



OM-4413

207 948D

July 2003

### Processes



MIG (GMAW) Welding



Flux Cored (FCAW) Welding



Stick (SMAW) Welding



TIG (GTAW) Welding



Air Plasma Cutting and Gouging  
with Spectrum<sup>®</sup> Unit



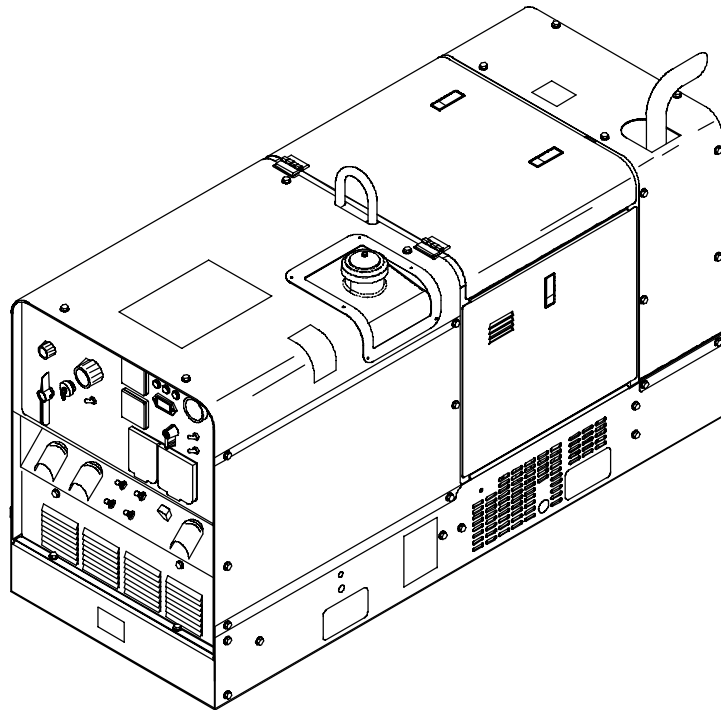
Air Carbon Arc (CAC-A) Cutting  
and Gouging

### Description



Engine Driven Welding Generator

# Trailblazer<sup>®</sup> Pro 350 D



## OWNER'S MANUAL



Visit our website at  
[www.MillerWelds.com](http://www.MillerWelds.com)

# From Miller to You

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

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

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

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

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



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

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

## CALIFORNIA

### Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and 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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
**▲ Warning: Protect yourself and others from injury — read and follow these precautions.**

## 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 1-6. Read and follow all Safety Standards.**

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

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



### ELECTRIC SHOCK can kill.

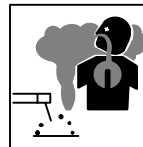
Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Additional safety precautions are required when any of the following electrically hazardous conditions are present: in damp locations or while wearing wet clothing; on metal structures such as floors, gratings, or scaffolds; when in cramped positions such as sitting, kneeling, or lying; or when there is a high risk of unavoidable or accidental contact with the workpiece or ground. For these conditions, use the following equipment in order presented: 1) a semiautomatic DC constant voltage (wire) welder, 2) a DC manual (stick) welder, or 3) an AC welder with reduced open-circuit voltage. In most situations, use of a DC, constant voltage wire welder is recommended. And, do not work alone!
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground — check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.

- When making input connections, attach proper grounding conductor first — double-check connections.
- 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 in inverters after stopping engine.

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



### FUMES AND GASES can be hazardous.

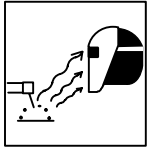
Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

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



### **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.



### **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.

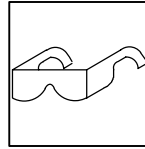


### **WELDING can cause fire or explosion.**

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.
- Follow requirements in OSHA 1910.252 (a) (2) (iv) and NFPA 51B for hot work and have a fire watcher and extinguisher nearby.



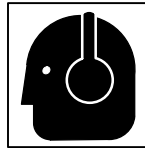
### **FLYING METAL can injure eyes.**

- 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.



### **HOT PARTS can cause severe burns.**

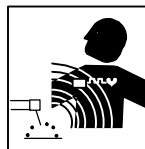
- Allow cooling period before maintaining.
- Wear protective gloves and clothing when working on a hot engine.
- Do not touch hot engine parts or just-welded parts bare-handed.



### **NOISE can damage hearing.**

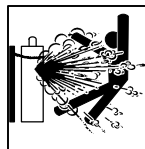
Noise from some processes or equipment can damage hearing.

- 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.

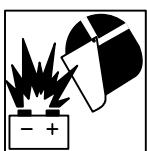


### **CYLINDERS can explode if damaged.**

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.

## **1-3. Engine Hazards**



### **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.



### **FUEL can cause fire or explosion.**

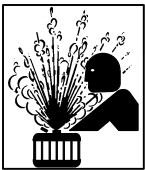
- Stop engine and let it cool off before checking or adding fuel.
- Do not add fuel while smoking or if unit is near any sparks or open flames.

- 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.
- Always keep nozzle in contact with tank when fueling.



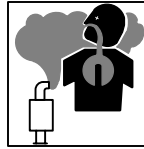
### MOVING PARTS can cause injury.

- 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.



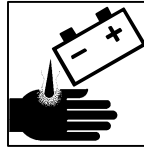
### STEAM AND HOT COOLANT can burn.

- 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.



### 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.



### BATTERY ACID can BURN SKIN and EYES.

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



### 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. Compressed Air Hazards



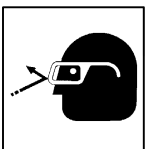
### BREATHING COMPRESSED AIR can cause serious injury or death.

- Do not use compressed air for breathing.
- Use only for cutting, gouging, and tools.



### HOT METAL from air arc cutting and gouging can cause fire or explosion.

- Do not cut or gouge near flammables.
- Watch for fire; keep extinguisher nearby.



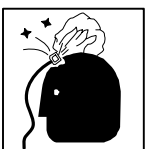
### COMPRESSED AIR can cause injury.

- Wear approved safety goggles.
- Do not direct air stream toward self or others.



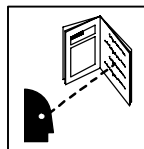
### HOT PARTS can cause burns and injury.

- Do not touch hot compressor or air system parts.
- Let system cool down before touching or servicing.



### TRAPPED AIR PRESSURE AND WHIPPING HOSES can cause injury.

- Release air pressure from tools and system before servicing, adding or changing attachments, or opening compressor oil drain or oil fill cap.



### READ INSTRUCTIONS.

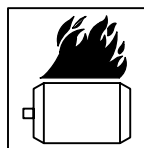
- Read Owner's Manual before using or servicing unit.
- Stop engine and release air pressure before servicing.

## 1-5. Additional Symbols For Installation, Operation, And Maintenance



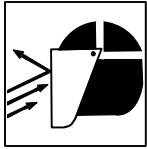
### FALLING UNIT can cause injury.

- 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.



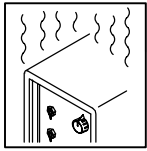
### OVERHEATING can damage motors.

- 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.



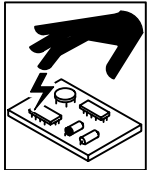
### FLYING SPARKS can cause injury.

- 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.



### 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.



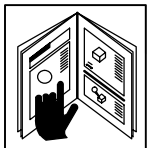
### STATIC (ESD) can damage PC boards.

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



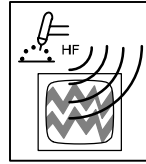
### TILTING OF TRAILER can cause injury.

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



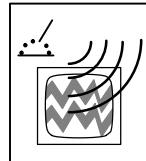
### READ INSTRUCTIONS.

- Use only genuine MILLER/Hobart replacement parts.
- Perform engine and air compressor (if applicable) maintenance and service according to this manual and the engine/air compressor (if applicable) manuals.



### 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 micro-processors, 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.

## 1-6. Principal Safety Standards

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

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

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

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

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

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

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

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

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

## 1-7. 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

rom\_10\_02fre

## ▲ Avertissement: Protégez vous et les autres des blessures – lisez et suivez ces précautions.

### 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.



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.

### 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.

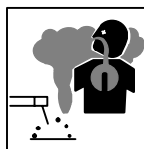
Un simple contact avec des pièces électriques peut provoquer une électrocution ou des blessures graves. L'électrode et le circuit de soudage sont sous tension dès que l'appareil est sur ON. Le circuit d'entrée et les circuits internes de l'appareil sont également sous tension à ce moment-là. En soudage 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 des 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.
- Des précautions de sécurité supplémentaires sont requises dans des environnements à risque comme: les endroits humides ou lorsque l'on porte des vêtements mouillés; sur des structures métalliques au sol, grillages et échafaudages; dans des positions assises, à genoux et allongées; ou quand il y a un risque important de contact accidentel avec la pièce ou le sol. Dans ces cas utiliser les appareils suivants dans l'ordre de préférence: 1) un poste à souder DC semi-automatique de type CV (MIG/MAG), 2) un poste à souder manuel (électrode enrobée) DC, 3) un poste à souder manuel AC avec tension à vide réduite. Dans la plupart des cas, un poste courant continu de type CV est recommandé. Et, ne pas travailler seul!
- Couper l'alimentation ou arrêter le moteur avant de procéder à l'installation, à la réparation ou à l'entretien de l'appareil. Déverrouiller l'alimentation selon la norme OSHA 29 CFR 1910.147 (voir normes de sécurité).
- Installer 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.
- N'utiliser qu'un matériel en bon état. Réparer ou remplacer sur-le-champ les pièces endommagées. Entretien 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 FUMÉES ET LES GAZ peuvent être dangereux.

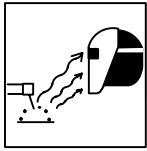
Le soudage génère des fumées et des gaz. Leur inhalation peut être dangereuse pour votre santé.

- 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.



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

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



### LES 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.



### 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 là 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 homologués.
- 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 le 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.

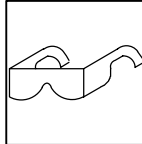
## 1-3. Engine Hazards



### 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.

- Suivre les recommandations dans OSHA 1910.252(a)(2)(iv) et NFPA 51B pour les travaux à chaud et avoir de la surveillance et un extincteur à proximité.



### DES 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.

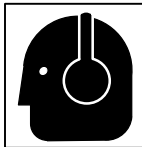
- Porter des lunettes de sécurité avec écrans latéraux ou un écran facial.



### 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.

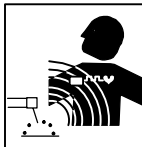
- Ne pas toucher à mains nues les parties chaudes du moteur ni les pièces récemment soudées.



### LE BRUIT peut affecter l'ouïe.

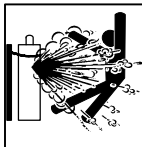
Le bruit des processus et des équipements peut affecter l'ouïe.

- Porter des protections approuvés 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.



### 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.



### 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.
- Eviter 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.



### 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 ORGANES MOBILES peuvent provoquer des blessures.

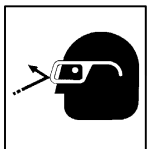
- Ne pas approcher les mains des ventilateurs, courroies et autres pièces en mouvement.
- Maintenir fermés et fixement en place les portes, panneaux, recouvrements et dispositifs de protection.
- Arrêter le moteur avant d'installer ou brancher l'appareil.
- Demander seulement à un personnel qualifié d'enlever les dispositifs de sécurité ou les recouvrements pour effectuer, s'il y a lieu, des travaux d'entretien et de dépannage.

## 1-4. Dangers liés à l'air comprimé



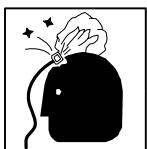
### RESPIRER L'AIR COMPRIMÉ peut provoquer des blessures graves ou causer la mort.

- Ne pas utiliser l'air comprimé pour respirer.
- Utiliser l'air comprimé seulement pour le coupage, gougeage et les outils pneumatiques.



### L'AIR COMPRIMÉ peut provoquer des blessures.

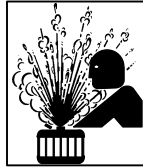
- Porter des lunettes de sécurité approuvées.
- Ne pas diriger le jet d'air vers d'autres ou soi-même.



### L'AIR COMPRIMÉ EMMAGASINE ET DES TUYAUX SOUS PRESSON peuvent provoquer des blessures.

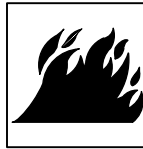
- Relâcher la pression d'air de l'outillage ou du système avant d'effectuer la maintenance, avant de changer ou de rajouter des éléments ou avant d'ouvrir la purge ou le bouchon de remplissage d'huile.

- 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.



### 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.



### 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.



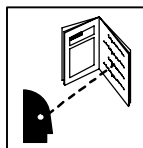
### Le METAL CHAUD lors du coupage et gougeage plasma peut provoquer un incendie ou une explosion.

- Ne pas couper ou gouger à proximité de produits inflammables.
- Surveillez et garder un extincteur à proximité.



### DES PIÈCES CHAUDES peuvent provoquer des brûlures et blessures.

- Ne pas toucher le compresseur ou d'autres éléments du circuit air comprimé chauds.
- Laisser l'ensemble se refroidir avant de toucher ou d'effectuer la maintenance.



### LIRE LES INSTRUCTIONS.

- Lisez le manuel d'instructions avant l'utilisation ou la maintenance de l'appareil.
- Arrêter le moteur et relâcher la pression avant d'effectuer la maintenance.

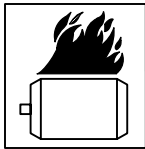
## 1-5. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance



### LA CHUTE DE L'APPAREIL peut blesser.

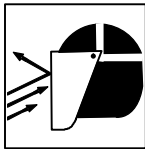
- Utiliser l'anneau de levage uniquement pour soulever l'appareil lui-même ; sans chariot, de bouteilles de gaz, remorque, ou autres accessoires.

- 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.



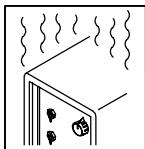
### LE SURCHAUFFEMENT peut endommager le moteur électrique.

- 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.



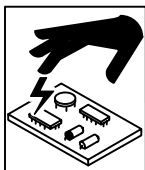
### LES ÉTINCELLES VOLANTES risquent de provoquer des blessures.

- 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.



### 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.



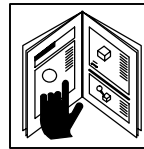
### LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

- 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.



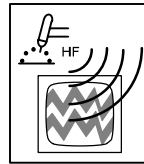
### UNE REMORQUE QUI BASCULE peut entraîner des blessures.

- 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.



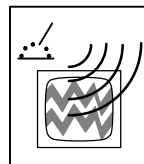
### LIRE LES INSTRUCTIONS.

- Utiliser seulement les pièces de rechange d'origine.
- Effectuer la maintenance du moteur et du compresseur (si applicable) suivant ce manuel et le manuel du moteur/compresseur (si applicable).



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

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



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

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

## 1-6. Principales normes de sécurité

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

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

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

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

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

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

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

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

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

## 1-7. Information sur les champs électromagnétiques

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

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

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

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

### Consignes relatives aux stimulateurs cardiaques :

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

# SECTION 2 – 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		High Temperature		Check Valve Clearance		Battery (Engine)
	Engine		Glow Plug	<b>A</b>	Amperes	<b>V</b>	Volts
	MIG (GMAW), Wire		Stick (SMAW)		TIG (GTAW)		Circuit Breaker
<b>CC</b>	Constant Current	<b>CV</b>	Constant Voltage		Electrode Positive		Electrode Negative
<b>+</b>	Positive	<b>—</b>	Negative		Alternating Current (AC)		Output
	Time	<b>h</b>	Hours	<b>s</b>	Seconds		Protective Earth (Ground)
	Do not switch while welding		Remote 14 Receptacle		Work Connection		Read Operator's Manual

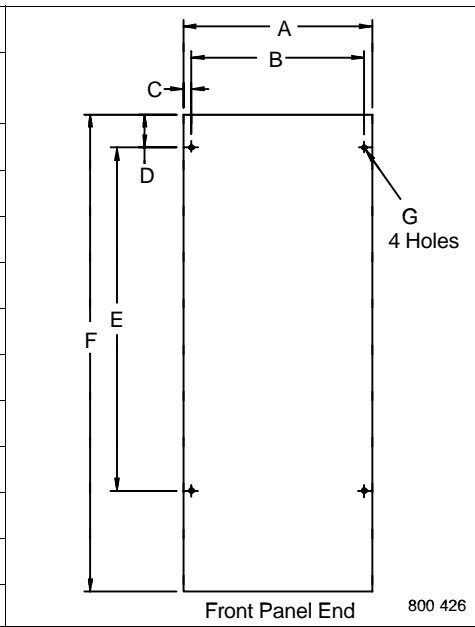
# SECTION 3 – SPECIFICATIONS

## 3-1. Weld, Power, And Engine Specifications

Welding Mode	Rated Welding Output At Weld Speed	Rated Welding Output At Idle Speed	Maximum Open-Circuit Voltage	Amperage Range In CC Mode	Voltage Range In CV Mode	Generator Power Rating	Fuel Capacity	Engine
CC/AC	200 A, 25 V, 60% Duty Cycle	—	75	35 – 250 A		<b>Continuous:</b> Single-Phase, 12 kVA/kW 100/50 A, 120/240 V AC, 60 Hz	13 gal (49 L) Tank	Kubota DH905 Water-Cooled, Three-Cylinder, Four-Cycle, 26 HP Diesel Engine
CC/DC	350 A, 28 V, 60% Duty Cycle	180 A, 28 V, 100% Duty Cycle	80	20 – 350 A				
CV/DC	300 A, 32 V, 100% Duty Cycle	—	50	—	10 – 34 V			

### 3-2. Dimensions, Weights, and Operating Angles

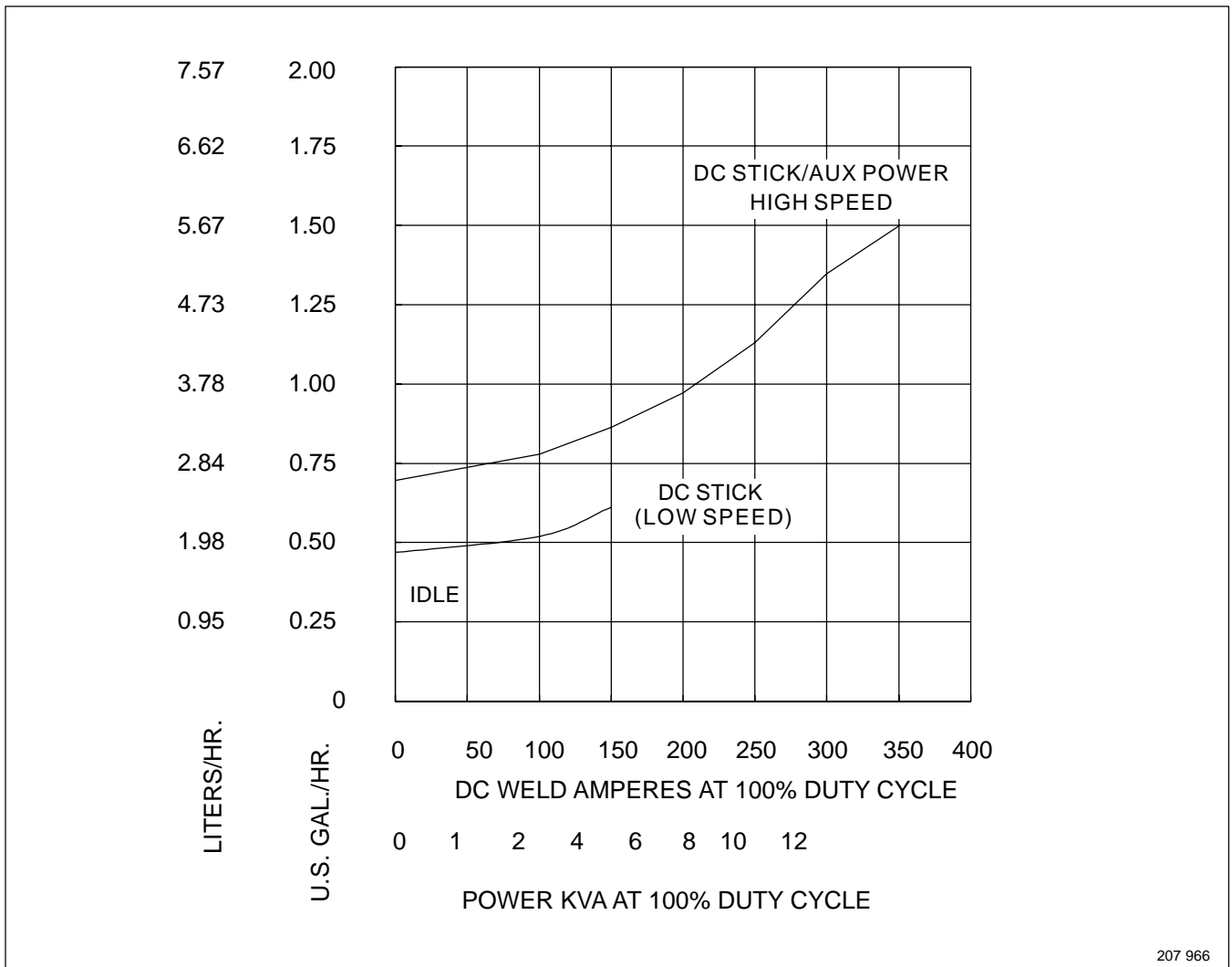
Dimensions	
Height	36 in (914 mm) (to top of exhaust)
Width	24 in (610 mm)
Depth	59-1/2 in (1511 mm)
A	23-5/8 in (600 mm)
B	21-1/2 in (546 mm)
C	1 in (25 mm)
D	15-5/8 in (397 mm)
E	26-3/8 in (679 mm)
F	58-3/4 in (1492 mm)
G	13/32 in (10 mm) Dia.
Weight	
1030 lb (467 kg)	



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

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

### 3-3. Fuel Consumption

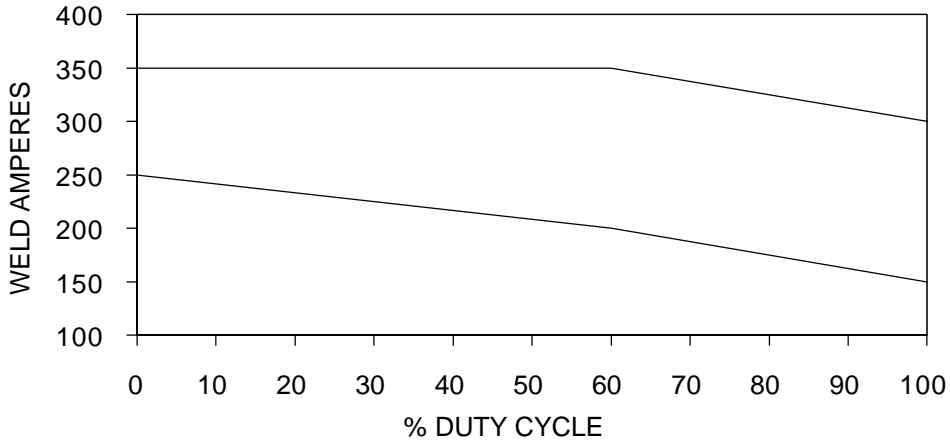


### 3-4. Duty Cycle And Overheating

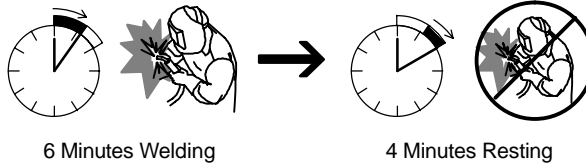


Duty Cycle is percentage of 10 minutes that unit can weld at rated load without overheating.

▲ Exceeding duty cycle can damage unit and void warranty.



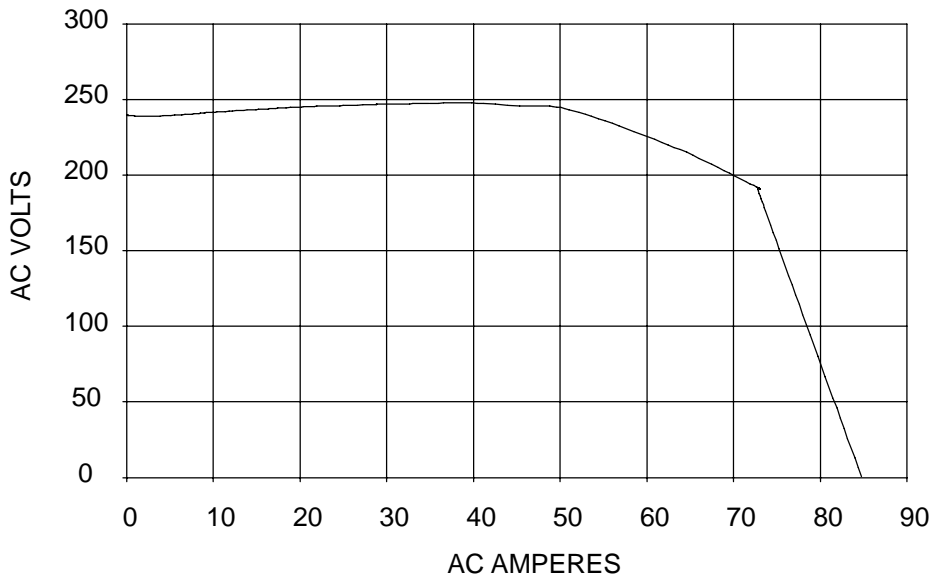
60% Duty Cycle at 350 Amperes DC



207 959

### 3-5. AC Generator Power Curve

The ac power curve shows the generator power in amperes available at the 120 and 240 volt receptacles.

