RED-D-ARC
Welderentals
1-800-245-3660

OM-4412 206 995B
November 2002

Processes

Stick (SMAW) Welding

TIG (GTAW) Welding

MIG (GMAW) Welding

Flux Cored (FCAW) Welding

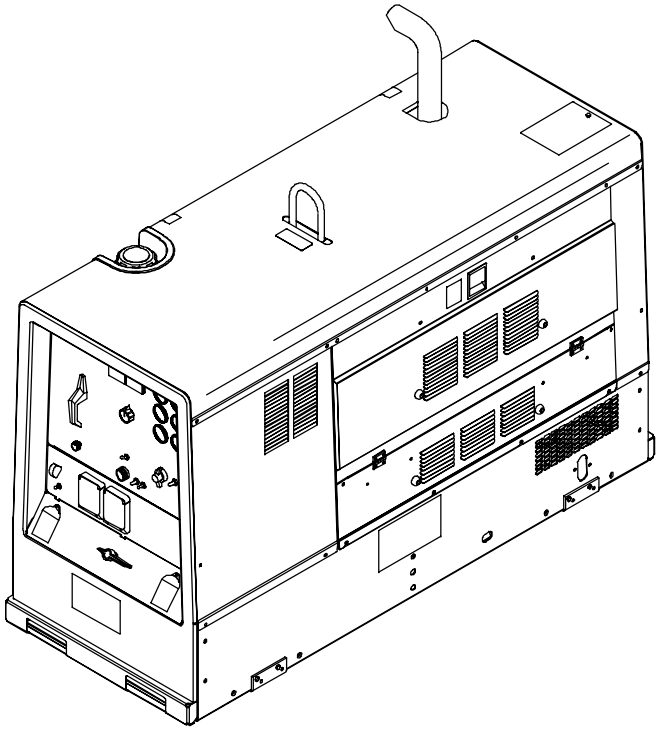
Air Carbon Arc (CAC-A) Cutting and Gouging

Description

Engine Driven Welding Generator

D502K 5+4

CC/CV DC Diesel Welder



OWNER'S MANUAL

www.red-d-arc.com

⚠ 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:

Stick = SMAW
TIG = GTAW
MIG = GMAW

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Welderentals
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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 watchperson 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.

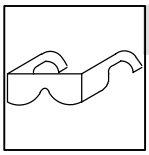
Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

- 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.

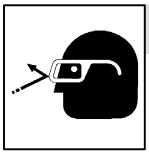
EXHAUST SPARKS can cause fire.

- 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.



COMPRESSED AIR can cause injury.

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

TRAPPED AIR PRESSURE AND WHIPPING HOSES can cause injury.

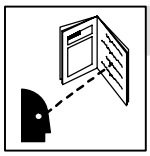
- Release air pressure from tools and system before servicing, adding or changing attachments, or opening compressor oil drain or oil fill cap.

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.

HOT PARTS can cause burns and injury.

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



READ INSTRUCTIONS.

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

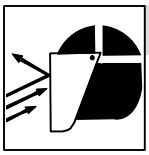
1-5. Additional Symbols For Installation, Operation, And Maintenance

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.

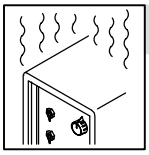
OVERHEATING can damage motors.

- 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.



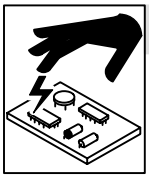
FLYING SPARKS can cause injury.

- 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.

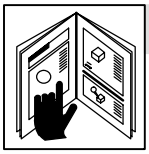


STATIC (ESD) can damage PC boards.

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

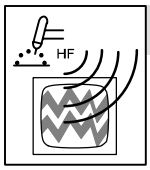
TILTING OF TRAILER can cause injury.

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



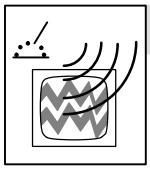
READ INSTRUCTIONS.

- 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 microprocessors, 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).

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

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

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

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3 (phone: 800-463-6727 or in Toronto 416-747-4044, website: www.csa-international.org).

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

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

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

1-7. 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

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 àcourant électrique dans les zones humides, dans les endroits confinés ou là où on risque de tomber.
- Se servir d'une source électrique àcourant électrique UNIQUEMENT si le procédé de soudage le demande.
- Si l'utilisation d'une source électrique àcourant électrique s'avère nécessaire, se servir de la fonction de télécommande si l'appareil en est équipé.
- Couper l'alimentation ou arrêter le moteur avant de procéder à l'installation, à la réparation ou à l'entretien de l'appareil. Déverrouiller l'alimentation selon la norme OSHA 29 CFR 1910.147 (voir normes de sécurité).
- Installer et mettre à la terre correctement cet appareil conformément à son manuel d'utilisation et aux codes nationaux, provinciaux et municipaux.
- Toujours vérifier la terre du cordon d'alimentation – Vérifier et s'assurer que le fil de terre du cordon d'alimentation est bien raccordé à la borne de terre du sectionneur ou que la fiche du cordon est raccordée à une prise correctement mise à la terre.
- En effectuant les raccordements d'entrée fixer d'abord le conducteur de mise à la terre approprié et contre-vérifier les connexions.
- Vérifier fréquemment le cordon d'alimentation pour voir s'il n'est pas endommagé ou dénudé – remplacer le cordon immédiatement s'il est endommagé – un câble dénudé peut provoquer une électrocution.
- Mettre l'appareil hors tension quand on ne l'utilise pas.
- Ne pas utiliser des câbles usés, endommagés, de grosseur insuffisante ou mal épissés.
- Ne pas enrouler les câbles autour du corps.
- Si la pièce soudée doit être mise à la terre, le faire directement avec un câble distinct – ne pas utiliser le connecteur de pièce ou le câble de retour.
- Ne pas toucher l'électrode quand on est en contact avec la pièce, la terre ou une électrode provenant d'une autre machine.
- N'utiliser qu'un matériel en bon état. Réparer ou remplacer sur-le-champ les pièces endommagées. Entretenir l'appareil conformément à ce manuel.
- Porter un harnais de sécurité quand on travaille en hauteur.
- Maintenir solidement en place tous les panneaux et capots.
- Fixer le câble de retour de façon à obtenir un bon contact métal-métal avec la pièce à souder ou la table de travail, le plus près possible de la soudure.
- Isoler la pince de masse quand pas mis à la pièce pour éviter le contact avec tout objet métallique.

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

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

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

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

- Porter un casque de soudage muni d'un écran de filtre approprié pour protéger votre visage et vos yeux pendant le soudage ou pour regarder (voir ANSI Z49.1 et Z87.1 énuméré dans les normes de sécurité).
- Porter des protections approuvés pour les oreilles si le niveau sondre est trop élevé.
- Utiliser des écrans ou des barrières pour protéger des tiers de l'éclair et de l'éblouissement; demander aux autres personnes de ne pas regarder l'arc.
- Porter des vêtements de protection constitué dans une matière durable, résistant au feu (laine ou cuir) et une protection des pieds.

LES FUMÉES ET LES GAZ peuvent être dangereux.

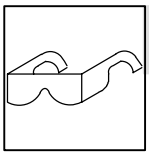
Le soudage génère des fumées et des gaz. Leur inhalation peut être dangereux pour votre santé.

- Eloigner votre tête des fumées. Ne pas respirer les fumées.
- À l'interieur, 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 dégraisseurs.
- Travailler dans un espace fermé seulement s'il est bien ventilé ou en portant un respirateur à alimentation d'air. Demander toujours à un surveillant dûment formé de se tenir à proximité. Des fumées et des gaz de soudage peuvent déplacer l'air et abaisser le niveau d'oxygène provoquant des blessures ou des accidents mortels. S'assurer que l'air de respiration ne présente aucun danger.
- Ne pas souder dans des endroits situés à proximité d'opérations de dégraissage, de nettoyage ou de pulvérisation. La chaleur et les rayons de l'arc peuvent réagir en présence de vapeurs et former des gaz hautement toxiques et irritants.
- Ne pas souder des métaux munis d'un revêtement, tels que l'acier galvanisé, plaqué en plomb ou au cadmium à moins que le revêtement n'ait été enlevé dans la zone de soudure, que l'endroit soit bien ventilé, et si nécessaire, en portant un respirateur à alimentation d'air. Les revêtements et tous les métaux renfermant ces éléments peuvent dégager des fumées toxiques en cas de soudage.

LE SOUDAGE peut provoquer un incendie ou une explosion.

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

- Se protéger et d'autres personnes de la projection d'étincelles et de métal chaud.
- Ne pas souder dans un endroit 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.



DES PARTICULES VOLANTES peuvent blesser les yeux.

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

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

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

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 sondre 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.

1-3. Dangers existant en relation avec le moteur

LE CARBURANT MOTEUR peut provoquer un incendie ou une explosion.

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

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

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

DES ORGANES MOBILES peuvent provoquer des blessures.

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

L'EXPLOSION DE LA BATTERIE peut RENDRE AVEUGLE.

- Toujours porter une protection faciale, des gants en caoutchouc et vêtements de protection lors d'une intervention sur la batterie.
- Arrêter le moteur avant de débrancher ou de brancher les câbles de batterie.
- 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.

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

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

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

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

LA CHALEUR DU MOTEUR peut provoquer un incendie.

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

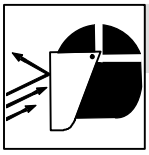
LES ÉTINCELLES À L'ÉCHAPPEMENT peuvent provoquer un incendie.

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

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

LA CHUTE DE L'APPAREIL peut blesser.

- Utiliser l'anneau de levage uniquement pour soulever l'appareil lui-même ; sans chariot, de bouteilles de gaz, remorque, ou autres accessoires.
- Utiliser un équipement de levage de capacité suffisante pour lever l'appareil.
- En utilisant des fourches de levage pour déplacer l'unité, s'assurer que les fourches sont suffisamment longues pour dépasser du côté opposé de l'appareil.

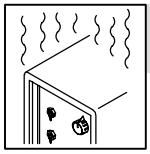


LES ÉTINCELLES VOLANTES risquent de provoquer des blessures.

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

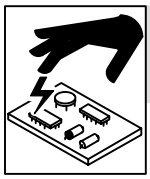
LE SURCHAUFFEMENT peut endommager le moteur électrique.

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



L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

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

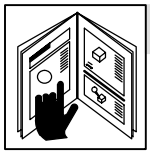


LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

- Établir la connexion avec la barrette de terre avant de manipuler des cartes ou des pièces.
- Utiliser des pochettes et des boîtes antistatiques pour stocker, déplacer ou expédier des cartes de circuits imprimes.

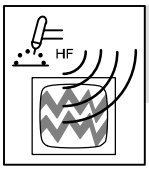
UNE REMORQUE QUI BASCULE peut entraîner des blessures.

- 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.
- Effecteur la maintenance et la mise en service d'après le manuel et celui du moteur.



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

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

1-5. Principales normes de sécurité

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

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

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

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

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

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

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

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

1-6. Information sur les champs électromagnétiques

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

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

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

1 Garder les câbles ensembles en les torsadant ou en les attachant avec du ruban adhésif.

2 Mettre tous les câbles du côté opposé de l'opérateur.

3 Ne pas courber pas et ne pas entourer pas les câbles autour de votre corps.

4 Garder le poste de soudage et les câbles le plus loin possible de vous.

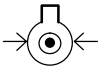
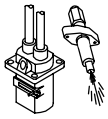
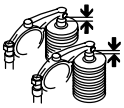
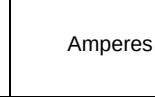
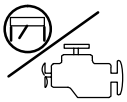
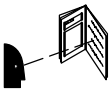
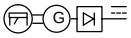
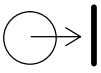
5 Relier la pince de masse le plus près possible de la zone de soudure.

Consignes relatives aux stimulateurs cardiaques :

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

SECTION 2 – DEFINITIONS

2-1. Symbols And Definitions

	Stop Engine		Fast (Run, Weld/ Power)		Slow (Idle)		Start Engine
	Starting Aid		Battery (Engine)		Engine Oil Pressure		Engine Oil
	Check Injectors/ Pump		Check Valve Clearance		Fuel		Protective Earth (Ground)
	Positive		Negative		Certified/Trained Mechanic		Welding Arc
	Amperes		Volts		Panel/Local		Remote
	Engine		Air Temperature Or Engine Temperature		Output		Alternating Current
	Stick (SMAW) Welding		Constant Current (CC)		MIG (GMAW) Welding		TIG (GTAW)
	Time	h	Hours	s	Seconds	1 	Single Phase
3	Three Phase		Read Operator's Manual		Circuit Breaker		Do Not Switch While Welding
	Electrode Connection		Work Connection		Engine-Driven, Three-Phase Alternator With Rectifier	Hz	Hertz
	Contactor On						

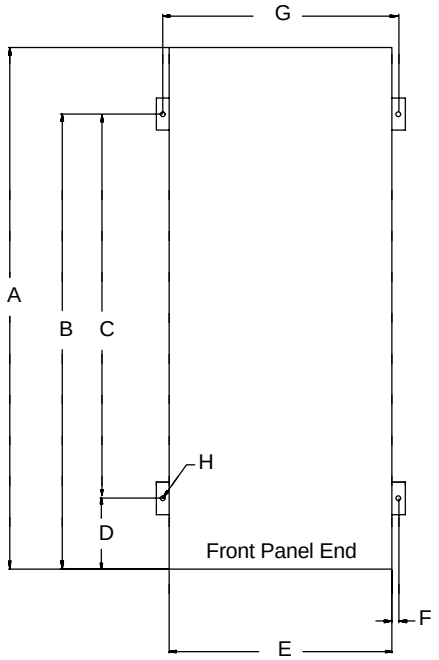
SECTION 3 – SPECIFICATIONS

3-1. Weld, Power, And Engine Specifications

Welding Mode	Weld Output Range	Rated Welding Output	Maximum Open-Circuit Voltage	Generator Power Rating	Engine	Fuel Capacity
CC/DC	20 – 600 A	500 A, 40 Volts DC, 100% Duty Cycle	95	**Standard**: Single-Phase, 4 kVA/kW, 20/17 A, 120/240 V AC, 50/60 Hz	Kubota V3300-B Water-Cooled, Four Cylinder, 49 HP Diesel Engine	25 gal (95 L)
CV/DC	14 – 40 V	600 A, 44 Volts DC, 40% Duty Cycle	56			

