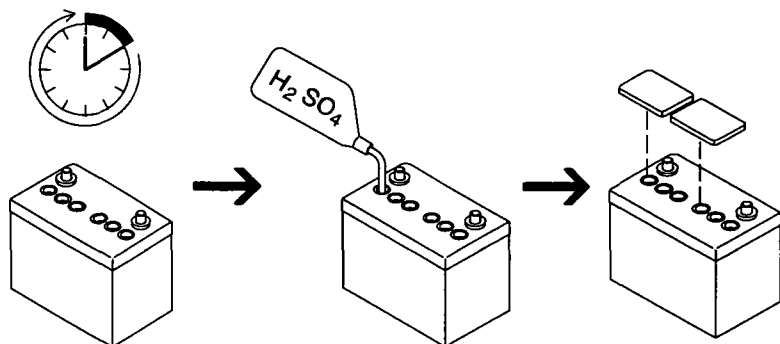
Wait ten minutes and check electrolyte level. If necessary, add electrolyte to raise to proper level. Reinstall vent caps.

- 6 Battery Charger

▲ **Read and follow all instructions supplied with battery charger.**

Charge battery for 12 minutes at 30 amperes or 30 minutes at 5 amperes. Disconnect charging cables and install battery.

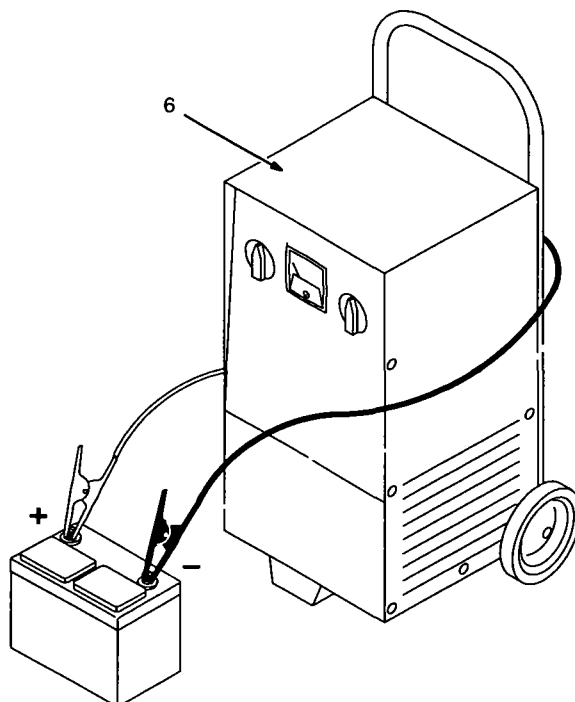
☞ *When electrolyte is low, add only distilled water to cells to maintain proper level.*



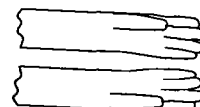
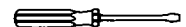
5 A For 30 Minutes

OR

30 A For 12 Minutes



Tools Needed:



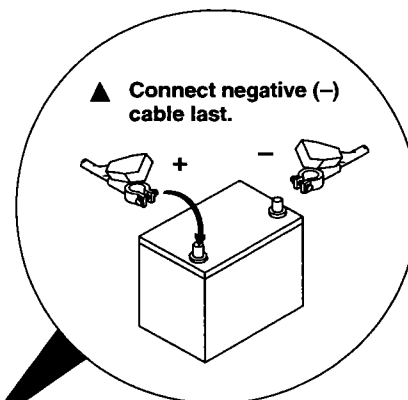
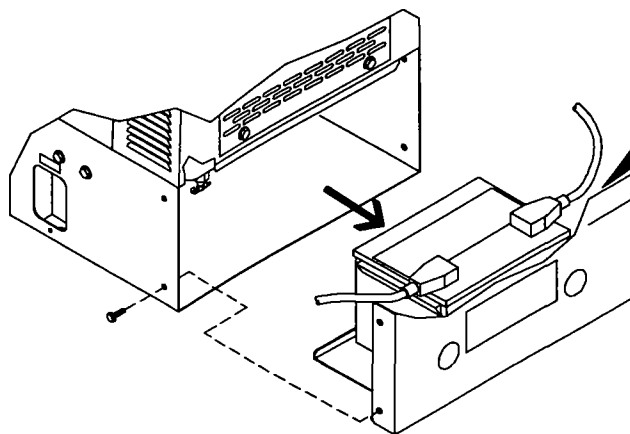
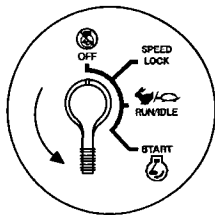
rubbergloves



glasses

drybatt1 1/98 – S-0886

4-5. Connecting The Battery

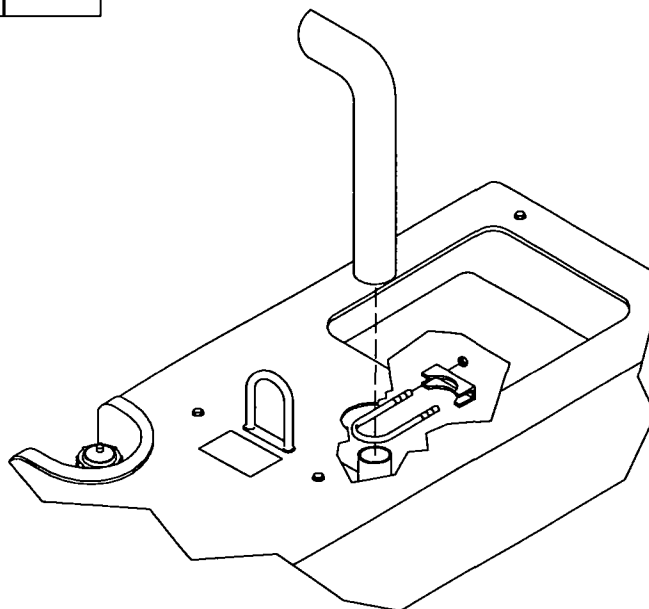
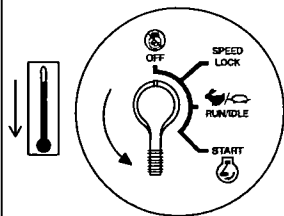


Tools Needed:

3/8, 1/2 in

Ref. 801 939 / Ref. 206 580 / Ref. S-0756-D

4-6. Installing Exhaust Pipe



▲ **Stop engine and let cool.**

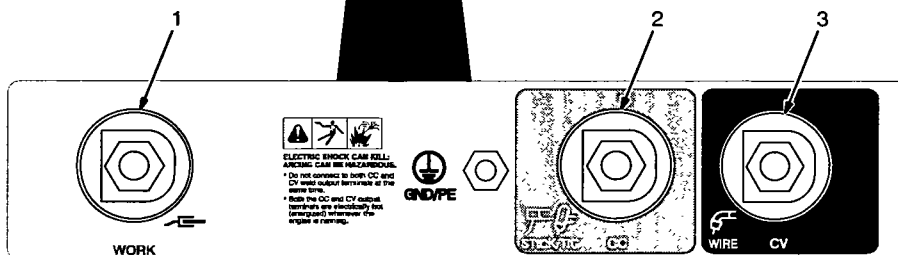
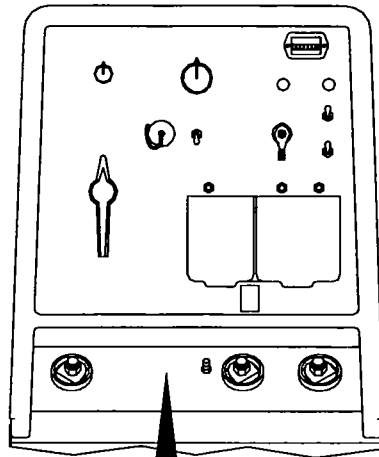
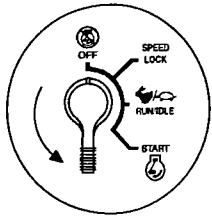
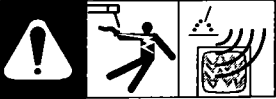
Do not blow exhaust toward rear of unit or air cleaner will require frequent service. Point exhaust pipe in desired direction but always away from front panel and direction of travel.

Tools Needed:

1/2 in

801 681 / Ref. 206 580

4-7. Connecting To Weld Output Terminals



▲ **Stop engine.**

▲ **Do not connect to CC and CV terminals at the same time.**

1 Work Weld Output Terminal

2 Stick/TIG (CC) Weld Output Terminal

3 Wire /CV Weld Output Terminal

For MIG welding, connect work cable to Work terminal and wire feeder cable to Wire (CV) terminal.

For Stick/TIG welding, connect work cable to Work terminal and electrode holder cable to Stick/TIG (CC) terminal.

4-8. Selecting Weld Cable Sizes*

 Weld Output Terminals ▲ Stop engine before connecting to weld output terminals. ▲ Do not use worn, damaged, undersized, or poorly spliced cables.		Weld Cable Size** and Total Cable (Copper) Length in Weld Circuit Not Exceeding***							
		100 ft (30 m) or Less		150 ft (45 m)	200 ft (60 m)	250 ft (70 m)	300 ft (90 m)	350 ft (105 m)	400 ft (120 m)
		10 – 60% Duty Cycle	60 – 100% Duty Cycle	10 – 100% Duty Cycle					
	Welding Amperes								
	100	4 (20)	4 (20)	4 (20)	3 (30)	2 (35)	1 (50)	1/0 (60)	1/0 (60)
	150	3 (30)	3 (30)	2 (35)	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	3/0 (95)
	200	3 (30)	2 (35)	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	4/0 (120)
	250	2 (35)	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 2/0 (2x70)
	300	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 3/0 (2x95)	2 ea. 3/0 (2x95)
	350	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 3/0 (2x95)	2 ea. 3/0 (2x95)	2 ea. 4/0 (2x120)
	400	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 3/0 (2x95)	2 ea. 4/0 (2x120)	2 ea. 4/0 (2x120)
* This chart is a general guideline and may not suit all applications. If cable overheating occurs (normally you can smell it), 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 ***For distances longer than those shown in this guide, call a factory applications representative at 920-735-4505.									

4-9. Remote Receptacle Information

NOTE 	<i>Engine runs at weld/power speed whenever a device connected to the remote receptacle is running.</i>
---	---

REMOTE 14	Socket*	Socket Information
24 VOLTS AC OUTPUT (CONTACTOR)	A	24 volts ac.
	B	Contact closure to A completes 24 volt ac contactor control circuit and keeps engine at Run speed in all modes. Protected by circuit breaker CB5.
A/V AMPERAGE VOLTAGE	C	0 to +10 volts dc output to remote control in Stick and TIG modes. +10 volts dc output to remote control in Wire mode.
	D	Remote control circuit common.
	E	0 to +10 volts dc input command signal from remote control.
GND	G	Circuit common for 24 volt ac circuits.
	K	Chassis common.

*The remaining sockets are not used.

4-10. Adjusting Wire (MIG) Weld Puddle Consistency



▲ Stop engine and let cool.

Stabilizer DC-Z is factory connected to suit most Wire (MIG) welding applications.

To change Wire (MIG) weld puddle consistency, proceed as follows:

Remove right side panel.

- 1 Stabilizer DC-Z
- 2 Leads 27, 28, And 29
- 3 Wire /CV Weld Output Terminal

Lead 29 is connected to the Wire/CV weld output terminal at the factory. Disconnect lead 29 from the Wire/CV weld output terminal.

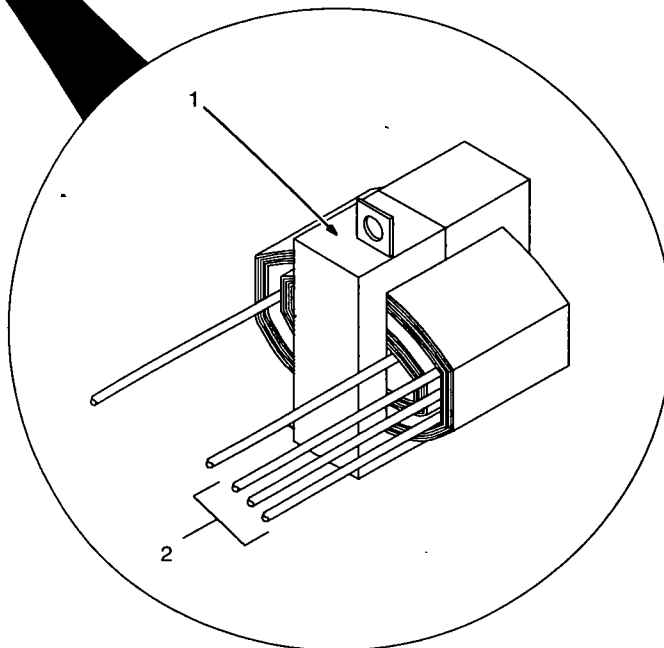
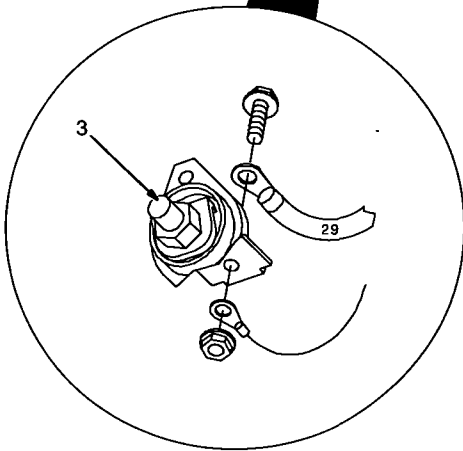
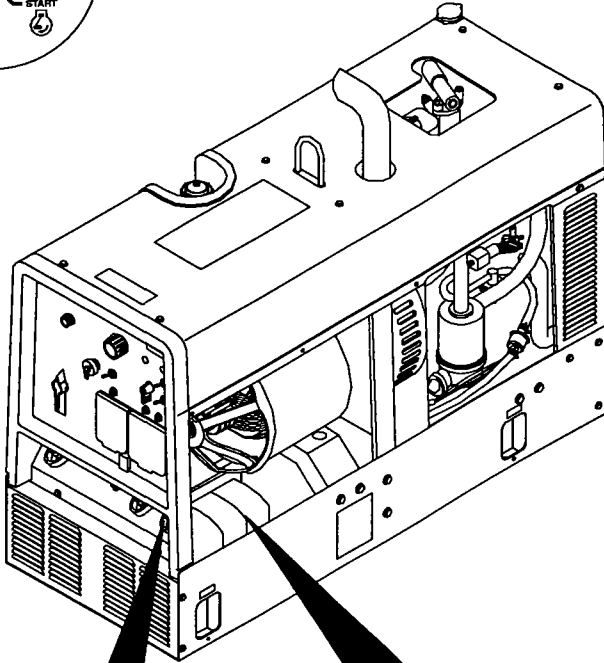
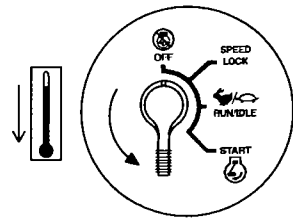
To wet out weld puddle:

Remove insulated sleeving from lead 28. Connect lead 28 to Wire/CV weld output terminal, reusing hardware. Insulate lead 29 with sleeving removed from lead 28. Secure sleeving with cable ties.