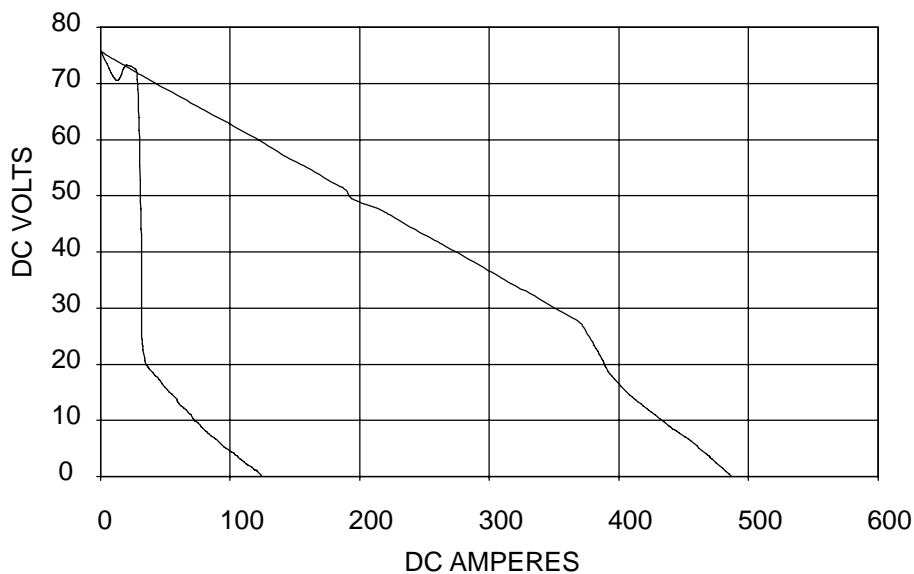


207 960

### 3-6. CC Stick Volt-Ampere Curves

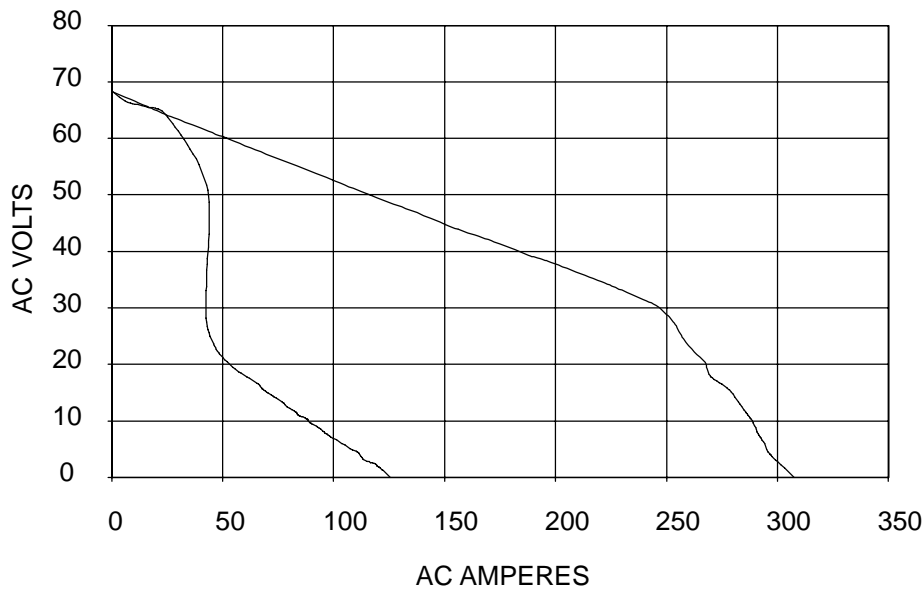
Volt-ampere curves show minimum and maximum voltage and amperage output capabilities of unit. Curves of other settings fall between curves shown.

#### A. CC/DC Stick Mode



☞ When welding in the Stick mode, the arc drive circuit provides additional amperage during low voltage (short arc length conditions) to prevent "sticking" electrodes.

#### B. CC/AC Stick Mode

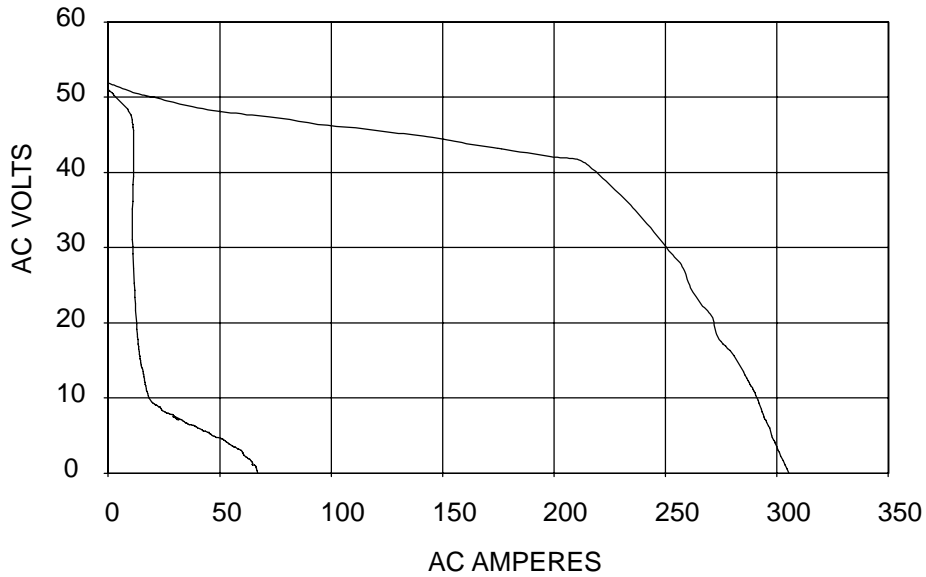




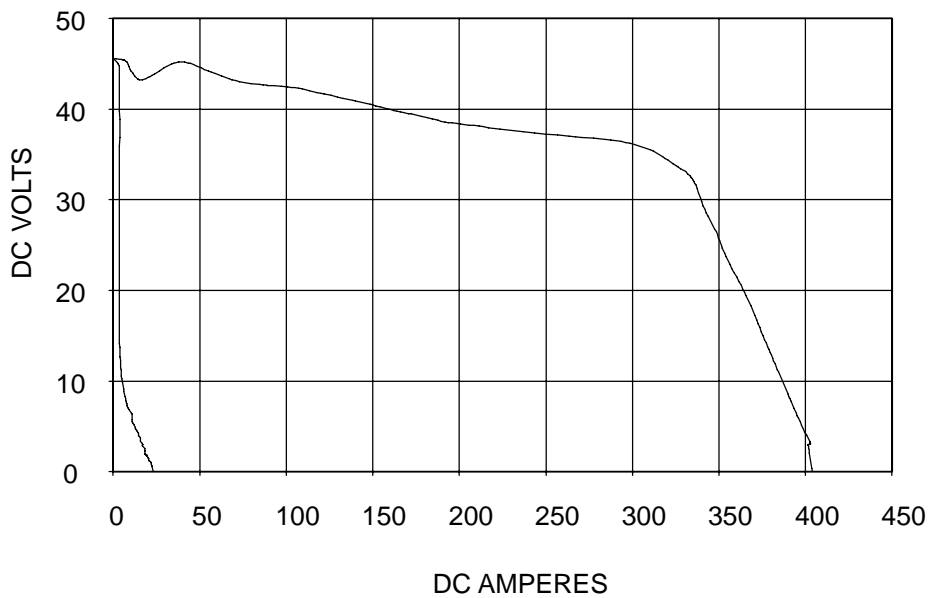
### 3-7. CC TIG Volt-Ampere Curves

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

#### A. CC/AC TIG Mode



#### B. CC/DC TIG Mode



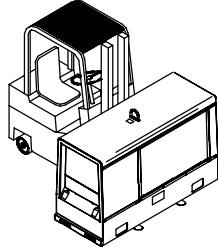


# SECTION 4 – INSTALLATION

## 4-1. Installing Welding Generator

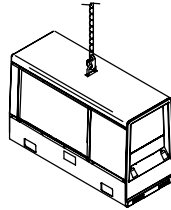


### Movement

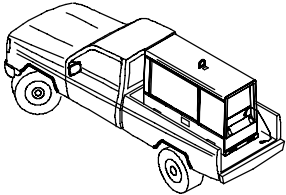


▲ Do not lift unit from end.

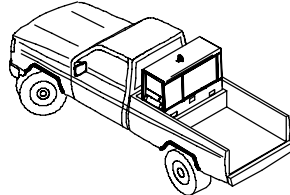
OR



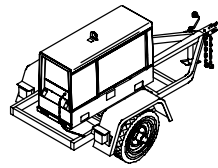
### Location



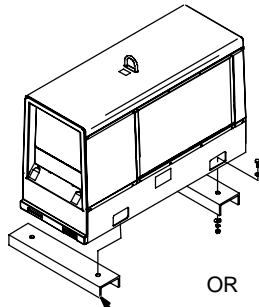
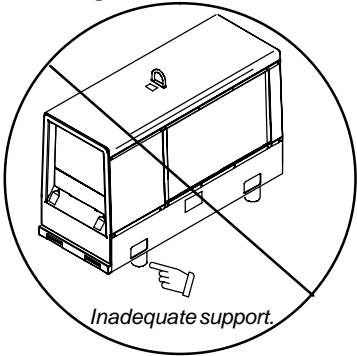
OR



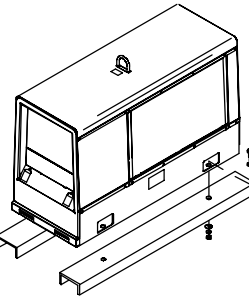
OR



### Mounting



OR



▲ Do not use flexible mounts.

- ▲ 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.
- ▲ Do not mount unit by supporting the base only at the four mounting holes. Use cross-supports to adequately support unit and prevent damage to base.
- ▲ Always ground generator frame to vehicle frame to prevent electric shock and static electricity hazards.
- ▲ If unit does not have GFCI receptacles, use GFCI-protected extension cord.

### Mounting:

- 1 Cross-Supports

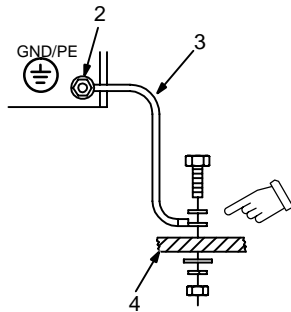
Mount unit on flat surface or use cross-supports to support base.

### Grounding:

- 2 Equipment Grounding Terminal (On Front Panel)
- 3 Grounding Cable (Not Supplied)
- 4 Metal Vehicle Frame

Connect cable from equipment ground terminal to metal vehicle frame. Use #10 AWG or larger insulated copper wire.

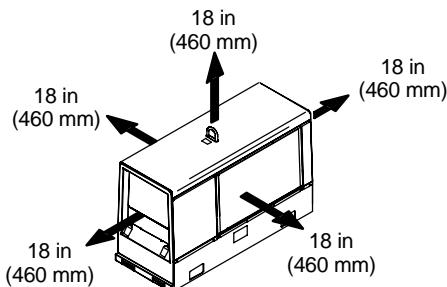
### Grounding



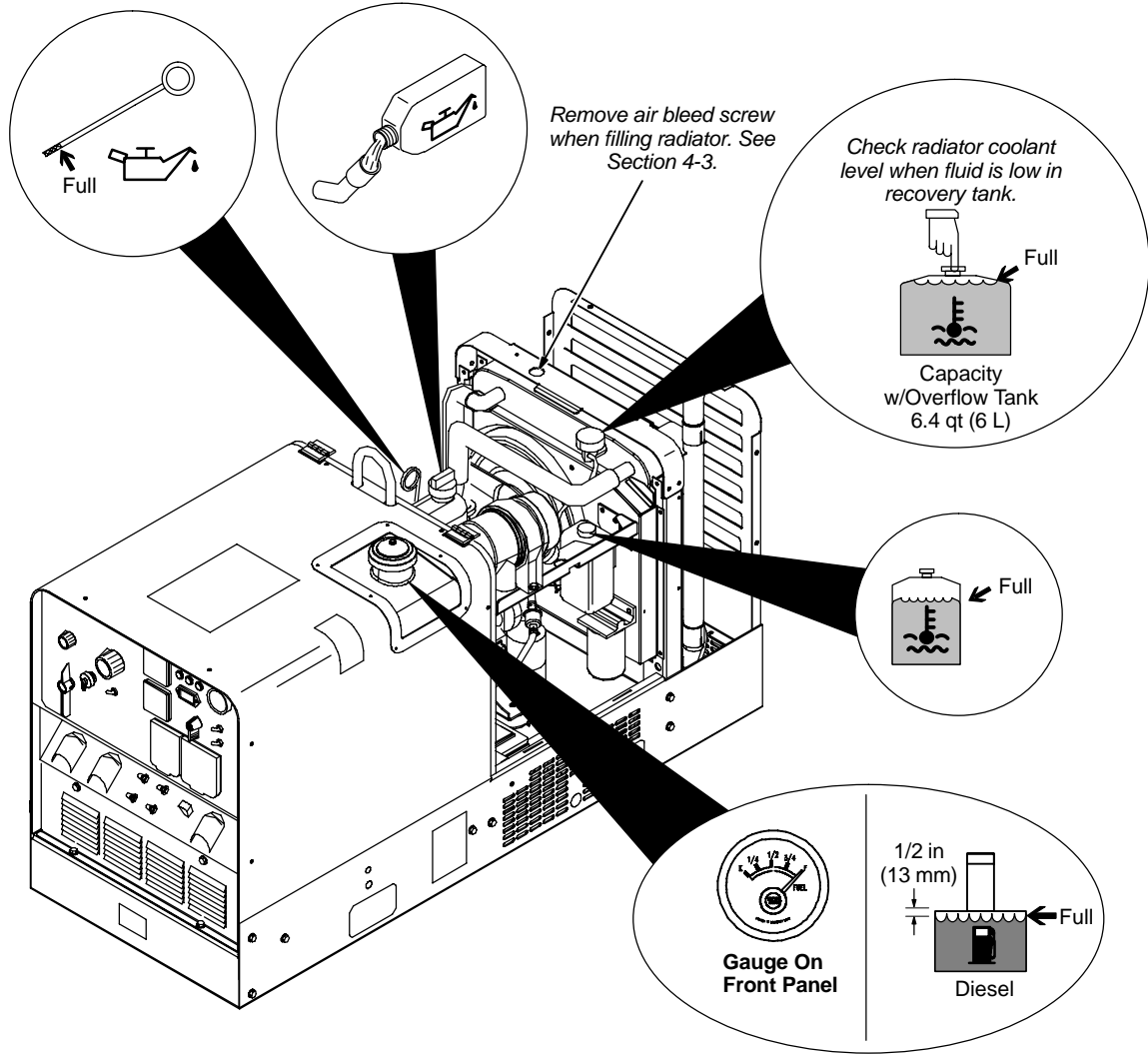
Electrically bond generator frame to vehicle frame by metal-to-metal contact.

- ▲ Bed liners, shipping skids, and some running gears insulate the welding generator from the vehicle frame. Always connect a ground wire from the generator equipment grounding terminal to bare metal on the vehicle frame as shown.

### Airflow Clearance



## 4-2. Engine Prestart Checks



803 178

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 too low or engine temperature is too high.

*☞ This unit has a low oil pressure shutdown 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 9.

### Fuel

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

Add fresh diesel fuel before starting engine the first time (see maintenance label for specifications). Always leave filler neck empty to allow room for expansion.

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 period. Check oil several times daily during run-in.**

### Coolant

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

Check coolant in recovery tank daily. If coolant is below Full level, add coolant until coolant level in tank is between Full and Low levels. If recovery tank coolant level was low, also 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 and free of dirt.

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

*☞ To improve cold weather starting:*

*Use engine block heater (see Section 4-6).*

*Keep battery in good condition. Store battery in warm area.*

*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.*

See Section 5-5 for additional information on cold weather operation.

### 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 Radiator Air Bleed Screw**  
Remove radiator air bleed screw. Add coolant to radiator until coolant is at bottom of filler neck. This ensures all air is purged from the system.

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

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

Capacity w/Overflow Tank  
6.4 qt (6 L)

Tools Needed:

Ref. 803 178

### 4-4. Connecting The Battery

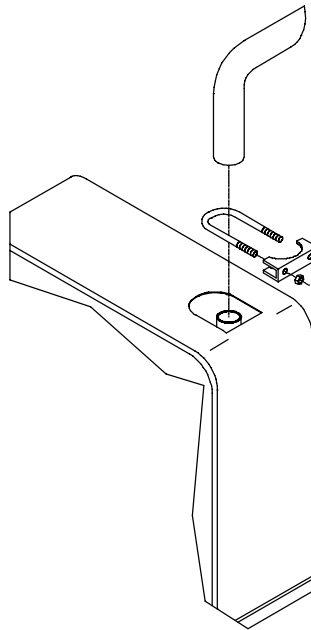
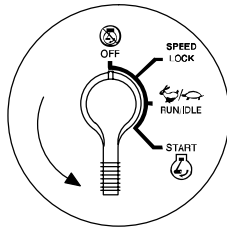
**▲ Connect negative (-) cable last.**

Tools Needed:

3/8, 1/2 in

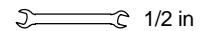
Ref. 207 554-A / Ref. 803 178 / Ref. S-0756-D

## 4-5. Installing Exhaust Pipe



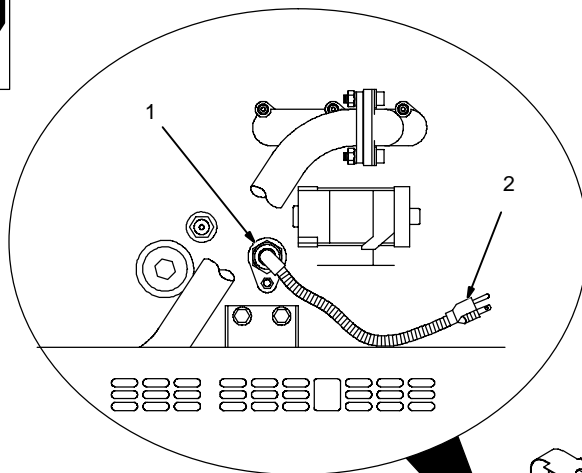
☞ Point exhaust pipe in desired direction but always away from front panel and direction of travel.

Tools Needed:



802 173-C / Ref. 207 554-A

## 4-6. Operating Engine Block Heater



- ▲ Do not run engine while coolant heater is on.
- ▲ Do not touch hot engine block. Engine block gets hot near heater.

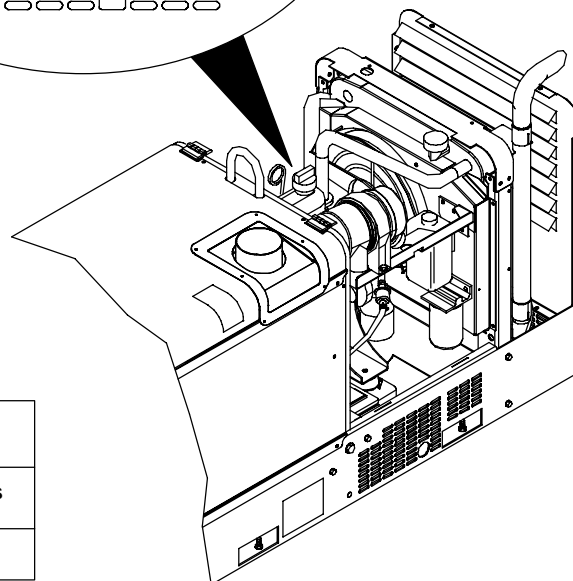
- 1 Coolant Heater
- 2 Heater Plug

Use heater to maintain a constant engine coolant temperature. See table for heater specifications.

To turn on heater, connect heater plug to a 120 volt ac grounded receptacle.

To turn off heater, disconnect plug.


Coolant Heater Specifications		
Watts	Volts $\pm 10\%$	Amps
400	120	3.3



Ref. 803 178 / 803 393



## 4-8. Selecting Weld Cable Sizes\*

 <p><b>Weld Output Terminals</b></p> <p>▲ Stop engine before connecting to weld output terminals.</p> <p>▲ Do not use worn, damaged, undersized, or poorly spliced cables.</p>	Welding Amperes	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					
	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 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.  
( ) = mm<sup>2</sup> for metric use

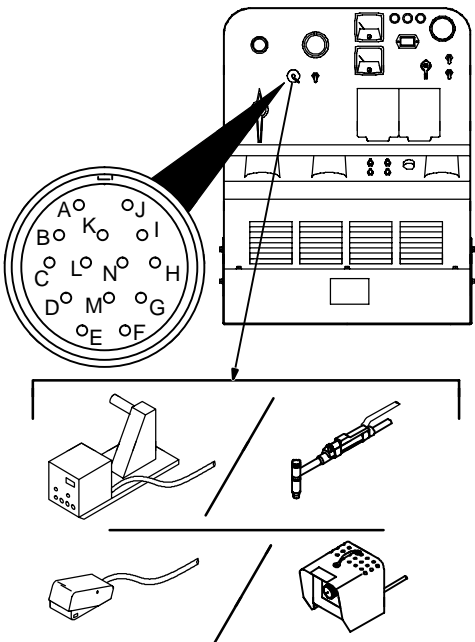

\*\*\*For distances longer than those shown in this guide, call a factory applications representative at 920-735-4505.

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## 4-9. Remote 14 Receptacle RC4 Information

### NOTE

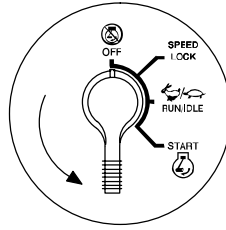
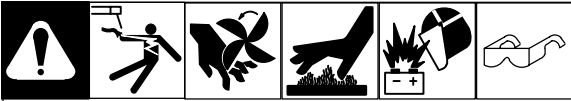
Engine runs at weld/power speed whenever a device connected to the remote 14 receptacle is running.

	 REMOTE 14	Socket*	Socket Information
	<b>24 VOLTS AC OUTPUT (CONTACTOR)</b>	A	24 volts ac. Protected by circuit breaker CB5.
B		Contact closure to A completes 24 volts ac contactor control circuit.	
<b>115 VOLTS AC OUTPUT (CONTACTOR)</b>	I	115 volts ac. Protected by circuit breaker CB6.	
	J	Contact closure to I completes 115 volts ac contactor control circuit.	
<b>REMOTE OUTPUT CONTROL</b>	C	Output to remote control; 0 to +10 volts dc.	
	D	Remote control circuit common.	
	E	0 to +10 volts dc input command signal from remote control. Voltage is dependent on front panel Voltage/Amperage control setting.	
<b>GND</b>	G	Circuit common for 24 and 115 volts ac circuits.	
	K	Chassis common.	

\*The remaining sockets are not used.



## 4-10. Guidelines For Installing Customer-Supplied Emergency Air Shutdown Valve



A customer-supplied emergency air shutdown valve can be installed to stop the engine immediately in emergency situations.

These guidelines show the typical installation of a Gator ESD 175-275-L3 air shutdown valve. Installation of other air shutdown valves may differ from that shown. Contact the air shutdown valve manufacturer or a Factory Authorized Service Agent for additional installation and operation information.

▲ **Stop engine, and let cool.**

▲ **Disconnect battery negative (-) cable.**

Open doors and remove side panels.

- 1 Air Cleaner
- 2 2 in (51 mm) Hose Clamp
- 3 1-3/4 x 2 in (44 x 51 mm) Rubber Hose
- 4 Air Shutdown Valve (Gator ESD 175-275-L3)
- 5 1-3/4 x 16-1/2 in (44 x 419 mm) Flexible Radiator Hose (NAPA Part No. FM68)

☞ *Use thick-walled rubber hose. Do not use heater hose. (Heater hose could let dirt into engine.)*

- 6 Engine Air Inlet
- 7 Shutdown Control
- 8 42 in (1067 mm) Shutdown Control Cable (Supplied By Gator)
- 9 Shutdown Valve Reset Lever

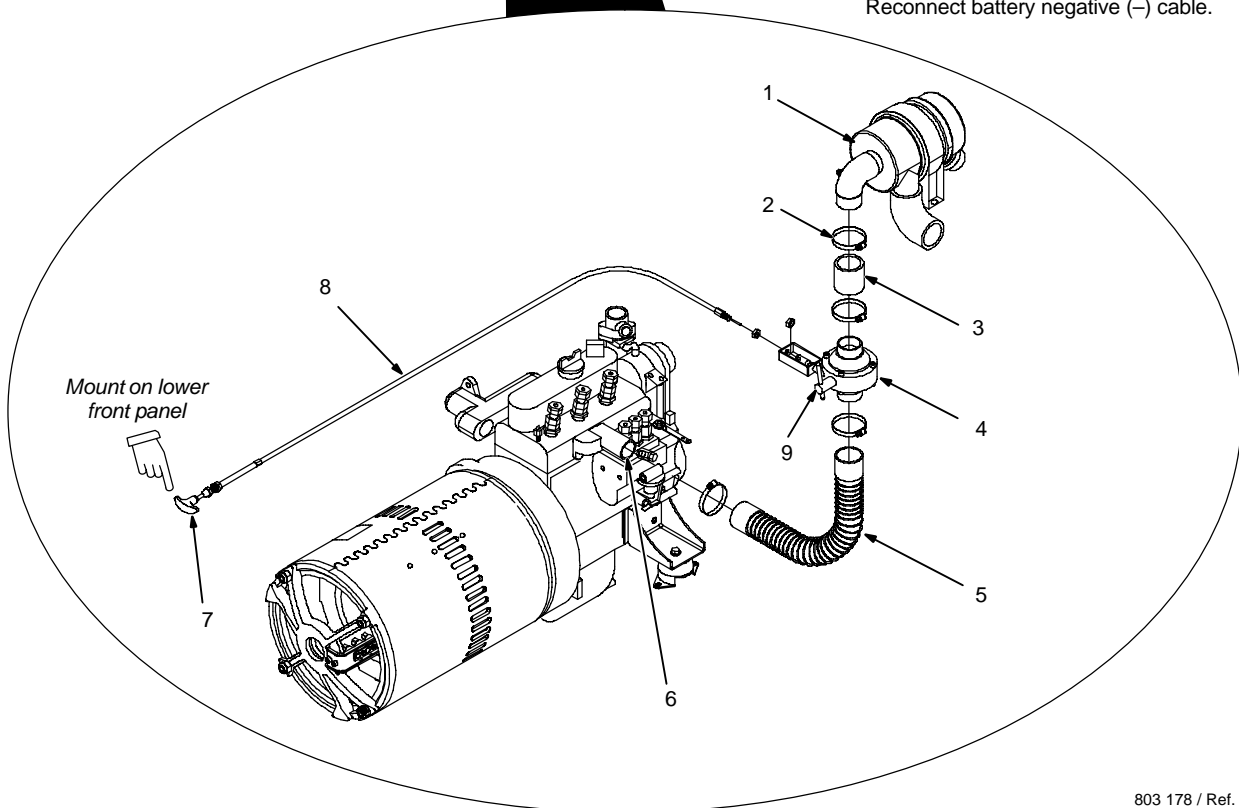
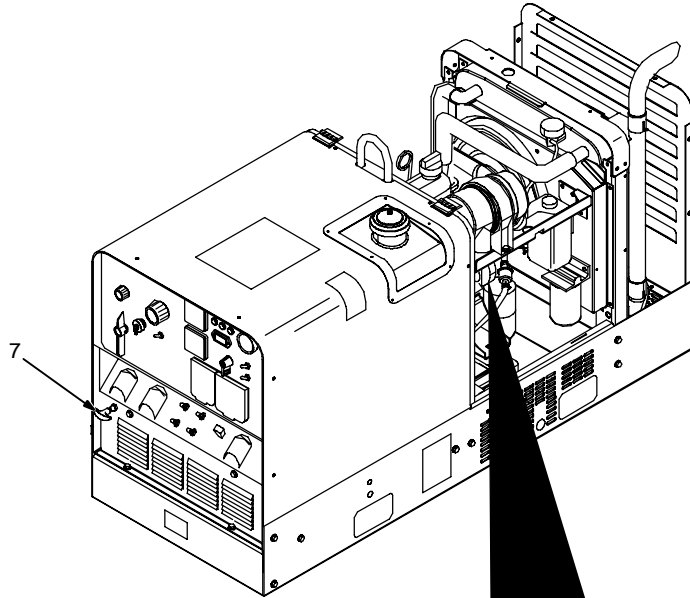
Install components as shown.