3-2. Dimensions, Weights, And Operating Angles

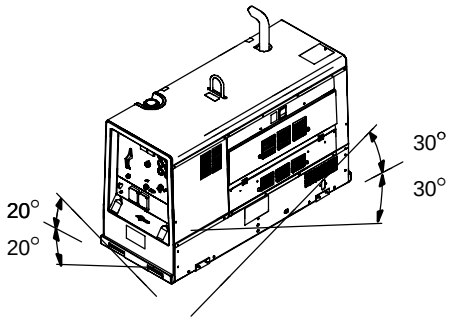
Dimensions	
Height	50 in (1270 mm) (to top of muffler)
Width	28-1/2 in (724 mm) (mtg. brackets turned in) 30-3/4 in (781 mm) (mtg. brackets turned out)
Depth	69-1/2 in (1765 mm)
A	69-1/2 in (1765 mm)
B*	55-7/8 in (1419 mm)
C*	46-3/8 in (1178)
D*	9-1/2 in (241 mm)
E	27-1/2 in (699 mm)
F	1 in (25 mm)
G	29-1/2 in (749 mm)
H	9/16 in (14 mm) Dia. 4 Holes
* With mounting brackets in center position. Dimensions vary with location of mounting brackets.	
Weight	
No fuel: 1808 lb (820 kg)	



802 161-A

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

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

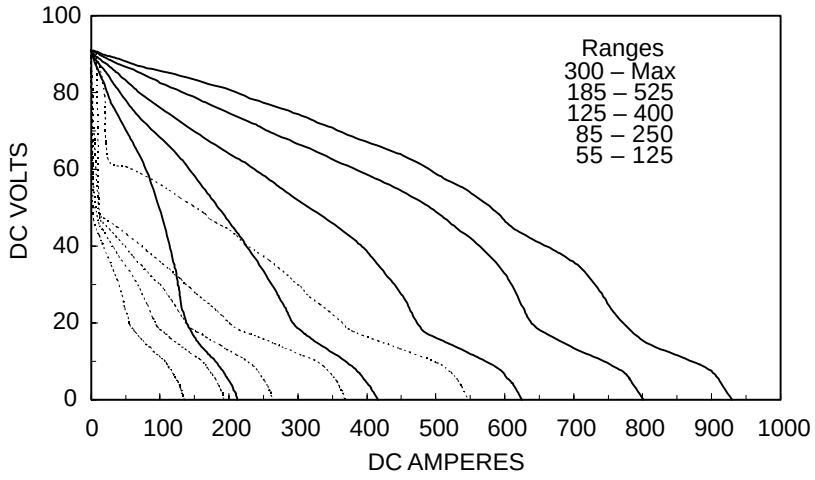


803 122

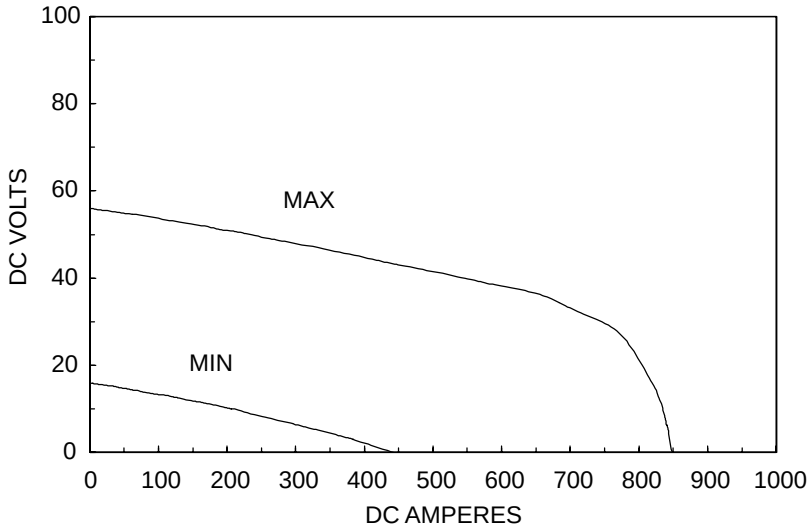
3-3. Volt-Ampere Curves

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

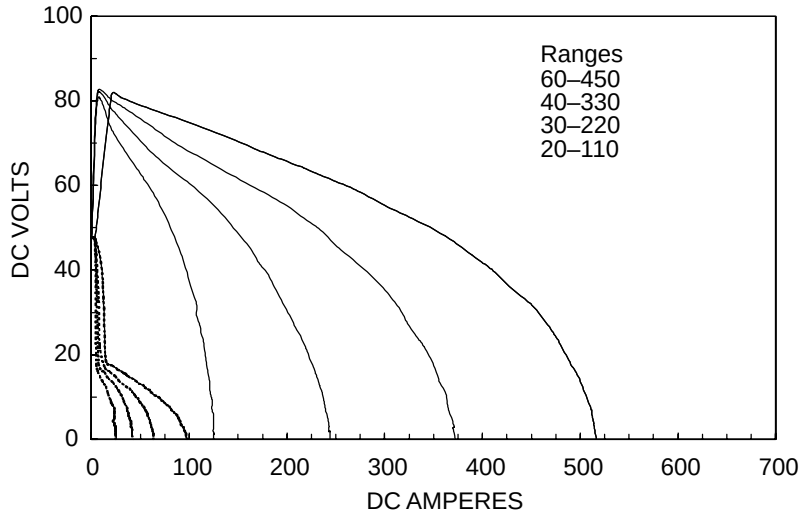
A. Stick Mode



B. MIG Mode



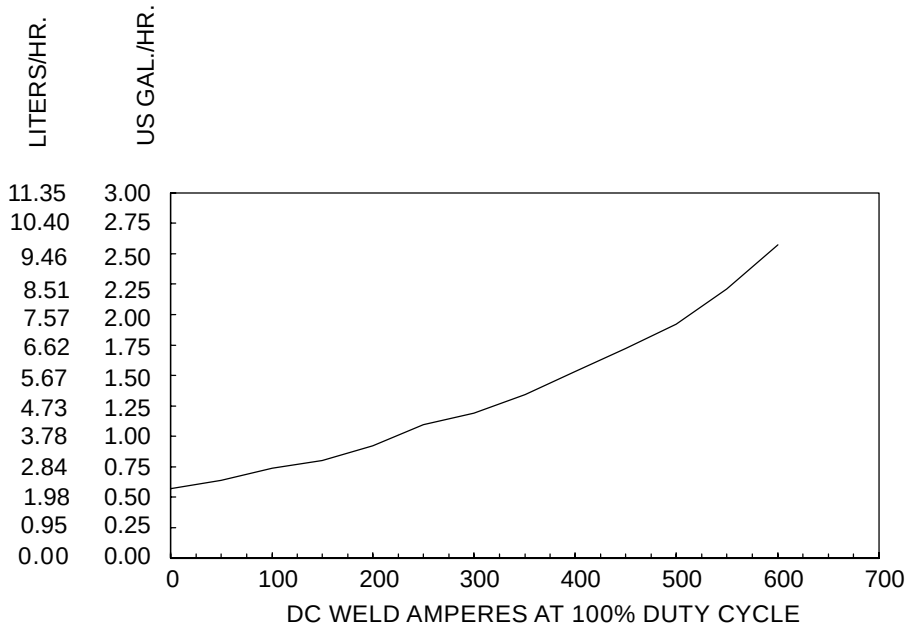
C. TIG Mode



208 135 / 203 415 / 208 136

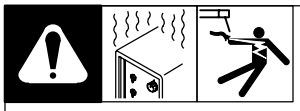
3-4. Fuel Consumption

The curve shows typical fuel use under weld or power loads.

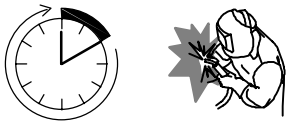


208 137

3-5. Duty Cycle And Overheating



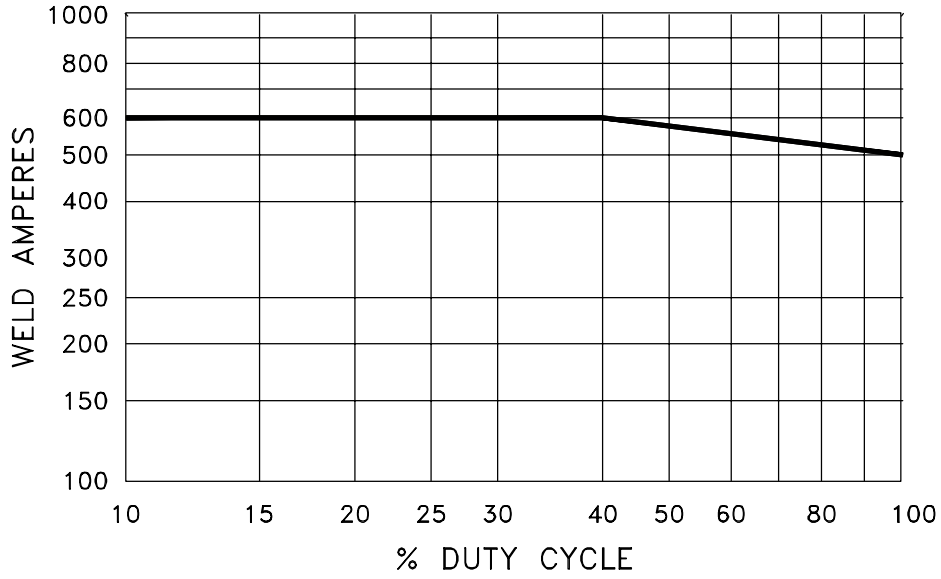
100% Duty Cycle At 500 Amperes



Continuous Welding

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

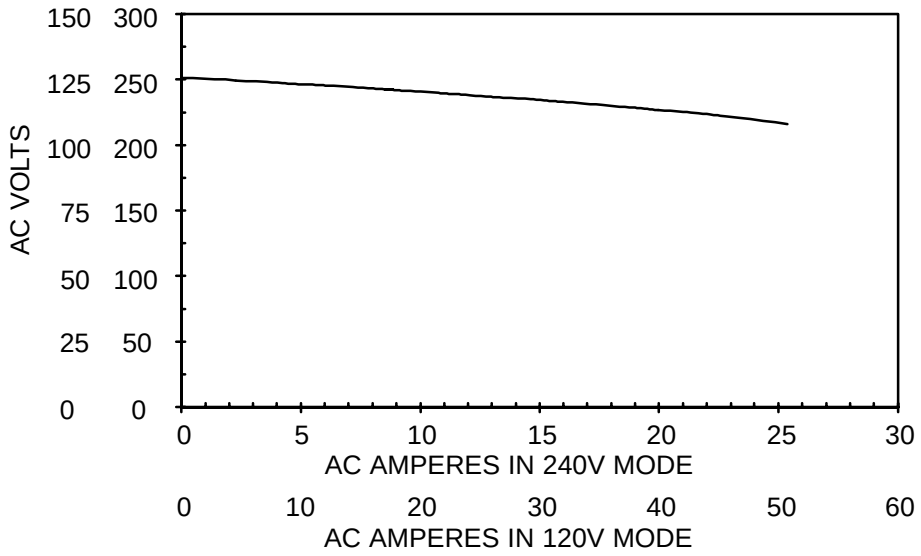
▲ **Exceeding duty cycle can damage unit and void warranty.**



202 356

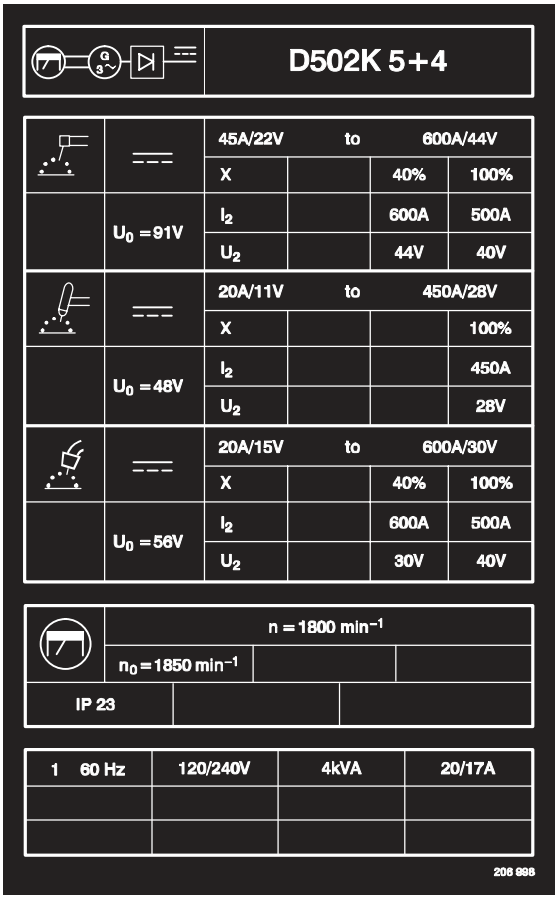
3-6. Generator Power Curve

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



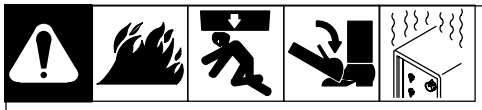
193 018

3-7. Manufacturer's Rating Label

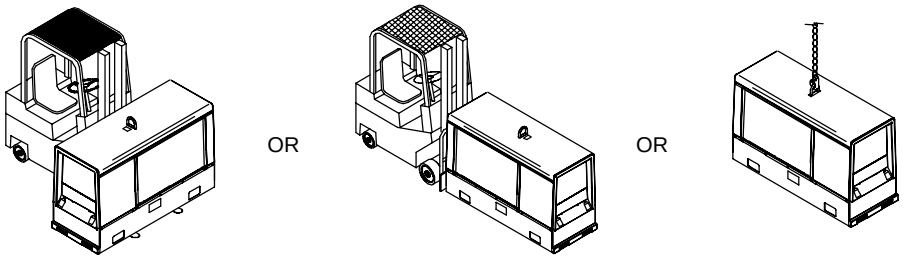


SECTION 4 – INSTALLATION

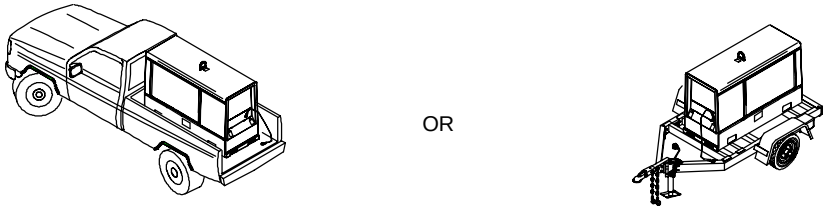
-1. Installing Welding Generator



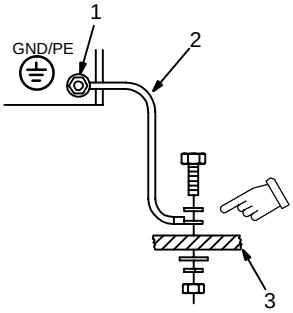
Movement



Location



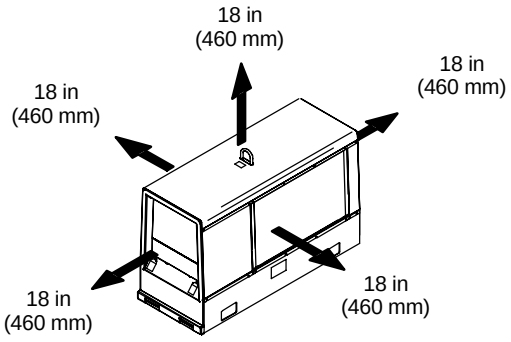
Grounding



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

▲ **Bed liners, shipping skids, an 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.**