To stiffen weld puddle:

Remove insulated sleeving from lead 27. Connect lead 27 to Wire/CV weld output terminal, reusing hardware. Insulate lead 29 with sleeving removed from lead 27. Secure sleeving with cable ties.

Reinstall side panel.



Tools Needed:

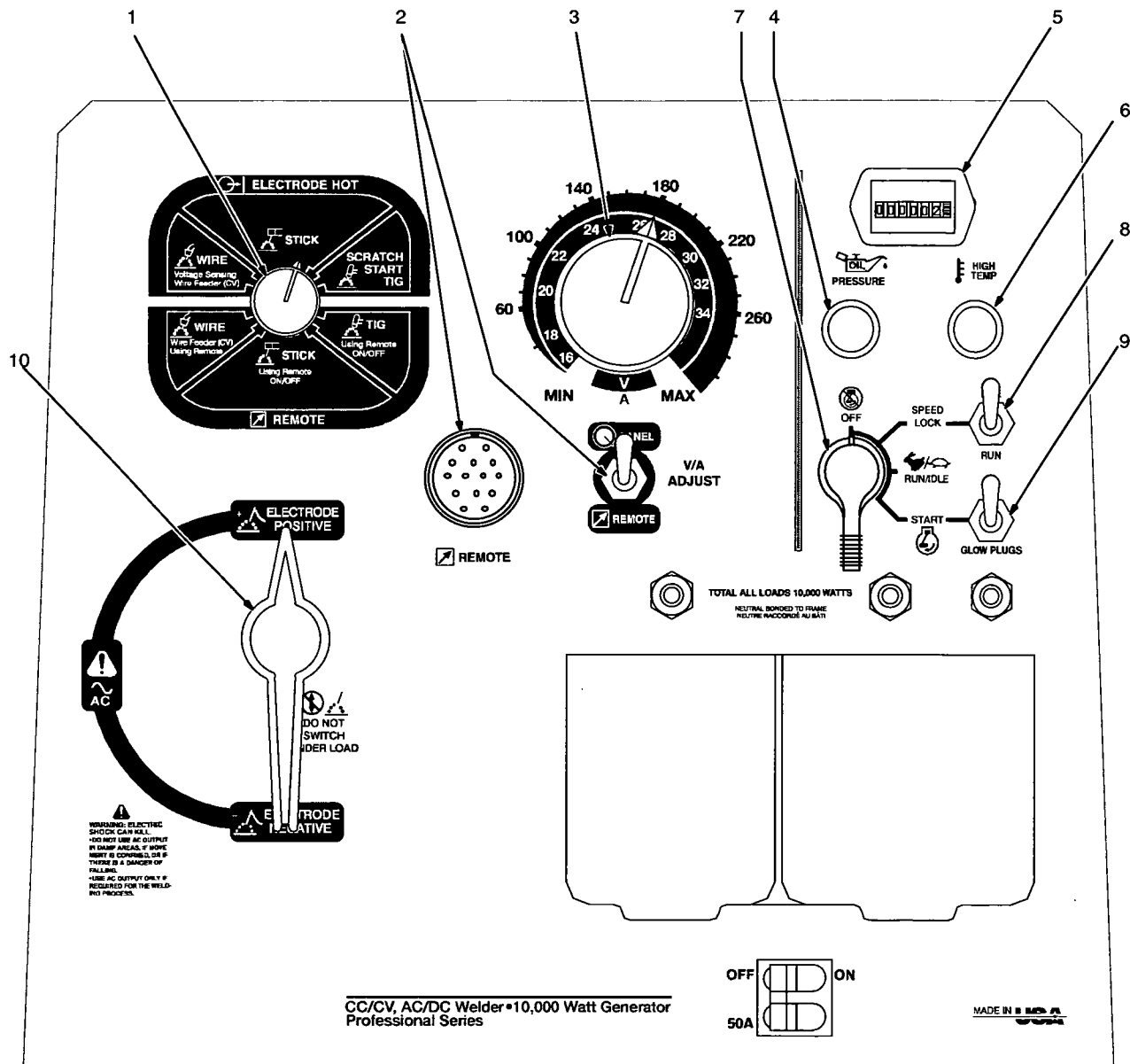


3/8, 7/16 in

Notes

SECTION 5 – OPERATING WELDING GENERATOR

5-1. Front Panel Controls (See Section 5-2)



5-2. Front Panel Controls (See Section 5-1)



1 Process/Contactor Switch

See Section 5-3 for Process/Contactor switch information.

2 Voltage/Amperage Adjust Switch And Remote Receptacle

Use switch to select front panel or remote voltage/amperage control. For remote control, place switch in Remote position and connect remote control to Remote receptacle RC4 (see Sections 4-9 and 5-4).

3 AV Control

Use control to select weld voltage or amperage. Control may be adjusted while welding.

With Process/Contactor switch in any Stick or TIG setting, use control to adjust amperage. With Process/Contactor switch in any Wire position, use control to adjust voltage. With V/A Adjust Switch in Remote position, control limits the remote amperage in Stick and TIG modes, but has no effect in MIG modes.

4 Low Oil Pressure Light

Light goes on and engine stops if engine oil pressure is too low.

▲ Do not run engine until trouble is fixed.

5 Engine Hour Meter

Use hour meter to help schedule maintenance (see Section 7-2).

6 High Engine Temperature Light

Light goes on and engine stops if engine temperature is too high.

▲ Do not run engine until trouble is fixed.

7 Engine Control Switch

Use switch to start engine, select speed, and stop engine. In Run/Idle position, engine runs at idle speed at no load, and weld/power speed under load. In Speed Lock position, engine speed is determined by position of Speed Lock switch (see item 8 and engine speed table following).

Place switch in Run position for TIG (GTAW) welding using a high frequency device.

The unit will not return to idle speed when the remote contactor is on.

8 Speed Lock Switch

Use switch to lock engine in idle or weld/power speed when Engine Control switch is in the Speed Lock position. The idle lock switch is not needed at start-up. The engine always starts at idle speed.

With switch in the Idle position and Engine Control switch in Speed Lock, the engine runs at idle speed. With switch in Run position and Engine Control switch in Speed Lock, engine runs at weld/power speed.

Speed Lock switch does not affect engine speed when Engine Control switch is in Run/Idle position. (Engine speed changes with load.)

9 Glow Plug Switch

If necessary, push switch down before start-up to activate glow plug. See glow plug table following for operating information.

▲ Do not use glow plugs longer than 20 seconds.

Glow Plug Time	
70°F (21°C)	0 seconds
32°F (0°C)	10 seconds
-4°F (-20°C)	20 seconds

To start:

▲ Do not use ether to start engine.

Use glow plug switch if necessary (see item 9 and glow plug table). Turn engine control switch to Start. Release engine control switch when engine starts.

If the engine does not start, let the engine come to a complete stop before attempting restart.

To Stop: turn Engine Control switch to Off position.

Close fuel valve to stop engine if Engine Control switch does not work (see Section 4-2).

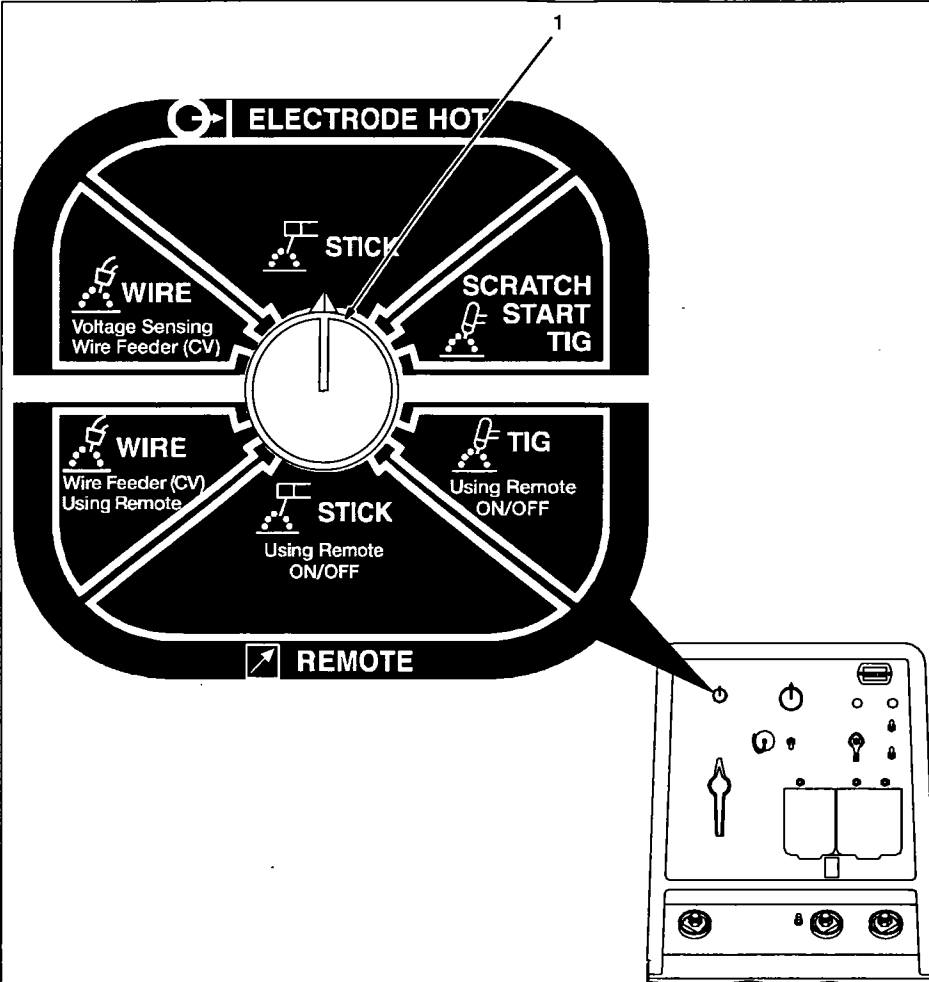
10 DC Polarity/AC Switch

▲ Do not switch under load.

Use switch to select AC weld output or polarity of DC weld output.

Controlling Engine Speed		
	=	1860 rpm (Idle Speed) Continuous
	=	3750 rpm max (Weld/Power Speed) Continuous
	=	No Load: 2450 rpm (Idle Speed) Load: 3750 rpm max (weld/Power Speed)

5-3. Process/Contactor Switch On CC/CV Models



1 Process/Contactor Switch

▲ **Weld output terminals are energized when Process/Contactor switch is in an Electrode Hot position and the engine is running.**

☞ *The unit will not return to idle speed when Process/Contactor switch is in a Wire or TIG mode and the remote contactor is on (closure between pins A and B on remote receptacle).*

Use switch to select weld process and weld output on/off control (see table below and Section 4-9).

Place switch in Remote positions to turn weld output on and off with a device connected to the remote receptacle.

Place switch in Electrode Hot positions for weld output to be on whenever the engine is running.

Use Stick positions for air carbon arc (CAC-A) cutting and gouging.

When switch is in a Stick position, the dig circuit provides additional amperage during low voltage (short arc length conditions) to prevent "sticking" electrodes.

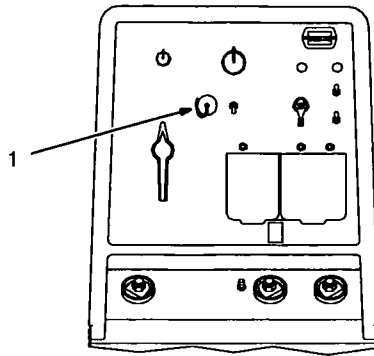
The dig circuit is disabled when switch is in Wire or TIG positions.

803 112

Process/Contactor Switch Settings

Switch Setting	Process	Output On/Off Control
Remote – TIG	GTAW With HF Unit, Pulsing Device, Or Remote Control	At Remote Receptacle
Remote – Stick	Stick (SMAW) With Remote On/Off	At Remote Receptacle
Remote – Wire	MIG (GMAW)	At Remote Receptacle
Electrode Hot – Wire	MIG (GMAW)	Electrode Hot
Electrode Hot – Stick	Stick (SMAW), Air Carbon Arc (CAC-A) Cutting And Gouging	Electrode Hot
Electrode Hot – Scratch Start TIG	Scratch Start TIG (GTAW)	Electrode Hot

5-4. Remote Amperage/Voltage Control



1 Remote Receptacle RC4

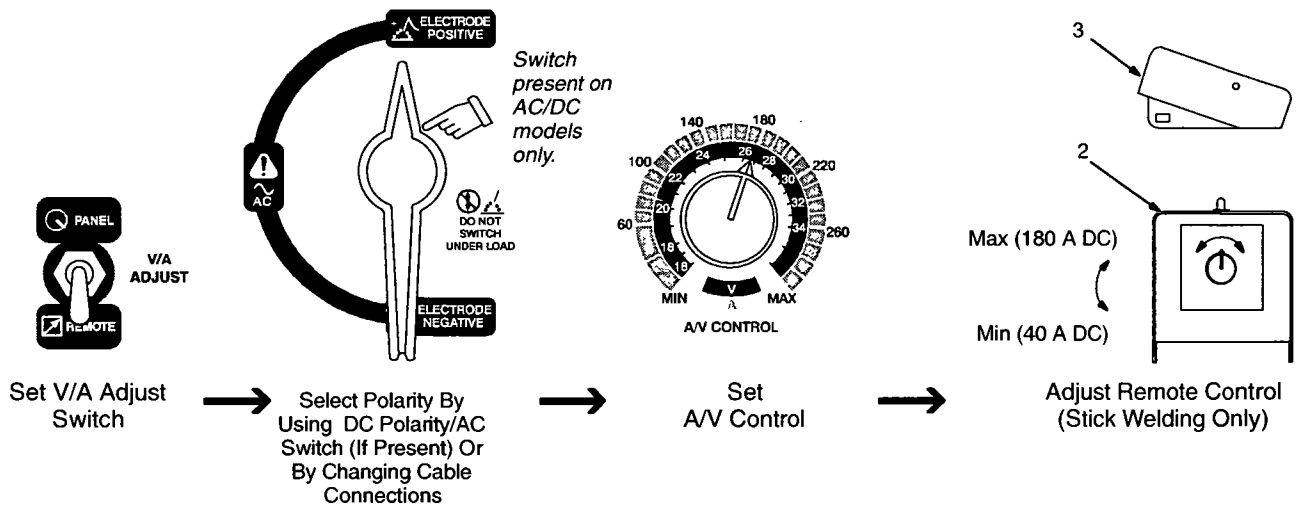
Connect optional remote control to RC4 (see Section 4-9).