Be sure air shutdown valve is installed with air flow arrow pointing toward air inlet. Use cable ties to keep air shutdown system components away from hot or moving parts.

Verify the emergency air shutdown system operates correctly. After testing, use reset lever to reset air shutdown valve.

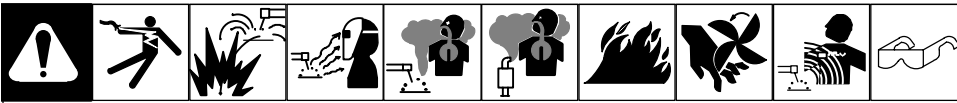
Reinstall side panels and close doors.

Reconnect battery negative (-) cable.





## 5-2. Description Of Controls (See Section 5-1)



### Engine Lights

#### 1 Engine Temperature Light

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

#### ▲ Stop engine and fix trouble if Engine Temperature light goes on.

#### 2 Engine Oil Pressure Light

Light goes on and engine stops if oil pressure is too low. Light goes on momentarily during start-up but goes out when engine reaches normal oil pressure.

#### ▲ Stop engine and fix trouble if Engine Oil Pressure light stays on after start-up.

#### 3 Battery Charging Light

Light goes on if engine alternator is not charging battery. Engine continues to run.

#### ▲ Stop engine and fix trouble if Battery Charging light goes on.

### Engine Gauges

#### 4 Fuel Gauge

Use gauge to check fuel level.

#### 5 Engine Hour Meter

Use meter to schedule maintenance.

### Engine Starting Controls

#### 6 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 7 and engine speed table following).

☞ Place Engine Control switch in Speed Lock position and Speed Lock switch in Run position for TIG (GTAW) welding using a high frequency device.

☞ 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).

#### 7 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.)

#### 8 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. Using ether voids warranty.

Use glow plug switch if necessary (see item 8 and glow plug table). Turn engine control switch to Start. Release engine control switch when engine starts.

See Section 5-5 for additional information on cold weather operation.

☞ 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.

☞ Push engine stop lever to stop engine if Engine Control switch does not work (see item 9).

#### 9 Engine Stop Lever

Use lever to stop engine if Engine Control switch does not work.

### Weld Controls

#### 10 Voltage/Amperage Adjust Switch And Remote 14 Receptacle

For front panel control, place switch in Panel position and use the Voltage/Amperage Adjustment control.

For remote control, make connections to Remote 14 receptacle, and place switch in Remote position (see Sections 4-9 and 5-4). The value selected on Voltage/Amperage Adjustment control is the maximum available at the remote.

☞ Set Voltage/Amperage Adjustment control (item 13) to max for MIG welding.

#### 11 DC Polarity/AC Selector Switch

#### ▲ Do not switch under load.

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

#### 12 Process/Contactor Switch

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

#### 13 Voltage/Amperage Adjustment Control

With Process/Contactor switch in any Stick or TIG setting, use control to adjust amperage. With Process/Contactor switch in any MIG position, use control to adjust voltage.

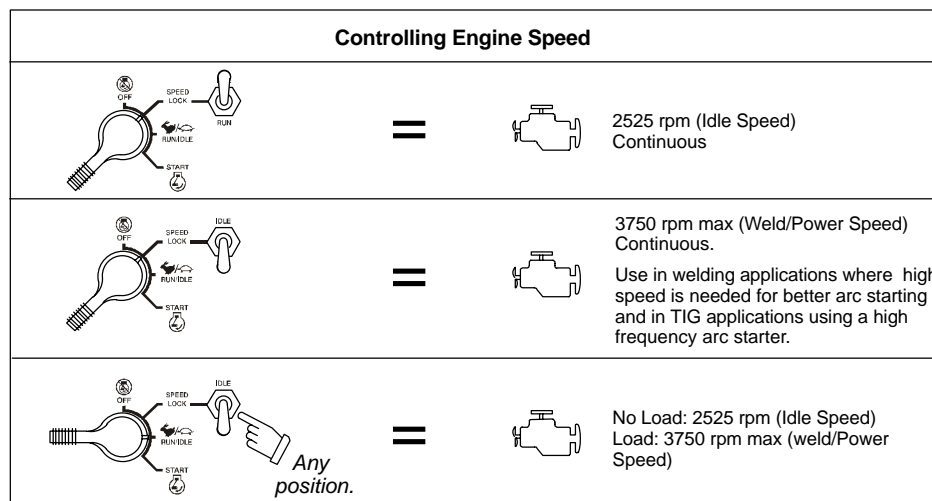
### Weld Meters

#### 14 Ammeter (Optional)

Meter displays weld amperage at the weld output terminals.

#### 15 Voltmeter (Optional)

Meter displays weld voltage at the weld terminals, but not necessarily at the welding arc due to resistance of cables and connections.



### 5-3. Process/Contactor Switch

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 5-4).

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 arc drive circuit provides additional amperage during low voltage (short arc length conditions) to prevent "sticking" electrodes.

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

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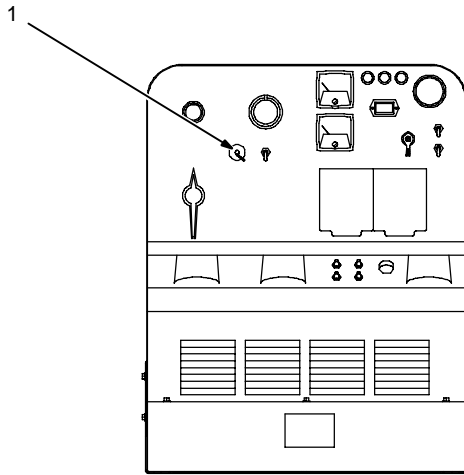
**Process/Contactor Switch Settings**

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 – MIG	MIG (GMAW)	At Remote Receptacle
Electrode Hot – MIG	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 Voltage/Amperage Control

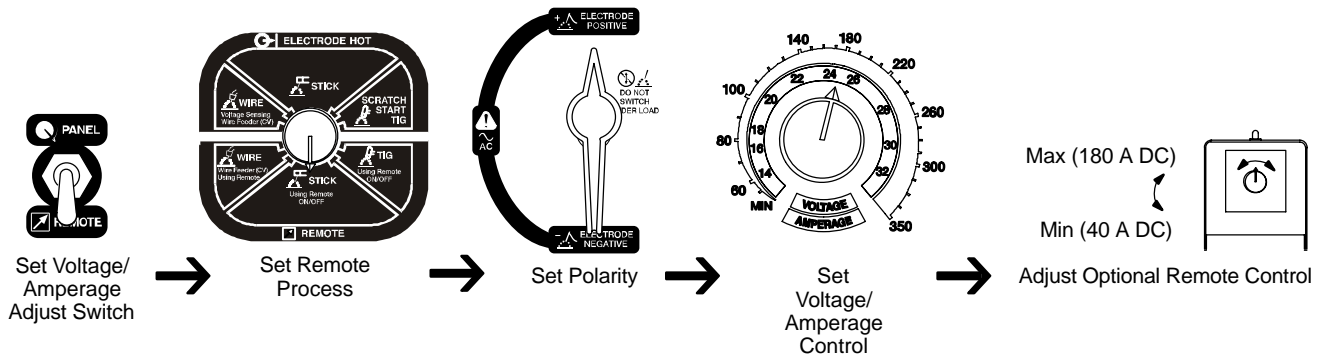


1 Remote 14 Receptacle RC4  
Connect optional remote control to RC4 (see Section 4-9).



### Example: Combination Remote Amperage Control (Stick)

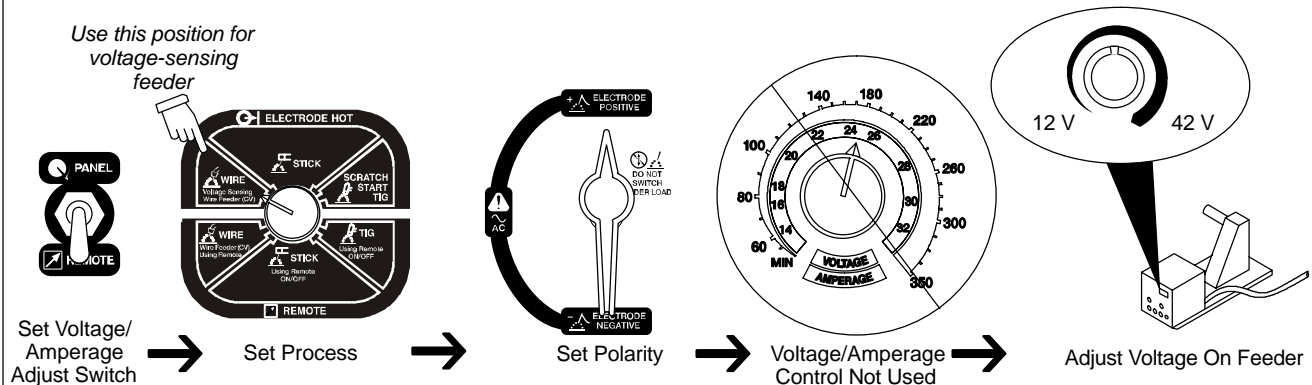
In Example:  
Process = Stick (Using Remote On/Off)  
Min = 40 A DC  
Max = 180 A DC



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### Example: Remote Voltage Control (MIG) Using A Voltage-Sensing Wire Feeder

In Example:  
Process = MIG  
Min = 12 V DC  
Max = About 42 V DC



## 5-5. Recommendations For Extreme Cold Weather Operation

☞ For more information on operating in cold weather, contact the nearest Factory Authorized Service Agent or Kubota Service Center.

### Fuel

- Use an arctic-grade diesel fuel and keep fuel tank at least half full to prevent fuel lines from draining back into tank.
- Do not use gasoline or kerosene.
- Do not use fuel additives.

### Oil

- Use 10W30 oil when operating at ambient temperatures above -4° F (-20° C).
- Use 5W30 oil when operating at ambient temperatures above -13° F (-25° C).
- Operating at extremely low temperatures thickens engine oil and reduces cranking speed. Contact a Factory Authorized Service Agent or Kubota Service Center for information on using 0W20 oil in these conditions. Low temperature oil must be replaced as ambient operating temperatures increase.

### Coolant

- Be sure the cooling system is completely filled with a 50/50 antifreeze/water mix (open the radiator vent when filling). Do not mix antifreeze and water solution in the overflow tank. Use a premixed 50/50 antifreeze/water solution to "top off" overflow tank. Use caution if rerouting cooling lines. **Engine damage due to lack of coolant or incorrect coolant mix is not covered by the warranty.**

- A 50/50 antifreeze/water mix protects engine to -34° F (-37° C). If operating at even lower temperatures, contact a Factory Authorized Service Agent or Kubota Service Center for coolant information.

### Battery

- Replacement Battery Rating: 12 Volt, 535 CCA (minimum) 90 RSV Group 55.
- Check connections at battery, starter, and engine block. Inspect battery cables for abrasion and wear, and verify the battery is secured.
- Consider installing easily-accessible battery booster leads (0 or 00 AWG) to provide easy connection to a service truck's battery.
- Boost the starting capability of the battery by using a battery heater.

### Starting

- **Do not use ether.**
- Use the engine block heater to maintain engine temperature above ambient temperature.
- Use the glow plugs for 20–30 seconds before starting. As a pre-season check, make sure the glow plugs are working properly.
- Disconnect all unnecessary loads from generator ac receptacles when starting.

### Operating

- To reduce crankcase condensation and breather tube freezing problems, allow engine to reach normal operating temperature as quickly as possible.
- Crankcase breather tubes will collect condensation and freeze if the hose is improperly routed. The breather tube should be free of sharp bends and kinks. A blocked breather tube will cause excessive crankcase pressure that will blow out the safety plug, oil seals, or dipstick. Contact a Factory Authorized Service Agent to obtain a shorter breather hose that is less likely to kink.
- Inspect the routing and condition of the breather tube frequently. Reroute or replace the hose if necessary.
- For continuous use in extreme cold, block the cooling holes in the base to reduce air flow through the radiator and achieve higher engine temperature. Close off the base inlet vents only if the engine coolant or oil temperatures can be monitored to ensure they remain within the specified limits.
- To obtain warmer air for combustion, turn the air cleaner inlet away from the inlet vents, and seal the inlet vents.
- If operating in cold weather all the time, consider replacing the existing radiator cooling fan with a smaller fan that draws less air through the radiator. Operation in warmer temperatures would require an additional "booster" electric fan to adequately cool the engine.

## Notes



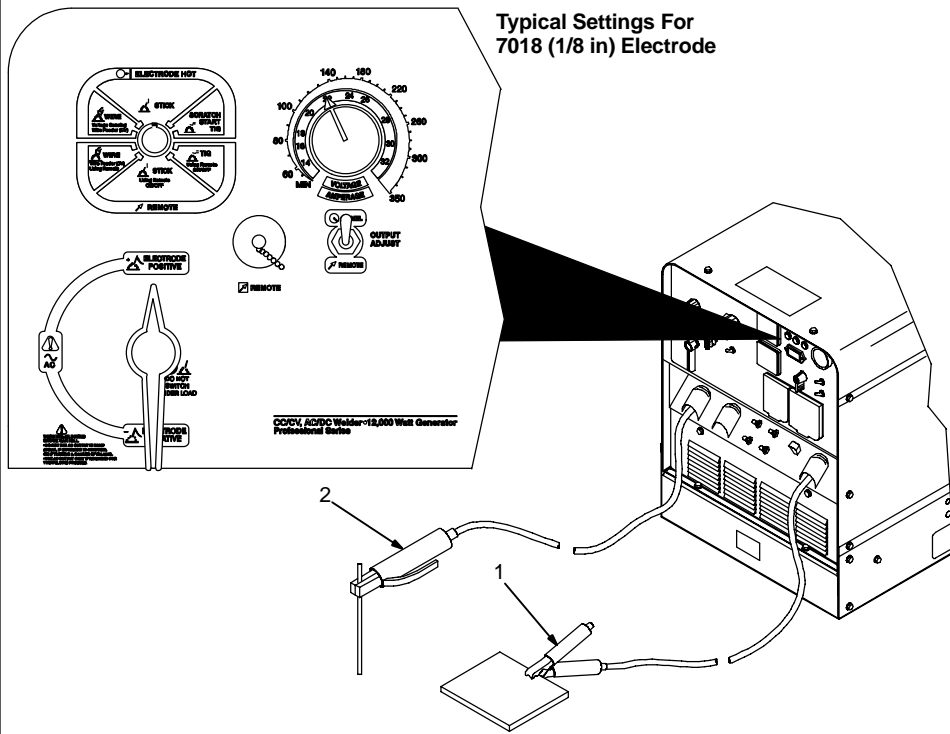
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## 5-6. Typical Stick Welding Connections And Control Settings



### ▲ Stop engine.

☞ This section provides general guidelines and may not suit all applications.

☞ The control panel shows the typical settings for welding with a 7018 (1/8 in) electrode. Consult the amperage selection tables below if welding with other electrodes.

- 1 Work Clamp
- 2 Electrode Holder

Connect Work cable to Work terminal and Electrode holder cable to CC (Stick/TIG) terminal on welding generator.

☞ Be sure to use the correct size weld cables (see Section 4-8).

### Typical Settings For 7018 (1/8 in) Electrode:

- > Set Process/Contactor switch to Electrode Hot – Stick position.
- > Set DC Polarity/AC Selector Switch to Electrode Positive position.
- > Set amperage (see table below).

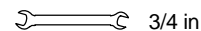
**Electrode Selection Tables**

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

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

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

Tools Needed:



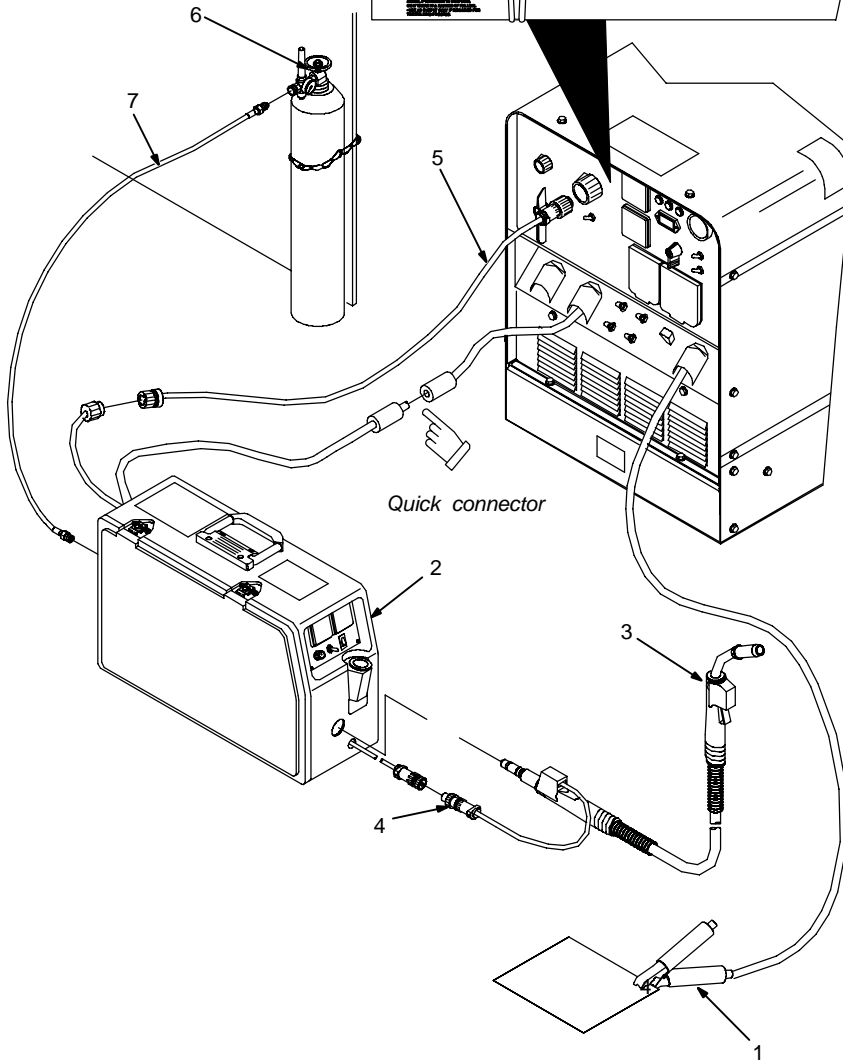
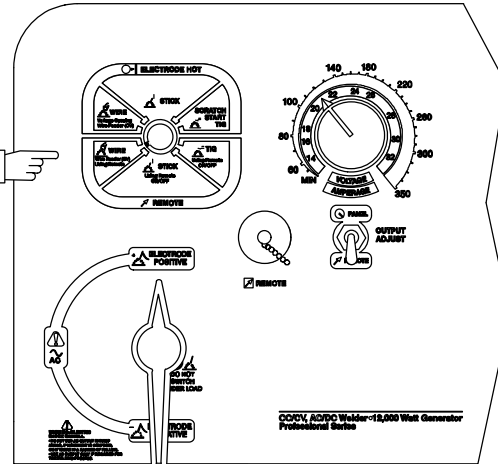
## 5-7. Typical MIG Welding Connections And Settings

### A. Solid Wire Applications



#### Typical Control Settings For .035 (ER70S-3) Solid Wire – Short Circuit Transfer w/Feeder Powered By 14-Pin Receptacle

Note Process/Contactor,  
Voltage/Amperage, and  
DC Polarity/AC Selector  
switch settings.



Tools Needed:



#### ▲ Stop engine.

This section provides general guidelines and may not suit all applications.

Control panel shows typical settings for welding with .035 (ER70S-3) solid wire. Use 75/25 Argon-based shielding gas.

- 1 Work Clamp
- 2 Wire Feeder
- 3 MIG Gun
- 4 Gun Trigger Plug
- 5 14-Pin Plug And Cord
- 6 Gas Cylinder: 75/25 Argon-Based Gas for Short Circuit Transfer
- 7 Gas Hose

Connect work cable to welding generator Work terminal. Connect cable from feeder to cable from welding generator CV (Wire) terminal. Connect feeder 14-pin plug to Remote 14 receptacle on welding generator.

Be sure to use the correct size weld cables (see Section 4-8).

Loosen MIG gun securing knob. Insert gun end through opening in feeder and position as close as possible to drive rolls without touching. Tighten knob.

See wire feeder manual for wire threading procedure

Insert gun trigger plug (item 4) into matching receptacle and tighten threaded collar.

Connect gas hose from feeder to regulator on cylinder.

#### Typical Control Settings For Short Circuit Transfer Using .035 (ER70S-3) Solid Wire And 75/25 Argon-Based Gas w/ Feeder Powered By 14-Pin Receptacle:

- > Set Process/Contactor switch to Remote – Wire position.
- > Set DC Polarity/AC Selector switch to Electrode Positive position.
- > Set Output Adjust switch to Remote position to adjust voltage at feeder. If feeder does not have remote voltage control, set Output Adjust switch to Panel and adjust voltage at welding generator.
- > Set V/A control to obtain minimum spatter (typically 17 - 20 volts).
- > Set wire feed speed between 150-300 ipm.

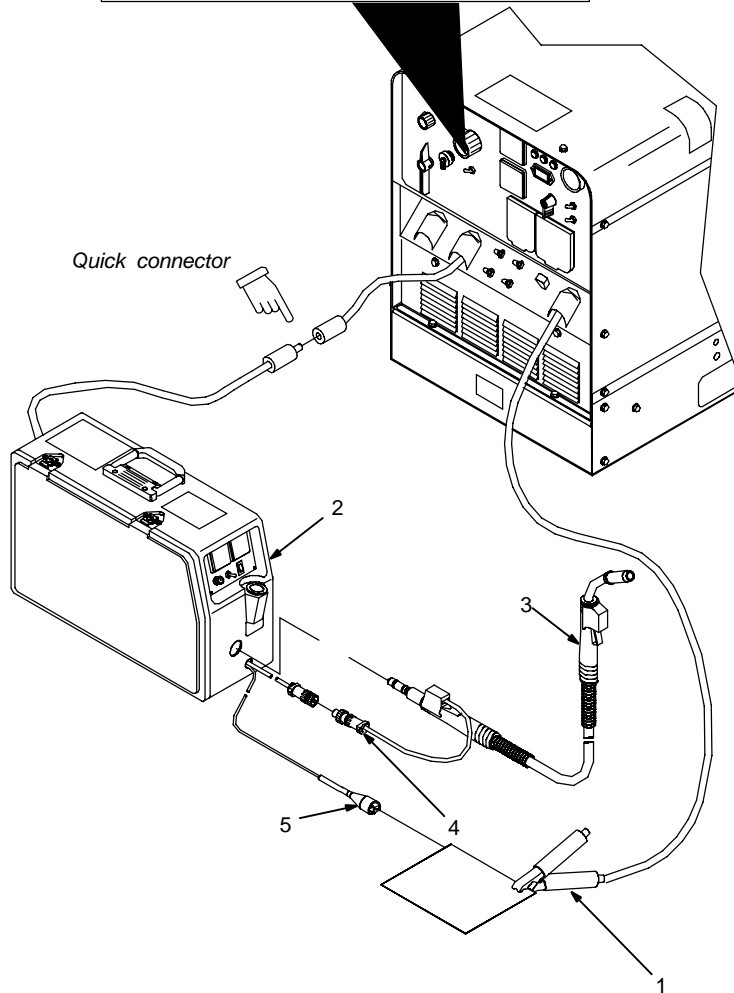
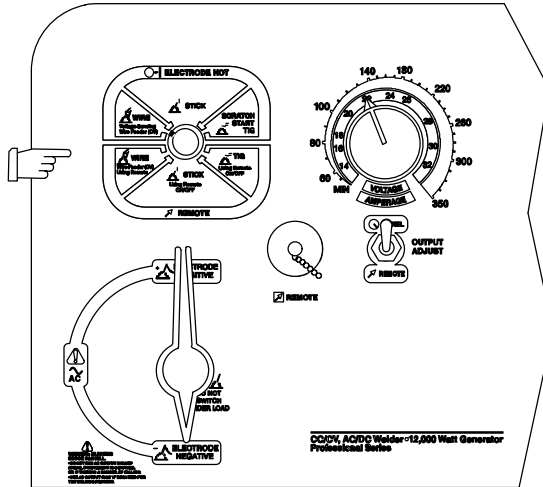


## B. Self-Shielded Flux Core Wire Applications

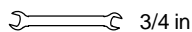


### Typical Control Settings For 5/64 in. Self-Shielded Flux Core Wire w/Voltage Sensing Feeder

Note Process/Contactor, Voltage/Amperage, and DC Polarity/AC Selector switch settings.



Tools Needed:



#### ▲ Stop engine.

This section provides general guidelines and may not suit all applications.

The control panel shows the typical settings for welding with 5/64 in. self-shielded flux core wire.

- 1 Work Clamp
- 2 Wire Feeder
- 3 MIG Gun
- 4 Gun Trigger Plug
- 5 Voltage Sensing Clamp

Connect work cable to welding generator Work terminal. Connect cable from wire feeder to cable from welding generator CV (Wire) terminal.

Be sure to use the correct size weld cables (see Section 4-8).

Loosen MIG gun securing knob. Insert gun end through opening in feeder and position as close as possible to drive rolls without touching. Tighten knob.


See wire feeder manual for wire threading procedure.

Insert gun trigger plug (item 4) into matching receptacle and tighten threaded collar.