Airflow Clearance



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

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

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

☞ *See Section 4-2 for mounting information.*

Grounding:

1 Equipment Grounding Terminal (On Front Panel)

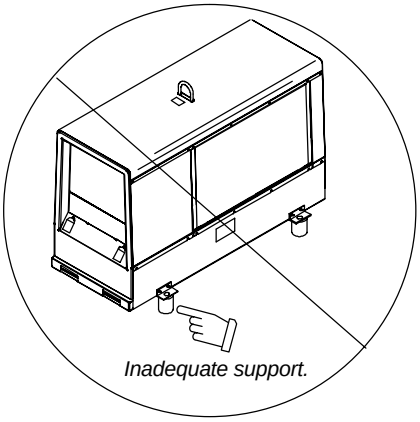
2 Grounding Cable (Not Supplied)

3 Metal Vehicle Frame

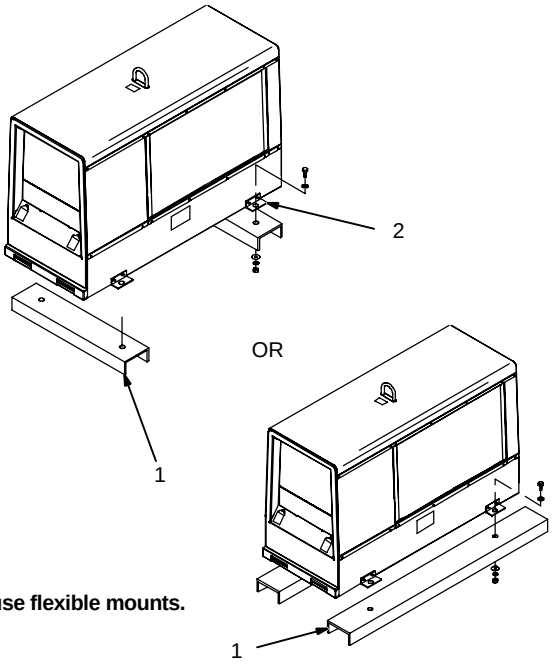
Connect cable from equipment ground terminal to metal vehicle frame. Use #10 AWG or larger insulated copper wire.

4-2. Mounting Welding Generator

Supporting The Unit



Inadequate support.



▲ **Do not use flexible mounts.**

▲ **Do not weld on base. Welding on base can cause fuel tank fire or explosion. Weld only on the four mounting brackets or bolt unit down.**

▲ **Do not mount unit by supporting the base <u>only</u> at the four mounting brackets. Use cross-supports to adequately support unit and prevent damage to base.**

Mounting Surface:

1 Cross-Supports

2 Mounting Brackets (Supplied)

Mount unit on flat surface or use cross-supports to support base. Secure unit with mounting brackets.

3 1/2 in Bolt And Washer (Minimum – Not Supplied)

4 3/8-16 x 1 in Screws (Supplied)

To Bolt Unit In Place:

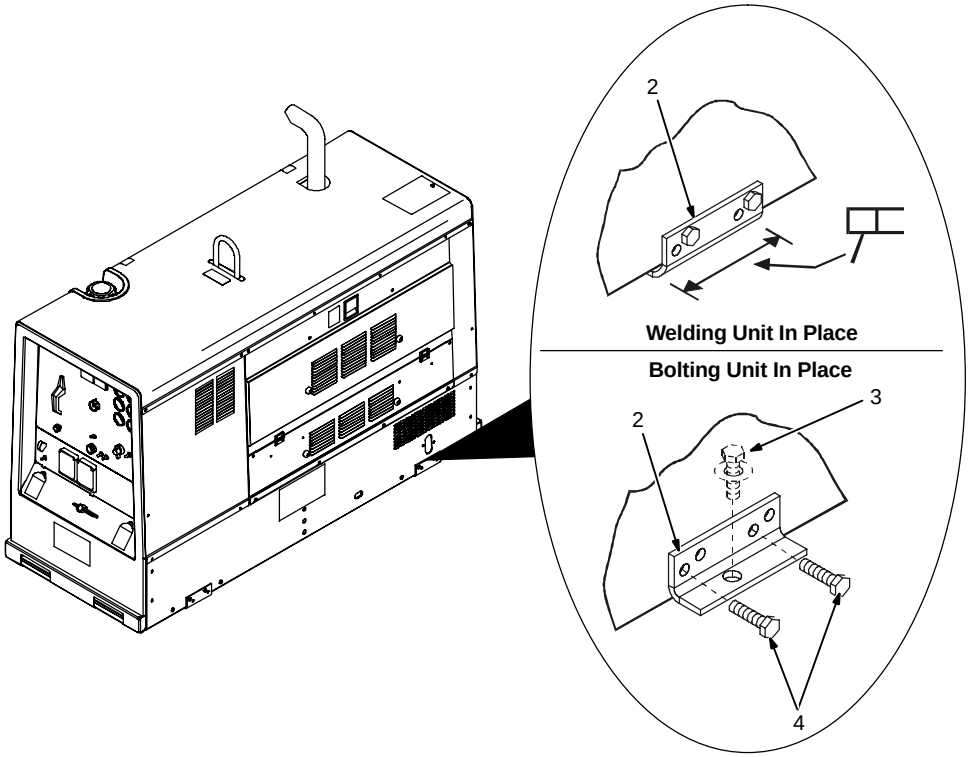
Remove hardware securing the four mounting brackets to the base. Reverse brackets and reattach to base with original hardware.

Mount unit to truck or trailer with 1/2 in (12 mm) or larger hardware (not supplied).

To Weld Unit In Place:

Weld unit to truck or trailer only at the four mounting brackets.

Using Mounting Brackets



Tools Needed:

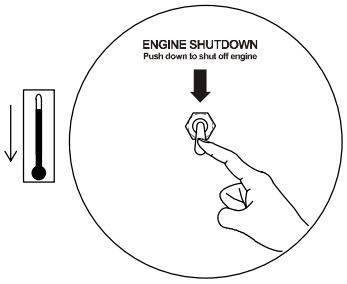
9/16 in

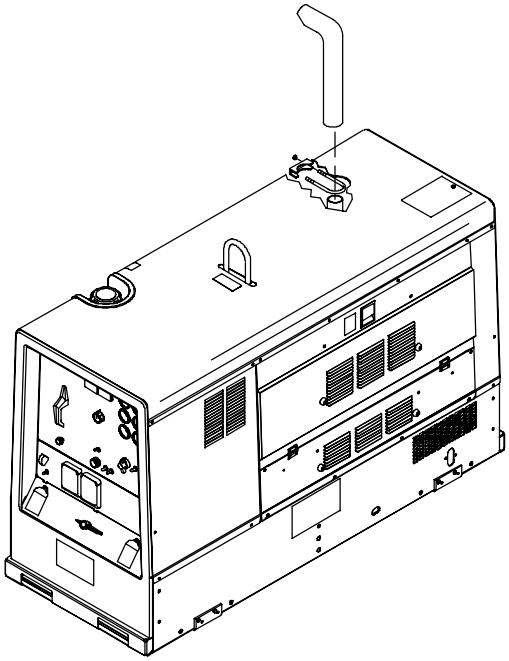
install3 5/02 803 274 / 803 123 / 190 250-A / 803 231

4-3. Installing Exhaust Pipe

▲ **Stop engine and let cool.**

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



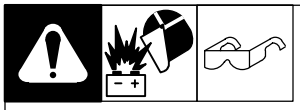


Tools Needed:

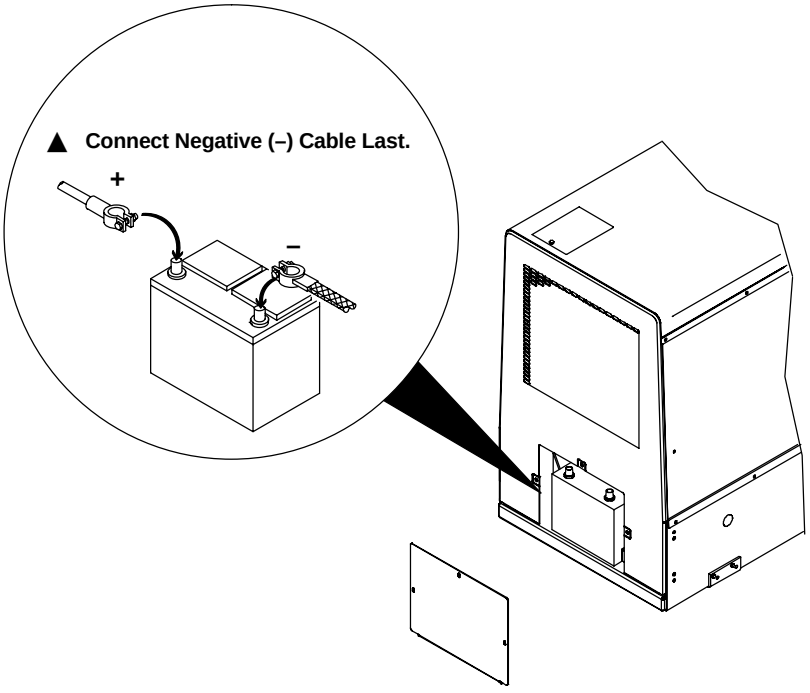
1/2 in

803 122 / Ref. 802 169 / Ref. 202 705

4-4. Connecting The Battery



☞ *Reinstall cover after connecting battery.*

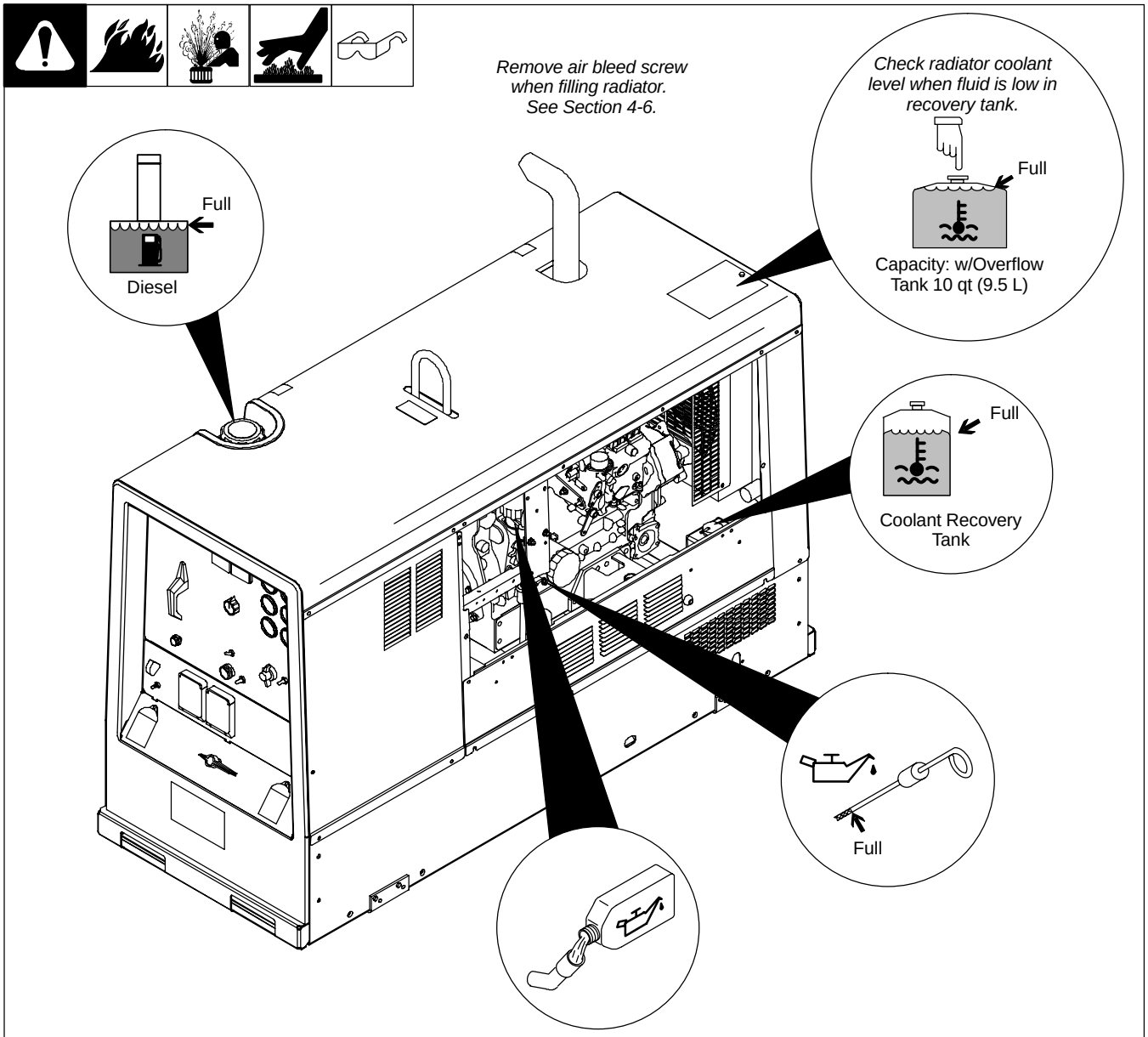


Tools Needed:

1/2 in

802 168-E / Ref. 202 705 / 802 313 / S-0756-C

4-5. Engine Prestart Checks



803 123-A

☞ *Check all engine fluids daily.*

Engine must be cold and on a level surface. Unit is shipped with 20W break-in oil. The Automatic shutdown system stops engine if oil pressure is too low or coolant 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.**

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

Add fresh diesel fuel before starting to prevent air from entering the fuel system (see engine maintenance label for fuel specifications). Leave filler neck empty to allow room for expansion.

Do not run out of fuel or air may enter fuel system and cause starting problems. See engine manual to bleed air from fuel system.

Oil

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

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

Coolant

Check coolant level in radiator before starting unit the first time. Add coolant if below bottom of filler neck (see Section 4-6 for radiator filling instructions).