2 Remote Hand Control (Optional)

3 Remote Foot Control (Optional)

 Engine runs at weld/power speed in Wire and TIG modes whenever a device connected to the remote receptacle makes closure between pins A and B (example: trigger pull on MIG gun).

In Example:
Process = Stick (Using Remote On/Off)
Min = 40 A CC/DC
Max = 180 A CC/DC



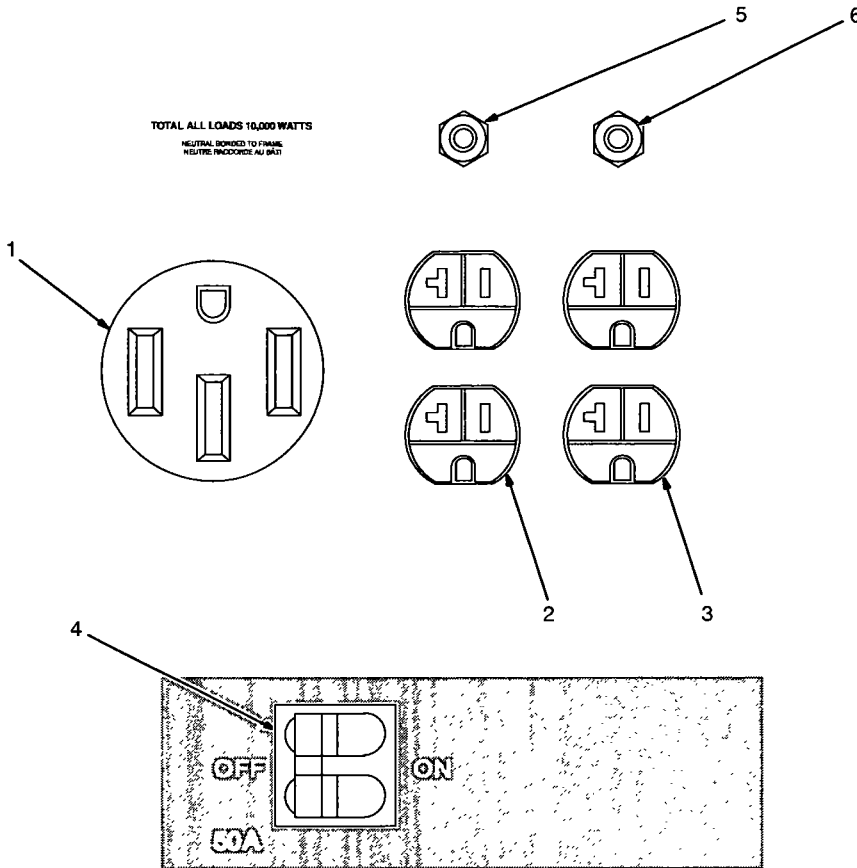
802 850 / 206 580 / S-0769 / S-0774

SECTION 6 – OPERATING AUXILIARY EQUIPMENT

6-1. Auxiliary Power Receptacles And Circuit Breakers



TOTAL ALL LOADS 10,000 WATTS
NEUTRAL BONDED TO FRAME
NEUTRE BRANCHE AU CHÂSSIS



▲ If unit does not have GFCI receptacles, use GFCI-protected extension cord.

☞ Auxiliary power decreases as weld current increases.

- 1 240 V 50 A AC Receptacle RC1

RC1 supplies 60 Hz single-phase power at weld/power speed. Maximum output is 9.5 kVA/kW.

- 2 120 V 20 A AC Duplex Receptacle RC2

- 3 120 V 20 A AC Duplex Receptacle RC3

RC2 and RC3 supply 60 Hz single-phase power at weld/power speed. Maximum output from RC2 or RC3 is 2.4 kVA/kW.

- 4 Circuit Breaker CB1

CB1 protects receptacles RC1, RC2, and RC3 from overload. If CB1 opens, the receptacles do not work. Place switch in On position to reset breaker.

- 5 Circuit Breaker CB3

- 6 Circuit Breaker CB4

CB3 protects RC2 and CB4 protects RC3 from overload. If a circuit breaker opens, the receptacle does not work. Press button to reset breaker.

☞ If circuit breaker continues to open, contact Factory Authorized Service Agent.

Combined output of all receptacles limited to 10 kVA/kW rating of the generator

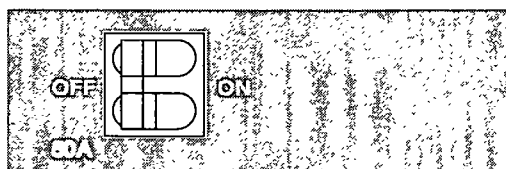
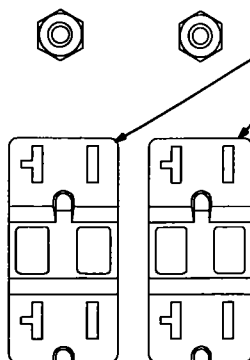
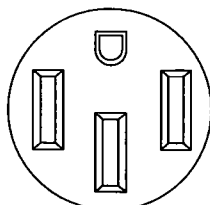
EXAMPLE: If 20 A is drawn from each 120 V duplex receptacle, only 20 A is available at the 240 V receptacle:

$$2 \times (120 \text{ V} \times 20 \text{ A}) + (240 \text{ V} \times 20 \text{ A}) = 9.6 \text{ kVA/kW}$$

6-2. Optional Auxiliary Power Receptacles



TOTAL ALL LOADS 10,000 WATTS
NEUTRAL BONDED TO FRAME
NEUTRE BRANCHEE AU CHÂSSIS



▲ If unit does not have GFCI receptacles, use GFCI-protected extension cord.

☞ Auxiliary power decreases as weld current increases.

Combined output of all receptacles limited to 8 kVA/kW rating of the generator

GFCI Receptacle Option

- 1 120 V 20 A AC GFCI Receptacles GFCI-2 and GFCI-3

GFCI2 and GFCI3 supply 60 Hz single-phase power at weld/power speed. Maximum output from GFCI-2 or GFCI-3 is 2.4 kVA/kW. Circuit breaker protection is the same as standard receptacles.

If a ground fault is detected, the GFCI Reset button pops out and the circuit opens to disconnect the faulty equipment. Check for damaged tools, cords, plugs, etc. connected to the receptacle. Press button to reset receptacle and resume operation.

☞ At least once a month, run engine at weld/power speed and press Test button to verify GFCI is working properly.

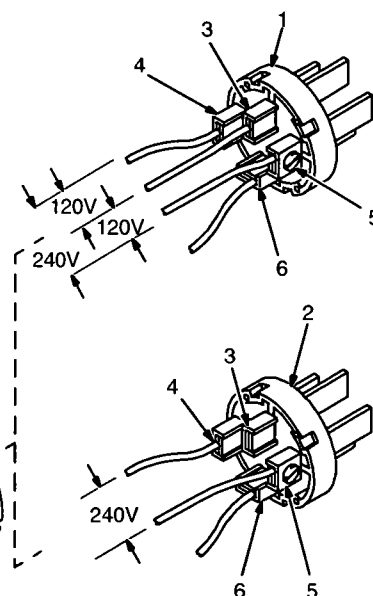
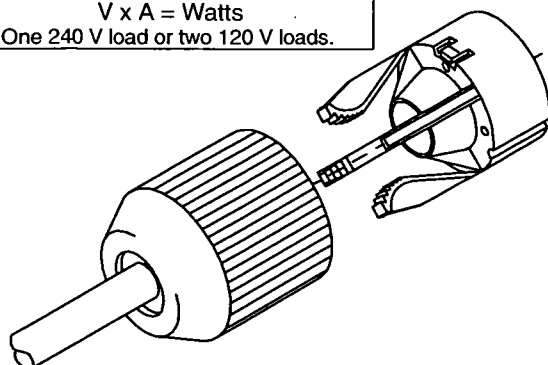
Ref. 206 580

6-3. Wiring Optional 240 Volt Plug



Current Available in Amperes	
240 V Receptacle*	Each 120 V Duplex Receptacle
20	0
15	5
10	10
5	15
0	20

V x A = Watts
*One 240 V load or two 120 V loads.



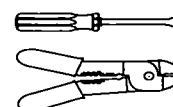
The plug can be wired for a 240 V, 2-wire load or a 120/240V, 3-wire load. See circuit diagram.

- 1 Plug Wired for 120/240 V, 3-Wire Load

When wired for 120 V loads, each duplex receptacle shares a load with one half of 240 V receptacle.

- 2 Plug Wired for 240 V, 2-Wire Load
- 3 Neutral (Silver) Terminal
- 4 Load 1 (Brass) Terminal
- 5 Load 2 (Brass) Terminal
- 6 Ground (Green) Terminal
- 7 Amperes Available using 120/240 V Plug

Tools Needed:



120 813-D

SECTION 7 – MAINTENANCE AND TROUBLESHOOTING

7-1. Maintenance Label

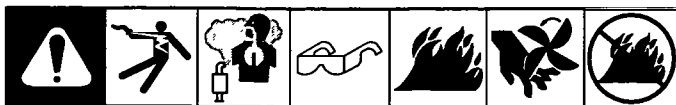
KUBOTA D722 DIESEL ENGINE	
 See Engine Manual for complete engine care. Give Engine Specification and Serial Number when ordering parts.	Air Filter Service 100 hours or less – see Owner's Manual Air Filter Element MILLER 187441 Baldwin RS3715 Donaldson P822686 Wix 46449 Air Filter Element (Safety) Opt MILLER 202102 Donaldson P535396
Check daily. 	12 Volt Battery . . . BCI Group 58 Cranking Performance at 0° F (-18°C) 430 Amps 
Recommended Oil API Service Classification CC/CD/CE or better Oil Change 75 hours or less Oil Filter Change . normal conditions – 150 hours or less Oil Filter MILLER 187443 Kubota 15853-99170 Hastings LF402 Fram PH2649A	Valve Clearance – Cold .0057 – .0072 in. .145 – .185 mm 
Engine RPM – No Load Weld/Power 3750 MAX Idle 2450 	Engine Cooling A solution of 50% anti-freeze and 50% water must be used in this engine. Do not use 100% anti-freeze, or severe damage will occur. 
Injectors MILLER 187819 Kubota 16001-53000 Have only trained technician maintain injection pump and injectors. AIR, WATER, or GASOLINE will harm the injection system. Note: Engine Equipped with Auto Air Bleed System. Do NOT use ether. 	Belt MILLER 187459 Kubota 15881-97011 
Fuel Grade 2-D Cetane No. 45 min. (.5% max. Sulfur content) Primary Fuel Filter MILLER 066113 Secondary Fuel Filter Element MILLER 187442 Kubota 15231-43560 Fill filter with clean fuel before installing – read instructions on filter. 	Glow Plugs MILLER 187820 Kubota 16851-65512 Note: Operation not required when above 50° F (10° C) or when engine is warm. Never operate for more than 20 seconds continuous. 

7-2. Routine Maintenance

NOTE



Follow the storage procedure in the engine owner's manual if the unit will not be used for an extended period.



Recycle engine fluids.

▲ Stop engine before maintaining.

See also Engine Manual and maintenance label. Service engine more often if used in severe conditions.

* To be done by Factory Authorized Service Agent.

⌚ 8 h

Check fluid levels.
See Section 4-2.

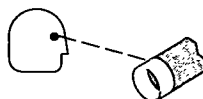


Wipe up spills.



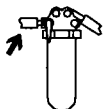
⌚ 20 h

Check and clean optional
spark arrestor screen.
See Section 7-5.



⌚ 50 h

Check fuel lines
and connections.

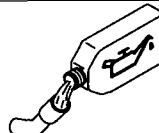
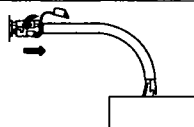


Clean and
tighten weld
terminals.



⌚ 75 h

Change oil. See Section 7-6
and maintenance label.

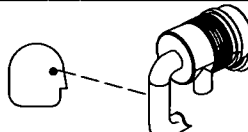


⌚ 100 h

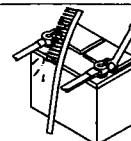
Service air filter
element (see
Section 7-3).



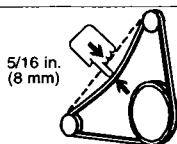
Check air cleaner
hoses for cracks
and loose clamps.



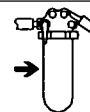
Clean and
tighten battery
connections.



Check belt tension.

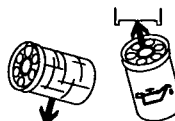


Clean secondary
fuel filter.



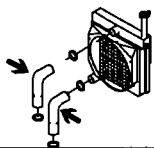
⌚ 150 h

Change oil filter. See
Section 7-6 and
maintenance label.

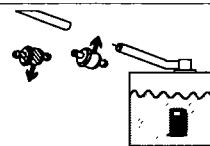


⌚ 200 h

Check radiator hoses and clamps.



Replace primary fuel filter. See Section 7-6.

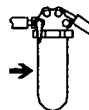


Replace unreadable labels.



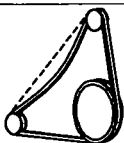
⌚ 400 h

Replace secondary fuel filter (see Section 7-6).

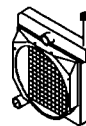


⌚ 500 h

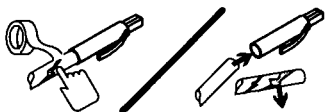
Replace fan belt.



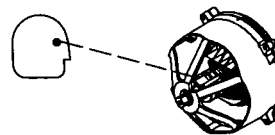
Flush radiator.



Repair or replace cracked cables.