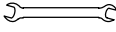
#### Typical Control Settings Using 5/64 in. Self-Shielded Flux Core Wire w/Voltage Sensing Feeder:

- > Set Process/Contactor switch to Electrode Hot – Wire position.
- > Set DC Polarity/AC Selector switch to Electrode Negative position.  
Set Output Adjust switch to Panel and adjust voltage at welding generator.
- > Do a test weld. To increase arc length, increase voltage. To shorten arc length, reduce voltage or increase wire feed speed.

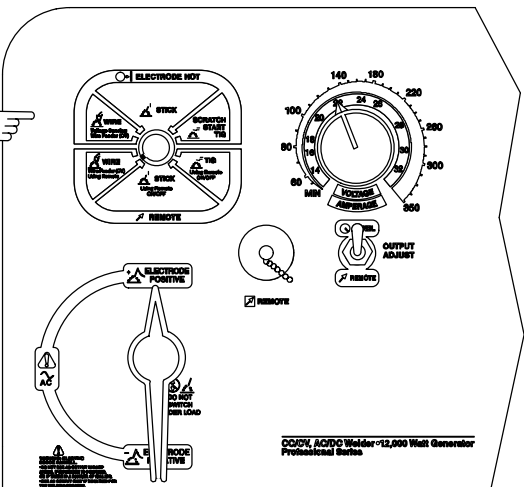
## 5-8. Typical MIG Connections And Settings Using Weld Control And Spoolgun

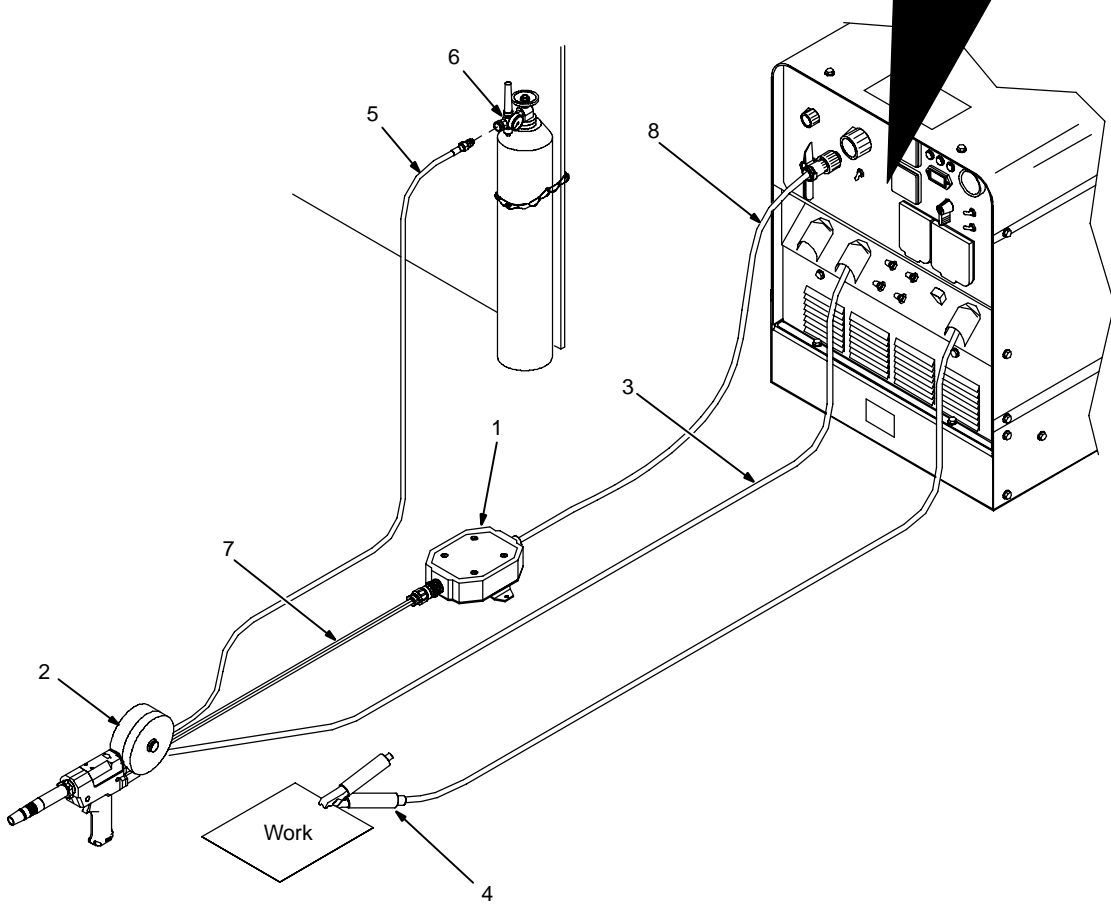


**Typical Settings For 4043 (.047) Aluminum On 1/8 in Material:**


**Tools Needed:**  
 3/4 in

*Note Process/Contactor, Voltage/Amperage, and DC Polarity/AC Selector switch settings.*






**▲ Stop engine.**

 This section provides general guidelines and may not suit all applications.

- 1 Weld Control
- 2 Spoolgun
- 3 Weld Power Cable From Spoolgun
- 4 Work Clamp
- 5 Gas Hose
- 6 Argon Cylinder
- 7 Trigger Control Cord
- 8 14-Pin Plug And Interconnecting Cord

 Be sure to use the correct size weld cables (see Section 4-8).

Connect work cable to welding generator Work terminal. Connect weld cable from spoolgun to welding generator CV (Wire) terminal.

Insert trigger control plug (item 7) into weld control receptacle. Tighten threaded collar. Insert 14-pin plug (item 8) into 14-pin receptacle on welding generator and tighten threaded collar.

Connect gas hose from spoolgun to regulator on Argon bottle.


**Typical Settings For 4043 (.047) Aluminum On 1/8 in Material:**

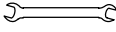
- > Set Process/Contactor switch to Remote – Wire position.
- > Set DC Polarity/AC Selector switch to Electrode Positive position.

Set Output Adjust switch to Panel and adjust voltage at welding generator (typically 21 – 28 volts).

803 308 / 207 554-A

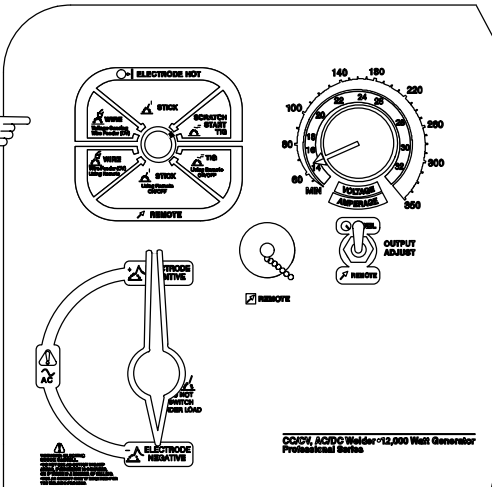
## 5-9. Typical DC Scratch Start TIG Connections And Settings



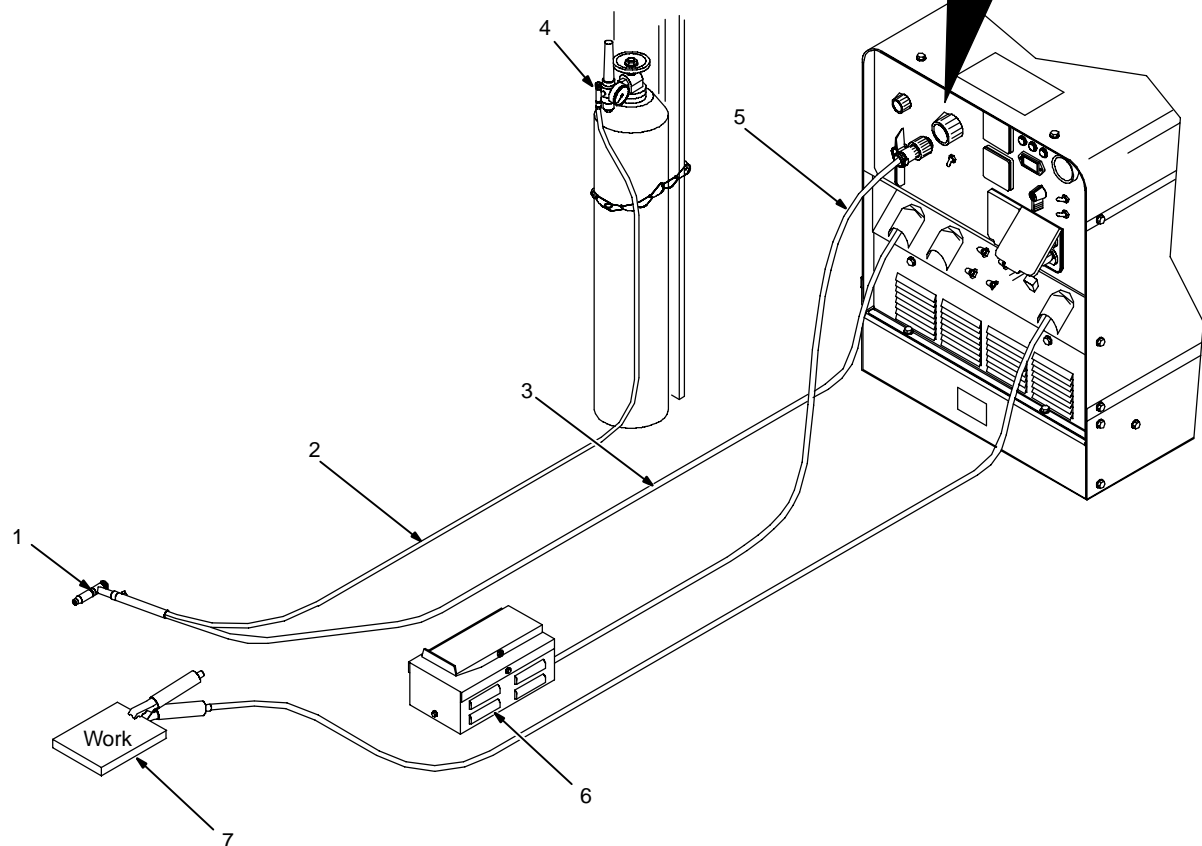
**Tools Needed:**  
 3/4 in

*Note Process/Contactor, Voltage/Amperage, and DC Polarity/AC Selector switch settings.*

**Typical Settings For 20 Gauge Material:**




CCDCV, AC/DC Welder • 12,000 Watt Generator Professional Series




803 309 / 207 554-A

**▲ Stop engine.**

 This section provides general guidelines and may not suit all applications.

- 1 TIG Torch
- 2 Gas Hose
- 3 Weld Power Cable
- 4 Argon Cylinder
- 5 14-Pin Plug And Interconnecting Cord
- 6 Remote Control (Foot Or Fingertip)
- 7 Work Clamp

 Be sure to use the correct size weld cables (see Section 4-8).

Connect work cable to welding generator Work terminal. Connect cable from TIG torch to welding generator CC (Stick/TIG) terminal.

Insert 14-pin plug (item 5) into 14-pin receptacle on welding generator and tighten threaded collar.

Connect gas hose from TIG torch to regulator on Argon bottle.

**Typical Settings For 20 Gauge Material:**

- > Set Process/Contactor switch to Electrode Hot – Scratch Start TIG position.
- > Set DC Polarity/AC Selector switch to Electrode Negative position.

Set Output Adjust switch to Panel and adjust amperage at welding generator (typically 30 – 60 Amps).

## 5-10. Typical AC TIG (With High Frequency Unit) Connections And Settings

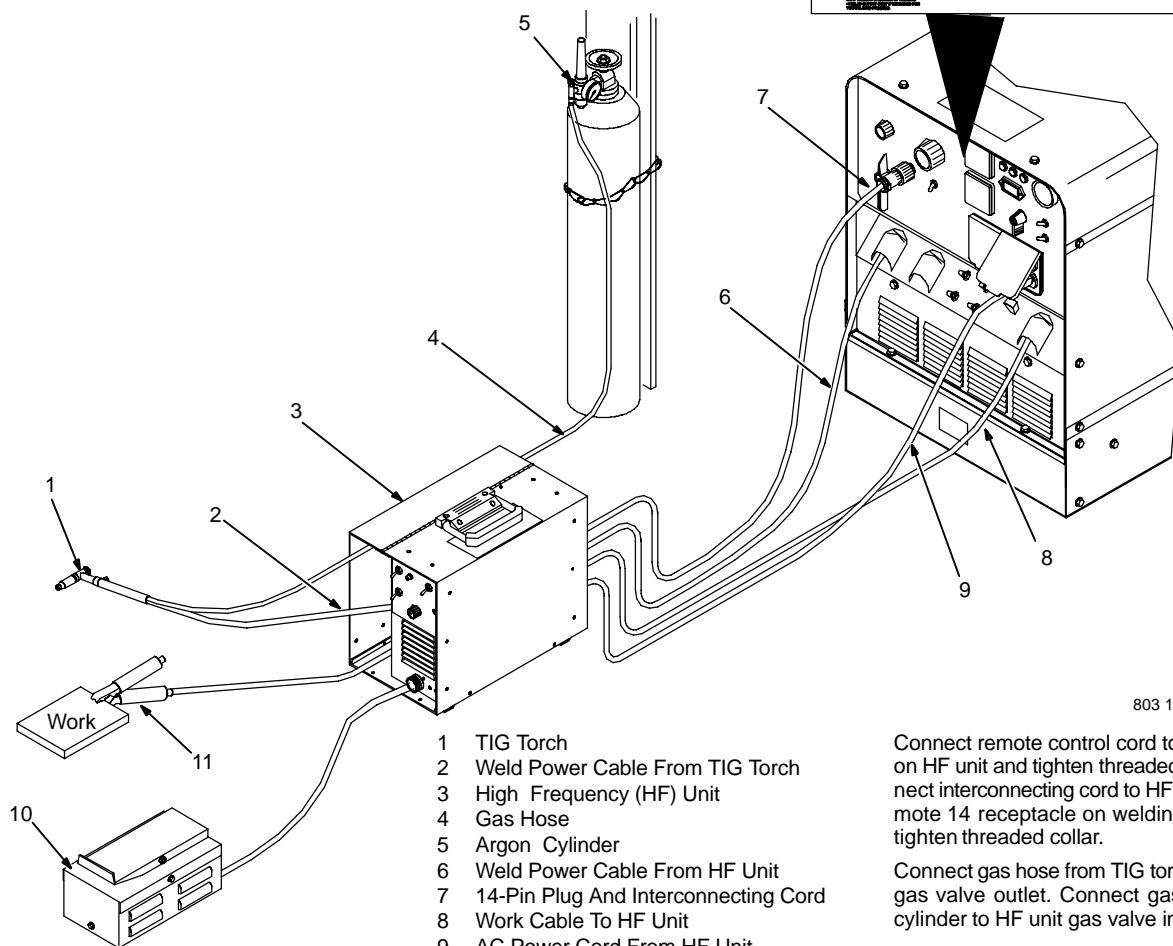
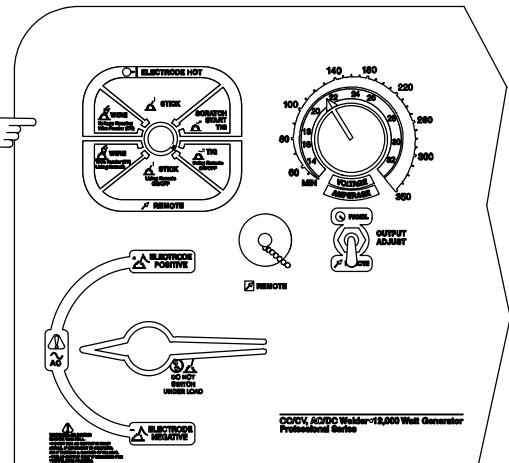


### Typical Settings For 3/16 in Aluminum

Tools Needed:

3/4 in

Note Process/Contactor, Voltage/Amperage, and DC Polarity/AC Selector switch settings.



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#### ▲ Stop engine.

▲ Turn Off HF Unit and welding power source, and disconnect input power before making connections. Stop engine on welding generators.

▲ Not connecting work cables to HF Unit will damage power source. Always connect work cables to Work Input/Output terminal.

This section provides general guidelines and may not suit all applications.

- 1 TIG Torch
- 2 Weld Power Cable From TIG Torch
- 3 High Frequency (HF) Unit
- 4 Gas Hose
- 5 Argon Cylinder
- 6 Weld Power Cable From HF Unit
- 7 14-Pin Plug And Interconnecting Cord
- 8 Work Cable To HF Unit
- 9 AC Power Cord From HF Unit
- 10 Remote Foot Control
- 11 Work Clamp From HF Unit

Be sure to use the correct size weld cables (see Section 4-8).

Connect the work cables from the welding generator and the work clamp to the HF unit Work Input/Output terminal. Connect weld power cable from welding generator CC (Stick/TIG) terminal to HF unit Electrode-In Terminal.

Connect torch cable to HF unit Electrode-Out Terminal.

Connect HF unit ac power cord to welding generator 120 volt ac receptacle.

Connect remote control cord to receptacle on HF unit and tighten threaded collar. Connect interconnecting cord to HF unit and Remote 14 receptacle on welding generator. tighten threaded collar.

Connect gas hose from TIG torch to HF unit gas valve outlet. Connect gas hose from cylinder to HF unit gas valve inlet.

#### Typical Settings For 3/16 in Aluminum:

- > Set HF unit to Continuous HF and Remote Amperage adjustment.
- > Set Process/Contactor switch to Remote – TIG position.
- > Set DC Polarity/AC Selector switch to AC position.  
Set Output Adjust switch to Remote. Adjust amperage at remote control.

If welding generator amperage setting is 100 amperes, maximum output through remote control is 100 amperes.

## 5-11. Typical Carbon Arc Cutting (CAC-A) Connections And Settings

**Typical Settings Using 1/4 in Carbon Electrode:**

**Tools Needed:**  
 3/4 in

*Note Process/Contactor, Voltage/Amperage, and DC Polarity/AC Selector switch settings.*

- ▲ **Stop engine.**
- ▲ **Breathing compressed air can cause serious injury or death. Do not use compressed air for breathing. Use only for cutting, gouging, and tools.**
- ▲ **Compressed air can cause injury. Wear approved safety goggles. do not direct air stream toward self or others.**
- ▲ **Hot metal from air cutting and gouging can cause fire or explosion. Do not cut or gouge near flammables.**

This section provides general guidelines and may not suit all applications.

- 1 Carbon Arc Torch Assembly
- 2 Air Hose
- 3 Air Valve
- 4 Compressed Air Supply Line (90 PSI at 20 CFM)
- 5 Weld Power Cable
- 6 Work Cable
- 7 Work Clamp

Be sure to use the correct size weld cables (see Section 4-8).

Connect the work cable to the welding generator Work terminal.

Connect torch assembly weld power cable to welding generator CC (Stick/TIG) terminal.

Connect torch assembly air hose to compressed air supply valve. Open valve.

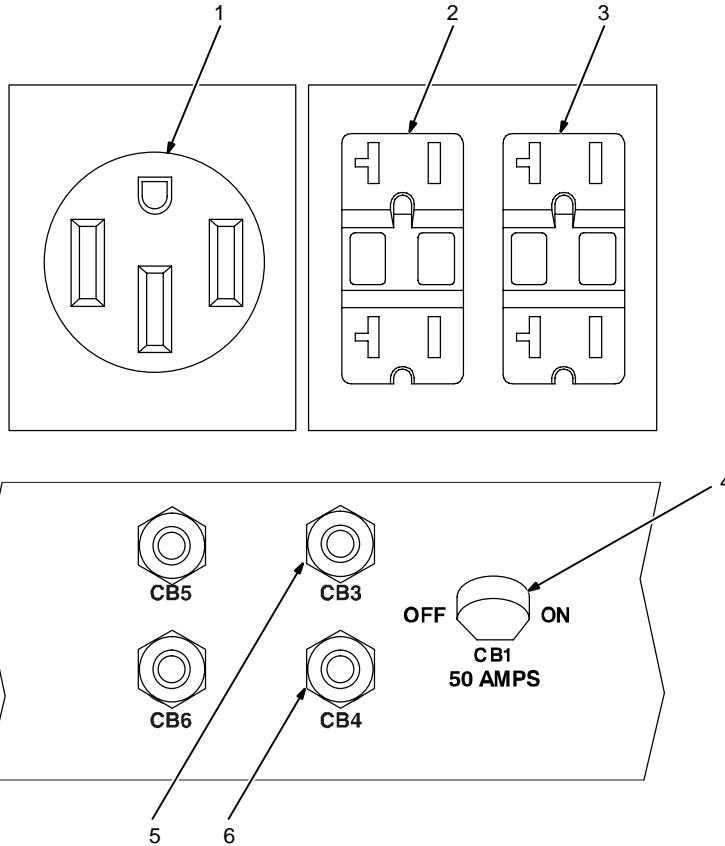
- > Set Process/Contactor switch to Electrode Hot – Stick position.
- > Set DC Polarity/AC Selector switch to Electrode Positive position.

Set Output Adjust switch to Panel and adjust amperage at welding generator.

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# SECTION 6 – OPERATING AUXILIARY EQUIPMENT

## 6-1. Generator Power Receptacles And Circuit Breakers



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

☞ Generator 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 continuous output is 12 kVA/kW.

2 120 V 20 A AC GFCI Duplex Receptacle GFCI-2

3 120 V 20 A AC GFCI Duplex Receptacle GFCI-3

GFCI-2 and GFCI-3 supply 60 Hz single-phase power at weld/power speed. Maximum output from GFCI-2 or GFCI-3 is 2.4 kVA/kW.

4 Circuit Breaker CB1

CB1 protects RC1, GFCI-2, GFCI-3 from overload. If CB1 opens, the receptacles do not work.

5 Circuit Breaker CB3

6 Circuit Breaker CB4

CB3 protects GFCI-2 and CB4 protects GFCI-3 from overload. If a circuit breaker opens, the receptacle does not work.

☞ Move switch (CB1) or press button (CB3, CB4) to reset circuit breaker. If breaker continues to open, contact Factory Authorized Service Agent.

Combined output of all receptacles limited to 12 kVA/kW rating of the generator.


EXAMPLE: If 20 A is drawn from each 120 V duplex receptacle, only 30 A is available at the 240 V receptacle:

$$2 \times (120 \text{ V} \times 20 \text{ A}) + (240 \text{ V} \times 30 \text{ A}) = 12 \text{ kVA/kW}$$

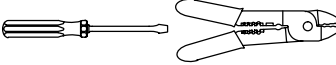
**Simultaneous Welding And Genertor Power Output**

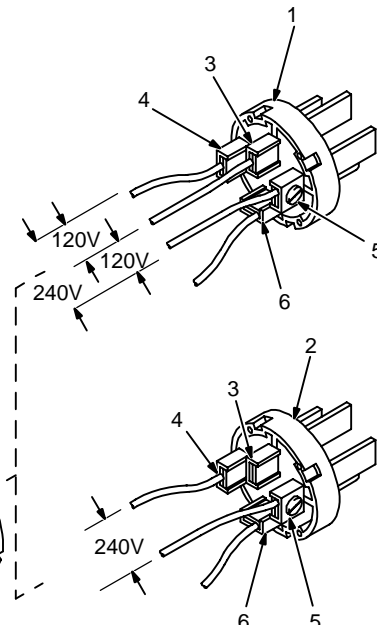
Weld Current Amperes	Watts	120 V Receptacle Amperes	240 V Receptacle Amperes
0	12000	100	50
100	11000	90	45
150	9500	80	40
200	7500	62	31
300	3000	25	12
350	1000	10	5

## 6-2. Wiring Instructions For Optional 240 Volt, Single-Phase Plug (NEMA 14-50P)



**Tools Needed:**





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
- 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

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

Strip cord jacket back enough to separate conductors.

Strip conductors enough to make good contact with plug terminals. Make plug connections and re-install outer shell and cord grip.

Tighten assembly screws onto shell. Do not overtighten.

Plug1 7/99 – ST-120 813-D

# SECTION 7 – MAINTENANCE AND TROUBLESHOOTING

## 7-1. Maintenance Label

### KUBOTA DH905/DH1005 DIESEL ENGINE

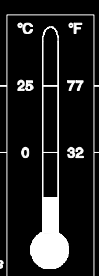
See Engine Manual for complete engine care.  
Give Engine Specification and Serial Number when ordering parts.

**Check daily.**

**To Drain Oil:**  
Push And Turn CCW  
1/2 in. ID Hose  
Pull

SAE 10W-30  
or  
SAE 10W-40

Multi-Viscosity Oils



°C      °F

SAE 30  
SAE 20  
SAE 10W

Single Viscosity Oils

**Recommended Oil** . . . . . API Service Classification CD/CE or better

**Oil Change** . . . . . 200 hours or less

**Oil Filter Change** . normal conditions – 200 hours or less

**Oil Filter** . . . . . MILLER 196428  
Kubota 16271-32092  
Wix 51394  
Baldwin B161-S  
Hastings LF402  
Fram PH2849A

**Oil Capacity** . . . . . 5.4 qt (5.1 L)

**Fuel Grade** . . . . . 2-D Cetane No. 45 min. (.5% max. Sulfur content)

**In Line Fuel Filter** . . . . . MILLER 066113

**Fuel Filter Element** . . . . . MILLER 192744 Fram P1145A Donaldson P550587


*Fill filter with clean fuel before installing – read instructions on filter.*














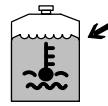


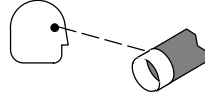


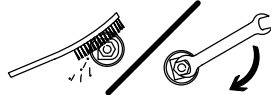


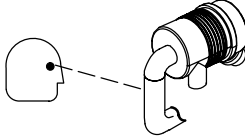
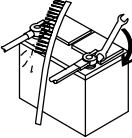
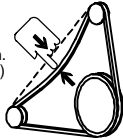

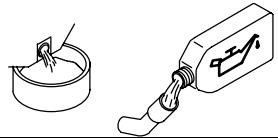
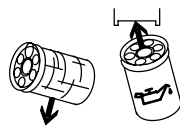
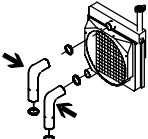
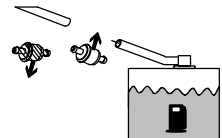



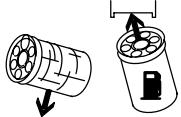
	<b>Air Filter Service</b> . . . . . 100 hours or less – see Owner's Manual
	<b>Air Filter Element</b> . . . . . MILLER 187441 Baldwin RSS715 Donaldson P822886 Wix 48449
	<b>Air Filter Element (Safety) Opt</b> . . . . . MILLER 202102 Donaldson P553396
	<b>12 Volt Battery</b> . . BCI Group 55
	<b>Cranking Performance at 0° F (-18°C)</b> . . . . . 535 Amps
	<b>Valve Clearance – Cold</b> .0057 – .0072 in. .145 – .185 mm
	<b>Engine RPM – No Load</b> <b>Weld/Power</b> . . . . . 3725 ±25 <b>Idle</b> . . . . . 2525 ±25
	<b>Engine Cooling</b> 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.
	<b>Injectors</b> . . . . . MILLER 206107 Kubota 16281-53000 <i>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.</i>
	<b>Belt</b> . . . . . MILLER 197197 Kubota 16282-97010 Gates 7375
	<b>Glow Plugs</b> . . . . . MILLER 187820 Kubota 16851-85512 <b>Note:</b> Operation not required when above 50° F (10° C) or when engine is warm. Never operate for more than 20 seconds continuous.