Check coolant level in recovery tank daily. If coolant is below Cold Full level, add coolant until level in tank is between Cold Full and Hot Full levels. If recovery tank coolant level was low, check coolant level in radiator (see Section 4-6).

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

Keep radiator and air intake clean.

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

☞ *To improve cold weather starting:*

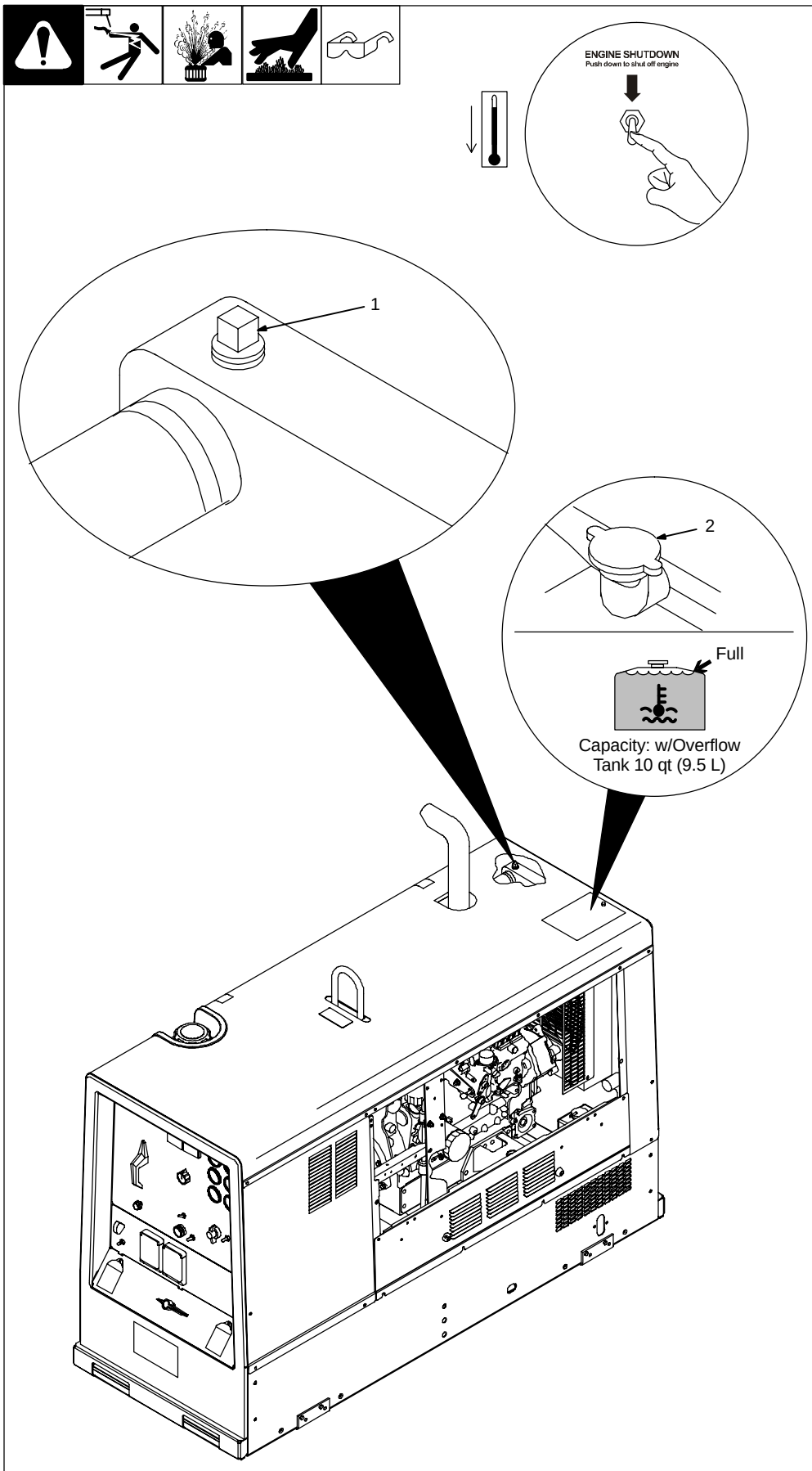
Use Engine Start/Preheat switch to operate glow plug (see Section 5-1).

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

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

Use correct grade oil for cold weather (see Section 7-1).

4-6. Adding Coolant To Radiator



▲ **Stop engine and let cool.**

☞ *Check coolant level according to Section 4-5 before starting this procedure.*

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.

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

1 Radiator Air Bleed Screw

2 Radiator Cap

Remove 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 air bleed screw and radiator cap. Check coolant level in recovery tank (see Section 4-5).

Tools Needed:

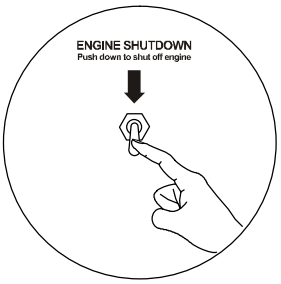
3/8 in

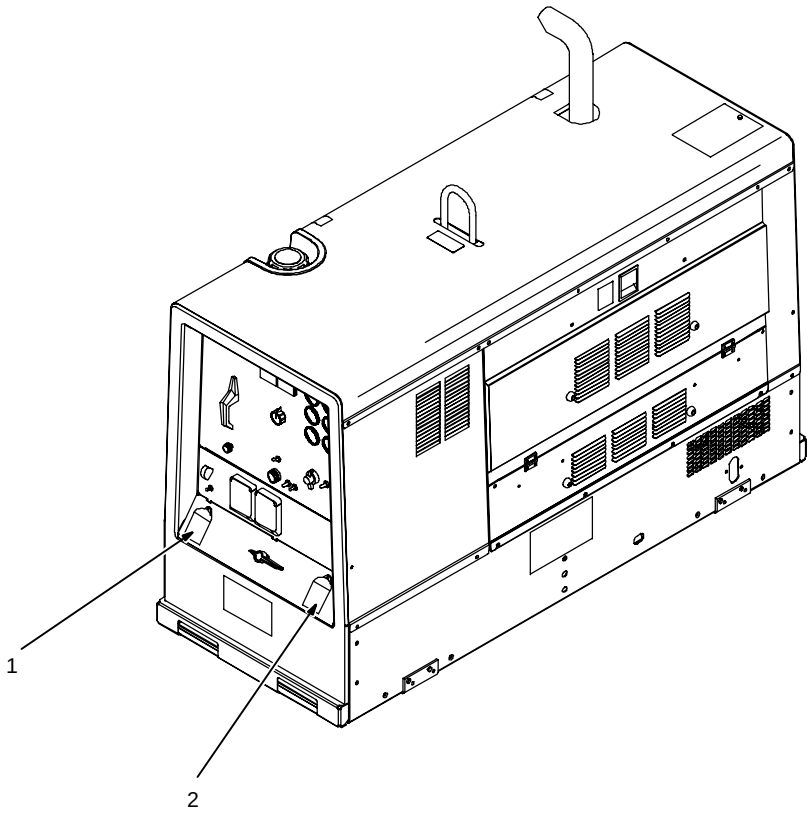
803 123-A / 206 580

4-7. Connecting To Weld Output Terminals

Tools Needed:

3/4 in





803 122

▲ **Stop engine.**

1 Positive (+) Weld Output Terminal

2 Negative (–) Weld Output Terminal

For Stick and TIG welding Direct Current Electrode Positive (DCEP), connect electrode holder cable to Positive (+) terminal on left and work cable to Negative (–) terminal on right.

For Direct Current Electrode Negative (DCEN), reverse cable connections.

If equipped with optional polarity switch, connect electrode holder cable to Electrode terminal on left and work cable to Work terminal on right.

For MIG and FCAW welding Direct Current Electrode Positive (DCEP) on CC/CV models, connect wire feeder cable to Positive (+) terminal on left and work cable to Negative (–) terminal on right. Use Process/Contactor Control switch to select type of weld output (see Section 5-3).

For Direct Current Electrode Negative (DCEN), reverse cable connections.

If equipped with optional polarity switch, connect wire feeder cable to Electrode terminal on left and work cable to Work terminal on right.

4-8. Selecting Weld Cable Sizes*

Weld Output Terminals

▲ **Stop engine before connecting to weld output terminals.**

▲ **Do not use worn, damaged, undersized, or poorly spliced cables.**

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)
500	2/0 (70)	3/0 (95)	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 3/0 (2x95)	2 ea. 4/0 (2x120)	3 ea. 3/0 (3x95)	3 ea. 3/0 (3x95)
600	3/0 (95)	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 3/0 (2x95)	2 ea. 4/0 (2x120)	3 ea. 3/0 (3x95)	3 ea. 4/0 (3x120)	3 ea. 4/0 (3x120)
700	4/0 (120)	2 ea. 2/0 (2x70)	2 ea. 3/0 (2x95)	2 ea. 4/0 (2x120)	3 ea. 3/0 (3x95)	3 ea. 4/0 (3x120)	3 ea. 4/0 (3x120)	4 ea. 4/0 (4x120)

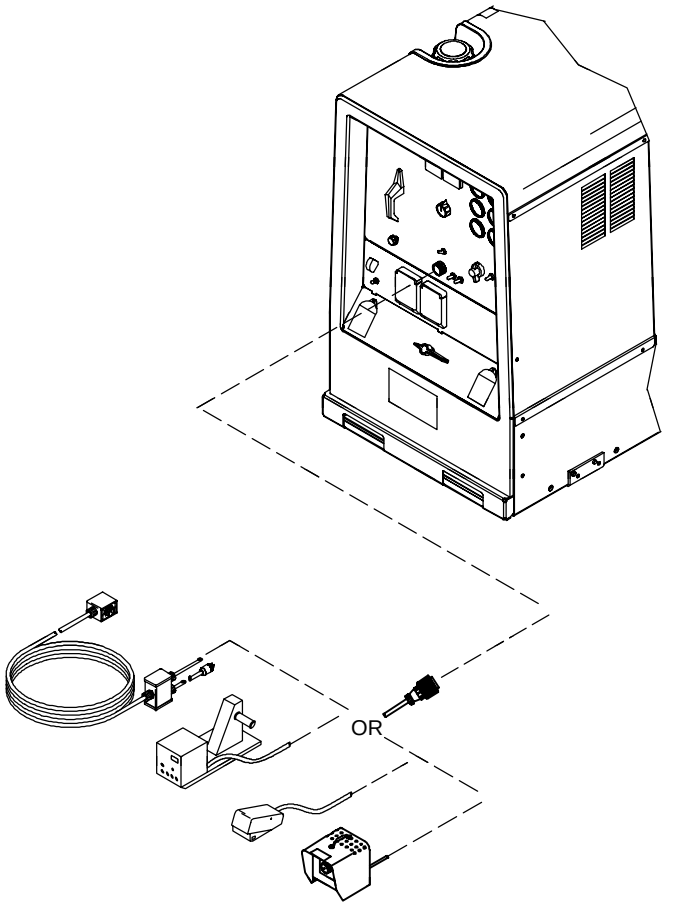
* This chart is a general guideline and may not suit all applications. If cable overheating occurs (normally you can smell it), use next size larger cable.

**Weld cable size (AWG) is based on either a 4 volts or less drop or a current density of at least 300 circular mils per ampere.
( ) = mm^2 for metric use

S-0007-E

***For distances longer than those shown in this guide, call a factory applications representative.

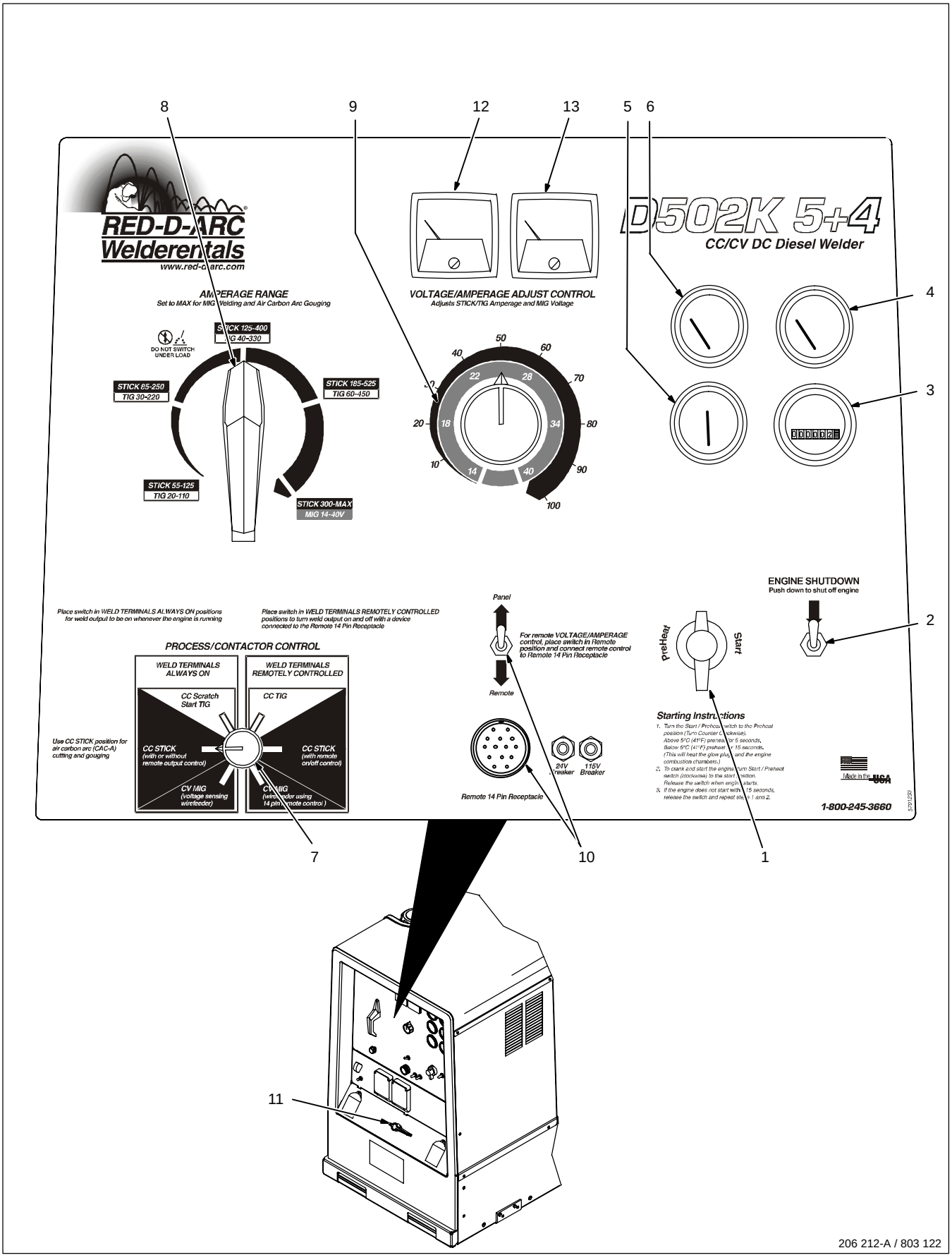
4-9. Connecting To Remote 14 Receptacle RC14



REMOTE 14	Socket*	Socket Information
24 VOLTS AC OUTPUT (CONTACTOR)	A	24 volts ac. Protected by circuit breaker CB5.
	B	Contact closure to A completes 24 volt ac contactor control circuit.
REMOTE OUTPUT CONTROL	C	Output to remote control:+10 volts dc in MIG or Stick mode; 0 to +10 volts dc in TIG mode.
	D	Remote control circuit common.
	E	DC input command signal: 0 to +10 volts from min. to max. of remote control with Voltage/ Amperage Adjust control at max.
115 VOLTS AC OUTPUT (CONTACTOR)	I	115 volts, 10 amperes, 60 Hz ac. Protected by circuit breaker CB13.
	J	Contact closure to I completes 115 volt ac contactor control circuit.
GND	K	Chassis common.
NEUTRAL	G	Circuit common for 24 and 115 volt ac circuit.