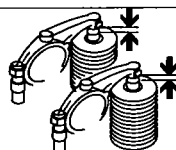


Service welding generator brushes and slip rings. Service more often in dirty conditions.*



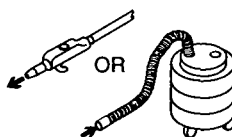
⌚ 800 h

Check valve clearance.*



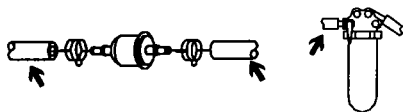
⌚ 1000 h

Blow out or vacuum inside. During heavy service, clean monthly.

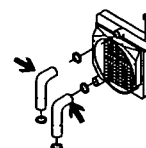


⌚ 2000 h

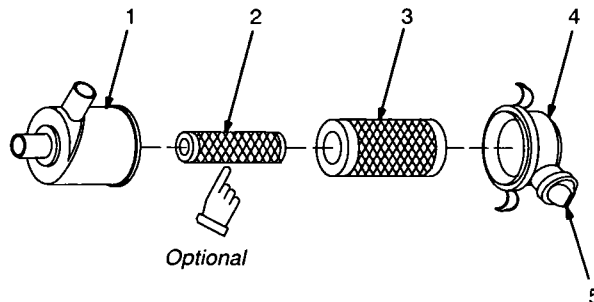
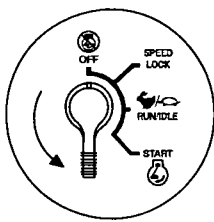
Replace fuel lines and clamps.



Replace radiator coolant and hoses (see Section 7-4).



7-3. Servicing Air Cleaner



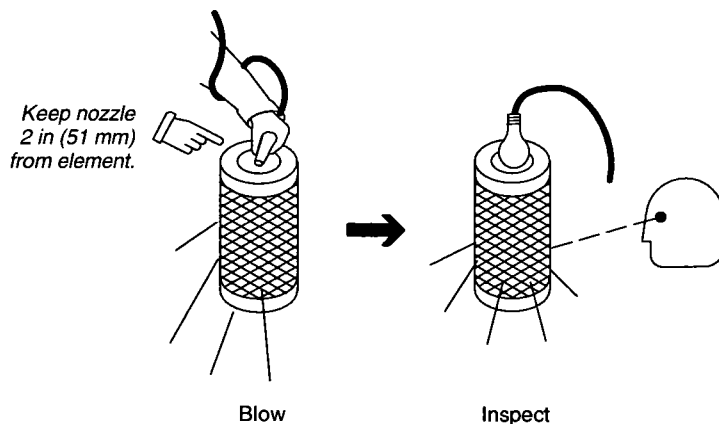
▲ Stop engine.

▲ Do not run engine without air cleaner or with dirty element. Engine damage caused by using a damaged element is not covered by the warranty.

☞ The air cleaner primary element can be cleaned but the dirt holding capacity of the filter is reduced with each cleaning. The chance of dirt reaching the clean side of the filter while cleaning and the possibility of filter damage makes cleaning a risk. Consider the risk of unwarrantable equipment damage when determining whether to clean or replace the primary element.

If you decide to clean the primary element, we strongly recommend installing an optional safety element to provide additional engine protection. **Never clean a safety element.** Replace the safety element after servicing the primary element three times.

Clean or replace primary element if dirty (see note above before cleaning). **Replace** primary element if damaged. Replace primary element yearly or after six cleanings.



- 1 Housing
- 2 Safety Element (Optional)
- 3 Primary Element
- 4 Dust Cap
- 5 Dust Ejector

To clean air filter:

Wipe off cap and housing. Remove cap and dump out dust. Remove element(s). Wipe dust from inside cap and housing with damp cloth. Reinstall safety element (if present). Reinstall cap.

▲ Do not clean housing with air hose.

Clean primary element with compressed air only.

Air pressure must not exceed 100 psi (690 kPa). Use 1/8 in (3 mm) nozzle and keep nozzle at least 2 in (51 mm) from inside of element. Replace primary element if it has holes or damaged gaskets.

Reinstall primary element and cap (dust ejector down).

7-4. Servicing Engine Cooling System

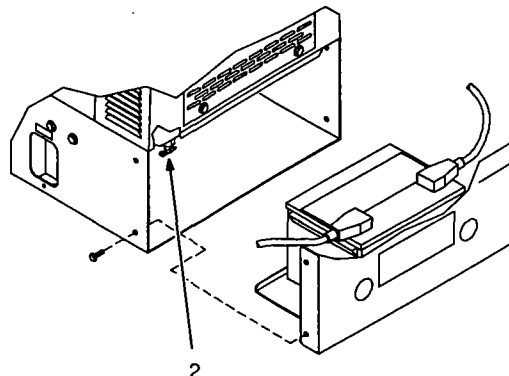
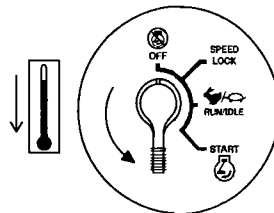
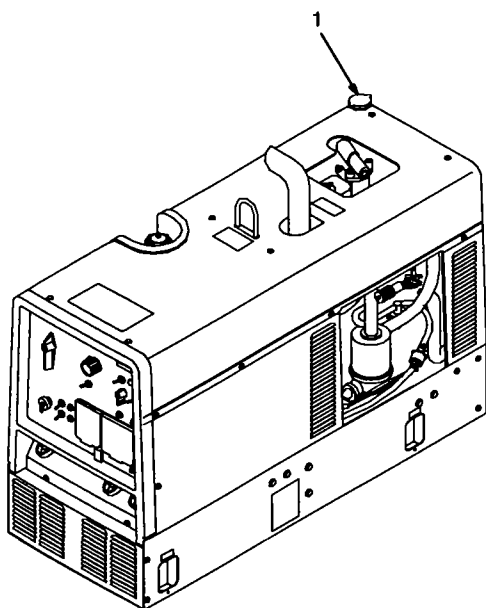


▲ Stop engine and let cool.

- 1 Radiator Cap
- 2 Radiator Drain Cock

Drain engine coolant according to procedure in engine manual.

Add engine coolant according to procedure in Section 4-3.



801 939 / 802 727

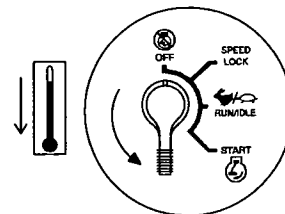
7-5. Servicing Optional Spark Arrestor



▲ Stop engine and let cool.

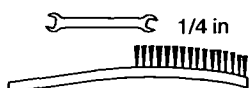
- 1 Spark Arrestor Screen

Clean and inspect screen. Replace spark arrestor if screen wires are broken or missing.



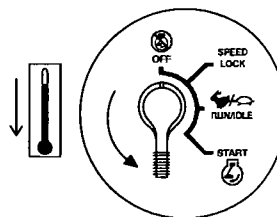
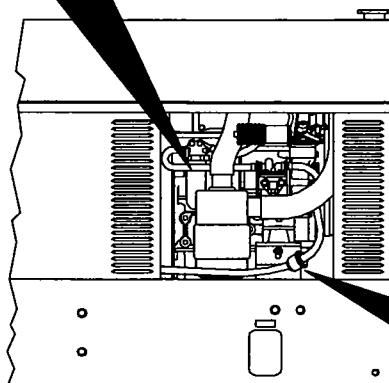
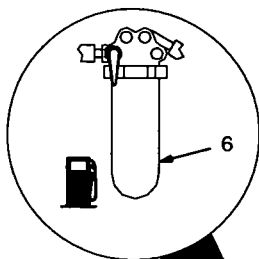
For Reference Only

Tools Needed:



801 939-C / Ref. 801 695-A / Ref. 203 084

7-6. Servicing Engine Fuel And Lubrication Systems



▲ Stop engine and let cool.

- 1 Oil Drain Valve
- 2 1/2 ID x 12 in Hose
- 3 Oil Filter

Change engine oil and filter according to engine manual.

▲ Close valve and valve cap before adding oil and running engine.

Fill crankcase with new oil to full mark on dipstick (see Section 7-1).

- 4 Fuel Lines

Replace fuel lines if cracked or worn.

- 5 Primary Fuel Filter

Install new filter as shown.

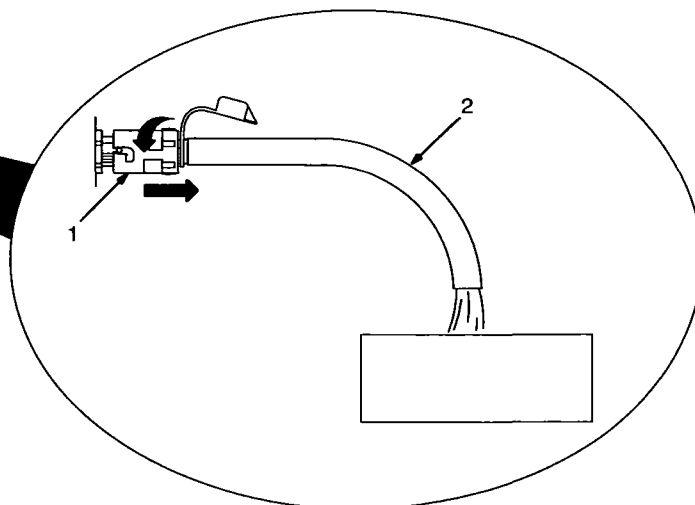
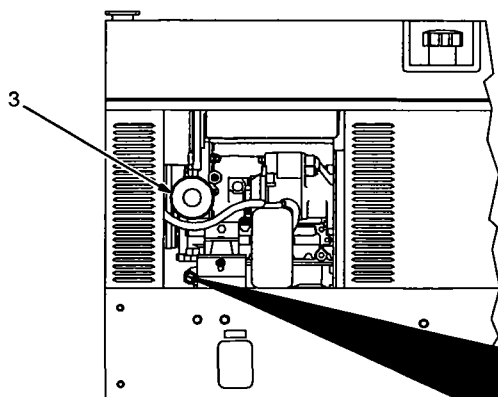
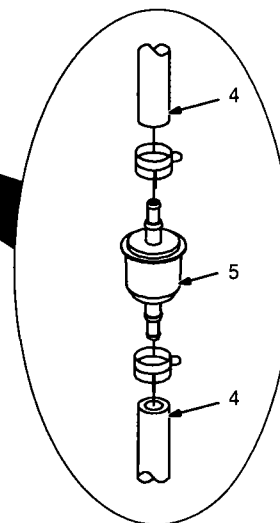
- 6 Secondary Fuel Filter

Replace filter according to engine manual.

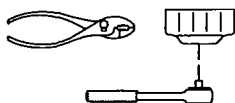
Wipe up any spilled fuel.

Start engine, and check for fuel leaks.

▲ Stop engine, tighten connections as necessary, and wipe up fuel.



Tools Needed:



7-7. Adjusting Engine Speed

NOTE



If the engine does not start and stop properly, verify the fuel solenoid is installed properly **before** adjusting engine speed (see Section A following).

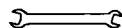
If the engine does not stay at idle speed, verify the throttle solenoid is installed and adjusted properly **before** adjusting engine speed (see Section B following).

If the engine runs properly but the speeds are incorrect, **do not** adjust the solenoids. Adjust the engine speed according to the instructions in Section C.

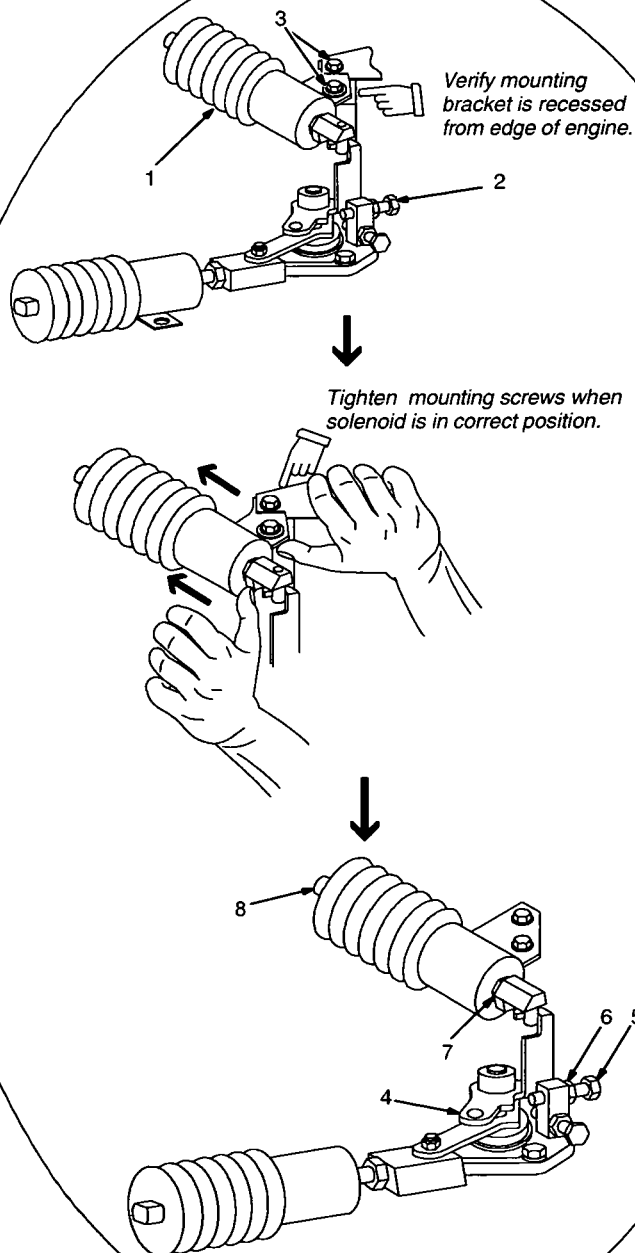
A. Checking Fuel Solenoid



Tools Needed:



7/16 in
10, 14 mm



▲ Stop engine.

If the engine does not start and stop when using the Engine Control switch, check the position of the fuel solenoid.

Adjusting Fuel Solenoid Position

- 1 Fuel Solenoid
- 2 Stop Screw
- 3 Fuel Solenoid Mounting Screws

☞ Stop screw is factory-set and should not be adjusted.

When properly adjusted, the solenoid bracket is slightly recessed from the edge of the engine block and the solenoid linkage easily travels between the stop screw and the fuel solenoid internal stop.

If adjustment is necessary, loosen the solenoid mounting screws and push the solenoid bracket back toward engine as far as possible.

Continue pushing on solenoid bracket in a clockwise direction while tightening mounting screws.