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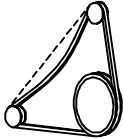
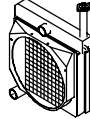
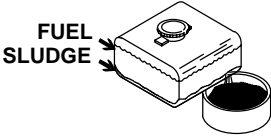
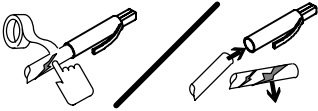
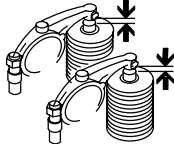
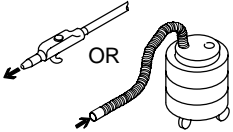
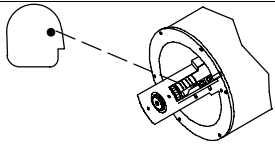

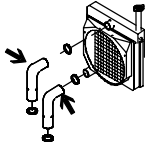


## 7-2. Routine Maintenance


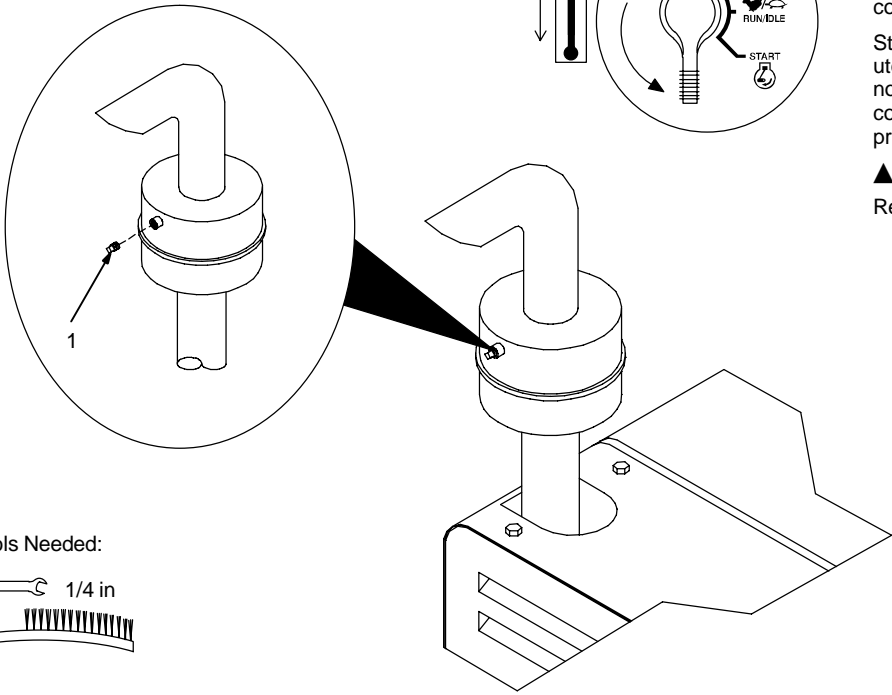
**Note**  Follow the storage procedure in the engine owner's manual if the unit will not be used for an extended period.

      		 <p>Recycle engine fluids.</p>	<p><b>▲ Stop engine before performing maintenance.</b></p> <p> See also Engine Manual and Maintenance Label. Service engine more often if used in severe conditions.</p> <p>* To be done by Factory Authorized Service Agent.</p>
 <b>Every 8 h</b>			
<p>Wipe Up Spills.</p> 	<p>Check Fluid Levels. See Section 4-2.</p>    <p>Recovery Tank</p>	<p>Drain Water From Fuel System. See Section 7-5.</p> 	
 <b>Every 20 h</b>			
<p>Check and clean optional spark arrestor screen. See Section 7-3.</p> 			
 <b>Every 50 h</b>			
<p>Check fuel lines and connections. See Section 7-5.</p> 	<p>Clean and tighten weld terminals.</p> 		
 <b>Every 100 h</b>			
<p>Service air filter element. See Section 7-4.</p> 	<p>Check air cleaner hoses for cracks and loose clamps.</p> 		
<p>Clean and tighten battery connections.</p> 	<p>Check belt tension.</p>  <p>5/16 in. (8 mm)</p>		
 <b>Every 200 h</b>			
<p>Change oil. See Section 7-5 and maintenance label.</p> 	<p>Change oil filter. See Section 7-5 and maintenance label.</p> 		
<p>Check radiator hoses and clamps.</p> 	<p>Replace primary (in-line) fuel filter. See Section 7-5.</p> 		
<p>Replace unreadable labels.</p>  			
 <b>Every 400 h</b>			
<p>Replace secondary fuel filter. See Section 7-5.</p> 			

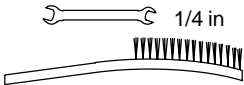


<b>🕒 Every 500 h</b>	
Replace fan belt.	Flush radiator.
	
Drain sludge from fuel tank. See Section 7-5.	Repair or replace cracked cables.
	
<b>🕒 Every 800 h</b>	
Check valve clearance.*	
<b>🕒 Every 1000 h</b>	
Blow out or vacuum inside. During heavy service, clean monthly.	Service welding generator brushes and slip rings. Service more often in dirty conditions.*
	
<b>🕒 Every 2000 h</b>	
Replace fuel lines and clamps. See Section 7-5.	Replace radiator coolant and hoses. See Section 7-6.
	

### 7-3. Servicing Optional Spark Arrestor

**Tools Needed:**



**▲ Stop engine and let cool.**

1 Cleanout Plug

Remove plug and remove any dirt covering cleanout hole.

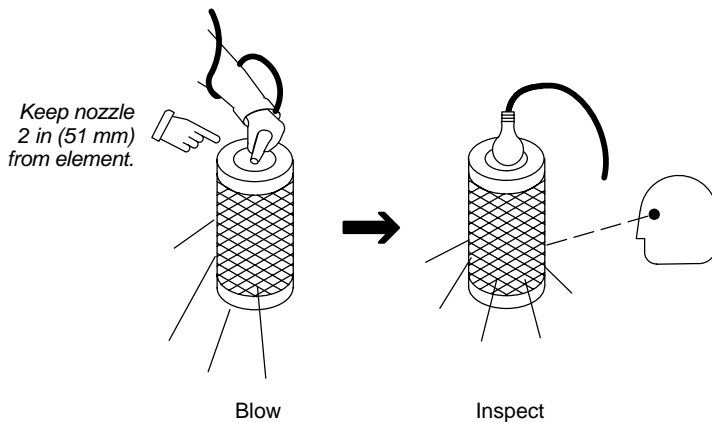
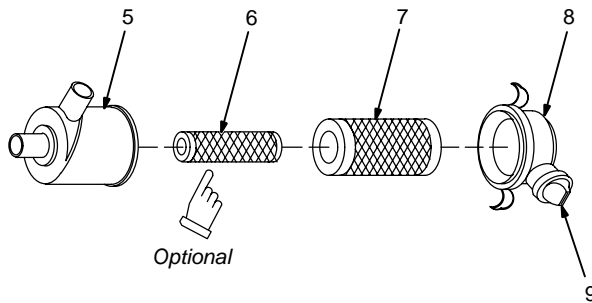
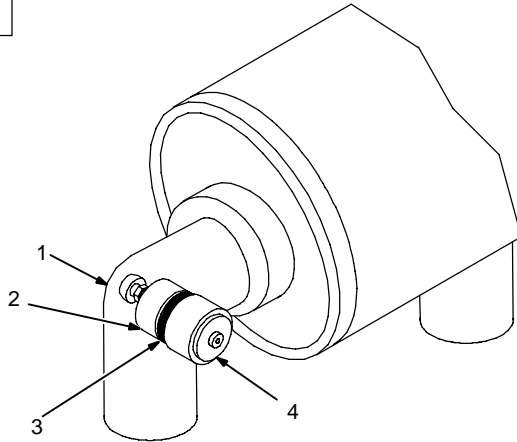
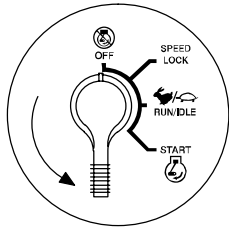
Start engine and run several minutes to blow out cleanout hole. If nothing blows out of hole, briefly cover end of exhaust pipe with fire-proof material.

**▲ Stop engine and let cool.**

Reinstall cleanout plug.

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## 7-4. 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.

- 1 Intake Manifold
- 2 Service Indicator
- 3 Window
- 4 Reset Button

Service air cleaner element if red band appears in window. A clear window means air cleaner is okay. Press button to reset indicator.

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.

- 5 Housing
- 6 Safety Element (Optional)
- 7 Primary Element
- 8 Dust Cap
- 9 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.

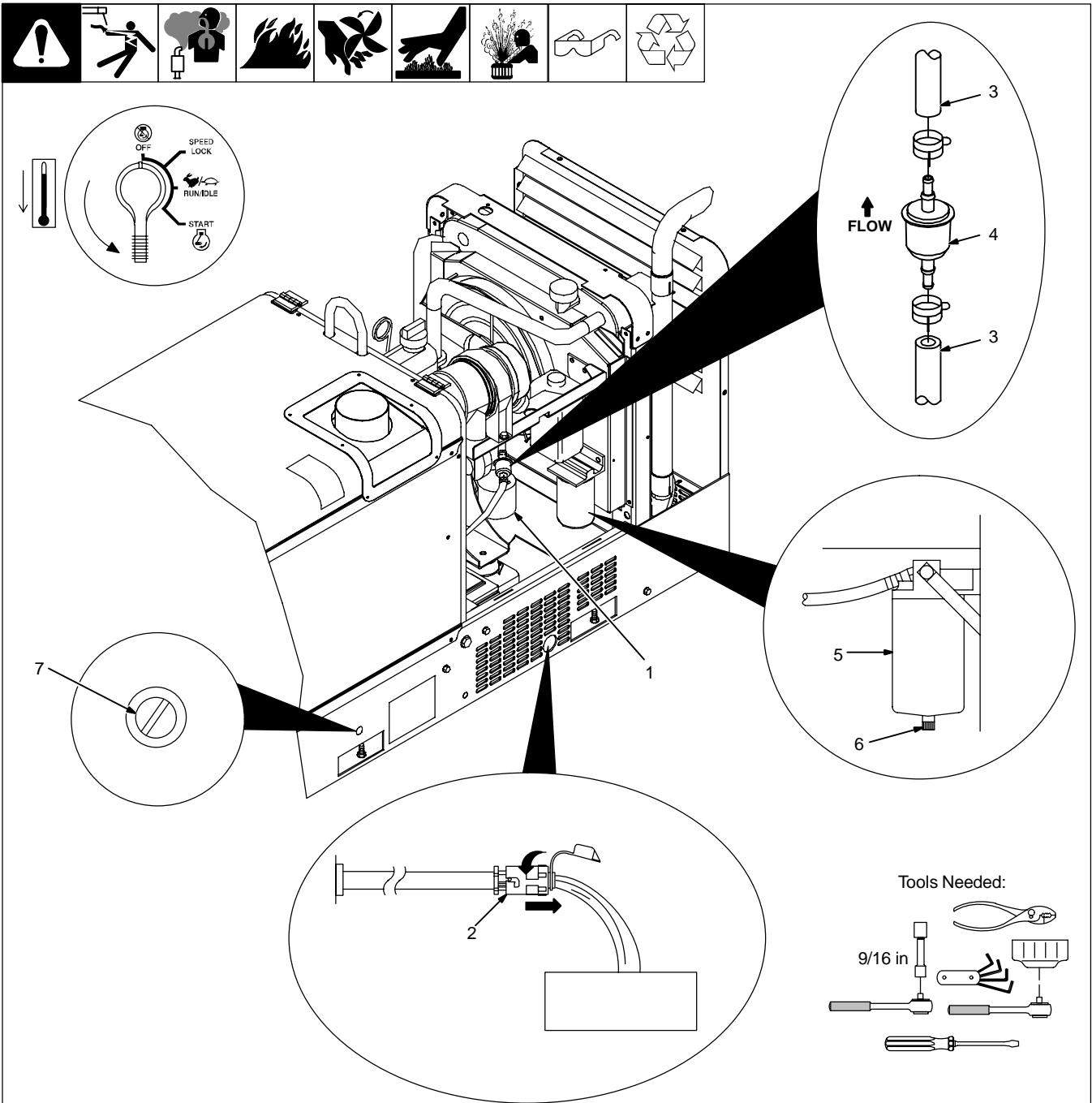
### ▲ Do not clean housing with air hose.

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).

## 7-5. Servicing Engine Lubrication And Fuel Systems



**▲ Stop engine and let cool.**

- 1 Oil Filter
- 2 Oil Drain Valve
- 3 Fuel Line
- 4 Primary (In-Line) Fuel Filter
- 5 Secondary (Canister) Fuel Filter
- 6 Petcock
- 7 Fuel Tank Sludge Drain Valve

**To change oil and filter:**

Pull oil drain hose through access hole in base. Change engine oil and filter according to instructions in 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 4-2).

**To drain water from fuel system:**

Open secondary fuel filter petcock and drain water into metal container. Close petcock when water-free fuel flows.

**To change fuel filters:**

Install new primary fuel filter as shown.

Replace secondary fuel filter according to engine manual.

Ref. 803 178 / Ref. 207 554-A / S-0842

Replace fuel lines if cracked or worn.

Wipe up any spilled fuel.

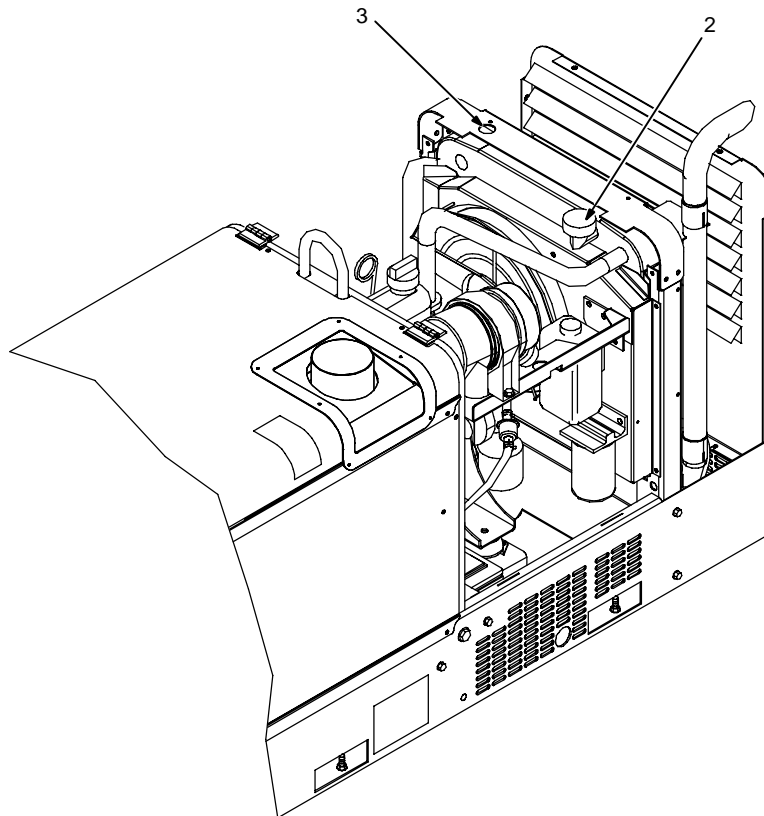
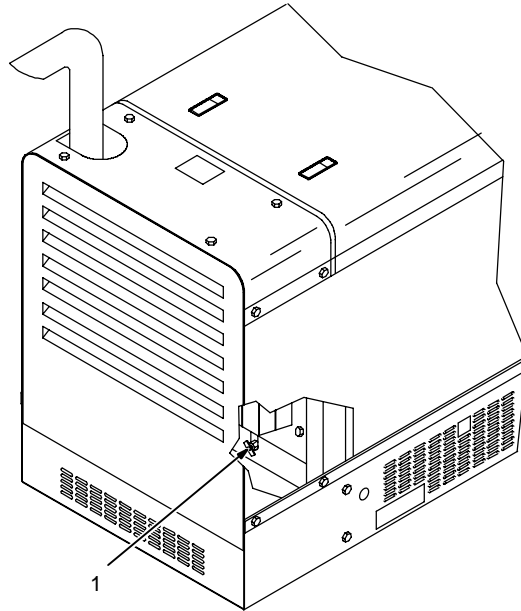
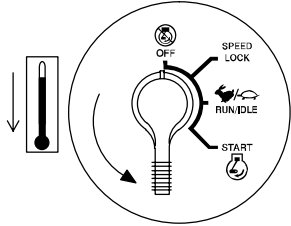
**▲ After servicing, start engine and check for fuel leaks.**

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

**To drain sludge from fuel tank:**

Attach hose to drain valve. Put metal container under drain. Open valve and drain sludge by turning valve screw counter-clockwise. Close valve and remove hose when done.

## 7-6. Servicing Engine Cooling System



### ▲ Stop engine and let cool.

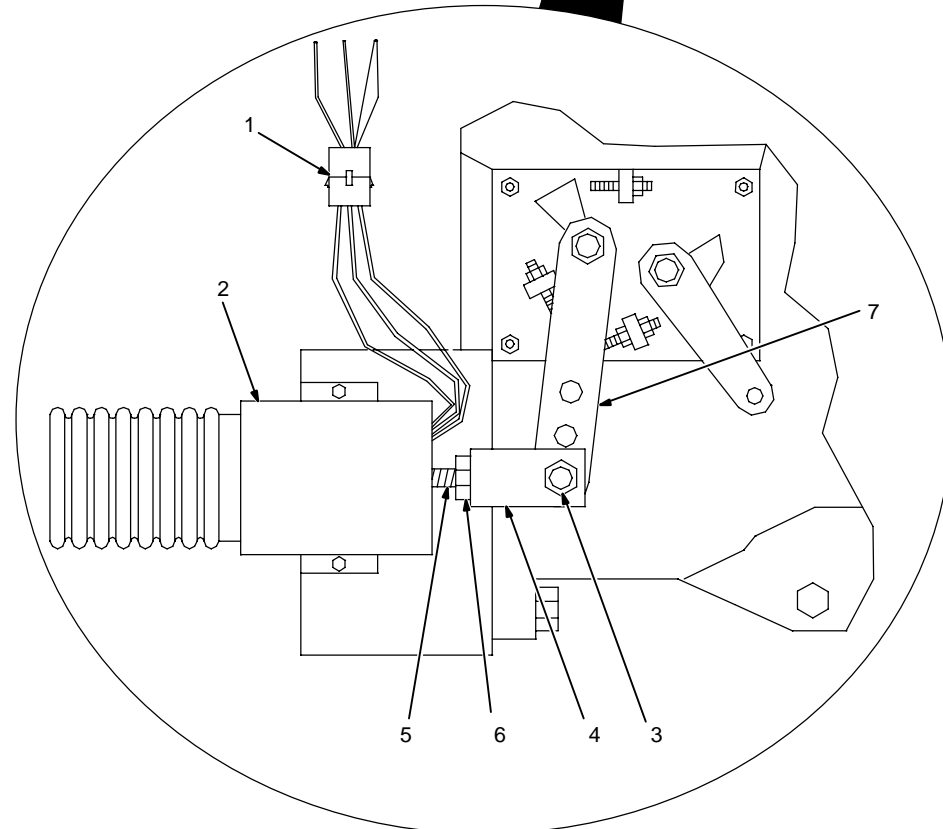
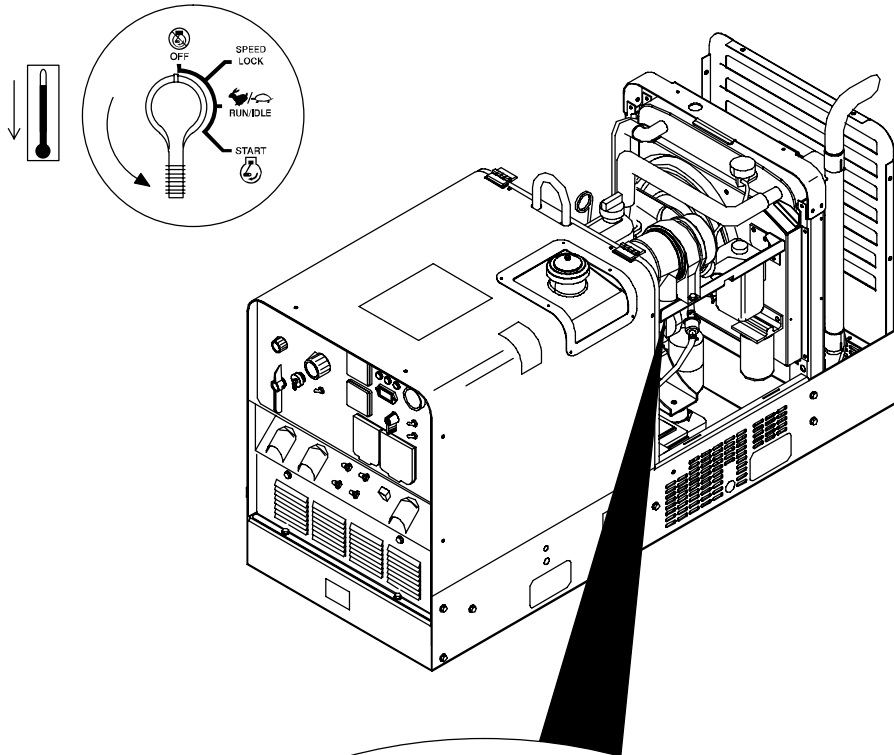
- 1 Radiator Draincock
- 2 Radiator Cap
- 3 Radiator Air Bleed Screw

Change coolant according to engine manual. Add coolant according to Section 4-3).

Run engine until engine reaches normal operating temperature. Loosen air bleed screw to remove air from cooling system. Tighten screw.

Check coolant level in recovery tank. Add coolant if necessary

## 7-7. Replacing Throttle Solenoid TS1



▲ **Stop engine, and let cool.**

▲ **Disconnect battery, negative (-) cable first.**

Remove right side engine panel.

- 1 Plug PLG39/Receptacle RC39
- 2 Throttle Solenoid TS1
- 3 Shoulder Bolt And Nut
- 4 Throttle Link
- 5 Throttle Solenoid Plunger Rod
- 6 Jam Nut
- 7 Throttle Arm

Disconnect solenoid plug PLG39 from wiring harness receptacle RC39.

Remove shoulder bolt and nut from throttle link.

Remove solenoid from mounting bracket.

Note how much thread is visible on solenoid plunger rod. Loosen jam nut just enough so throttle link can be removed from solenoid rod.

Install throttle link on new solenoid plunger rod. Turn link until the same amount of thread will be visible on plunger rod when the jam nut is tightened. (Do not tighten jam nut yet.)

Mount solenoid on bracket. Move solenoid plunger manually to align slot in throttle link with hole in throttle arm. Insert shoulder bolt through slot/hole and secure with nut.

**⚠ Be sure solenoid plunger rod pulls all the way in "bottoms" when energized. If plunger rod does not pull all the way in, re-adjust throttle link.**

Tighten jam nut on solenoid plunger rod. Verify all other hardware is tight.

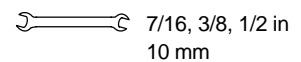
Connect solenoid plug PLG39 to wiring harness receptacle RC39.

Reconnect battery, negative (-) lead last.

Check engine speeds and adjust if necessary according to Section 7-8.

Reinstall side panel.

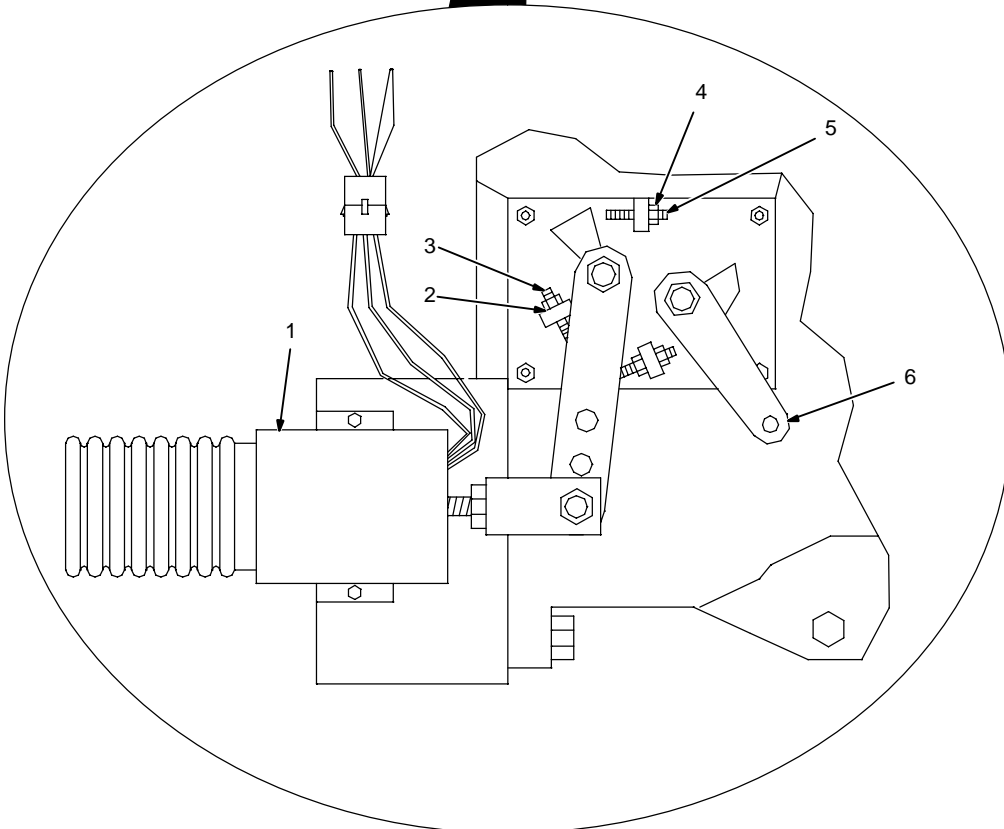
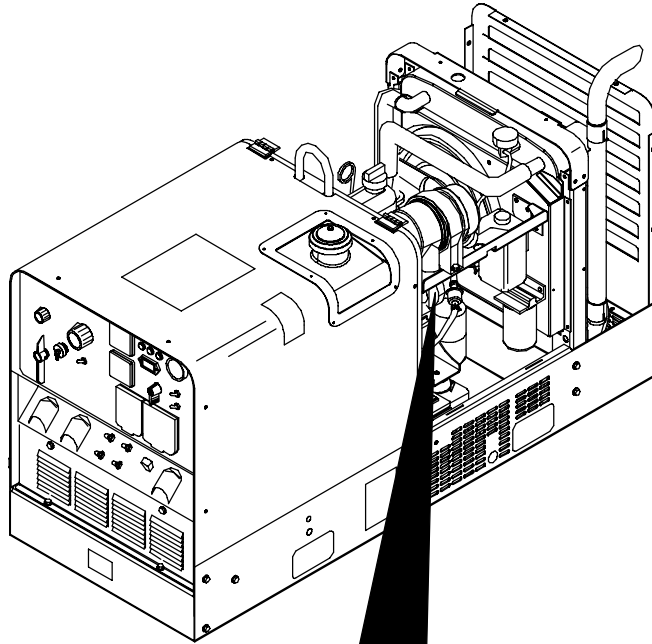
Tools Needed:



## 7-8. Adjusting Engine Speed



	2500 rpm
	3750 Max



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

Start engine and run until warm. Turn Voltage/Amperage control to max.