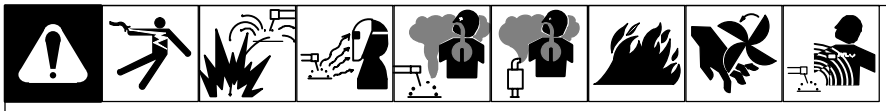
*The remaining sockets are not used.

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



206 212-A / 803 122

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



Engine Starting Controls

1 Start/Preheat Switch

Use switch to start engine and operate glow plug for cold weather starting.

Engine runs at weld/power speed continuously.

Turn switch to Preheat position to operate the glow plug and heat the combustion chambers before cranking engine (see starting instructions following).

2 Engine Shutdown Switch

Push switch down to stop engine.

To Start:

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

Above 41° F (5° C): turn Start/Preheat switch to Preheat position for 5 seconds and then turn switch to Start position. Release Start/Preheat switch when engine starts.

Below 41° F (5° C):
Turn Start/Preheat switch to Preheat position for 15 seconds and then turn switch to Start. Release Start/Preheat switch when engine starts.

To Stop:

Push Engine Shutdown switch down to stop engine.

3 Engine Hour Meter

Use meter to monitor engine running time for scheduling maintenance.

Engine Gauges

☞ *To read gauges with engine off, turn Start/Preheat switch to Preheat position.*

4 Fuel Gauge

Use gauge to check fuel level when engine is running.

5 Battery Ammeter

Use gauge to check amperage output to the battery. The gauge reads near 0 (zero) when the engine is running. If gauge is at a negative number, the battery is discharging.

▲ **Stop engine, and do not run engine until problem is fixed.**

6 Engine Temperature Gauge

Normal temperature is 170 - 205° F (77 - 96° C). Engine stops if temperature exceeds 221° F (105° C).

Weld Controls

7 Process/Contactor Control Switch

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

8 Amperage Range Switch

▲ **Do not switch under load.**

Use switch to select weld amperage range.

Use the lowest four ranges for Stick and TIG welding. Read the upper set of numbers at each range for Stick welding and the lower set at each range for TIG welding.

Use the highest range for MIG welding and for cutting and gouging (CAC-A).

For most welding applications, use lowest amperage range possible to help prevent arc outages.

9 Voltage/Amperage Adjust Control

With Process/Contactor Control switch in any Stick or TIG setting, use control to adjust amperage within range selected by Amperage Range switch. With Process/Contactor Control switch in any MIG position, use control to adjust voltage. With Voltage/Amperage Adjust Control switch (item 10) in Remote position, control limits the remote amperage in TIG mode, but has no effect in Stick and MIG modes.

Weld output would be about 263 A DC with controls set as shown (50% of 125 to 400 A).

☞ *The numbers around the control are for reference only and do not represent an actual percentage value.*

10 Voltage/Amperage Adjust Control Switch And Remote 14 Receptacle

Use switch to select front panel or remote voltage/amperage control. For remote control, place switch in Remote position and connect remote control to Remote 14 receptacle RC14 (see Sections 4-9 and 5-4).

11 Polarity/AC Selector Switch (Optional)

▲ **Do not switch under load.**

Use switch to change weld output. Select either DC Electrode Positive (DCEP) or DC Electrode Negative (DCEN).

Weld Meters

12 DC Voltmeter (Optional)

Voltmeter displays voltage at the weld output terminals, but not necessarily the welding arc due to resistance of cable and connections.

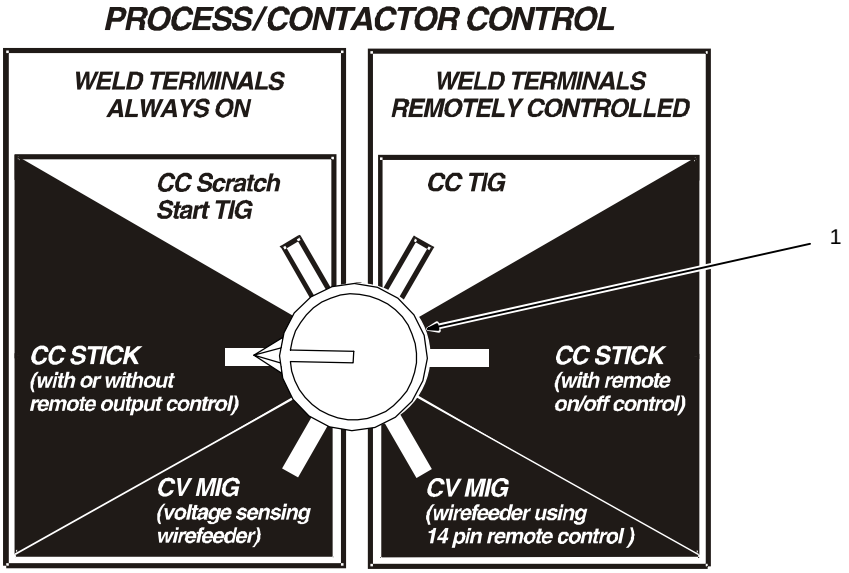
13 DC Ammeter (Optional)

Ammeter displays amperage output of the unit.

5-3. Process/Contactor Control Switch

Place switch in WELD TERMINALS ALWAYS ON positions for weld output to be on whenever the engine is running

Place switch in WELD TERMINALS REMOTELY CONTROLLED positions to turn weld output on and off with a device connected to the Remote 14 Pin Receptacle



Use CC STICK position for air carbon arc (CAC-A) cutting and gouging

206 212-A

1 Process/Contactor Control Switch (See Section 5-1 For Location)

▲ **Weld output terminals are energized when Process/Contactor Control switch is in a Weld Terminals Always On position and the engine is running.**

Use switch to select weld process and weld output on/off control (see table below and Section 5-4).

Place switch in Weld Terminals Remotely Controlled positions to turn weld output on and off with a device connected to the remote 14 receptacle.

Place switch in Weld Terminals Always On positions for weld output to be on whenever the engine is running.

Use Weld Terminals Always On – CC Stick position for air carbon arc (CAC-A) cutting and gouging.

When switch is in a Weld Terminals Always On – CC Stick position, the arc drive (dig) circuit provides additional amperage during low voltage (short arc length conditions) to prevent “sticking” electrodes.

The arc drive (dig) circuit is disabled when switch is in MIG, TIG, and CC stick (With Remote On/Off Control) positions.

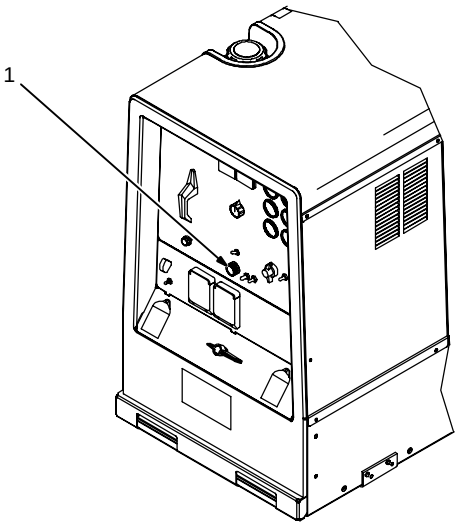
Process/Contactor Control Switch Settings

Switch Setting	Process	Output On/Off Control
Weld Terminals Remotely Controlled – CC TIG	GTAW With HF Unit, Pulsing Device, Or Remote Control	At Remote 14 Receptacle
Weld Terminals Remotely Controlled – CC Stick	Stick (SMAW) With Remote On/Off	At Remote 14 Receptacle
Weld Terminals Remotely Controlled – CV MIG	MIG (GMAW)	At Remote 14 Receptacle
Weld Terminals Always On – CV MIG	MIG (GMAW)	Electrode Hot
Weld Terminals Always On – CC Stick	Stick (SMAW), Air Carbon Arc (CAC-A) Cutting And Gouging	Electrode Hot
Weld Terminals Always On – CC Scratch Start TIG	Scratch Start TIG (GTAW)	Electrode Hot

5-4. Remote Voltage/Amperage Control

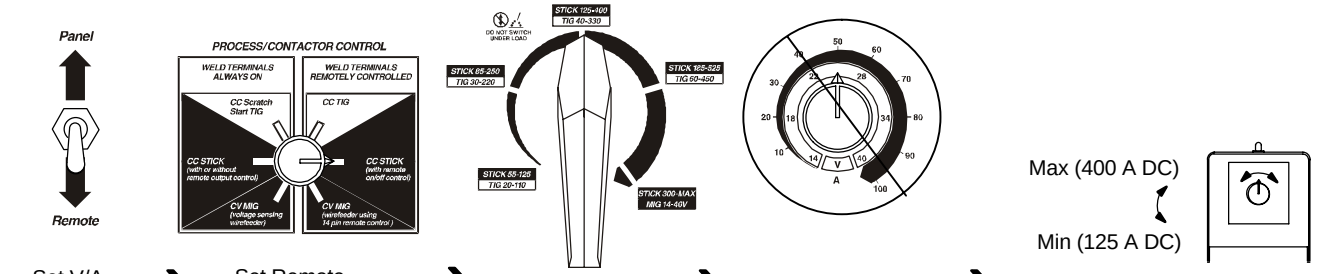
1 Remote 14 Receptacle RC14

Connect optional remote control to RC14 (see Section 4-9).



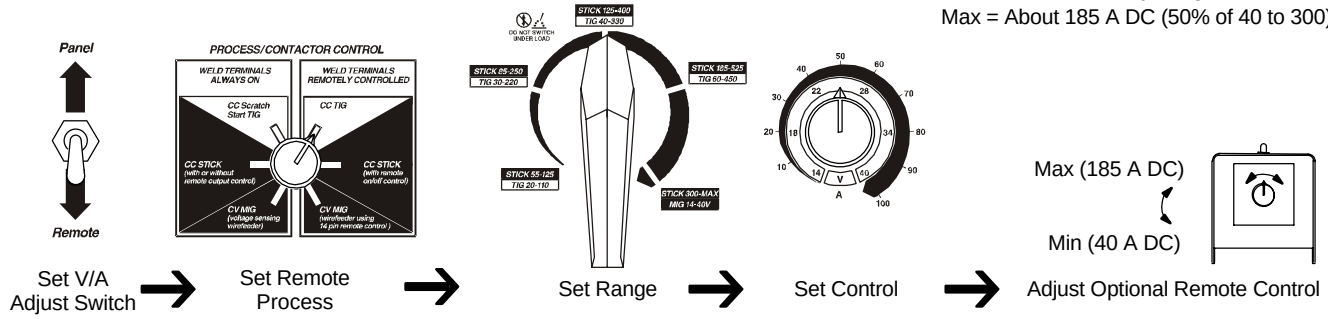
Example: Combination Remote Amperage Control (Stick) With Remote On/Off Control

In Example:
Process = Stick (Using Remote On/Off)
Range = 125 to 400 A DC
Min = 125 A DC
Max = 400 A DC



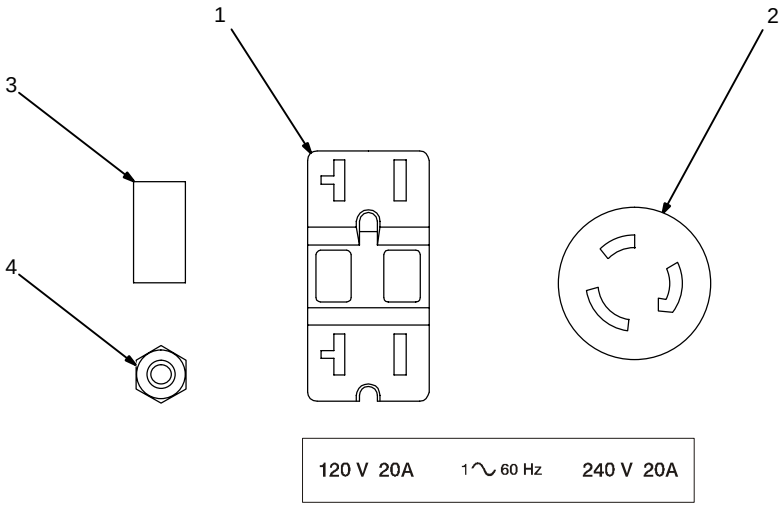
Example: Combination Remote Amperage Control (TIG) With Remote On/Off Control

In Example:
Process = TIG (Using Remote On/Off)
Range = 40 to 330 A DC
Percentage Of Range = 50%
Min = 40 A DC
Max = About 185 A DC (50% of 40 to 300)



0774 / Ref. 192 895-A / 802 311-A

6-1. 120 Volt And 240 Volt Receptacles



☞ *Generator power is not affected by weld output.*

1 120 V 20 A AC GFCI Receptacle GFCI1

2 240 V 30 A AC Twistlock Receptacle RC1

Receptacles supply 60 Hz single-phase power at weld/power speed.

If a ground fault is detected, GFCI Reset button pops out and receptacle does not work. Check for faulty tools plugged in receptacle. Press button to reset GFCI1.

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

3 Circuit Breaker CB1

4 Circuit Breaker CB2

CB1 protects RC1 and the generator winding from overload. If CB1 opens, RC1 and GFCI1 do not work. Place switch in On position to reset breaker.