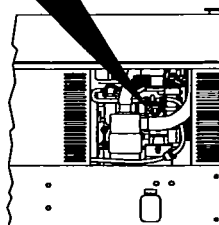
- 4 Shutdown Lever
- 5 Stop screw
- 6 Stop Screw Jam Nut
- 7 Fuel Solenoid Jam Nut
- 8 Plunger

☞ Stop screw is factory-set and should not be adjusted.

Hold throttle solenoid in idle (energized) position. If shutdown lever is touching or within 1/16 in of stop screw, fuel solenoid is properly adjusted.

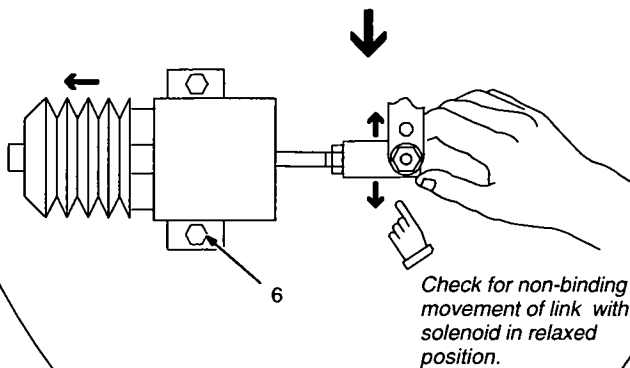
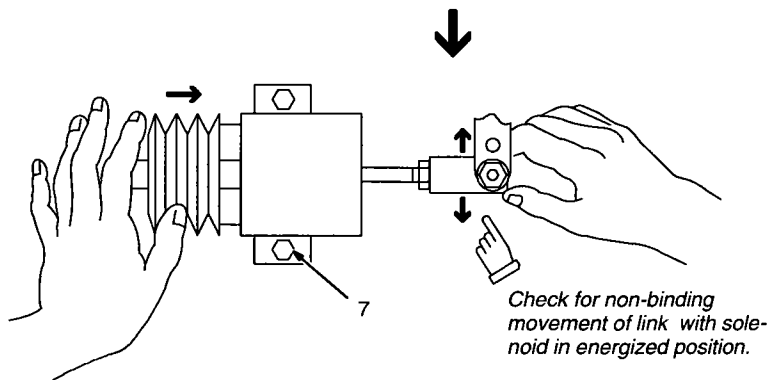
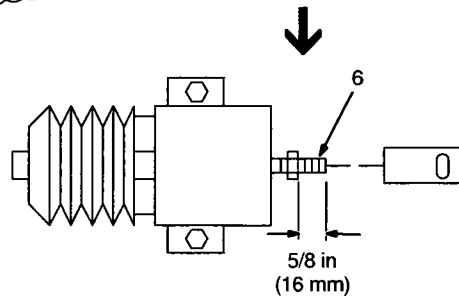
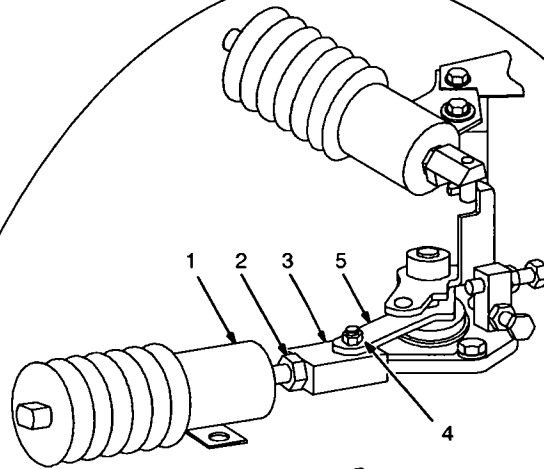
If lever is more than 1/16 in. from stop screw, check for clearance between jam nut and fuel solenoid. If there is clearance between jam nut and solenoid, loosen nut and turn plunger clockwise until lever touches stop screw. Retighten nut.

If there is no clearance between jam nut and solenoid, loosen the solenoid mounting screws and reposition the solenoid as described at the beginning of this section.



Ref. 801 961 / 802 649

B. Checking Throttle Solenoid



▲ Stop engine.

If the engine does not stay at idle speed, verify the the throttle solenoid and linkage is installed properly.

Adjusting Throttle Solenoid

- 1 Throttle Solenoid
- 2 Jam Nut
- 3 Solenoid Link
- 4 Shoulder Bolt
- 5 Throttle Lever
- 6 Solenoid Rod
- 7 Throttle Solenoid Mounting Screw

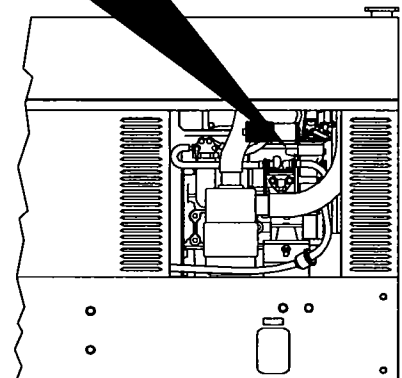
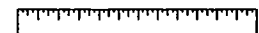
Loosen jam nut, remove shoulder bolt, and remove link from throttle lever. Install link 5/8 in (16 mm) on solenoid rod. Reconnect link to shoulder bolt and throttle lever.

Push solenoid rod into idle (energized) position and check for non-binding lateral movement of throttle link at throttle lever. If link binds, loosen solenoid mounting screws. Move the solenoid slightly until the link moves freely with solenoid in **relaxed and energized** positions. Tighten screws.

Tighten jam nut.

Go to Step C.

Tools Needed:



C. Making Engine Speed Adjustments



	2450 ± 100 rpm
	3750 Max

Before adjusting engine speed, verify throttle solenoid is installed properly (see Section B on previous page).

Check engine speeds with a tachometer (see table). If necessary, adjust speeds as follows:

Start engine and run until warm. Turn A/V control to max.

Adjusting Idle Speed

Turn Engine Control switch to Run/Idle position.

- 1 Throttle Solenoid
- 2 Idle Speed Jam Nut
- 3 Plunger
- 4 Throttle Link
- 5 Throttle Lever

Loosen jam nut. While holding throttle link with a 3/8 in wrench, turn plunger clockwise to increase idle speed or counter-clockwise to decrease idle speed.

After adjusting idle speed, verify the throttle link is parallel with the throttle lever. If necessary, loosen the idle speed jam nut and reposition the throttle link.

Do not twist solenoid boot while adjusting engine speed.

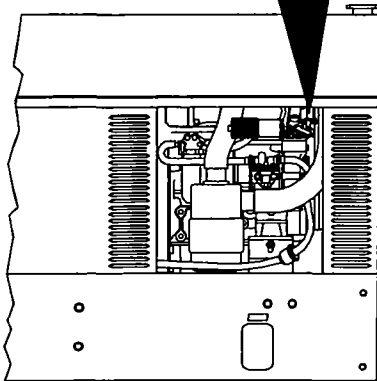
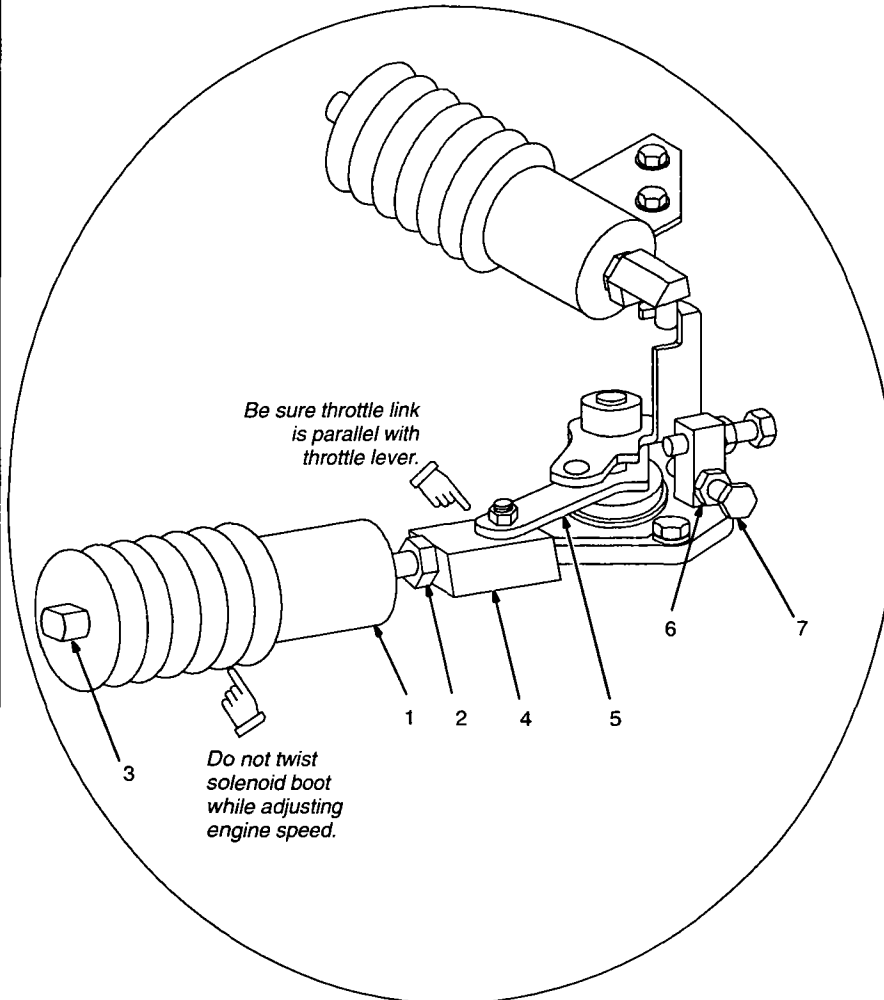
Tighten jam nut.

Adjusting Weld/Power Speed

Start engine and run until warm. Turn A/V control to max.

- 6 Weld Speed Jam Nut
- 7 Adjustment Screw

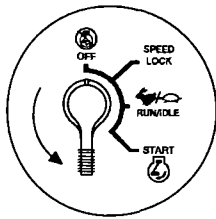
Turn Engine Control switch to Run position. Loosen nut and turn screw counter-clockwise to increase speed. Turn screw clockwise to decrease speed. Tighten nut.



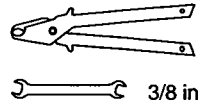
Tools Needed:
 3/8, 7/16 in
10, 14 mm

Ref. 801 961 / 801 963

7-8. Overload Protection



Tools Needed:



▲ Stop engine.

When a circuit breaker or fuse opens, it usually indicates a more serious problem exists. Contact a Factory Authorized Service Agent.

1 Circuit Breaker CB5

CB5 protects the 24 volt ac output to Remote receptacle RC4. If CB5 opens, 24 volt ac output to RC4 stops.

Press button to reset breaker.

2 Fuse F2 (See Parts List)

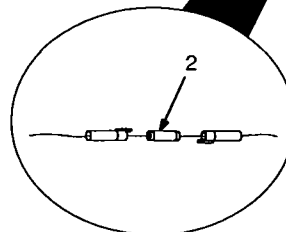
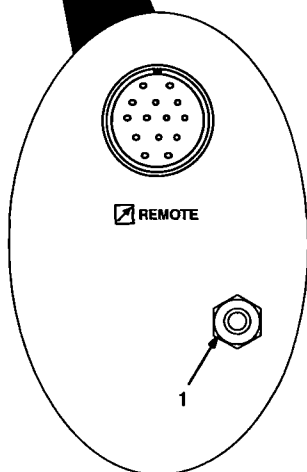
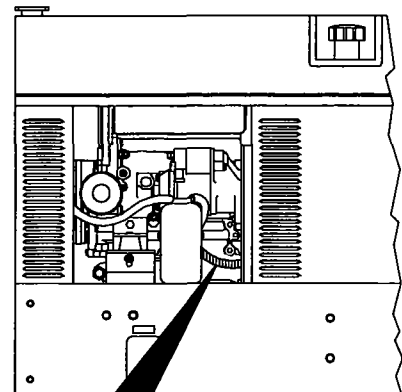
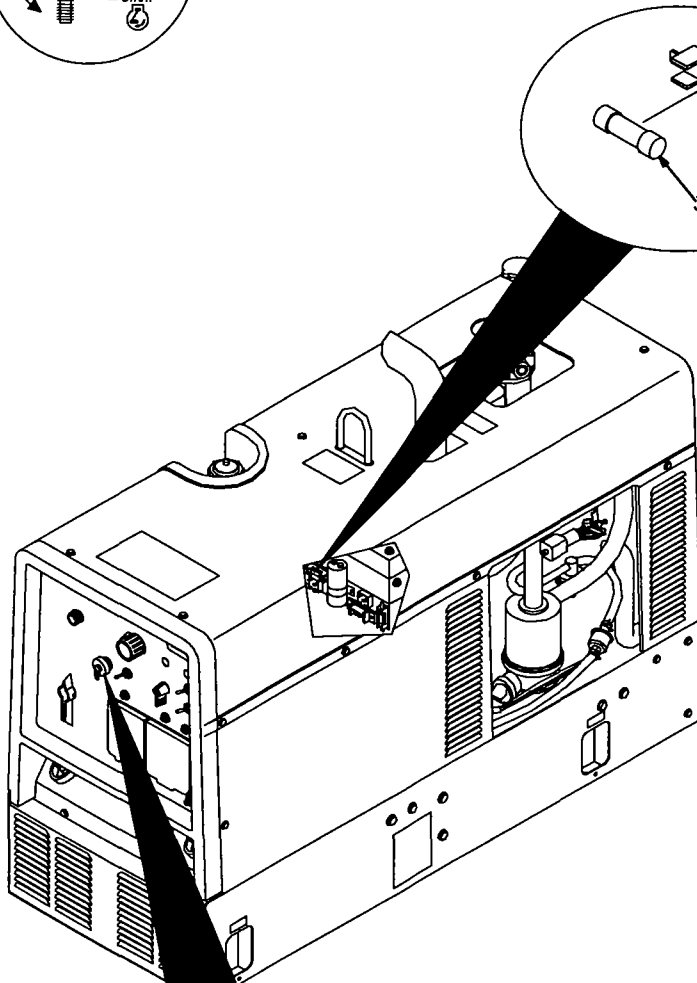
F2 protects the engine wiring system from overload. If F2 opens, the engine will not crank.

3 Fuse F1 (See Parts List)

Remove side panel.

F1 protects the exciter excitation winding from overload. If F1 opens, weld and auxiliary power output stops.

Replace any open fuses. Reinstall cover before operating unit.