### Adjusting Idle Speed

Turn Engine Control switch to Run/Idle position.

- 1 Throttle Solenoid
- 2 Idle Speed Jam Nut
- 3 Idle Speed Screw

Loosen nut and turn screw clockwise to increase idle speed. Turn screw counterclockwise to decrease idle speed. Tighten nut.

See engine manual for governor sensitivity adjustment.

### Adjusting Weld/Power Speed

- 4 Weld Speed Jam Nut
- 5 Adjustment Screw

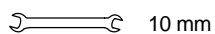
Turn Engine Control switch to Run position. Loosen nut and turn screw counterclockwise to increase speed. Turn screw clockwise to decrease speed. Tighten nut.

### Using Engine Stop Lever

- 6 Engine Stop Lever

Use lever to stop engine if Engine Control switch does not work.

Tools Needed:

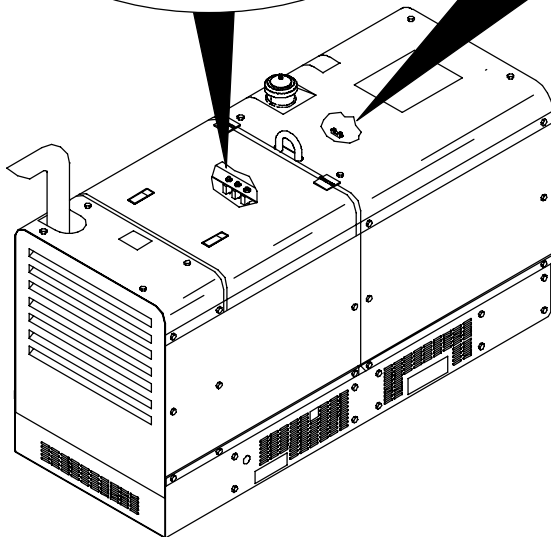
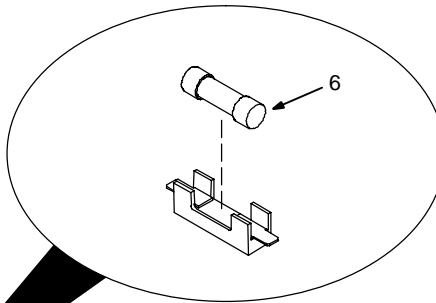
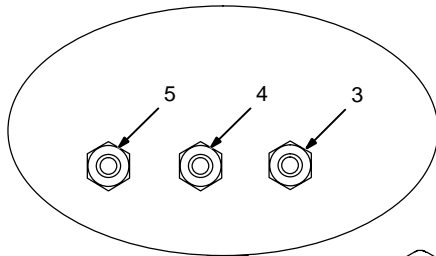
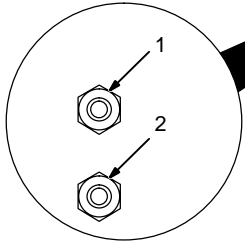
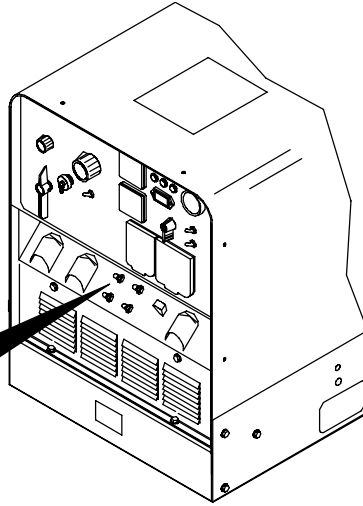
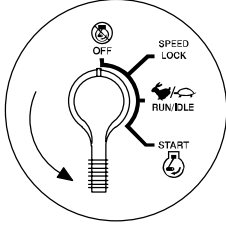
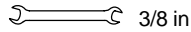


10 mm

## 7-9. Overload Protection



Tools Needed:



### ▲ Stop engine.

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

#### 1 Circuit Breaker CB5

CB5 protects the 24 volt ac output to Remote 14 receptacle RC4. If CB5 opens, 24 volt ac output to RC4 stops.

#### 2 Circuit Breaker CB6

CB6 protects the 115 volt ac output to Remote 14 receptacle RC4. If CB6 opens, 115 volt ac output to RC4 stops.

Press button to reset breaker.

#### 3 Circuit Breaker CB7

#### 4 Circuit Breaker CB8

#### 5 Circuit Breaker CB10

CB7 protects the engine glow plug from overload. If CB7 opens, the glow plug does not work and engine may not start in cold weather. Check continuity and connections of engine glow plug.

CB8 protects the engine wiring system from overload. If CB8 opens, the engine will not crank. Check battery, starter, and engine control switch.

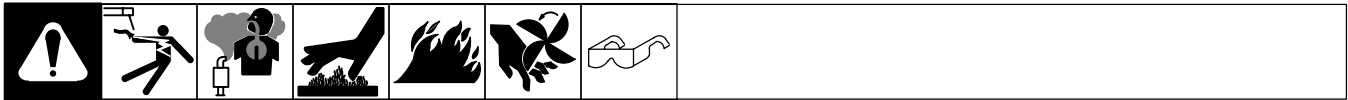
CB10 protects the engine fuel solenoid from overload. If CB10 opens, the engine cranks but does not start. Check fuel solenoid FS1 for obstructions.

#### 6 Fuse F1 (On Power Board PC7)

F1 protects the exciter excitation winding from overload. If F1 opens, generator power output stops or is low. Weld output is still available.

Replace any open fuses. Reinstall cover before operating unit.

## 7-10. Troubleshooting



### A. Welding

Trouble	Remedy
No weld output; generator power output okay at ac receptacles.	Place Process/Contactor switch in a Electrode Hot position, or place switch in a Remote position and connect remote contactor to optional Remote 14 receptacle RC4 (see Section 4-9).
	Check position of DC Polarity/AC switch.
	Reset circuit breaker(s) CB5 and CB6 (see Section 7-9). Check for faulty remote device connected to RC4.
	Check and secure connections to Remote 14 receptacle RC4 (see Section C).
	Have Factory Authorized Service Agent check capacitor board PC4 and connections.
	Have Factory Authorized Service Agent check brushes and slip rings, field excitation circuit, circuit boards PC1 and PC2, and the rotor.
No weld output or generator power output at ac receptacles.	Disconnect equipment from generator power receptacles during start-up.
	Check fuse F1, and replace if open (see Section 7-9).
	Have Factory Authorized Service Agent check brushes and slip rings, field excitation circuit, circuit boards PC1 and PC7, and the rotor.
Erratic weld output.	Check control settings.
	Clean and tighten connections both inside and outside unit.
	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 7-8).
	Check and secure lead connections to remote A/V control.
	Have Factory Authorized Service Agent check brushes, slip rings, and circuit boards PC1 and PC2.
High weld output.	Check position of Voltage/Amperage Adjust control.
	Check engine speed, and adjust if necessary.
	Have Factory Authorized Service Agent check circuit boards PC1 and PC2.
Low weld output.	Check engine speed, and adjust if necessary.
	Have Factory Authorized Service Agent check brushes and slip rings, field excitation circuit, circuit boards PC1 and PC2, and the rotor.
Low open-circuit voltage.	Check engine speed, and adjust if necessary.
Weld output cannot be adjusted.	Check position of Voltage/Amperage Adjust switch (see Section 5-1).
No power output at Remote 14 receptacle RC4.	Reset circuit breaker CB5 and/or CB6 (see Section 6-1).
No remote fine amperage or voltage control.	Place Voltage/Amperage Adjust switch in Remote position.
	Check and secure connections to Remote 14 receptacle RC4 (see Section 4-9).
	Repair or replace remote control device.



<b>Trouble</b>	<b>Remedy</b>
Min or max CV weld output only.	Check position of Voltage/Amperage Adjustment control and Voltage/Amperage Adjust switch (see Section 5-1).
	Repair or replace remote control device.
	Have Factory Authorized Service Agent check circuit boards PC1 and PC2.
Lack of high frequency; difficulty in establishing Gas Tungsten Arc Welding arc.	Use proper size tungsten for welding amperage.
	Operate unit at weld/power speed.
	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.

## **B. Generator Power**

<b>Trouble</b>	<b>Remedy</b>
No generator power output at ac receptacles; weld output okay.	Reset circuit breakers CB1, CB3 and/or CB4 (see Section 6-1).
	Check fuse F1, and replace if necessary (see Section 7-9).
	Have Factory Authorized Service Agent check brushes, slip rings, and circuit boards PC1 and PC7.
No generator power at ac receptacles or weld output.	Disconnect equipment from generator power ac receptacles during start-up.
	Check fuse F1, and replace if necessary (see Section 7-9).
	Have Factory Authorized Service Agent check brushes and slip rings, field excitation circuit, circuit boards PC1 and PC7, and the rotor.
Low power output at ac receptacles.	Check and clean air cleaner as necessary (see Section 7-4).
	Check engine speed, and adjust if necessary (see Section 7-8).
	Have Factory Authorized Service Agent check circuit boards PC1 and PC7.
	See engine manual.
High power output at ac receptacles.	Check engine speed, and adjust if necessary (see Section 7-8).
	Have Factory Authorized Service Agent check circuit boards PC1 and PC7.
Erratic power output at ac receptacles.	Have Factory Authorized Service Agent check brushes, slip rings, and circuit boards PC1 and PC7.
	Check receptacle wiring and connections.
	Check governor according to engine manual.

## C. Engine

Trouble	Remedy
Engine will not crank.	Reset circuit breaker CB8 (see Section 7-9).
	Check battery voltage.
	Check battery connections and tighten if necessary.
	Have Factory Authorized Service Agent check Engine Control switch S2.
Engine cranks, but does not start.	Check fuel level (see Section 4-2).
	Check oil level (see Section 4-2). Engine will not start if oil pressure is low.
	Reset circuit breaker CB10 (see Section 7-9).
	Check coolant level and fan belt (see Section 4-2 and engine manual). Engine will not start if coolant temperature is high.
	Use Glow Plug if unit does not start in cold weather. If unit still does not start, reset circuit breaker CB7 (see Section 7-9).
	Service primary and secondary fuel filters (see Section 7-5).
	Check battery and replace if necessary.
	Check engine charging system according to engine manual.
	Bleed air from fuel system according to engine manual.
	Have Factory Authorized Service Agent check low oil pressure switch S5, engine coolant temperature switch S4, and control relay CR1.
See engine manual.	
Engine starts but stops when Engine Control switch is released.	Check oil level (see Section 4-2). Engine will not start if oil pressure is too low.
	Reset circuit breaker CB10 (see Section 7-9).
	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 engine manual).
	Have Factory Authorized Service Agent check low oil pressure switch S5 and engine coolant temperature switch S4.
Engine does not stop.	Stop engine by pushing down engine stop lever (see Section 7-8). After stopping engine, adjust fuel solenoid linkage (see engine manual).
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 switch S5 and engine coolant 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.

Trouble	Remedy
Engine does not return to idle speed when load is removed with Engine Control switch in Run/Idle position.	Remove all weld and generator 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 throttle solenoid linkage.
	Have Factory Authorized Service Agent check control relay CR2, current transformer CT1, throttle solenoid TS1, and circuit boards PC1 and PC2.
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 7-8).
	Have Factory Authorized Service Agent check control relay CR2, current transformer CT1, throttle solenoid TS1, and circuit boards PC1 and PC2.
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 7-8).
	Have Factory Authorized Service Agent check control relay CR2, Idle Lock switch S7, throttle solenoid TS1, and circuit boards PC1 and PC2.
Engine does not remain at weld/power speed with Engine Control switch in Speed Lock position and Speed Lock switch in Run position.	Check for obstructed movement of solenoid linkage (see Section 7-8).
	Have Factory Authorized Service Agent check control relay CR2, Idle Lock switch S7, throttle solenoid TS1, and circuit boards PC1 and PC2.
Engine uses oil during run-in period; wetstacking occurs.	Dry engine (see Section 9 and engine manual).
Coolant recovery tank continuously overflows.	Bleed air from radiator, and replace lost coolant (see Section 4-3).

# SECTION 8 – ELECTRICAL DIAGRAMS

**⚠ WARNING**

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

**ELECTRIC SHOCK HAZARD**

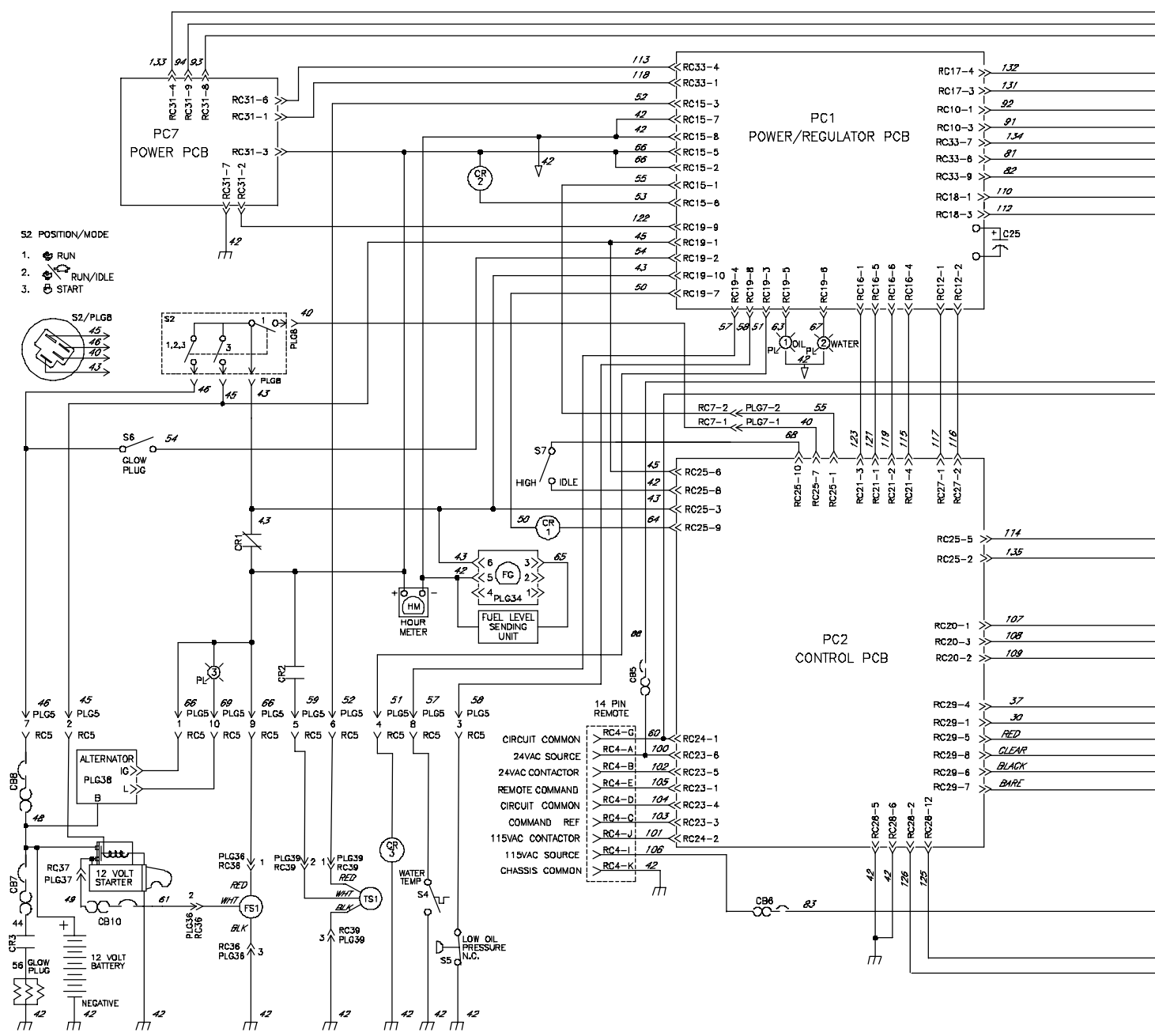
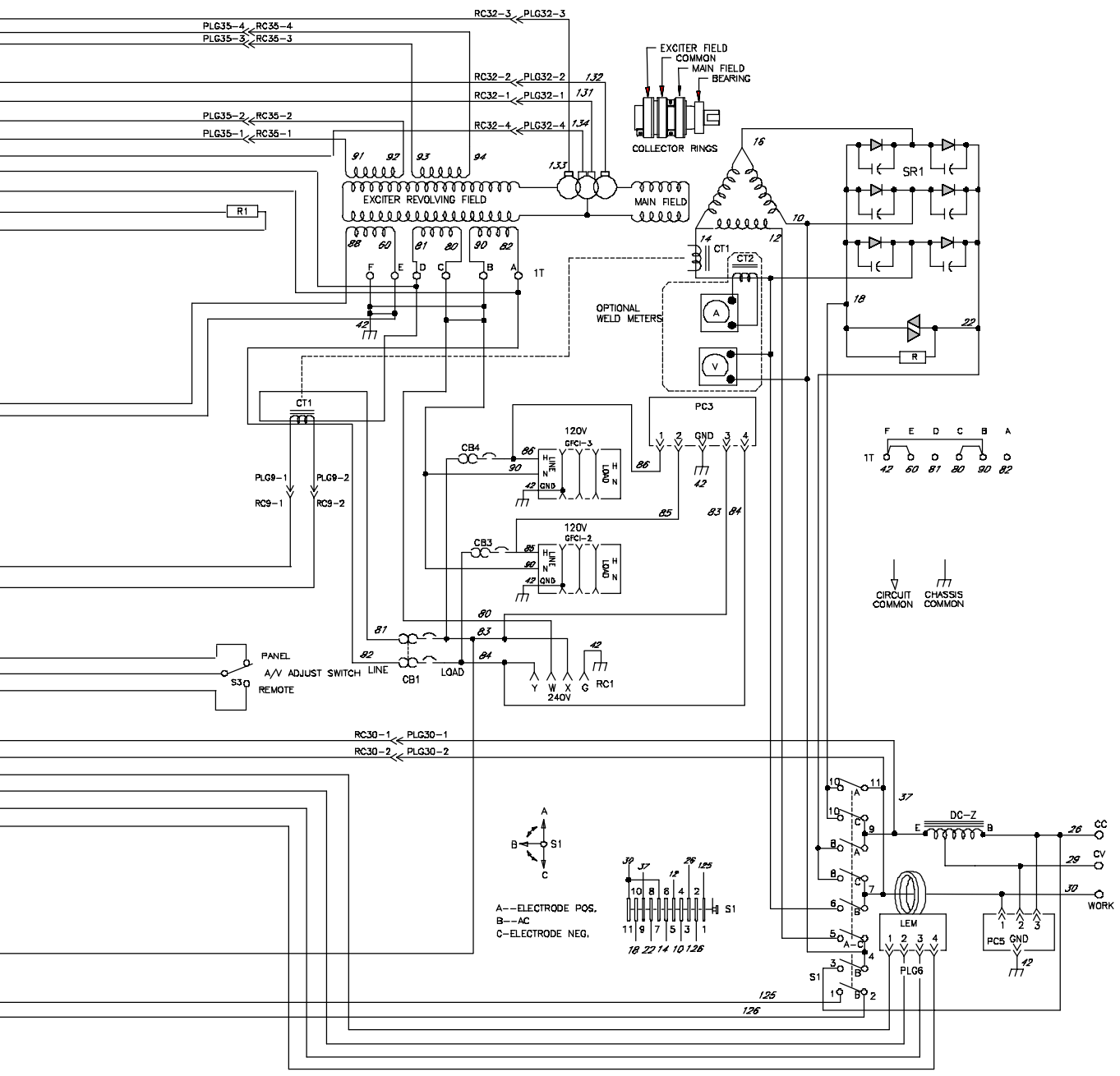


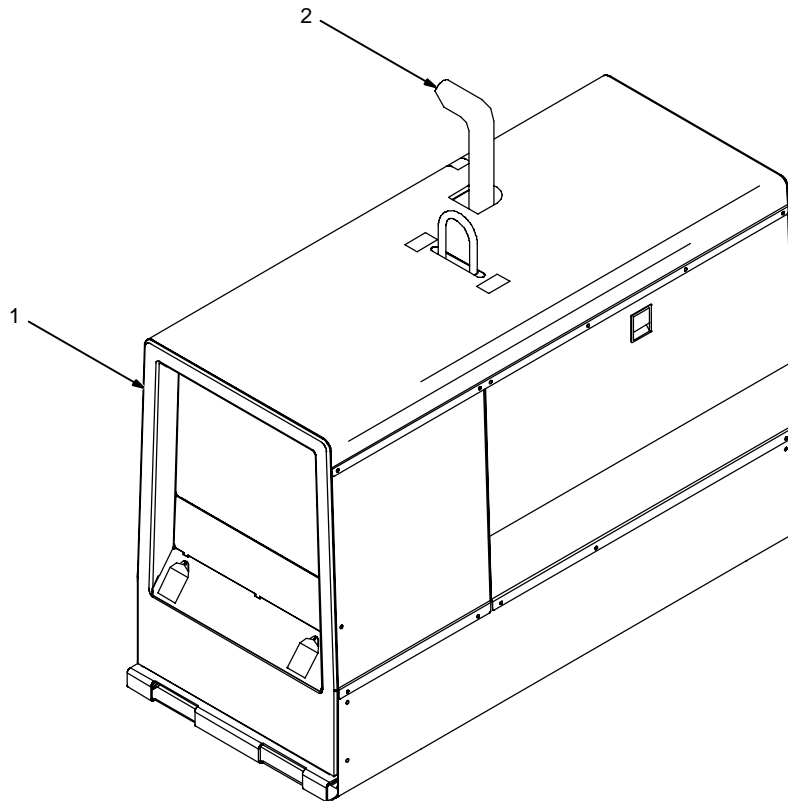
Figure 8-1. Circuit Diagram For Welding Generator



# SECTION 9 – RUN-IN PROCEDURE

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## 9-1. 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.

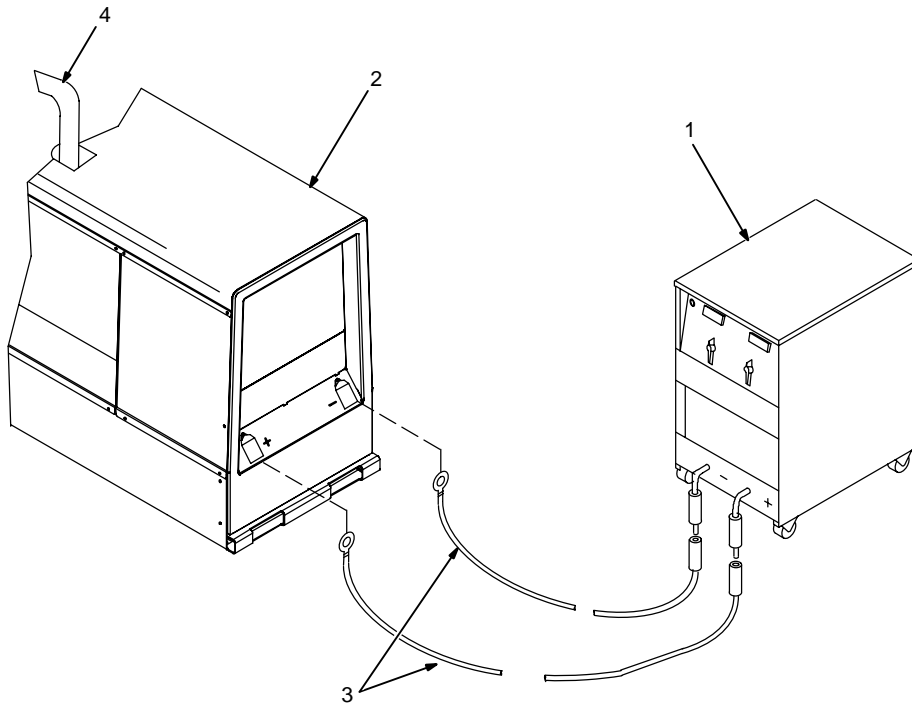
### 2 Engine Exhaust Pipe

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.

## 9-2. 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

### 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 V/A control so load equals 225 amps at 30 volts.

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.