CB2 protects GFCI1 from overload. If CB2 opens, GFCI1 does not work. Press button to reset breaker.

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

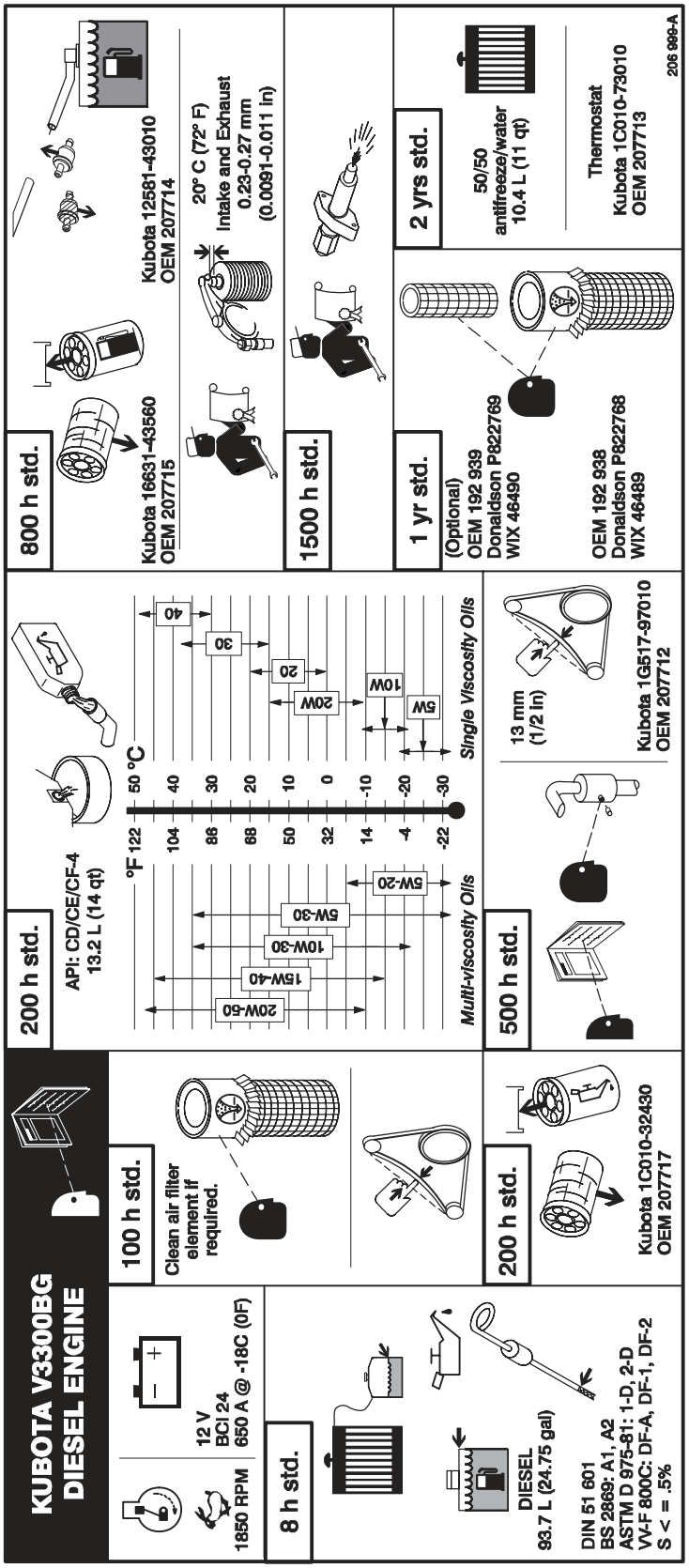
Maximum output is 2.4 kVA/kW from GFCI1 and 4 kVA/kW from RC1. Maximum output from all receptacles is 4 kVA/kW.

EXAMPLE: If 13 A is drawn from RC1, only 7 A is available at GFCI1:

(240 V x 13 A) + (120 V x 7 A) = 4.0 kVA/kW

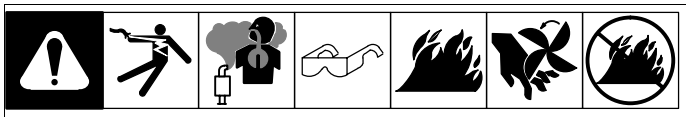
191 624

7-1. Maintenance Label



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

7-2. Routine Maintenance



Recycle engine fluids.

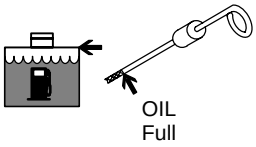
▲ **Stop engine before maintaining.**

☞ *See also Engine Manual and Maintenance Label. Service engine more often if used in severe conditions.*

* To be done by Factory Authorized Service Agent.

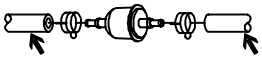
Every 8 h

Wipe Up Spills.

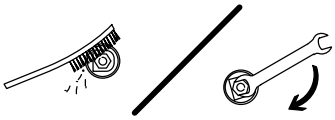


Check Fluid Levels. See Section 4-5.

Every 50 h



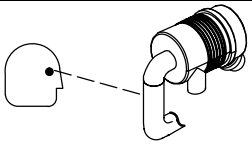
Check Fuel Lines And Connections.



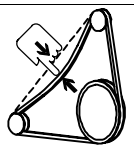
Clean And Tighten Weld Terminals.

Every 100 h

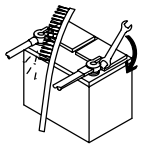
Clean Air Filter. See Section 7-3.



Check Air Cleaner Hoses For Cracks And Loose Clamps.

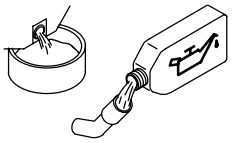


Check Belt Tension.

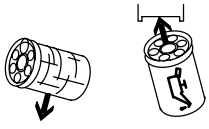


Clean And Tighten Battery Connections.

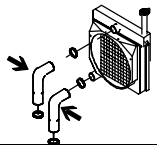
Every 200 h



Change Oil. See Section 7-6.

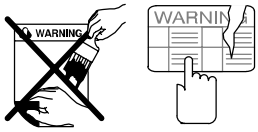


Change Oil Filter. See Section 7-6. Service More Often In Dirty Conditions.



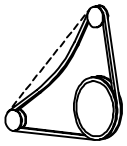
Check Radiator Hoses And Clamps.

Every 250 h

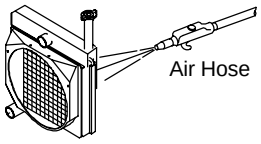


Replace Unreadable Labels.

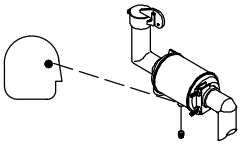
Every 500 h



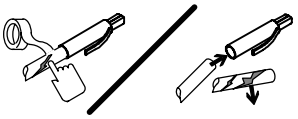
Replace Fan Belt.



Clean Radiator Exterior.

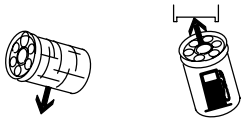


Check And Clean Spark Arrestor. See Section 7-4.

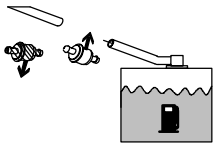


Repair Or Replace Cracked Cables.

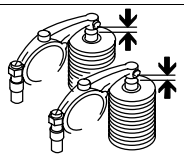
Every 800 h



Replace Secondary Fuel Filter. See Section 7-6.

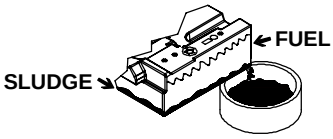


Replace Primary Fuel Filter. See Section 7-6.

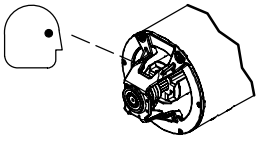


Check Valve Clearance.*

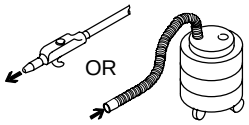
Every 1000 h



Drain Sludge From Fuel Tank. See Section 7-6.

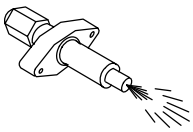


Service Welding Generator Brushes And Slip Rings. Service More Often In Dirty Conditions.*



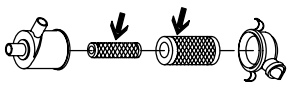
Blow Out Or Vacuum Inside. During Heavy Service, Clean Monthly.

Every 1500 h



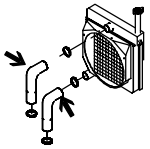
Clean/Set Injectors.*

Every 1 Year



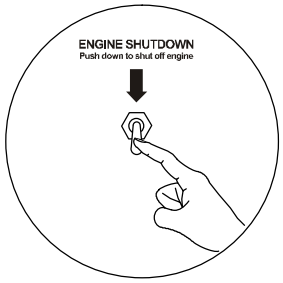
Replace Air Filter Element(s). See Section 7-3.

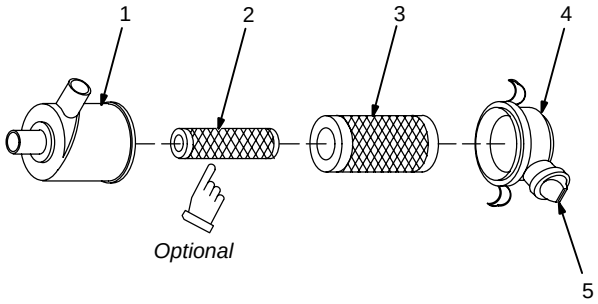
Every 2 Years



Replace Radiator Coolant And Hoses. See Section 7-7.

7-3. Servicing Air Cleaner





▲ **Stop engine.**

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

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

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

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

1 Housing

2 Safety Element (Optional)

3 Primary Element

4 Dust Cap

5 Dust Ejector

To clean air filter:

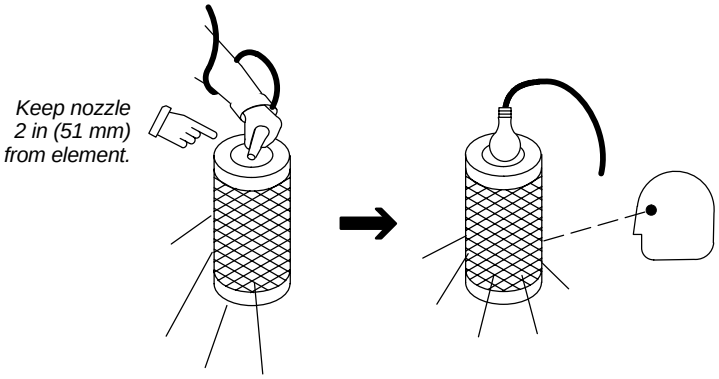
Wipe off cap and housing. Remove cap and dump out dust. Remove element(s). Wipe dust from inside cap and housing with damp cloth. Reinstall safety element (if present). Reinstall cap.

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

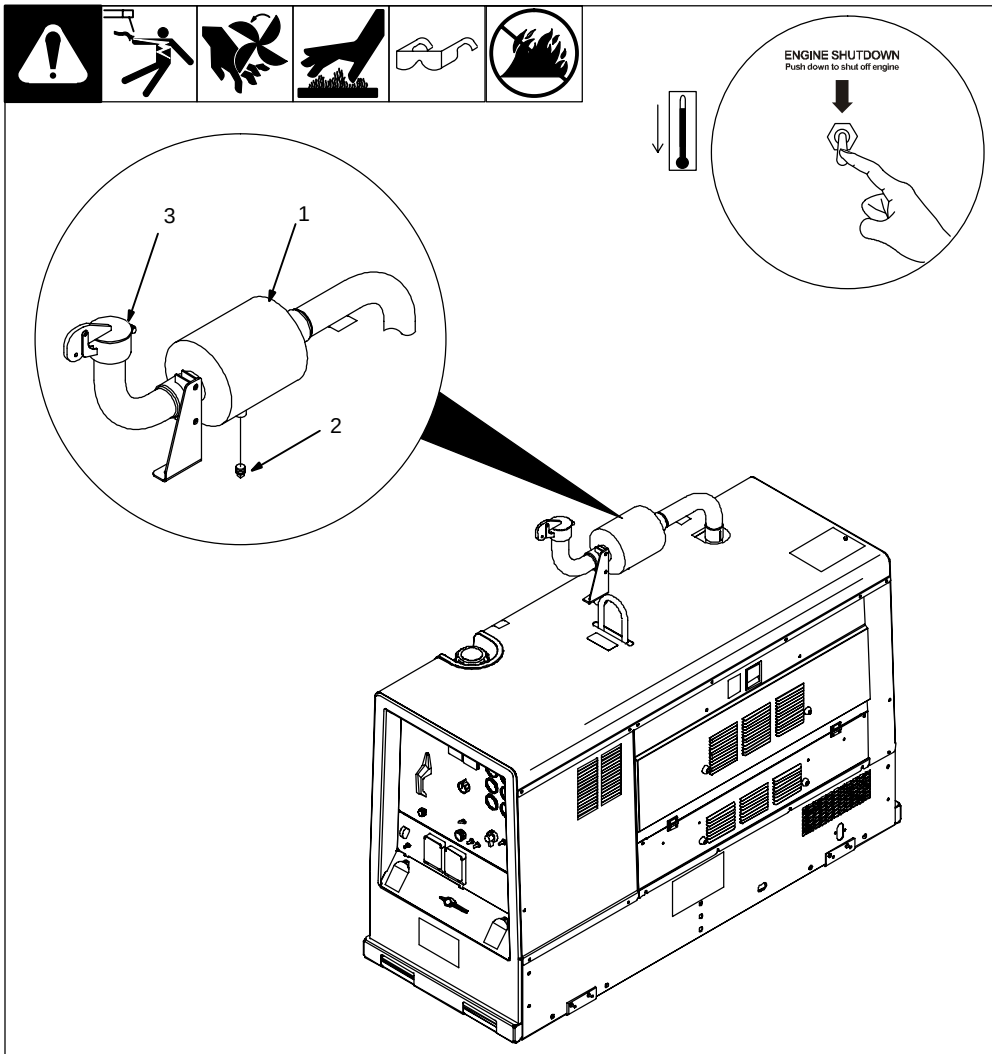
Clean primary element with compressed air only.

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

Reinstall primary element and cap (dust ejector down).



7-4. Inspecting/Cleaning Optional Spark Arrestor



▲ **Stop engine and let cool.**

1 Spark Arrestor Muffler

2 Cleanout Plug

Remove plug and remove any dirt covering cleanout hole.

3 Exhaust Pipe With Rain Cap

Start engine and run at idle speed to blow out cleanout hole. If nothing blows out of hole, briefly cover end of exhaust pipe with fireproof material.