SECTION 8 – TROUBLESHOOTING

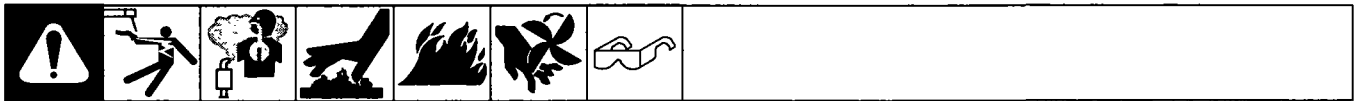
8-1. Welding Troubleshooting



Trouble	Remedy
No weld output.	Check control settings.
	Check weld connections.
	Disconnect equipment from auxiliary power receptacles during start-up.
	Place V/A Adjust switch in Panel position, or move switch to Remote position and connect remote control to Remote receptacle RC4 (see Sections 4-9 and 5-1).
	Check and secure connections to Remote receptacle RC4 (see Sections 4-9).
	Check fuse F1, and replace if necessary (see Section 7-8).
	Have Factory Authorized Service Agent check brushes, slip rings, integrated rectifier SR2, and circuit boards PC1 and PC2.
Low weld output.	Check control settings.
	Place V/A Adjust switch in Panel position, or move switch to Remote position and connect remote control to Remote receptacle RC4 (see Sections 4-9 and 5-1).
	Check and clean air cleaner as necessary (see Section 7-3).
	Check engine speed, and adjust if necessary (see Section 7-7).
	Have Factory Authorized Service Agent check brushes, slip rings, integrated rectifier SR2, and circuit boards PC1 and PC2.
	See engine manual.
High weld output.	Check control settings.
	Check and adjust engine speed (see Section 7-7).
	Check for obstructed movement of solenoid linkage (see Section 7-7).
	Have Factory Authorized Service Agent check circuit boards PC1 and PC2.
Weld output cannot be adjusted.	Check position of V/A Adjust switch (see Section 5-1).
	Have Factory Authorized Service Agent check field current control board PC2.
Erratic weld output.	Check control settings.
	Clean and tighten connections both inside and outside unit.
	Check and secure lead connections to A/V control.
	Be sure connection to work piece is clean and tight.
	Remove excessive coils from weld cables.
	Use dry, properly stored electrodes.
	Check and adjust engine speed (see Section 7-7).
	Have Factory Authorized Service Agent check brushes, slip rings, and circuit boards PC1 and PC2.
No remote fine amperage control.	Place V/A Adjust switch in correct position (see Section 5-1).
	Check and tighten connections to Remote receptacle RC4 (see Section 4-9).
No power output at Remote receptacle RC4.	Reset circuit breaker CB5 (see Section 7-8).

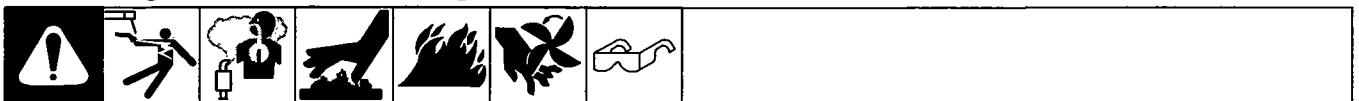
Trouble	Remedy
Lack of high frequency; difficulty in establishing Gas Tungsten Arc Welding arc.	Use proper size tungsten for welding amperage.
	Reduce leakage of high frequency from torch or work cable (check grounding, remove excessive coils from weld cables, use shorter weld cables, etc.).
	Check cables and torch for cracked or deteriorated insulation or bad connections. Repair or replace necessary parts.
Wandering arc – poor control of arc direction.	Reduce gas flow rate.
	Select proper size tungsten. Properly prepare tungsten.
Tungsten electrode oxidizing and not remaining bright after conclusion of weld.	Shield weld zone from drafts.
	Increase postflow time.
	Check and tighten all gas fittings.
	Properly prepare tungsten.

8-2. Auxiliary Power Troubleshooting



Trouble	Remedy
No power output.	Reset circuit breakers CB1, CB3 and/or CB4 (see Section 6-1).
	Check fuse F1, and replace if necessary (see Section 7-8).
	Have Factory Authorized Service Agent check brushes, slip rings, integrated rectifier SR2, and circuit boards PC1 and PC2.
Low power output.	Check and clean air cleaner as necessary (see Section 7-3).
	Check engine speed, and adjust if necessary (see Section 7-7).
	See engine manual.
High power output.	Check engine speed, and adjust if necessary (see Section 7-7).
Erratic power output.	Have Factory Authorized Service Agent check brushes, slip rings, and field current control board PC2.
	Check receptacle wiring and connections.
	Check governor according to engine manual.

8-3. Engine Troubleshooting

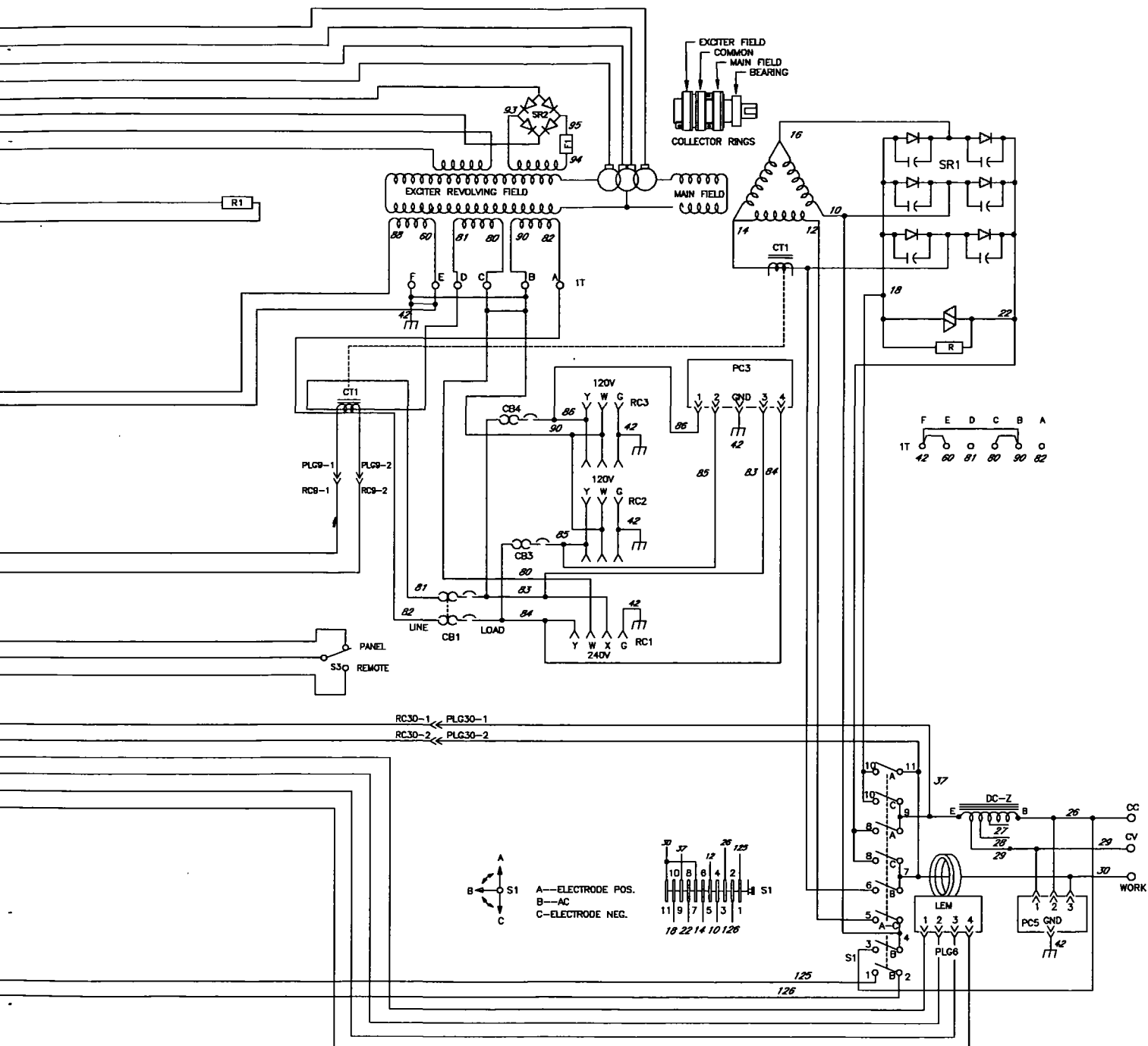


Trouble	Remedy
Engine will not crank.	Check fuse F2, and replace if open (see Section 7-8).
	Check battery voltage.
	Check battery connections and tighten if necessary.
	Check plug PLG5 and plug PLG8 connections.
	Have Factory Authorized Service Agent check Engine Control switch S2.
Engine does not start.	Check fuel level (see Section 4-2).
	Open fuel valve (see Section 4-2).

Trouble	Remedy
	Service primary and secondary fuel filters (see Section 7-6).
	Check battery and replace if necessary.
	Check engine charging system according to engine manual.
	Bleed air from fuel system according to engine manual.
	Check fuel solenoid according to engine manual.
	Have Factory Authorized Service Agent check glow Plug switch S6, glow plug, and control relay CR3.
Engine starts but stops when Engine Control switch returns to Run/Idle position.	Check oil level (see Section 4-2). Engine will not start if oil pressure is too low.
	Check coolant level and fan belt (see Section 4-2 and engine manual). Engine will not start if engine temperature is too high.
	Check and refill crankcase with proper viscosity oil for operating temperature, if necessary (see Section 7-1).
	Have Factory Authorized Service Agent check low oil pressure shutdown switch S5 and engine temperature switch S4.
Engine does not stop.	Stop engine by closing fuel valve (see Section 4-2). Adjust shutdown solenoid (see Section 7-7).
Engine stopped during normal operation.	Check fuel level (see Section 4-2).
	Open fuel valve (see Section 4-2).
	Check oil level (see Section 4-2). Engine stops if oil pressure is too low.
	Check coolant level and fan belt (see Section 4-2 and engine manual). Engine stops if engine temperature is too high.
	Bleed air from fuel system according to engine manual.
	Have Factory Authorized Service Agent check low oil pressure shutdown switch S5 and engine temperature switch S4.
Battery discharges between uses.	Clean top of battery with baking soda and water solution; rinse with clear water.
	Periodically recharge battery (approximately every 3 months).
	Replace battery.
	Check voltage regulator according to engine manual.
Engine does not return to idle speed when load is removed with Engine Control switch in Run/Idle position.	Remove all weld and auxiliary power loads.
	Place Process/Contactor switch in Electrode Hot position or turn off remote contactor. The unit will not return to idle speed when Process/Contactor switch is in a remote position and the remote contactor is on.
	Turn off remote device connected to Remote 14 receptacle RC4 (see Section 4-9).
	Check for obstructed movement of solenoid linkage (see Section 7-7).
	Have Factory Authorized Service Agent check control relay CR2, current transformer CT1, throttle solenoid TS1, control board PC1, and power board PC1.
Engine does not remain at weld/power speed when power or weld load is applied with Engine Control switch in Run/Idle position.	Check for obstructed movement of solenoid linkage (see Section 7-7).
	Have Factory Authorized Service Agent check control relay CR2, current transformer CT1, throttle solenoid TS1, control board PC1, and power board PC1.
Engine does not remain at idle speed with Engine Control switch in Speed Lock position and Speed Lock switch in Idle position.	Check for obstructed movement of solenoid linkage (see Section 7-7).
	Have Factory Authorized Service Agent check control relay CR2, Idle Lock switch S7, throttle solenoid TS1, power board PC1, and control board PC2.

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

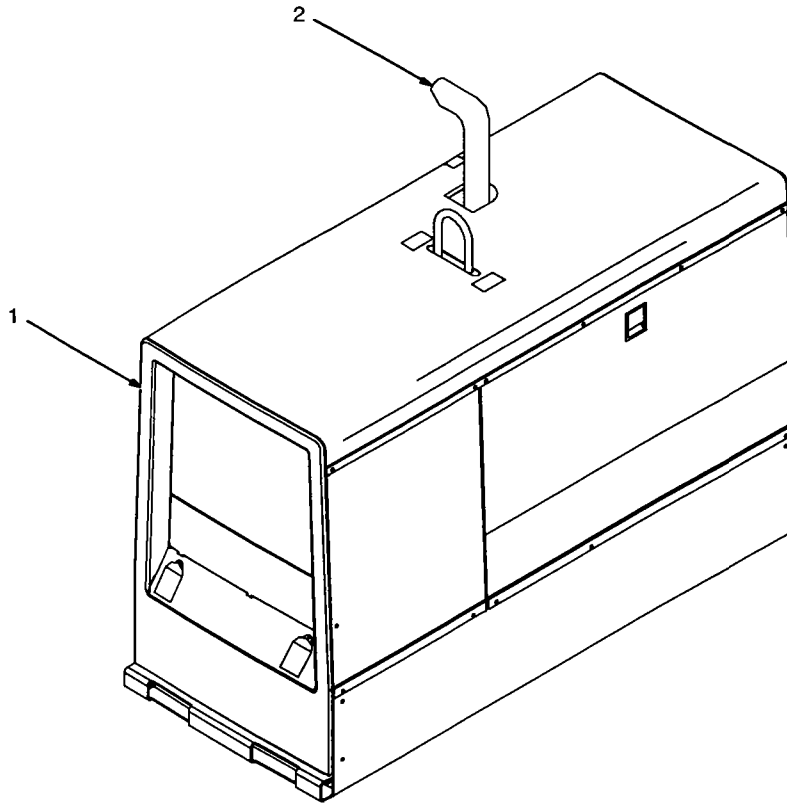




SECTION 10 – RUN-IN PROCEDURE

run_in1 8/01

10-1. Wetstacking



▲ Do not perform run-in procedure at less than 20 volts weld output and do not exceed duty cycle or equipment damage may occur.

1 Welding Generator

Run diesel engines near rated voltage and current during run-in period to properly seat piston rings and prevent wetstacking. See nameplate, rating label, or specifications section in this manual to find rated voltage and current.

☞ Do not idle engine longer than necessary. Piston rings seat faster if engine runs at weld/power rpm, and the welding generator is kept loaded during run-in.