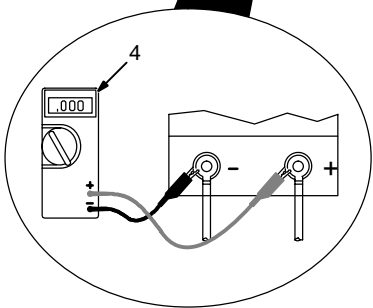
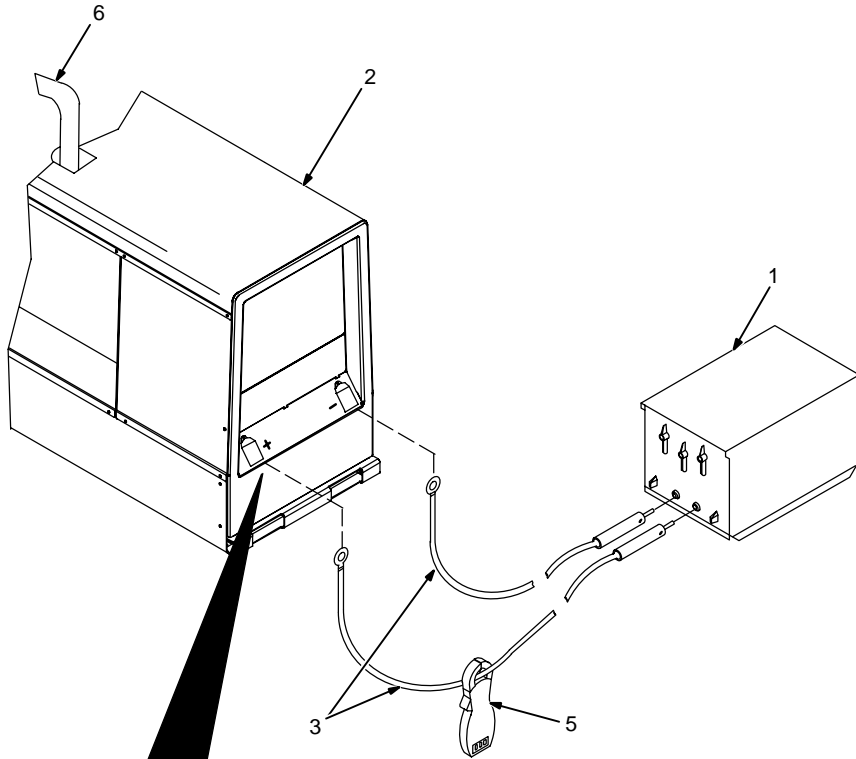
After one hour (minimum) place V/A control in minimum position, then turn off load bank to remove load. Run engine several minutes at no load.

- ▲ Stop engine and let cool.

### 4 Engine Exhaust Pipe

Repeat procedure if wetstacking is present.

### 9-3. 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

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 V/A control so load equals 225 amps at 30 volts.

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 V/A 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.





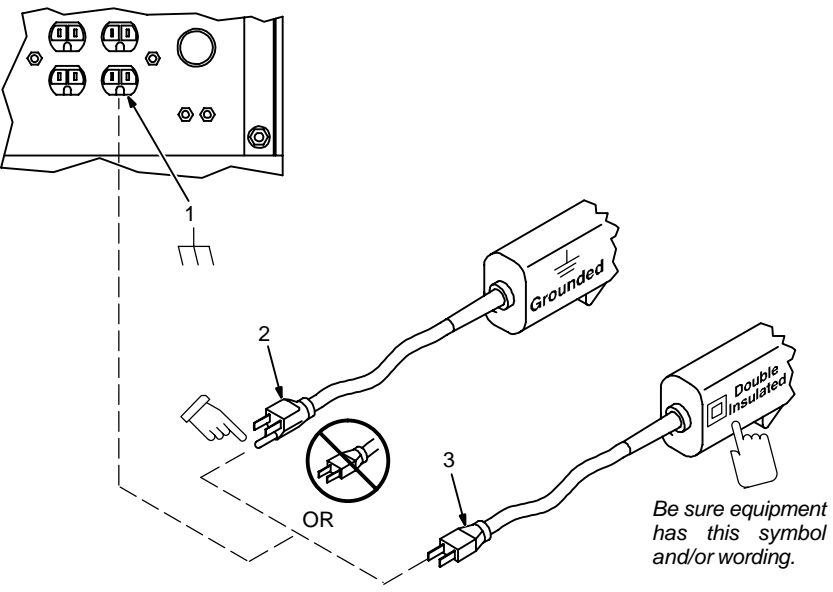
# SECTION 10 – GENERATOR POWER GUIDELINES

## NOTE

The views in this section are intended to be representative of all engine-driven welding generators. Your unit may differ from those shown.

### 10-1. Selecting Equipment





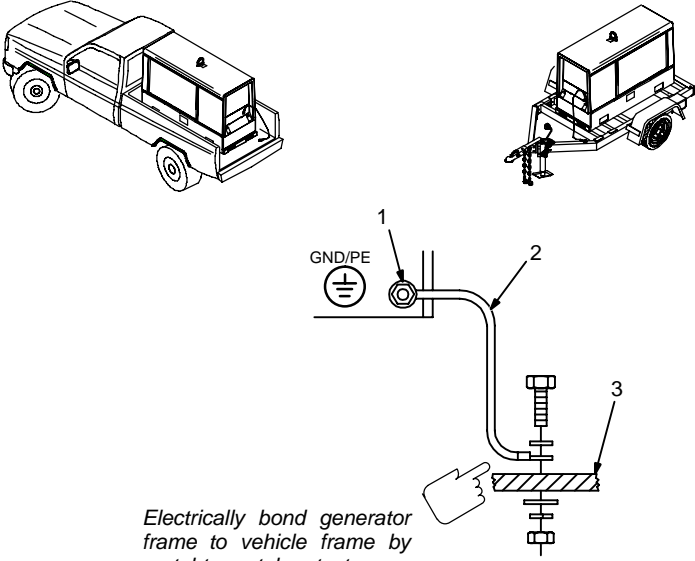
- 1 Generator Power Receptacles – Neutral Bonded To Frame
- 2 3-Prong Plug From Case Grounded Equipment
- 3 2-Prong Plug From Double Insulated Equipment

▲ **Do not use 2-prong plug unless equipment is double insulated.**

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### 10-2. Grounding Generator To Truck Or Trailer Frame



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

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

- 1 Equipment Grounding Terminal (On Front Panel)
- 2 Grounding Cable (Not Supplied)
- 3 Metal Vehicle Frame

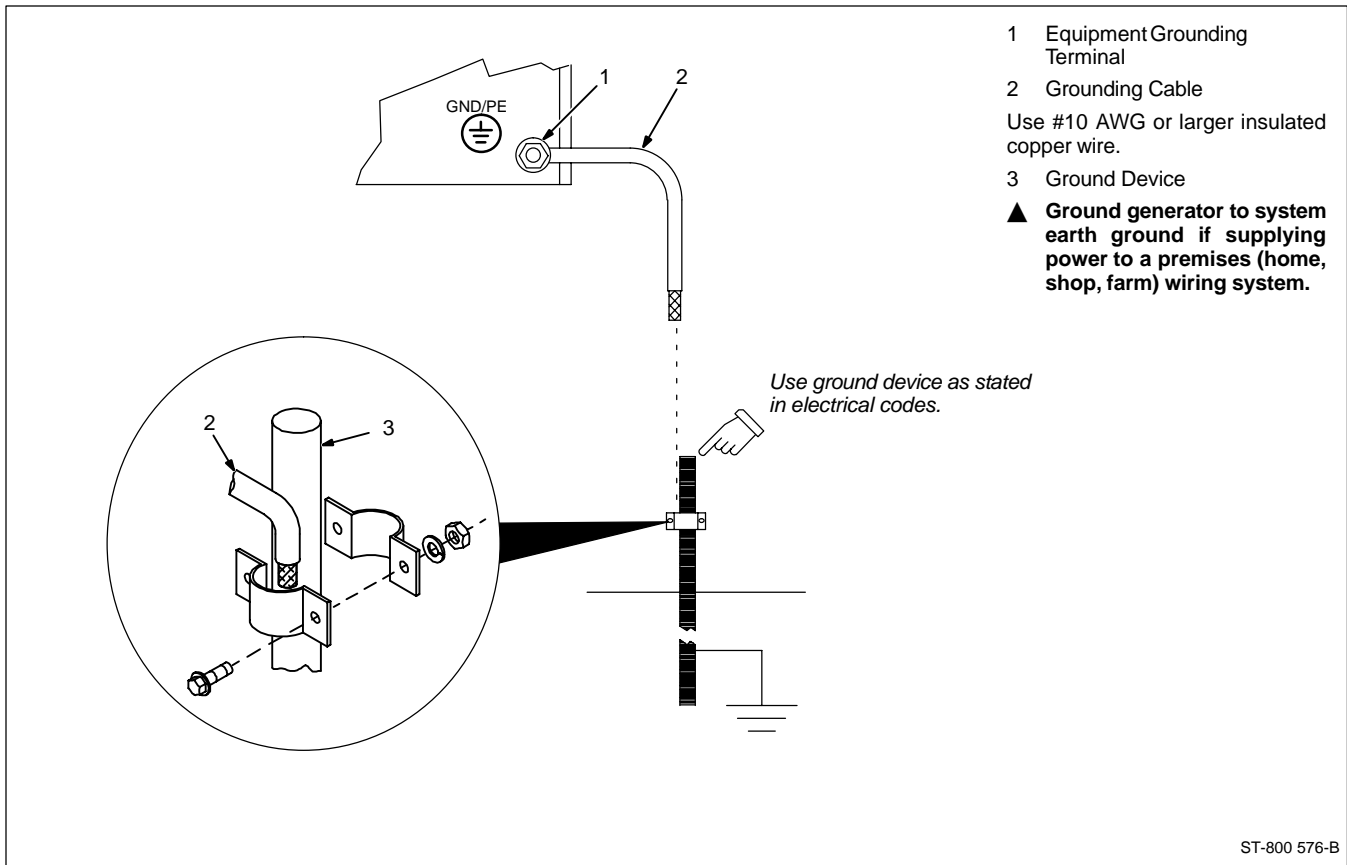
Connect cable from equipment ground terminal to metal vehicle frame. Use #10 AWG or larger insulated copper wire.

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

▲ **Bed liners, shipping skids, and some running gear insulate the welding generator from the vehicle frame. Always connect a ground wire from the generator equipment grounding terminal to bare metal on the vehicle frame as shown.**

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### 10-3. Grounding When Supplying Building Systems



### 10-4. 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 10-8).

3 Rating Data  
 Rating shows volts and amperes, or watts required to run equipment.

**AMPERES x VOLTS = 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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## 10-5. 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
Capacitor Start-Capacitor Run	5 HP	23300	6800
	1-1/2 HP	8100	2000
	5 HP	23300	6000
	7-1/2 HP	35000	8000
Fan Duty	10 HP	46700	10700
	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

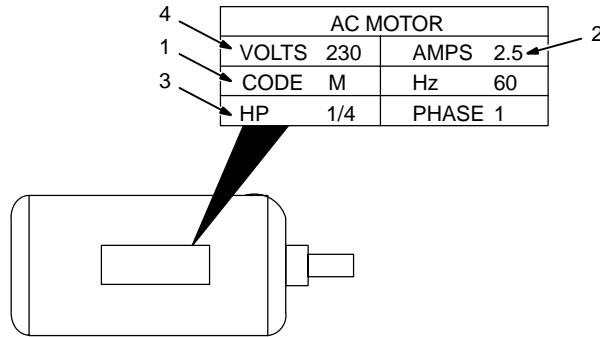
## 10-6. Approximate Power Requirements For Farm/Home Equipment

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

## 10-7. 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 Vapor	1400	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

## 10-8. 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

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

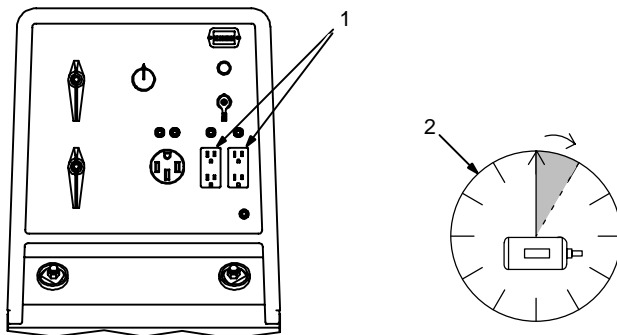
**EXAMPLE:** Calculate the starting amperage required for a 230 V, 1/4 HP motor with a motor start code of M.

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

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

S-0624

## 10-9. 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



## 10-11. 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

# SECTION 11 – PARTS LIST

 Hardware is common and not available unless listed.

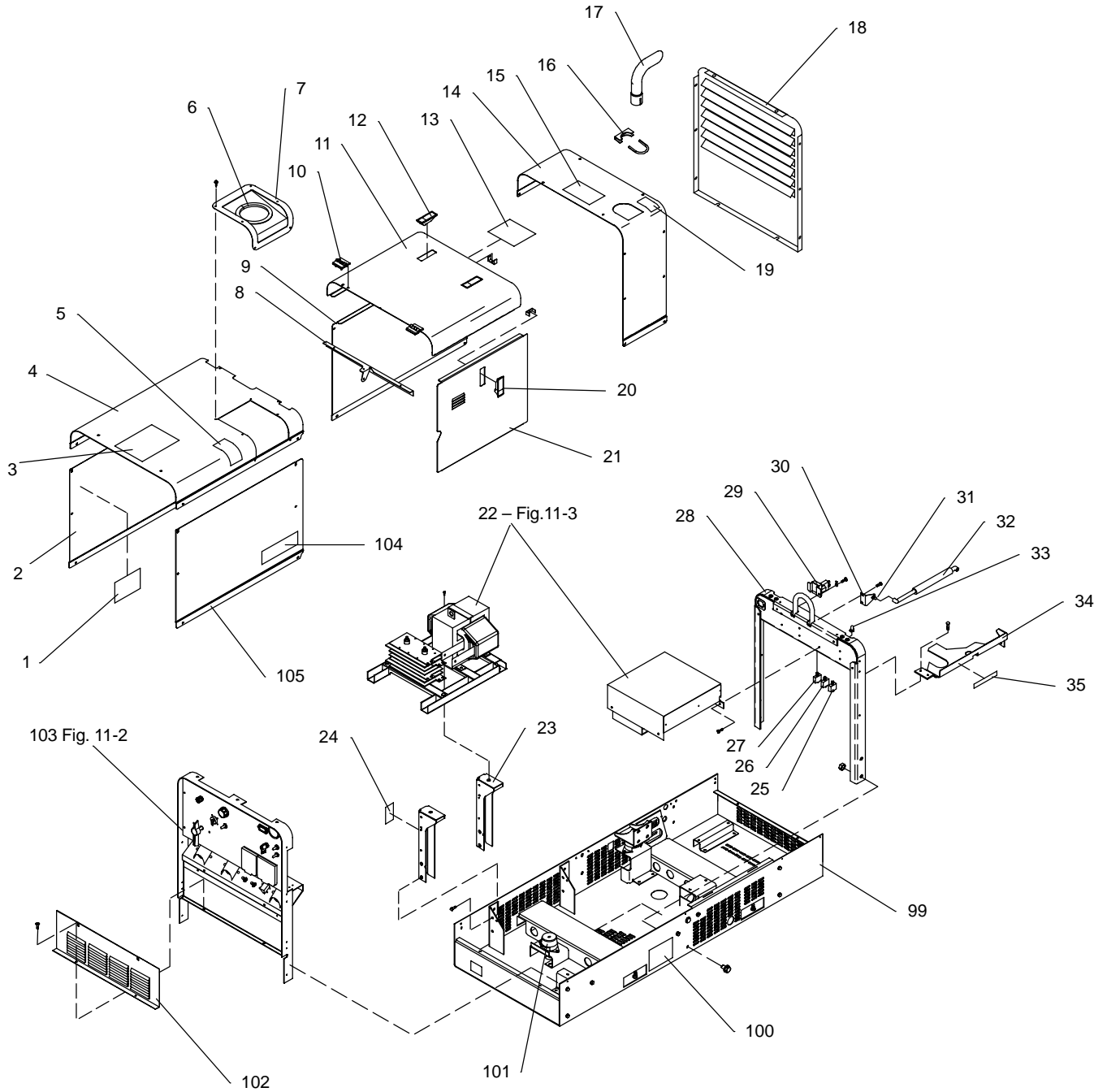
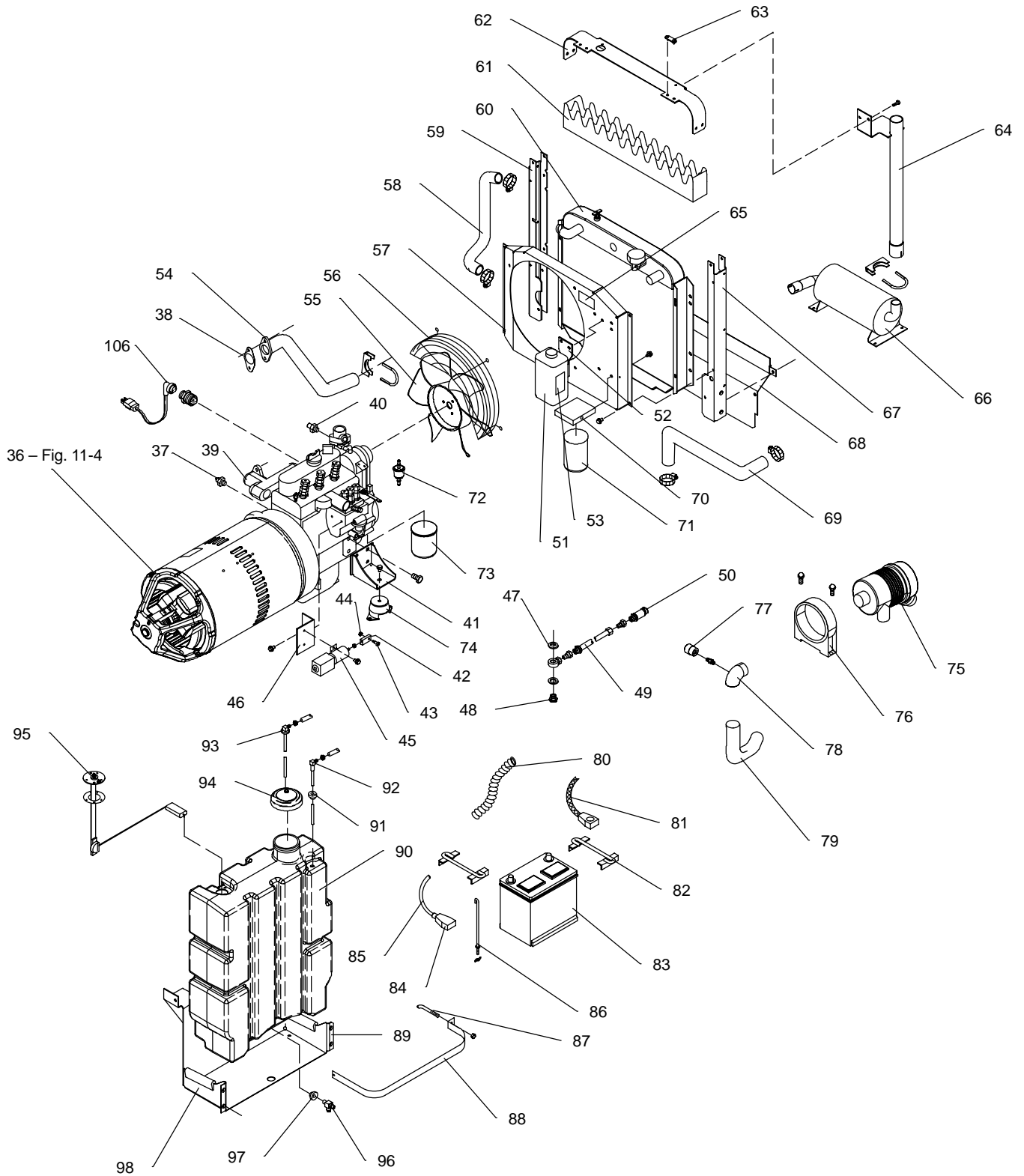


Figure 11-1. Main Assembly





Item No.	Dia. Mkgs.	Part No.	Description	Quantity
<b>Figure 11-1. Main Assembly</b>				
...	1	013367	Label, Warning Moving Parts Can Cause Serious Etc	1
...	2	+198157	Panel, Generator Left	1
...	2	◆+198 873	Panel, Generator Left Stainless	1
...	3	200795	Label, Warning General Precautionary Csa	1
...	4	+198155	Cover, Generator	1
...	4	+◆198 871	Cover, Generator Stainless	1
...		◆163175	Screw, 250–20x .75 Hex Hd–pln Stainless Pln T18–8 302–305	37
...		◆163167	Washer, Lock .254idx0.489odx.062t Stainless Split.250	37
...		◆163174	Washer, Flat .281idx0.625odx.050t Stainless	37
...		173348	Extrusion, Rubber W/Adhesive .370 X .750	4.75 ft
...	5	192041	Label, Use Diesel Fuel Only	1
...	6	200775	Edge, Trim	2 ft
...	7	198159	Tray, Fuel Spill	1
...	8	193411	Brace, Hood Access Rear	1
...	9	198156	Panel, Access	1
...	9	◆198872	Panel, Access Stainless	1
...	10	198525	Hinge, Door Access 180 Deg.	2
...	11	198164	Hood, Access	1
...	11	+◆198 878	Hood, Access Stainless	1
...	12	194320	Latch, Lever Flush Trigger	1
...	13	194295	Label, Diesel Engine Maintenance Kubota 905/1005	1
...	14	+198162	Plenum, Radiator Cover	1
...	14	◆198 875	Plenum, Radiator Cover Stainless	1
...	15	200448	Label, Warning Steam And Hot Coolant Can Burn	1
...	16	183314	Clamp, Muffler 1.625 Dia U Pld	3
...	17	201882	Pipe, Exhaust Elbow 1.654 ID Stainless	1
...	18	198153	Panel, Rear	1
...	19	176230	Label, Hot Exhaust Parts Do Not Touch	1
...	20	194320	Latch, Lever Flush Trigger	2
...	21	+198154	Door, Access Removable	1
...	21	◆198 870	Door, Access Removable Stainless	1
...	22	Figure 11-3	Stabilizer/Rectifier/Control box Assy	1
...	23	198167	Support, Weld Components	2
...	24	190861	Label, Warning Electric Shock And Moving Parts Etc	1
...		208871	Harness, Wrg Engine Compartment (consisting of)	1
...		RC5	Conn, Rect Univ 084 12p/S 3row Rcpt Cable/Panel Lkg	1
...		PLG38	Conn, Rect 250 2skt 2row Plug Cable Lkg	1
...		192169	Conn, Rect 250 1skt 1row Plug Cable Lkg	1
...		PLG36	Conn, Rect 250 3skt 2row Plug Cable Lkg	1
...		PLG37	Conn, Rect 250 1pin 1row Rcpt Cable Lkg	1
...		PLG39	Conn, Rect Univ 084 3p/S 1row Plug Cable Lkg	1
...		192167	Seal, Wire Univ 3p/S 1row	1
...	25	CB10	Circuit Breaker, Man Reset 1p 15a 250vac Frict	1
...	26	CB8	Circuit Breaker, Man Reset 1p 25a 250vac Frict	1
...	27	CB7	Circuit Breaker, Man Reset 1p 30a 250vac Screw	1
...		187654	Seal, Wire Univ 12p/S 3row	1
...	28	198054	Upright, Base Center	1
...		209344	Seal, Upright	1
...	29	CR3	Contact, Solenoid 12vdc Continuous 400a Inrush	1
...	30	193414	Bracket, Mtg Gas Spring Front	1
...	31	172296	Ball Gas Spring, Stud .39 Dia	2
...	32	192239	Spring, Pressure Gas	1
...	33	206795	Boot, Circuit Breaker Clear Hex Nut	3
...	34	+197265	Bracket, Mtg Air Cleaner	1
...	35	203260	Label, Caution Do Not Use Ether	1
...	36	Figure 11-4	Generator	1
...	37	S5	Switch, Pressure Oil 7psi Nc Screw Term	1
...	38	192517	Gasket, Exhaust Manifold	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
<b>Figure 11-1. Main Assembly (Continued)</b>				
39		193624	Engine, Kubota Dsl Elec Dh905-mi-b (Consisting Of)	1
40	S4	205800	Switch, Thermo Temp 230deg +/-5deg F No	1
41		192475	Support, Engine	2
42		118829	Screw, shld stl sch .312-18 x .500 x .375	1
43		194127	Linkage, Throttle Solenoid	1
44		145675	Nut, .312-18 .50 hex .37h stl Pld Deformed Lkg thrd	1
45	TS1	192196	Solenoid, Throttle	1
46		192663	Bracket, Mtg Solenoid	1
47		047235	Washer, Seal Oil Copper .879id X 1.059od 111-8737	2
48		047234	Banjo Bolt,	1
49		203897	Hose, Oil W/Fittings 22.500 Lg	1
50		165271	Valve, Oil Drain 3/8-18 Nptf	1
51		+187462	Bottle, Overflow W/Cap & Hose	1
52		192934	Bracket, Mtg Coolant Recovery Tank	1
		192517	Gasket, Exhaust Manifold	1
	GLOW PLUG	187820	Glow Plug	1
		206107	Injector Assy	1
		*197197	Belt, Fan Kubota 905	1
		010146	Clamp, Nyl .625 Clamp Dia X.500 Wide (For Overflow Bottle Hose)	1
53		197671	Label, Coolant Level	1
54		192194	Pipe, Exhaust Flexible Inlet W/Insulation	1
55		197146	Fan, Engine 330mm Pusher Kubota	1
56		191693	Guard, Fan	1
57		+202243	Shroud, Fan	1
58		191341	Hose, Radiator Outlet	1
59		198186	Bracket, Mtg Radiator Lh	1
60		197822	Radiator, W/14# Cap 3 Row Core 1.125 Inlet/Outlet	1
		187120	Cap, radiator pressure 14 lb	1
61		194578	Baffle, Foam Air	1
62		198181	Radiator Arch	1
63		191626	Bumper, Door Engine Access	2
64		192195	Pipe, Exhaust Outlet 1.625 Od	1
65		182092	Label, Warning Moving Parts Can Cause Serious Etc	1
66		201528	Muffler, Exhaust Engine Kubota Dh905	1
67		198187	Bracket, Mtg Radiator Rh	1
68		198185	Baffle, Lower Radiator	1
69		191342	Hose, Radiator Inlet	1
70		202198	Base, Fuel Filter	1
71		*192744	Filter, Fuel Spin-on	1
72		*066113	Filter, Fuel Inline .250	1
73		*196428	Filter, Oil Kubota 905dh/1005dh	1
74		192476	Mount, Engine Vibration	2
75		192188	Air Cleaner, Intake 90deg Outlet 4.25in Dia.	1
		*187441	Element, Air Cleaner	1
		*202102	Element, Air Cleaner Safety	1
76		193026	Band, Mtg Air Cleaner Case	1
77		209329	Indicator, restriction air	1
78		197256	Hose, Elbow Air Intake	1
79		197227	Hose, Elbow Air Cleaner 1.750id	1
80		110465	Tubing, Corrugated Plastic Slit .500 dia x coil	2.1 ft
81		032453	Cable, Bat Neg 26.000 No.2 Awg W/Clamp & .406 Rng	1
82		204875	Hold Down, Battery	1
83	BATT	146237	Battery, Stor 12v 535 Crk 90 Rsv Gp 55 Maint Free	1
		108081	Terminal Protector, Battery Post Mtg	2
84		114923	Boot, Insulator Term Post Red 1/0 Cable .875odx1.00	2
85		182276	Cable, Bat Pos 28.000 No 1 Awg W/Clamp & .406 Rng	1
86		494604	Bolt, J Stl .250-20 X 8.000 Pld W/Nuts&washers	2
87		097829	Bolt, J Stl .250-20 X 2.750 Pld	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
<b>Figure 11-1. Main Assembly (Continued)</b>				
88		200407	Strap, Fuel Tank	1
89		198168	Support, Fuel Tank/Weld Components	1
90		198180	Tank, Fuel 13.1 Gal (consisting of)	1
91		181572	Bushing, Tank Fuel	1
92		198510	Ftg, Stand Pipe Hose .3125 X24.570lg 90 Deg Zinc	1
93		198511	Ftg, Stand Pipe Hose .1875x24.570lg 90 Deg Zinc	1
94		190198	Cap, Tank Screw-on 3.500 In W/Vent W/Lanyard 8"	1
95	FUEL SEND	198512	Sender, Fuel Gauge 22.500 Deep Tank	1
96		189908	Valve, Drain Fuel 180 Deg Zinc Pld	1
97		124253	Bushing, Tank Fuel	2
98		199500	Tank, Fuel 13.1 Gal Detail	1
99		+197835	Base	1
100		197930	Label, Warning Do Not Weld On Base	2
101		192477	Mount, Generator Vibration	1
102		199701	Panel, Front Access	1
103	Figure 11-2		Front Panel Assembly	1
104		168385	Label, Warning Battery Explosion Can Blind	1
105		+198158	Panel, Generator Right	1
105		◆198 874	Panel, Generator Right Stainless	1
106		200653	Heater, Block Engine 120v 400w Kabota 905	1
		204773	Plug, W/Leads (consisting of)	1
	PLG18	131198	Conn, Rect Mini 045 3skt 1row Plug Cable Lkg	1
		194126	Kit, Acoustical Foam Noise Reduction	1
		209496	Kit, Label (consisting of)	1

◆Optional

\*Recommended Spare Parts.