▲ **Stop engine and let cool.**

Reinstall cleanout plug.

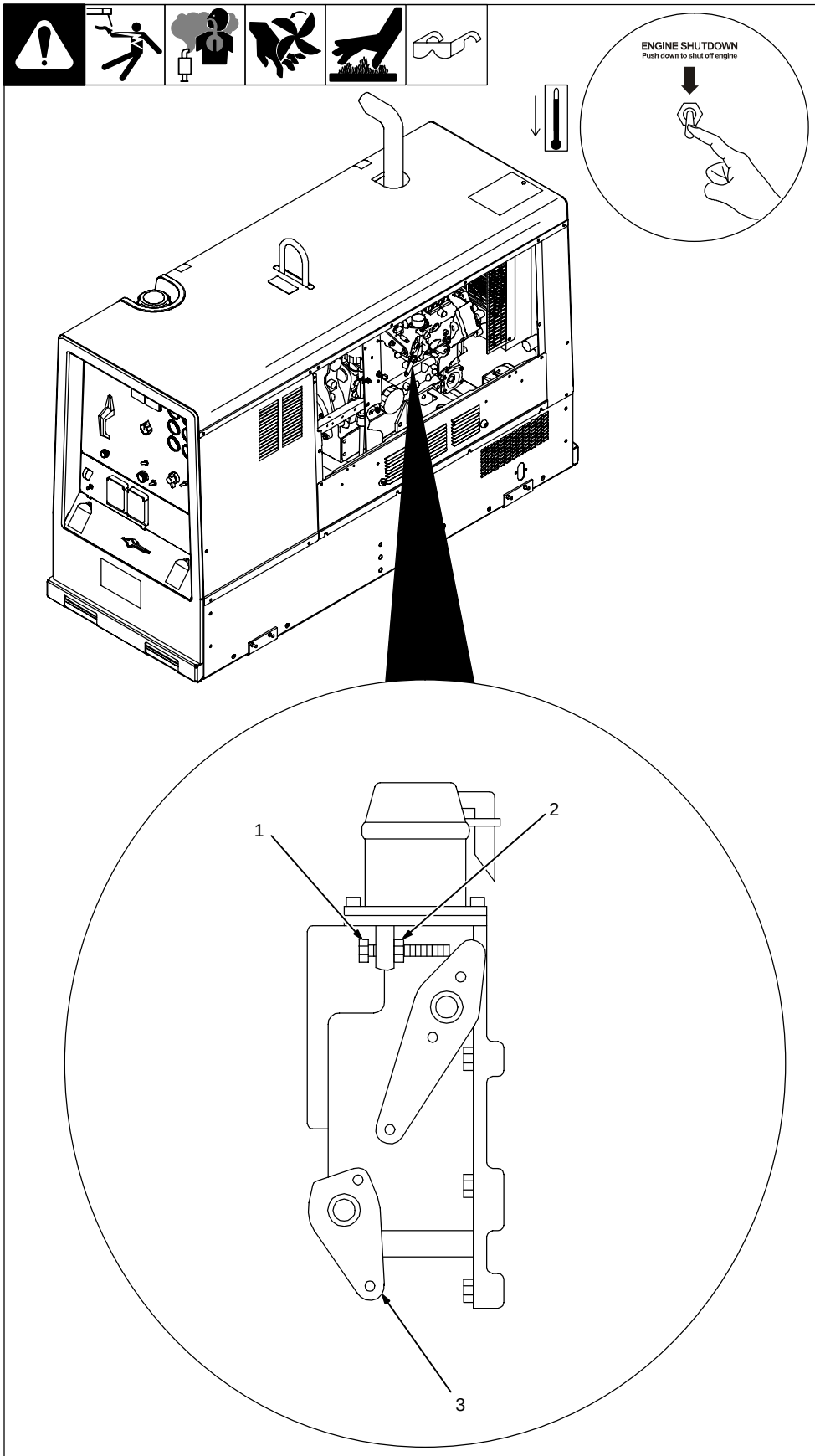
Tools Needed:

3/8 in

Ref. 206 212-A / 803 122

Notes

7-5. Adjusting Engine Speed



▲ **Stop engine and let cool.**

Engine speed is factory set and should not require adjustment. After tuning engine, check engine no load speed with a tachometer or frequency meter (see table for no load speeds). If necessary, adjust speed as follows:

Start engine and run until warm.

Turn Process/Contactor Control switch to Stick – Electrode Hot position.

1 Engine Speed Adjustment Screw

2 Locking Nut

Loosen nut. Turn screw until engine runs at weld/power speed. Tighten nut.

☞ *Do not set engine speed higher than specified.*

3 Engine Shutdown Lever

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

▲ **Stop engine.**

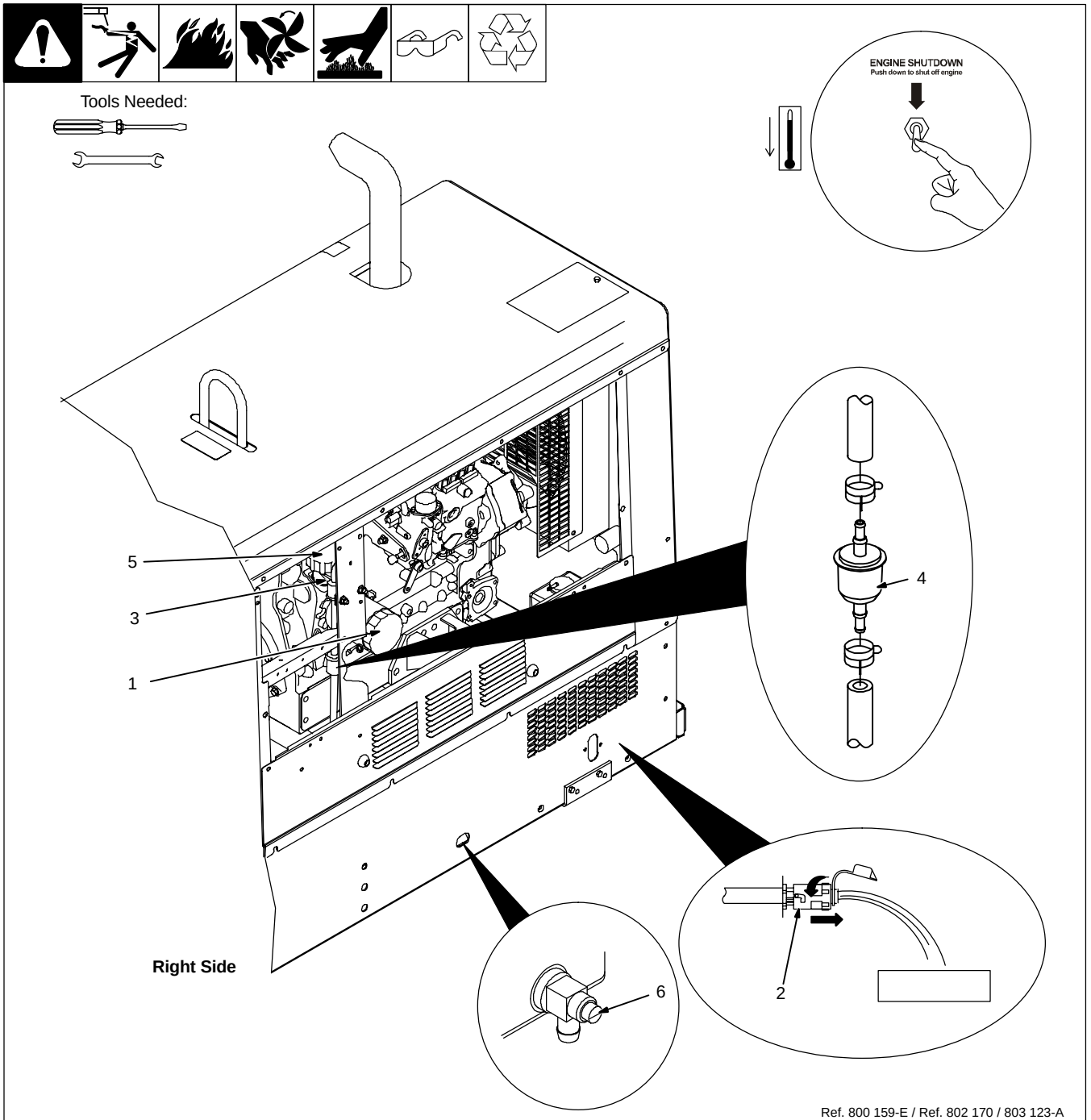
Close door.

	1850 rpm Max. (61.6 Hz)

Tools Needed:

803 123-A

7-6. Servicing Fuel And Lubrication Systems



Ref. 800 159-E / Ref. 802 170 / 803 123-A

▲ **Stop engine and let cool.**

▲ **After servicing, start engine and check for fuel leaks. Stop engine, tighten connections as necessary, and wipe up spilled fuel.**

1 Oil Filter
2 Oil Drain Valve And Hose
3 Oil Fill Cap
4 Primary Fuel Filter (In-Line)
5 Secondary Fuel Filter
6 Fuel Tank Sludge Drain Valve

To change oil and filter:

Route oil drain hose and valve through hole in base. See engine manual and engine maintenance label for oil/filter change information.

To drain water from fuel system:

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

To replace primary fuel filter:

Turn filter counterclockwise. Remove filter.

Apply thin coat of fuel to gasket on new filter. Fill filter with fuel. Install filter and turn clockwise. Bleed air from fuel system according to engine manual.

Inspect fuel line, and replace if cracked or worn.

To replace secondary fuel filter:

See engine manual.

Close doors.

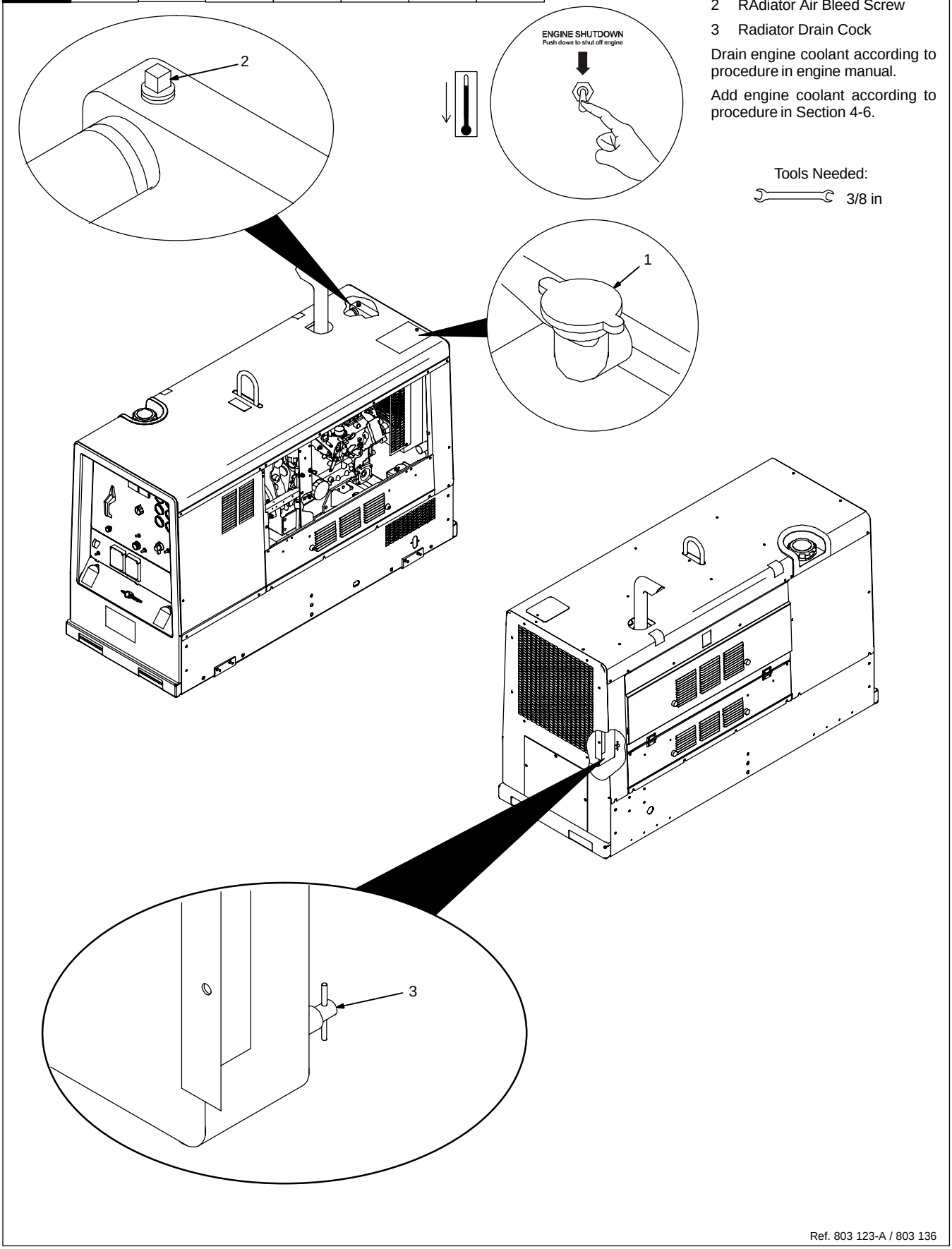
To drain sludge from fuel tank:

▲ **Beware of fire. Do not smoke and keep sparks and flames away from drained fuel. Dispose of drained fuel in an environmentally-safe manner. Do not leave unit unattended while draining fuel tank.**

▲ **Properly lift unit and secure in a level position. Use adequate blocks or stands to support unit while draining fuel tank.**

Attach 1/2 ID hose to drain valve. Put metal container under drain, and use screwdriver to open sludge drain valve. Close valve when sludge has drained. Remove hose.

7-7. Servicing Engine Cooling System



▲ **Stop engine and let cool.**

1 Radiator Cap

2 RAdiator Air Bleed Screw

3 Radiator Drain Cock

Drain engine coolant according to procedure in engine manual.

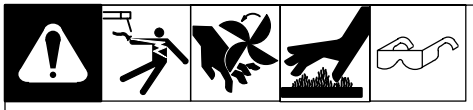
Add engine coolant according to procedure in Section 4-6.