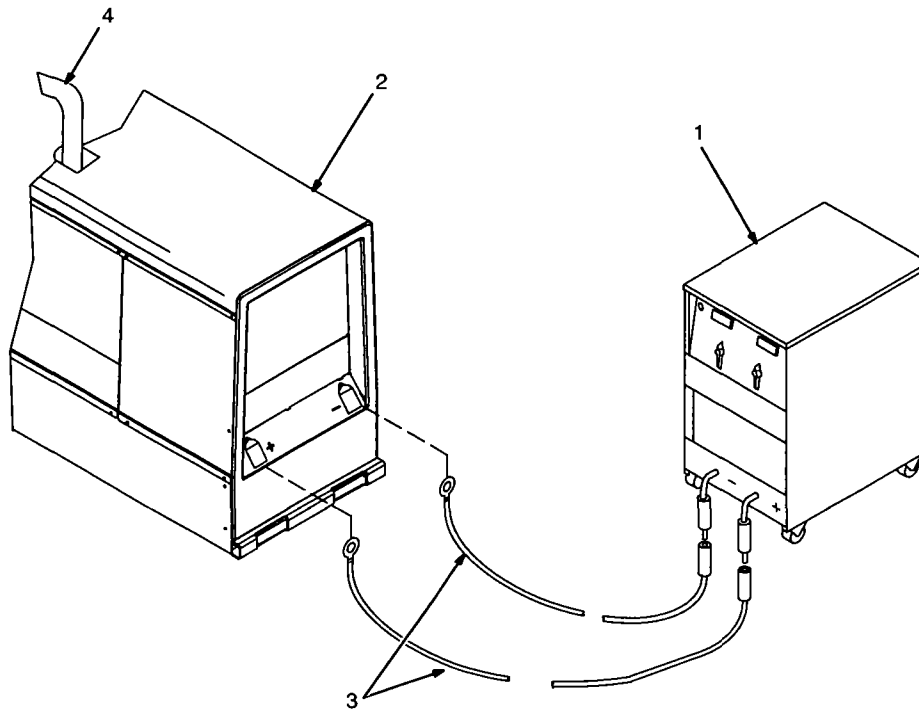
2 Engine Exhaust Pipe

Wetstacking is unburned fuel and oil in the exhaust pipe and occurs during run-in if the engine is run too long at light load or idle rpm.

If exhaust pipe is coated with a wet, black, tar-like substance, dry the engine using one of the following run-in procedures.

See the engine manual for additional engine run-in information.

10-2. Run-In Procedure Using Load Bank



- ▲ Stop engine.
- ▲ Do not touch hot exhaust pipe, engine parts, or load bank/grid.
- ▲ Keep exhaust and pipe away from flammables.
- ▲ Do not perform run-in procedure at less than 20 volts weld output and do not exceed duty cycle or equipment damage may occur.

1 Load Bank

Turn all load bank switches Off. If needed, connect load bank to 115 volts ac wall receptacle or generator auxiliary power receptacle.

2 Welding Generator

Place A/V range switch in maximum position, A/V control in minimum position, and Output Selector switch (if present) in either DC position.

3 Weld Cables

Connect load bank to generator weld output terminals using proper size weld cables with correct connectors. Observe correct polarity.

Start engine and run for several minutes.

Set load bank switches and then adjust generator A/V control so load equals rated voltage and current of generator (see nameplate, rating label, or the specifications section in this manual).

Check generator and load bank meters after first five minutes then every fifteen minutes to be sure generator is loaded properly.

☞ Check oil level frequently during run-in; add oil if needed.

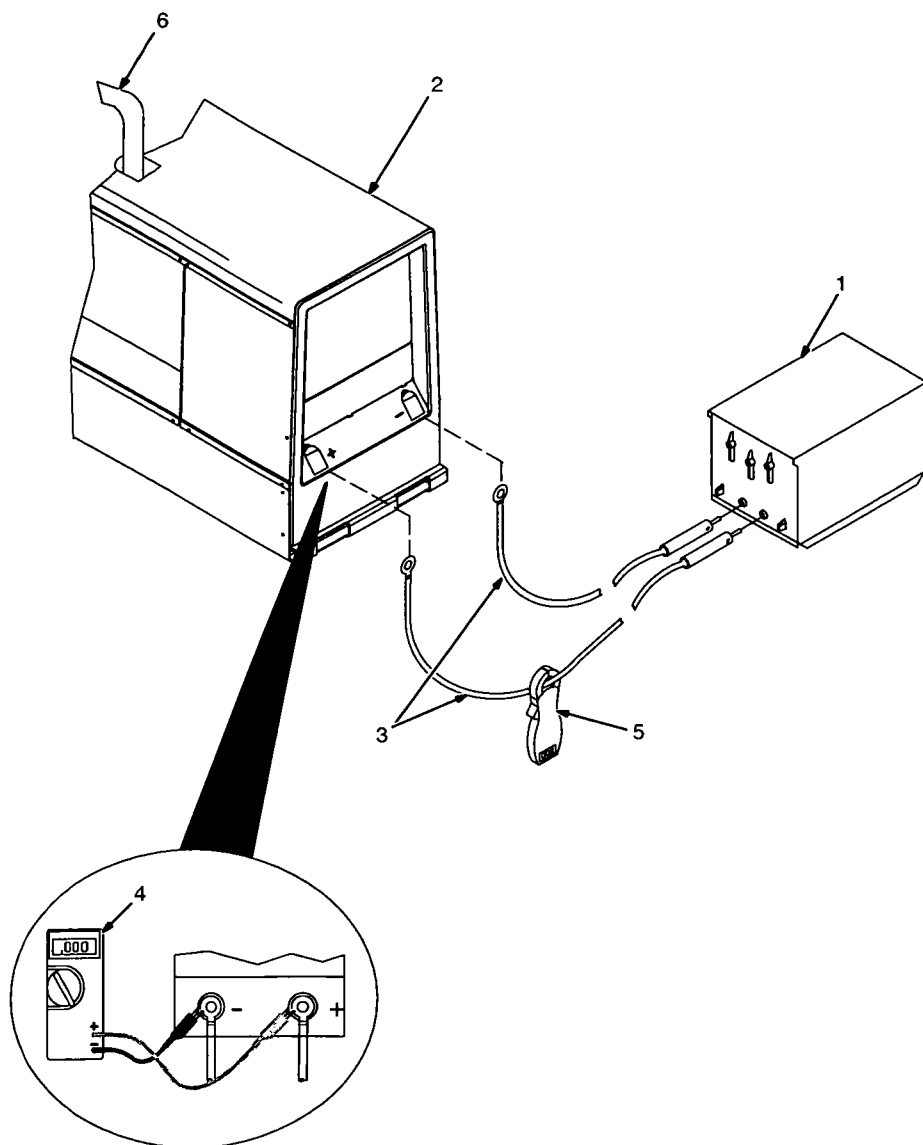
After one hour (minimum) place A/V control in minimum position, then turn off load bank to remove load. Run engine several minutes at no load.

▲ Stop engine and let cool.

4 Engine Exhaust Pipe

Repeat procedure if wetstacking is present.

10-3. Run-In Procedure Using Resistance Grid



- ▲ Stop engine.
- ▲ Do not touch hot exhaust pipe, engine parts, or load bank/grid.
- ▲ Keep exhaust and pipe away from flammables.
- ▲ Do not perform run-in procedure at less than 20 volts weld output and do not exceed duty cycle or equipment damage may occur.

1 Resistance Grid

Use grid sized for generator rated output.

Turn Off grid.

2 Welding Generator

Place A/V range switch in maximum position, A/V control in minimum position, and Output Selector switch (if present) in either DC position.

3 Weld Cables

Connect grid to generator weld output terminals using proper size weld cables with correct connectors (polarity is not important).

4 Voltmeter

5 Clamp-On Ammeter

Connect voltmeter and ammeter as shown, if not provided on generator. Start engine and run for several minutes.

Set grid switches and then adjust generator A/V control so load equals rated voltage and current of the generator (see nameplate, rating label, or the specifications section in this manual).

Check generator and meters after first five minutes then every fifteen minutes to be sure generator is loaded properly.

☞ Check oil level frequently during run-in; add oil if needed.

After one hour (minimum), place A/V control in minimum position, then shut down grid to remove load. Run engine several minutes at no load.

▲ Stop engine and let cool.

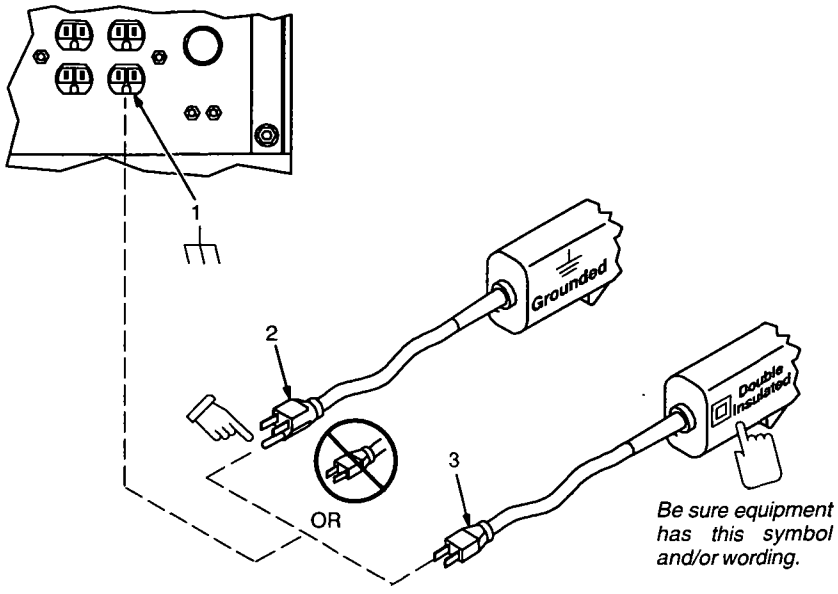
6 Engine Exhaust Pipe

Repeat procedure if wetstacking is present.

SECTION 11 – AUXILIARY POWER GUIDELINES

11-1. Selecting Equipment



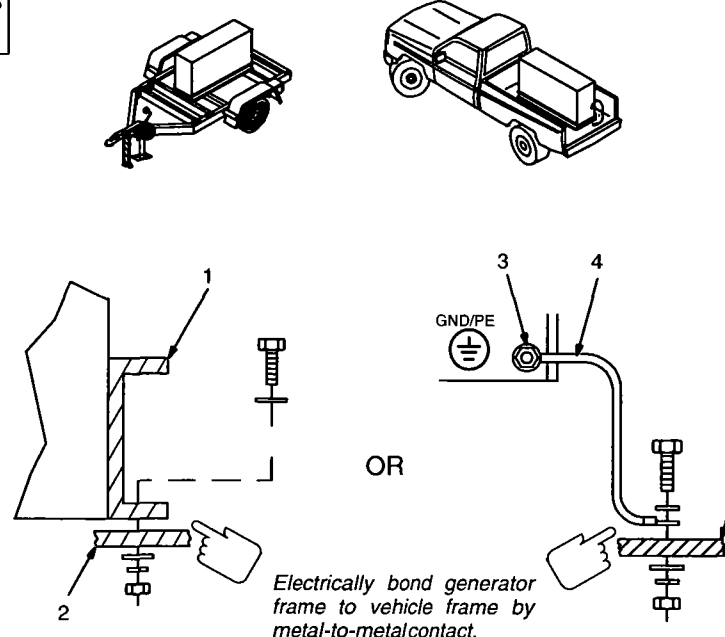


- 1 Auxiliary Power Receptacles – Neutral Bonded To Frame
- 2 3-Prong Plug From Case Grounded Equipment
- 3 2-Prong Plug From Double Insulated Equipment

aux_pwr 4/01 – Ref. ST-159 730 / ST-800 577

11-2. Grounding Generator To Truck Or Trailer Frame





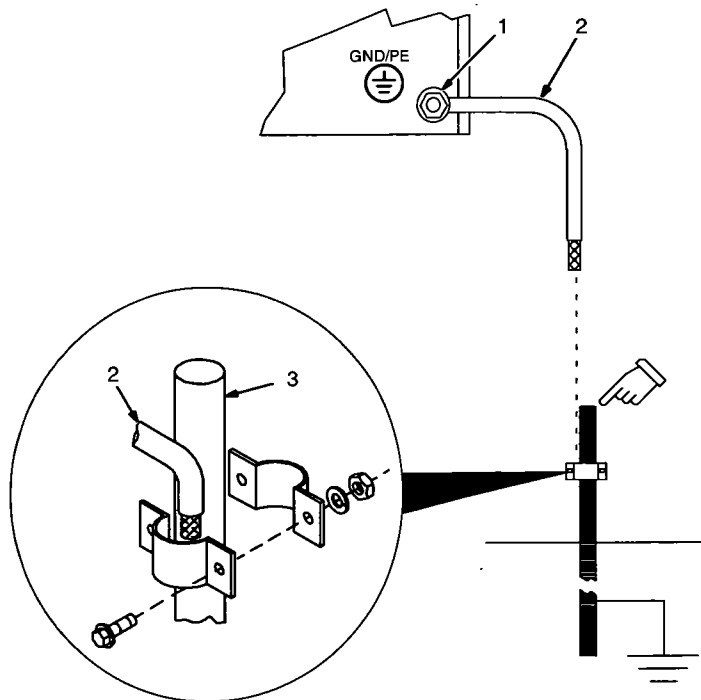
- 1 Generator Base
- 2 Metal Vehicle Frame
- 3 Equipment Grounding Terminal
- 4 Grounding Cable

Use #10 AWG or larger insulated copper wire.

▲ If unit does not have GFCI receptacles, use GFCI-protected extension cord.

S-0854

11-3. Grounding When Supplying Building Systems

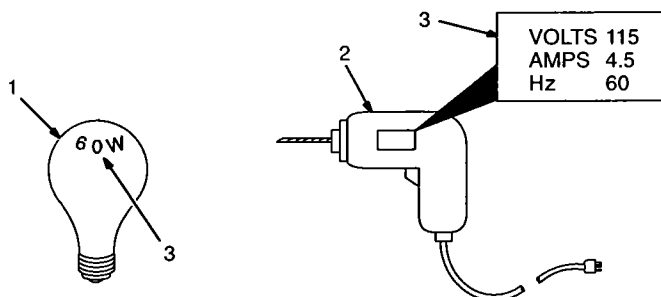


- 1 Equipment Grounding Terminal
 - 2 Grounding Cable
Use #10 AWG or larger insulated copper wire.
 - 3 Ground Device
- ▲ Ground generator to system earth ground if supplying power to a premises (home, shop, farm) wiring system.

Use ground device as stated in electrical codes.

ST-800 576-B

11-4. How Much Power Does Equipment Require?