- + When ordering a component originally displaying a precautionary label, the label should also be ordered. Order label individually or as part of Label Kit 209 496.

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☐ Hardware is common and not available unless listed.

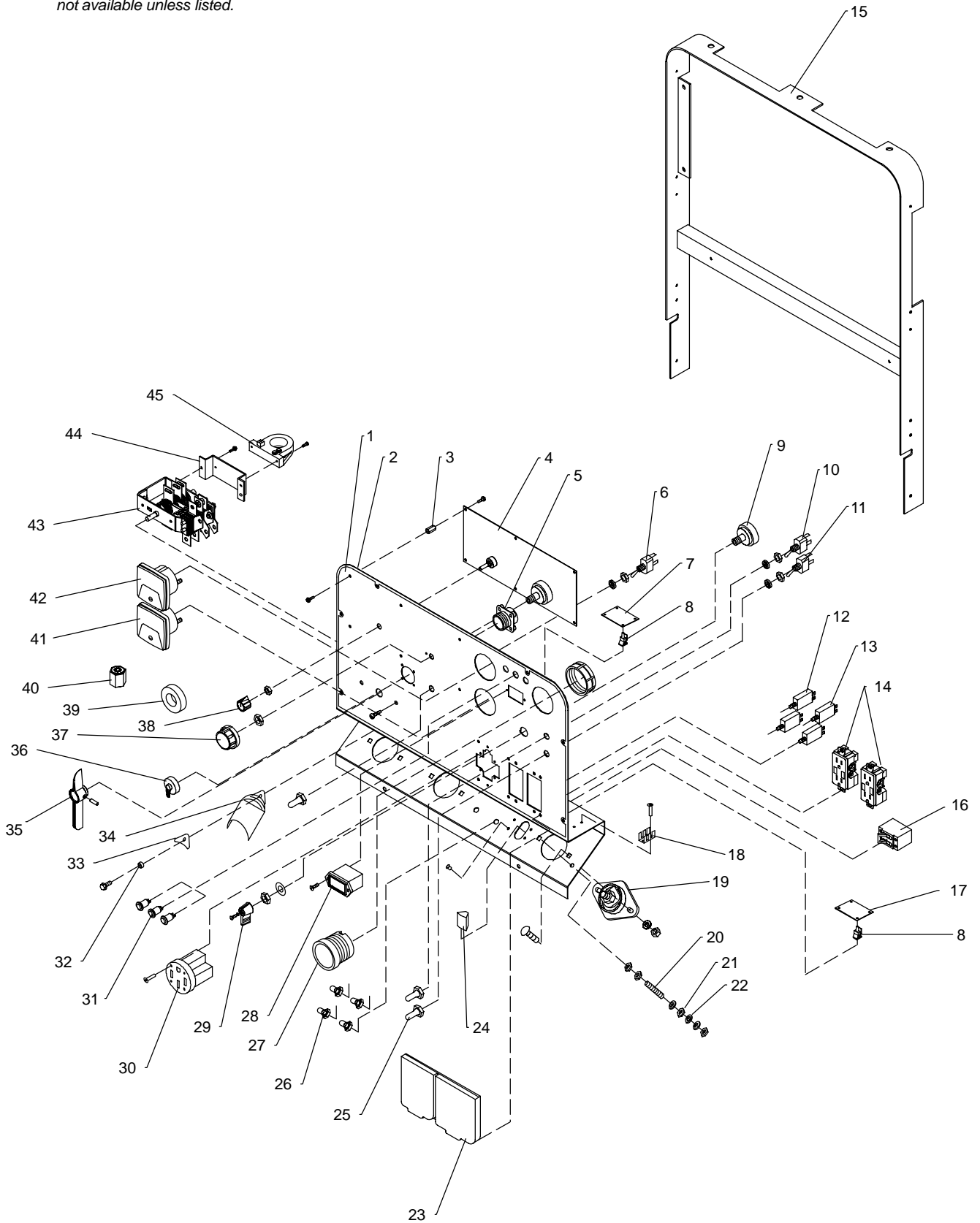


Figure 11-2. Panel, Front w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
<b>Figure 11-2. Panel, Front w/Components (Figure 11-1 Item 103)</b>				
1			Nameplate (order by model and serial number)	1
2		207088	Panel, Front	1
3		115440	Stand-off, No 6-32 X .687 Lg .250 Hex Al Fem	3
4	PC2	215235	Circuit Card Assy, Control	1
		207781	Harness, Control Power Board Interconnecting (consisting of)	1
	PLG16	114655	Conn, Rect Mini 045 6skt 2row Plug Cable Lkg	1
	PLG12,PLG27	117037	Conn, Rect Mini 045 2skt 2row Plug Cable Lkg	2
	PLG21	113750	Conn, Rect Mini 045 4skt 2row Plug Cable Lkg	1
		206794	Shield, Pcb Protective Anti Static 4.813x12.750	1
		207779	Harness, Remote Control 14pin (consisting of)	1
5	RC4	143976	Conn, Circ Ms/Cpc 14skt Size 20 Rcpt Panel Pushin (Service Kit)	1
	PLG24	131054	Conn, Rect Mini 045 2skt 2row Plug Cable Lkg (Service Kit)	1
	RC23	115093	Conn, Rect Mini 045 6skt 2row Plug Cable Lkg (Service Kit)	1
		202884	Harness, Switch Control (consisting of)	1
	PLG20	131198	Conn, Rect Mini 045 3skt 1row Plug Cable Lkg	1
6	S3	011609	Switch,Tgl Spdt 15a 125vac On-none-on Spd Term Chr	1
7	PC5	148030	Circuit Card Assy, Filter Hf	1
8		134201	Stand-off Support, Pc Card .312/.375w/Post&lock .43	3
9	S2	176606	Switch, Ignition 4 Position W/Out Handle	1
		207783	Harness, Wrg Interconnecting (consisting of)	1
	PLG25	113752	Conn, Rect Mini 045 10skt 2row Plug Cable Lkg	1
	RC7,RC9	136924	Conn, Rect Comm 093 2p/S 1row Rcpt Cable Lkg	2
10	S7	011609	Switch,Tgl Spdt 15a 125vac On-none-on Spd Term Chr	1
11	S6	021467	Switch, Tgl Spst 3a 250v Off-none-(On) Spd Term (Included In Ignition Wiring Harness, See Figure 11-3)	1
12	CB5,CB6	083432	Circuit Breaker, Man Reset 1p 10a 250vac Frict	2
13	CB3,CB4	093996	Circuit Breaker, Man Reset 1p 20a 250vac Frict	2
14	GFCI-2,GFCI-3	151981	Rcpt, Str Dx Grd 2p3w 15/20a 125v *5-20r Gfi	2
15		198049	Upright, Base Front	1
16	CB1	203026	Circuit Breaker, Man Reset 2p 50a 240vac Screw-90	1
17	PC3	148021	Circuit Card Assy, Filter Hf	1
18		129524	Term, Frict 250x032 Uninsul Male .130 Stud Mtg 3pr	1
19		099255	Terminal, Pwr Output Neutral	3
20		083030	Stud, Brs .250-20 X 1.750 W/Hex Collar	1
21		601836	Nut, 250-20 .50hex .19h Brs	3
22		010915	Washer, Flat .257idx0.640odx.031t Brs	3
23		188039	Cover, Receptacle W/Gasket	1
24		203016	Boot, Circuit Breaker 2 Pole	1
25		021385	Boot, Toggle Switch Lever	3
26		206795	Boot, Circuit Breaker Clear Hex Nut	4
27	FG	192265	Gauge, Fuel Elec Switch W/O Switchgage Sensor	1
28	HM	145247	Meter, Hour 12-24vdc 1.25 X 2.12 Rect	1
29		119014	Lever, Switch Black	1
30	RC1	182954	Rcpt, Str 3p4w 50a 125/250v Flush Mtg *14-50	1
31	PL1,PL2,PL3	206879	Light, Ind Amber Lens 12v Snap-in Mtg .500 Mtg Hol	3
32		181169	Spacer, Output Stud	3
33		180735	Washer, Output Stud	3
34		186621	Boot, Generic Output Stud	3
35		115493	Handle, Switch Range	1
36		170391	Conn, Circ Ms Protective Cap Size 20 Nylon	1
37		097924	Knob, Pointer 1.625 Dia X .250 Id W/Set Screwsplstc	1
38		097922	Knob, Pointer .875 Dia X .250 Id W/Set Screwsplstc	1
39	CT1	207786	Xfmr, Current Sensing	1
40		025248	Stand-off, Insul .250-20 X 1.250 Lg X .437 Thd	1
41	V	◆	Voltmeter	1
42	A	◆	Ammeter	1
43	S1	207577	Switch, Changeover Assy W/Leads (consisting of)	1
44		187 189	Bracket, Shunt Mtg	1
45	LEM	168829	Transducer, Current 1000a Module Max Open Loop	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
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
**Figure 11-2. Panel, Front w/Components (Continued)**

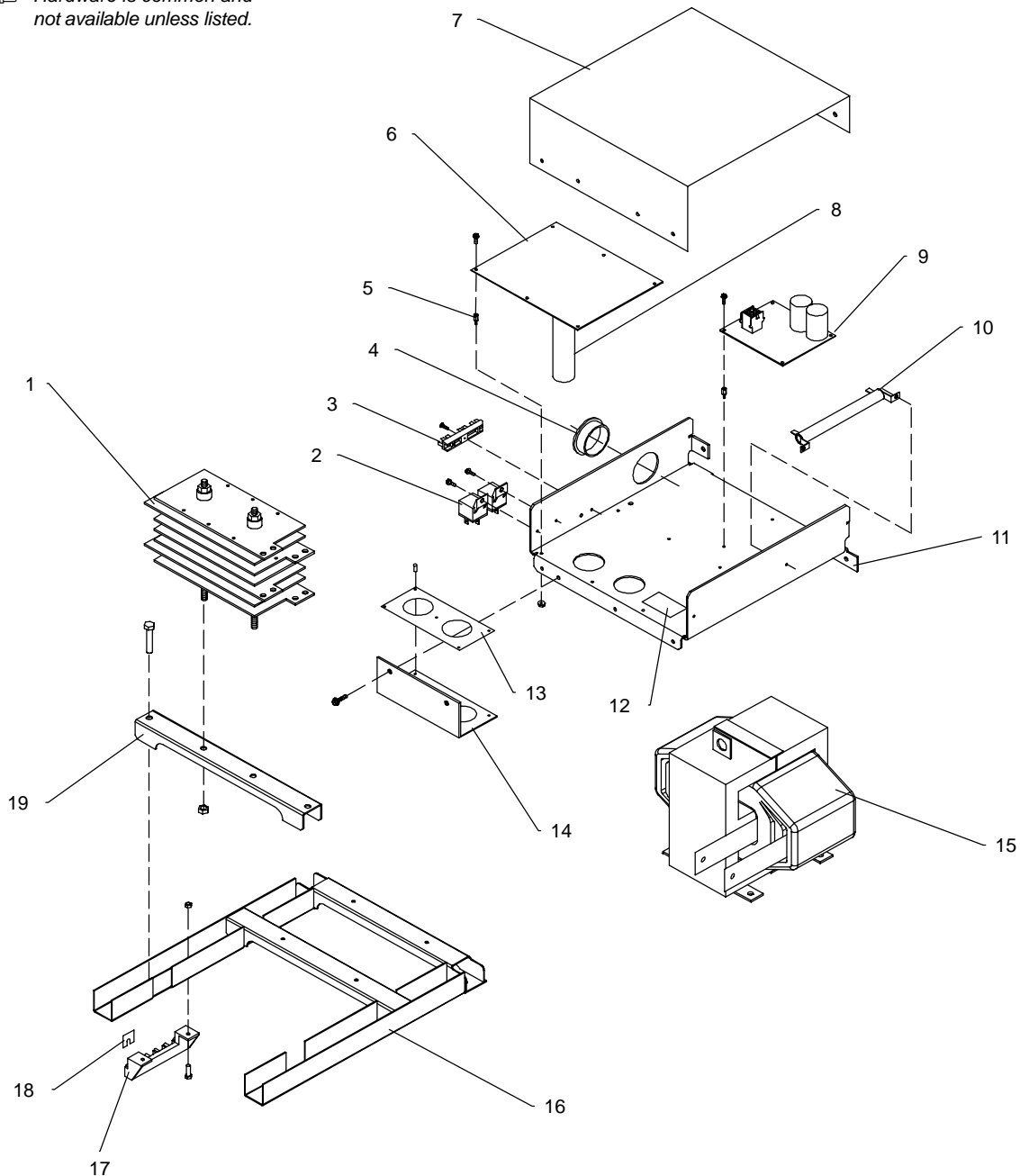
.....	209831	..	Receptacles, W/Leads (consisting of)	..... 1
.....	RC29	.....	113751 Conn, Rect Mini 045 8skt 2row Plug Cable Lkg	..... 1
.....	PLG6	.....	204640 Cable,Lem	..... 1
.....	RC30	.....	136924 Conn, Rect Comm 093 2p/S 1row Rcpt Cable Lkg	..... 1

◆ Optional

+ When ordering a component originally displaying a precautionary label, the label should also be ordered. Order label individually or as part of Label Kit 209 496.

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

 Hardware is common and not available unless listed.



**Figure 11-3. Stabilizer/Rectifier/Control Box Assembly**

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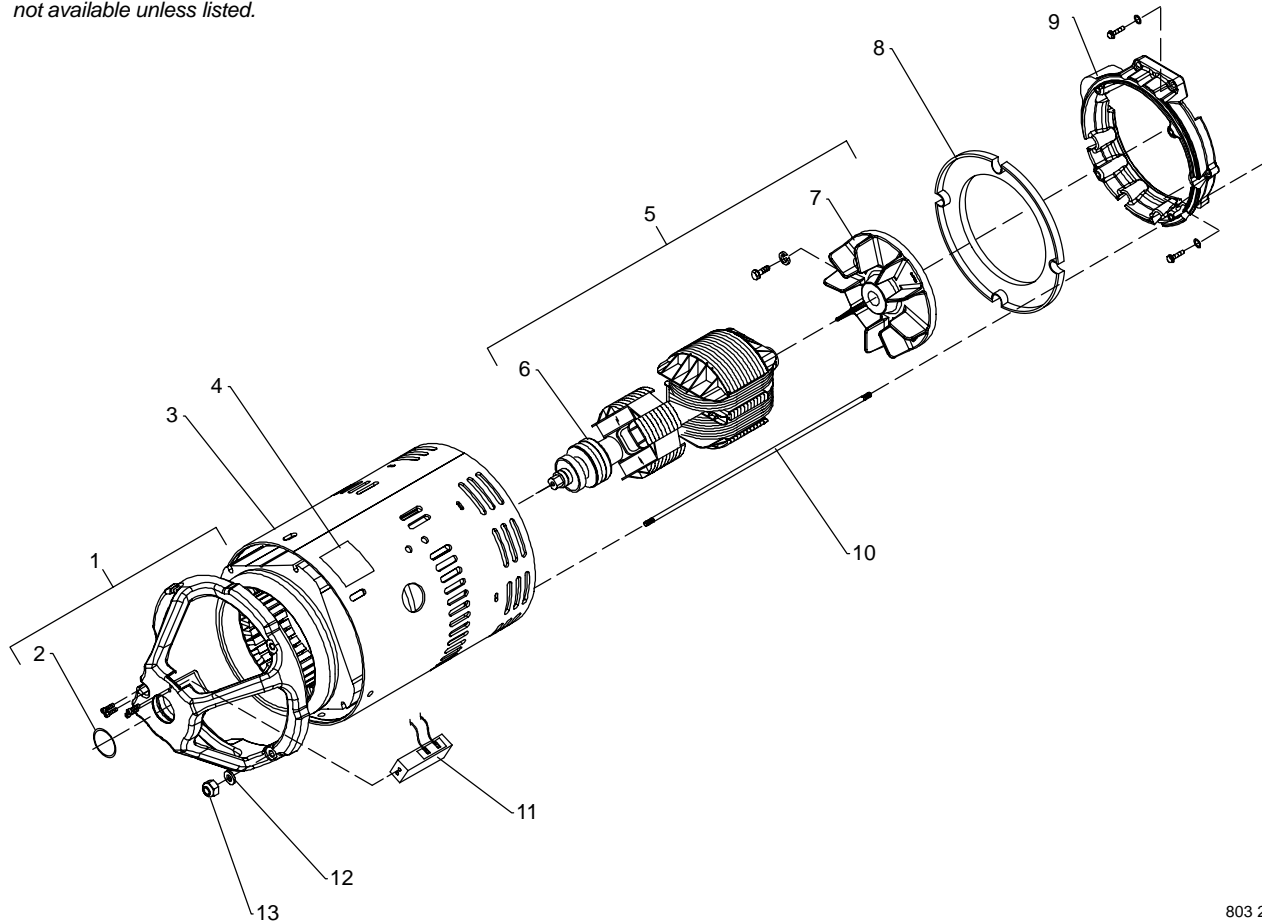
Item No.	Dia. Mkgs.	Part No.	Description	Quantity
<b>Figure 11-3. Stabilizer/Rectifier/Control Box Assembly (Figure 11-1 Item 22)</b>				
...	1	SR1	198514 .. Rectifier, Si 3ph 350 Amp 400 Piv 100% Duty Cycle	1
		010381	Connector, Rectifier	1
		207791	Harness, Wrg Ignition (consisting of)	1
...	2	CR1,CR2	173069 .. Relay, Encl 12vdc Spdt 30a/20a 5pin Flange Mtg	2
...	3	2T	197147 .. Block, Term 5-4-3	1
		PLG5	158465 .. Conn, Rect Univ 084 12p/S 3row Plug Cable Lkg	1
		S6	021467 .. Switch, Tgl Spst 3a 250v Off-none-(On) Spd Term (On Front Panel, See Figure 11-2)	1
		PLG10	092670 .. Conn, Rect Univ 084 3p/S 1row Plug Cable Lkg	1
		PLG15	113751 .. Conn, Rect Mini 045 8skt 2row Plug Cable Lkg	1
		PLG19	113752 .. Conn, Rect Mini 045 10skt 2row Plug Cable Lkg	1
		PLG35	114063 .. Conn, Rect Univ 084 4p/S 1row Plug Cable Lkg	1
		PLG8	177859 .. Conn, Body 5 Terminal	1
		148850	Socket, Relay 5 Pin	2
		RC7	136925 .. Conn, Rect Comm 093 2p/S 1row Plug Cable Lkg	1
		PLG31, PLG33	135134 .. Conn, Rect Univ 084 9p/S 3row Plug Cable Lkg	2
		PLG17	066104 .. Conn, Rect Univ 084 6p/S 3row Plug Cable Lkg	1
		RC32	148389 .. Conn, Rect Univ 084 4p/S 1row Rcpt Cable/Panel Lkg	1
		187654	Seal, Wire Univ 12p/S 3row	1
		PLG34	150316 .. Conn, Rect Univ 039 6p/S 3row Plug Cable Lkg	1
...	4		004214 .. Bushing, Snap-in Nyl 1.625 Id X 2.000 Mtg Hole	1
...	5		097132 .. Stand-off, No 6-32 X .375 Lg .250 Hex Brs M&f	10
...	6	PC1	212701 .. Circuit Card Assy, Power	1
...	7		209355 .. Cover, PCB Tray	1
...	8	C25	176007 .. Capacitor, Elctlt 1200 Uf 300 Vdc Can 1.37 Dia	1
...	9	PC7	203130 .. Circuit Card Assy, Gen Power	1
...	10	R1	188067 .. Resistor, Ww Fxd 100 W 200 Ohm W/Clips	1
...	11	+207803	Bracket, Mtg Pc Board	1
...	12	200263	Label, Warning Electric Shock Hazard	1
...	13	202331	Gasket, Capacitor Support	1
...	14	204166	Bracket, Capacitor Support	1
...	15	DC-Z	207664 .. Stabilizer	1
...	16	207733	Frame, Mtg Stab/Rect	1
...	17	1T	172661 .. Block, Stud Connection 6 Position	1
...	18	173734	Link, Jumper	2
...	19	207735	Bracket, Mtg Rectifier	1

+ When ordering a component originally displaying a precautionary label, the label should also be ordered. Order label individually or as part of Label Kit 209 496.

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

Item No.	Part No.	Description	Quantity
<b>Figure 11-4. Generator (Figure 11-1 Item 36)</b>			
1	210438	Endbell (consisting of)	1
2	183419	O-Ring	1
3	STATOR +207637	Stator, Generator	1
4	013367	Label, Moving Parts Can Cause Serious Injury	1
5	ROTOR 207591	Rotor, Generator (consisting of)	1
6	181143	Bearing, Ball Rdl Sgl Row .984 X 2.047 X .591	1
7	192600	Fan, Rotor Gen	1
8	159918	Baffle, fan	1
9	193515	Adapter, Engine	1
10	170861	Stud, Stl .375-16 X 17.375	4
11	BRUSH 205725	Brushholder Assy, Generator	2
	207640	Plug, W/Leads Brushholder (consisting of)	1
	PLG32 114063	Conn, Rect Univ 084 4p/S 1row Plug Cable Lkg	1
12	010910	Washer, Flat .406 ID x 0.812 OD x .065t Stl Pld Ansi .375	4
13	010909	Nut, .375-16 .56 hex .46h Stl Pld Elastic Stop	4

 Hardware is common and not available unless listed.



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**Figure 11-4. Generator**

+ When ordering a component originally displaying a precautionary label, the label should also be ordered. Order label individually or as part of Label Kit 209 496.

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

# TRUE BLUE® WARRANTY

Effective January 1, 2002

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

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

## Warranty Questions?

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reliable response you  
need. Most replacement  
parts can be in your  
hands in 24 hours.

### Support

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

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

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

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

1. 5 Years Parts — 3 Years Labor
  - \* Original main power rectifiers
  - \* Inverters (input and output rectifiers only)
2. 3 Years — Parts and Labor
  - \* Transformer/Rectifier Power Sources
  - \* Plasma Arc Cutting Power Sources
  - \* Semi-Automatic and Automatic Wire Feeders
  - \* Inverter Power Supplies
  - \* Intelligig
  - \* Maxstar 150
  - \* Engine Driven Welding Generators  
**(NOTE: Engines are warranted separately by the engine manufacturer.)**
3. 1 Year — Parts and Labor Unless Specified
  - \* DS-2 Wire Feeder
  - \* Motor Driven Guns (w/exception of Spoolmate Spoolguns)
  - \* Process Controllers
  - \* Positioners and Controllers
  - \* Automatic Motion Devices
  - \* RFCS Foot Controls
  - \* Induction Heating Power Sources
  - \* Water Coolant Systems
  - \* Flowgauge and Flowmeter Regulators (No Labor)
  - \* HF Units
  - \* Grids
  - \* Maxstar 85, 140
  - \* Spot Welders
  - \* Load Banks
  - \* Racks
  - \* Running Gear/Trailers
  - \* Plasma Cutting Torches (except APT & SAF Models)
  - \* Field Options  
**(NOTE: Field options are covered under True Blue® for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)**
4. 6 Months — Batteries
5. 90 Days — Parts
  - \* MIG Guns/TIG Torches
  - \* Induction Heating Coils and Blankets

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

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

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

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

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

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

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

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

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





# Owner's Record

Please complete and retain with your personal records.

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



## For Service

**Call 1-800-4-A-Miller or see our website at [www.MillerWelds.com](http://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
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Contact the Delivering Carrier to:	File a claim for loss or damage during shipment.  For assistance in filing or settling claims, contact your distributor and/or equipment manufacturer's Transportation Department.
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### Miller Electric Mfg. Co.

An Illinois Tool Works Company  
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Appleton, WI 54914 USA

### International Headquarters—USA

USA Phone: 920-735-4505 Auto-Attended  
USA & Canada FAX: 920-735-4134  
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