- 1 Resistive Load
A light bulb is a resistive load and requires a constant amount of power.
- 2 Non-Resistive Load
Equipment with a motor is a non-resistive load and requires approximately six times more power while starting the motor than when running (see Section 11-8).
- 3 Rating Data
Rating shows volts and amperes, or watts required to run equipment.

$$\text{AMPERES} \times \text{VOLTS} = \text{WATTS}$$

EXAMPLE 1: If a drill uses 4.5 amperes at 115 volts, calculate its running power requirement in watts.

$$4.5 \text{ A} \times 115 \text{ V} = 520 \text{ W}$$

The load applied by the drill is 520 watts.

EXAMPLE 2: If three 200 watt flood lamps are used with the drill from Example 1, add the individual loads to calculate total load.

$$(200 \text{ W} + 200 \text{ W} + 200 \text{ W}) + 520 \text{ W} = 1120 \text{ W}$$

The total load applied by the three flood lamps and drill is 1120 watts.

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11-5. Approximate Power Requirements For Industrial Motors

Industrial Motors	Rating	Starting Watts	Running Watts
Split Phase	1/8 HP	800	300
	1/6 HP	1225	500
	1/4 HP	1600	600
	1/3 HP	2100	700
	1/2 HP	3175	875
Capacitor Start-Induction Run	1/3 HP	2020	720
	1/2 HP	3075	975
	3/4 HP	4500	1400
	1 HP	6100	1600
	1-1/2 HP	8200	2200
	2 HP	10550	2850
	3 HP	15900	3900
	5 HP	23300	6800
Capacitor Start-Capacitor Run	1-1/2 HP	8100	2000
	5 HP	23300	6000
	7-1/2 HP	35000	8000
	10 HP	46700	10700
Fan Duty	1/8 HP	1000	400
	1/6 HP	1400	550
	1/4 HP	1850	650
	1/3 HP	2400	800
	1/2 HP	3500	1100

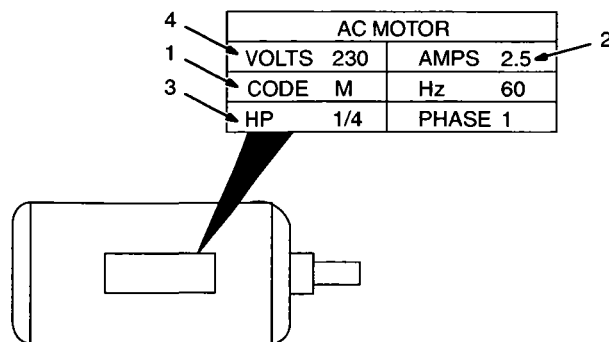
11-6. Approximate Power Requirements For Farm/Home Equipment

Farm/Home Equipment	Rating	Starting Watts	Running Watts
Stock Tank De-Icer		1000	1000
Grain Cleaner	1/4 HP	1650	650
Portable Conveyor	1/2 HP	3400	1000
Grain Elevator	3/4 HP	4400	1400
Milk Cooler		2900	1100
Milker (Vacuum Pump)	2 HP	10500	2800
FARM DUTY MOTORS	1/3 HP	1720	720
Std. (e.g. Conveyors,	1/2 HP	2575	975
Feed Augers, Air	3/4 HP	4500	1400
Compressors)	1 HP	6100	1600
	1-1/2 HP	8200	2200
	2 HP	10550	2850
	3 HP	15900	3900
	5 HP	23300	6800
High Torque (e.g. Barn	1-1/2 HP	8100	2000
Cleaners, Silo Unloaders,	5 HP	23300	6000
Silo Hoists, Bunk Feeders)	7-1/2 HP	35000	8000
	10 HP	46700	10700
3-1/2 cu. ft. Mixer	1/2 HP	3300	1000
High Pressure 1.8 Gal/Min	500 PSI	3150	950
Washer 2 gal/min	550 PSI	4500	1400
2 gal/min	700 PSI	6100	1600
Refrigerator or Freezer		3100	800
Shallow Well Pump	1/3 HP	2150	750
	1/2 HP	3100	1000
Sump Pump	1/3 HP	2100	800
	1/2 HP	3200	1050

11-7. Approximate Power Requirements For Contractor Equipment

Contractor	Rating	Starting Watts	Running Watts
Hand Drill	1/4 in	350	350
	3/8 in	400	400
	1/2 in	600	600
Circular Saw	6-1/2 in	500	500
	7-1/4 in	900	900
	8-1/4 in	1400	1400
Table Saw	9 in	4500	1500
	10 in	6300	1800
Band Saw	14 in	2500	1100
Bench Grinder	6 in	1720	720
	8 in	3900	1400
	10 in	5200	1600
Air Compressor	1/2 HP	3000	1000
	1 HP	6000	1500
	1-1/2 HP	8200	2200
	2 HP	10500	2800
Electric Chain Saw	1-1/2 HP, 12 in	1100	1100
	2 HP, 14 in	1100	1100
Electric Trimmer	Standard 9 in	350	350
	Heavy Duty 12 in	500	500
Electric Cultivator	1/3 HP	2100	700
Elec. Hedge Trimmer	18 in	400	400
Flood Lights	HID	125	100
	Metal Halide	313	250
	Mercury	1000	
	Sodium	1400	
	Vapor	1250	1000
Submersible Pump	400 gph	600	200
Centrifugal Pump	900 gph	900	500
Floor Polisher	3/4 HP, 16 in	4500	1400
	1 HP, 20 in	6100	1600
High Pressure Washer	1/2 HP	3150	950
	3/4 HP	4500	1400
	1 HP	6100	1600
55 gal Drum Mixer	1/4 HP	1900	700
Wet & Dry Vac	1.7 HP	900	900
	2-1/2 HP	1300	1300

11-8. Power Required To Start Motor



- 1 Motor Start Code
- 2 Running Amperage
- 3 Motor HP
- 4 Motor Voltage

To find starting amperage:

Step 1: Find code and use table to find kVA/HP. If code is not listed, multiply running amperage by six to find starting amperage.

Step 2: Find Motor HP and Volts.

Step 3: Determine starting amperage (see example).

Welding generator amperage output must be at least twice the motor's running amperage.

Single-Phase Induction Motor Starting Requirements

Motor Start Code	G	H	J	K	L	M	N	P
KVA/HP	6.3	7.1	8.0	9.0	10.0	11.2	12.5	14.0

$$\frac{\text{kVA/HP} \times \text{HP} \times 1000}{\text{VOLTS}} = \text{STARTING AMPERAGE}$$

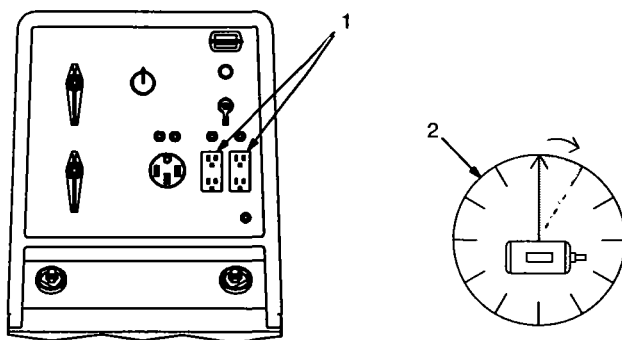
EXAMPLE: Calculate the starting amperage required for a 230 V, 1/4 HP motor with a motor start code of M.

Volts = 230 HP = 1/4 Using Table, Code M results in kVA/HP = 11.2

$$\frac{11.2 \times 1/4 \times 1000}{230} = 12.2 \text{ A} \quad \text{Starting the motor requires 12.2 amperes.}$$

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11-9. How Much Power Can Generator Supply?



- 1 Limit Load To 90% Of Generator Output

Always start non-resistive (motor) loads in order from largest to smallest, and add resistive loads last.

- 2 5 Second Rule

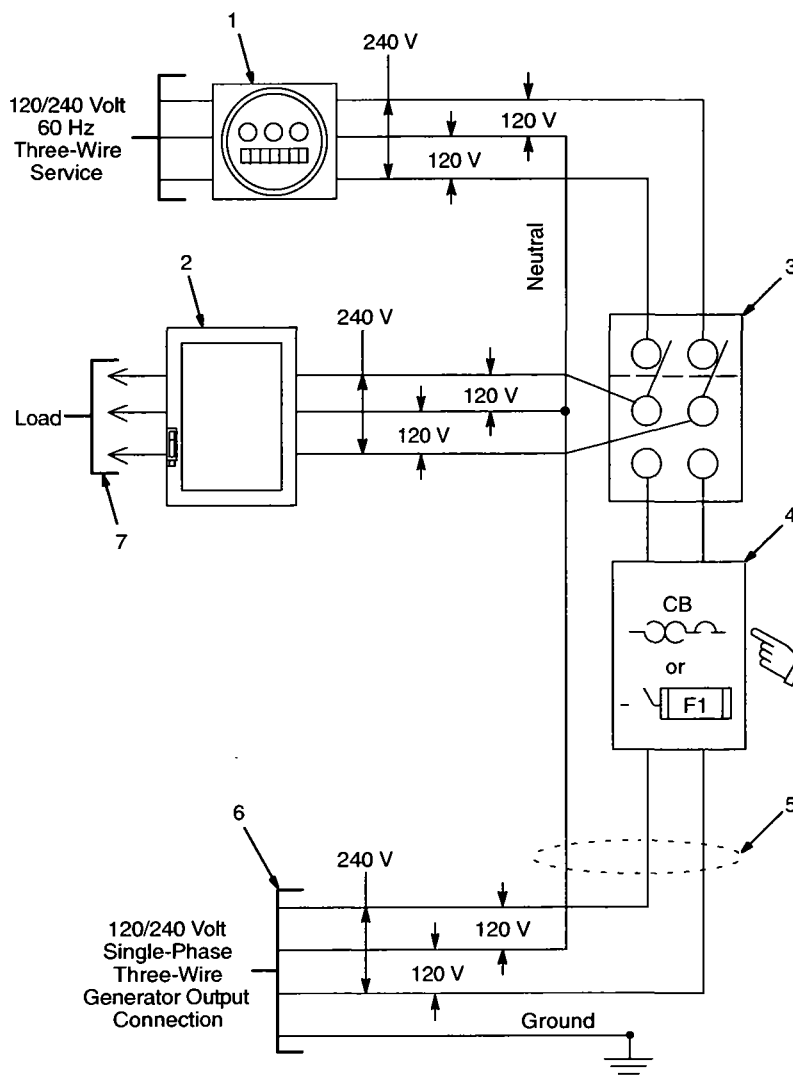
If motor does not start within 5 seconds, turn off power to prevent motor damage. Motor requires more power than generator can supply.

Ref. ST-800 396-A / S-0625

11-10. Typical Connections To Supply Standby Power



Customer-supplied equipment is required if generator is to supply standby power during emergencies or power outages.



▲ Have only qualified persons perform these connections according to all applicable codes and safety practices.

- 1 Power Company Service Meter
- 2 Main and Branch Overcurrent Protection
- 3 Double-Pole, Double-Throw Transfer Switch

Obtain and install correct switch. Switch rating must be same as or greater than the branch overcurrent protection.

- 4 Circuit Breakers or Fused Disconnect Switch

Obtain and install correct circuit breakers or switch.

- 5 Extension Cord

Select as shown in Section 11-11.

- 6 Generator Connections

Connect terminals or plug of adequate amperage capacity to cord. Follow all applicable codes and safety practices.

Turn off or unplug all equipment connected to generator before starting or stopping engine. When starting or stopping, the engine has low speed which causes low voltage and frequency.

- 7 Load Connections

Item 4 is not necessary if circuit protection is already present in welding generator auxiliary power output circuit.

S-0405-A

11-11. Selecting Extension Cord (Use Shortest Cord Possible)



Cord Lengths for 120 Volt Loads

▲ If unit does not have GFCI receptacles, use GFCI-protected extension cord.

Current (Amperes)	Load (Watts)	Maximum Allowable Cord Length in ft (m) for Conductor Size (AWG)*					
		4	6	8	10	12	14
5	600			350 (106)	225 (68)	137 (42)	100 (30)
7	840		400 (122)	250 (76)	150 (46)	100 (30)	62 (19)
10	1200	400 (122)	275 (84)	175 (53)	112 (34)	62 (19)	50 (15)
15	1800	300 (91)	175 (53)	112 (34)	75 (23)	37 (11)	30 (9)
20	2400	225 (68)	137 (42)	87 (26)	50 (15)	30 (9)	
25	3000	175 (53)	112 (34)	62 (19)	37 (11)		
30	3600	150 (46)	87 (26)	50 (15)	37 (11)		
35	4200	125 (38)	75 (23)	50 (15)			
40	4800	112 (34)	62 (19)	37 (11)			
45	5400	100 (30)	62 (19)				
50	6000	87 (26)	50 (15)				

*Conductor size is based on maximum 2% voltage drop

Cord Lengths for 240 Volt Loads

▲ If unit does not have GFCI receptacles, use GFCI-protected extension cord.

Current (Amperes)	Load (Watts)	Maximum Allowable Cord Length in ft (m) for Conductor Size (AWG)*					
		4	6	8	10	12	14
5	1200			700 (213)	450 (137)	225 (84)	200 (61)
7	1680		800 (244)	500 (152)	300 (91)	200 (61)	125 (38)
10	2400	800 (244)	550 (168)	350 (107)	225 (69)	125 (38)	100 (31)
15	3600	600 (183)	350 (107)	225 (69)	150 (46)	75 (23)	60 (18)
20	4800	450 (137)	275 (84)	175 (53)	100 (31)	60 (18)	
25	6000	350 (107)	225 (69)	125 (38)	75 (23)		
30	7000	300 (91)	175 (53)	100 (31)	75 (23)		
35	8400	250 (76)	150 (46)	100 (31)			
40	9600	225 (69)	125 (38)	75 (23)			
45	10,800	200 (61)	125 (38)				
50	12,000	175 (53)	100 (31)				

*Conductor size is based on maximum 2% voltage drop



Owner's Record

Please complete and retain with your personal records.

Model Name

Serial/Style Number

Purchase Date

(Date which equipment was delivered to original customer.)

Distributor

Address

City

State

Zip



For Service

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

Always provide Model Name and Serial/Style Number.

Contact your Distributor for:

Welding Supplies and Consumables

Options and Accessories

Personal Safety Equipment

Service and Repair

Replacement Parts

Training (Schools, Videos, Books)

Technical Manuals (Servicing Information and Parts)

Circuit Diagrams

Welding Process Handbooks

Contact the Delivering Carrier for:

File a claim for loss or damage during shipment.

For assistance in filing or settling claims, contact your distributor and/or equipment manufacturer's Transportation Department.

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