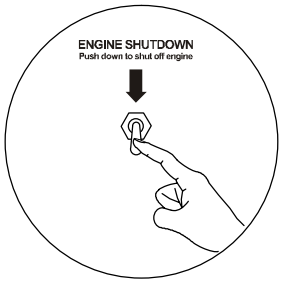
Tools Needed:

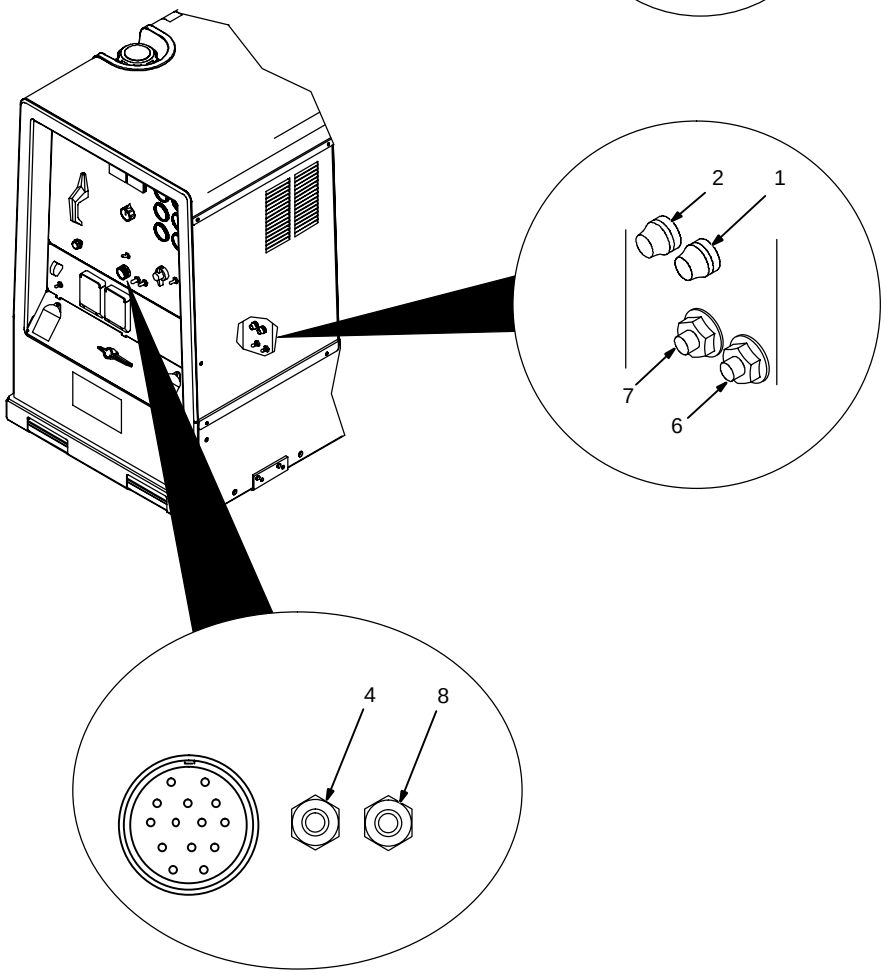
3/8 in

Ref. 803 123-A / 803 136

7-8. Overload Protection







▲ **Stop engine.**

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

1 Fuse F1

2 Fuse F2

F1 and F2 protect the stator exciter winding from overload. If F1 opens, weld and generator power is low or stops entirely. If F2 opens, weld output stops. 4 kVA/kW generator power is still available.

3 Circuit Breaker CB4 (Not Shown)

4 Circuit Breaker CB5

5 Circuit Breaker CB10 (Not Shown)

6 Circuit Breaker CB11

7 Circuit Breaker CB12

8 Circuit Breaker CB13

CB4 protects the welding arc drive (dig) circuit. If CB4 opens, the electrode may stick to the workpiece more frequently during low voltage (short arc length) conditions. CB4 automatically resets when the fault is corrected.

CB5 protects the 24 volt ac output to remote receptacle RC14, and 24 volt output to field current regulator board PC1. If CB5 opens, weld output and 24 volt output to RC14 stops.

CB10 protects the engine battery circuit. If CB10 opens, the engine will not crank. CB10 automatically resets when the fault is corrected.

CB11 protects the control box wiring harness. If CB11 opens, weld output stops (generator power is still available).

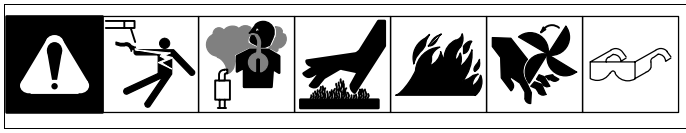
CB12 protects the field flashing circuit. If CB12 opens, the generator may not excite at start-up and weld and generator power output may not be available.

CB13 protects the 115 volt ac output to remote receptacle RC14. If CB13 opens, 115 volt output to RC14 stops.

Press button to reset breaker.

803 123-A / 802 170-D / Ref. 802 313

7-9. Troubleshooting



A. Welding

Trouble	Remedy
No weld output; generator power output okay.	Place Process/Contactor Control switch in a Electrode Hot position, or place switch in a Remote position and connect remote contactor to optional Remote 14 receptacle RC14 (see Sections 4-9 and 5-1).
	Check position of Amperage Range switch.
	Check position of optional polarity switch.
	Reset circuit breaker CB11 (see Section 7-8).
	Reset circuit breaker CB5 (see Section 7-8). Check for faulty remote device connected to RC14.
	Check and secure connections to Remote 14 receptacle RC14 (see Section 4-9).
	Have Factory Authorized Service Agent check connector board PC6 and connections.
	Check fuse F2, and replace if open (see Section 7-8). Have Factory Authorized Service Agent check brushes and slip rings, field excitation circuit, field current regulator board PC1, and the rotor.
No weld output or generator power output.	Disconnect equipment from generator power receptacles during start-up.
	Check fuses F1 and F2, and replace if open (see Section 7-8). Have Factory Authorized Service Agent check integrated rectifier SR1, capacitor C9, field current regulator board PC1, and the rotor.
	Have Factory Authorized Service Agent check brushes and slip rings, control relay CR5, and field excitation circuit.
Erratic weld output.	Check and tighten connections inside and outside unit.
	Be sure connection to work piece is clean and tight.
	Use dry, properly stored electrodes.
	Remove excessive coils from weld cables.
High weld output.	Check position of Amperage Range switch and Voltage/Amperage Adjust control.
	Check engine weld/power speed, and adjust if necessary (see Section 7-5).
	Have Factory Authorized Service Agent check field current regulator board PC1.
Low weld output.	Check engine weld/power speed, and adjust if necessary (see Section 7-5).
	Check fuses F1 and F2, and replace if open (see Section 7-8). Have Factory Authorized Service Agent check integrated rectifier SR1, capacitor C9, field current regulator board PC1, and the rotor.
Electrode sticks to the workpiece more frequently during low voltage (short arc length) conditions.	Circuit breaker CB4 may be open. CB4 automatically resets when the fault is corrected (see Section 7-8). Have Factory Authorized Service Agent check transformer T1 and integrated rectifiers SR4 and SR5.
Low open-circuit voltage.	Check engine weld/power speed, and adjust if necessary.
No remote fine amperage or voltage control.	Place Voltage/Amperage Adjust Control switch in Remote position.
	Check and secure connections to Remote 14 receptacle RC14 (see Section 4-9).
	Repair or replace remote control device.
Constant speed wire feeder does not work.	Reset circuit breaker(s) CB5 and/or CB13 (see Section 7-8).
	Check and secure connections to Remote 14 receptacle RC14 (see Section 4-9).
	Repair or replace wire feeder.
Low CV weld output.	Set Amperage Range switch to highest range.

Trouble	Remedy
Min or max CV weld output only.	Check position of Voltage/Amperage Adjust control and Voltage/Amperage Adjust Control switch.
	Repair or replace remote control device.
	Have Factory Authorized Service Agent check field current regulator board PC1.

B. Generator Power

Trouble	Remedy
No generator power output; weld output okay.	Reset receptacle circuit breakers.
No generator power or weld output.	Disconnect equipment from generator power receptacles during start-up.
	Check fuses F1 and F2, and replace if open (see Section 7-8). Have Factory Authorized Service Agent check integrated rectifier SR1, capacitor C9, and the rotor.
	Reset circuit breaker CB12. Have Factory Authorized Service Agent check field current regulator board PC1 (see Section 7-8).
	Have Factory Authorized Service Agent check brushes and slip rings, and field excitation circuit.
High output at generator power receptacles.	Check engine weld/power speed, and adjust if necessary (see Section 7-5).
	Have Factory Authorized Service Agent adjust generator power field current resistor R3.
Low output at generator power receptacles.	Check engine weld/power speed, and adjust if necessary (see Section 7-5).
	Check fuse F1, and replace if open (see Section 7-8). Have Factory Authorized Service Agent check integrated rectifier SR1, resistor R3, and capacitor C9.

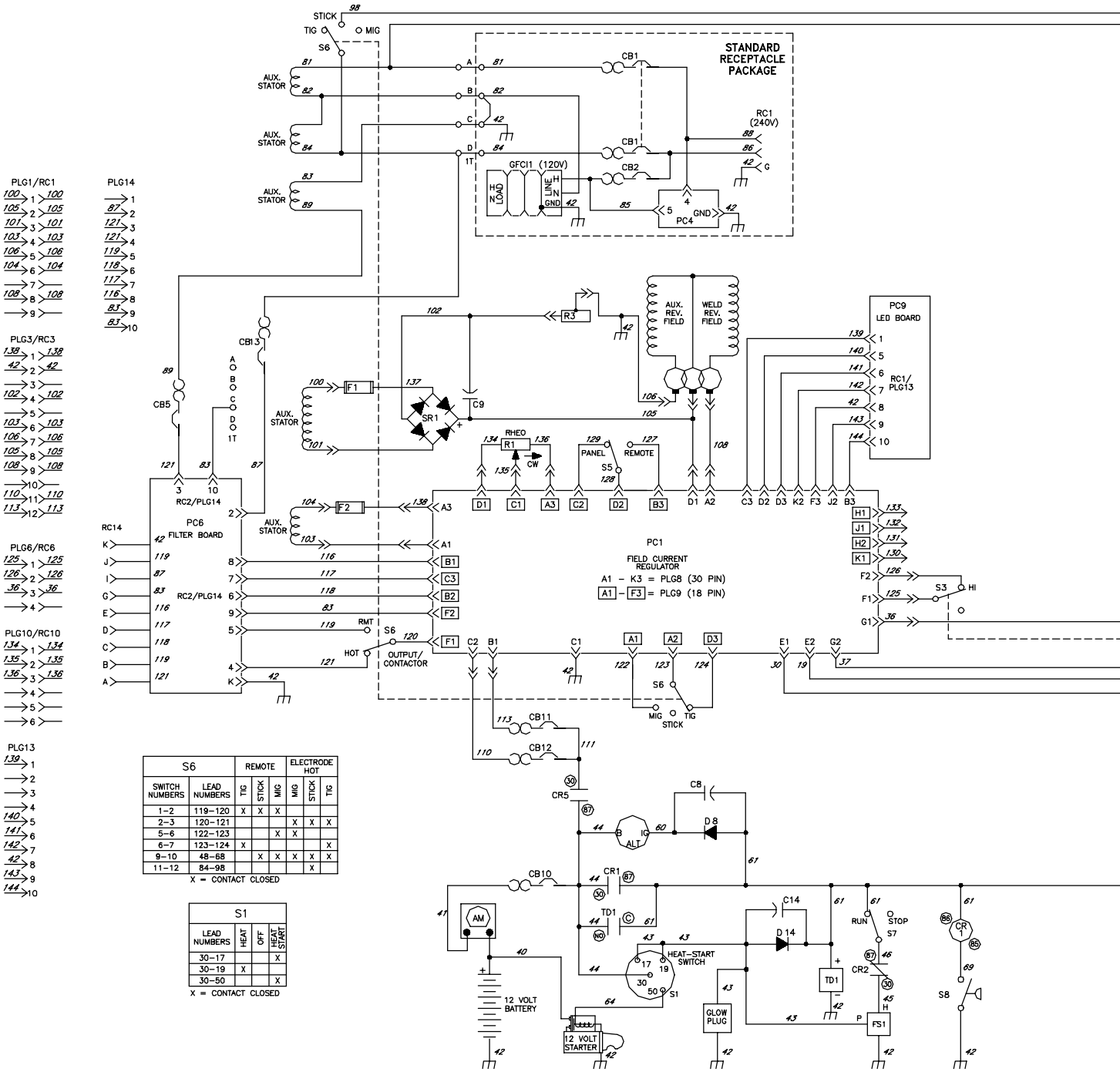
C. Engine

Trouble	Remedy
Engine will not crank.	Check battery, and replace if necessary.
	Check battery connections and tighten if necessary.
	Circuit breaker CB10 may be open. CB10 automatically resets when fault is corrected (see Section 7-8). Have Factory Authorized Service Agent check engine wiring harness and components.
	Check engine wiring harness plug connections.
	Have Factory Authorized Service Agent check Start/Preheat switch S1.
Engine cranks but does not start.	Check fuel level.
	Check battery and replace if necessary. Check engine charging system according to engine manual.
	Have Factory Authorized Service Agent check electric fuel pump, fuel solenoid FS1, control relays CR1 and CR2, engine oil pressure switch S12, engine coolant temperature switch, time delay relay T, and Engine Shutdown switch S7.
	Air in fuel system. See engine manual.
Engine hard to start in cold weather.	Turn Preheat/Start switch to Preheat position before starting (see Section 5-1).
	Keep battery in good condition. Store battery in warm area off cold surface.
	Use fuel formulated for cold weather (diesel fuel can gel in cold weather). Contact local fuel supplier for fuel information.
	Use correct grade oil for cold weather (see Section 7-1).
	Have Factory Authorized Service Agent check glow plug circuit.

Trouble	Remedy
Engine suddenly stops.	Check fuel level.
	Check engine oil level. Engine stops if engine oil pressure is too low.
	Check engine coolant level. Engine Shutdowns if engine temperature is too high (see Section 4-5).
	See engine manual.
Engine slowly stopped and cannot be restarted.	Check fuel level.
	Check engine air and fuel filters (see Sections 7-3 and 7-6).
	See engine manual.
Battery discharges between uses.	Clean top of battery with baking soda and water solution; rinse with clear water.
	Recharge or replace battery if necessary.
	Periodically recharge battery (approximately every 3 months).
Engine uses oil during run-in period; wetstacking occurs.	Dry engine (see Section 9).

Notes

SECTION 8 – ELECTRICAL DIAGRAM



S6		REMOTE			ELECTRODE HOT		
SWITCH NUMBERS	LEAD NUMBERS	TIG	STICK	MIG	MIG	STICK	TIG
1–2	119–120	X	X	X			
2–3	120–121				X	X	X
5–6	122–123			X	X		
6–7	123–124	X					X
9–10	48–68		X	X	X	X	X
11–12	84–98					X	

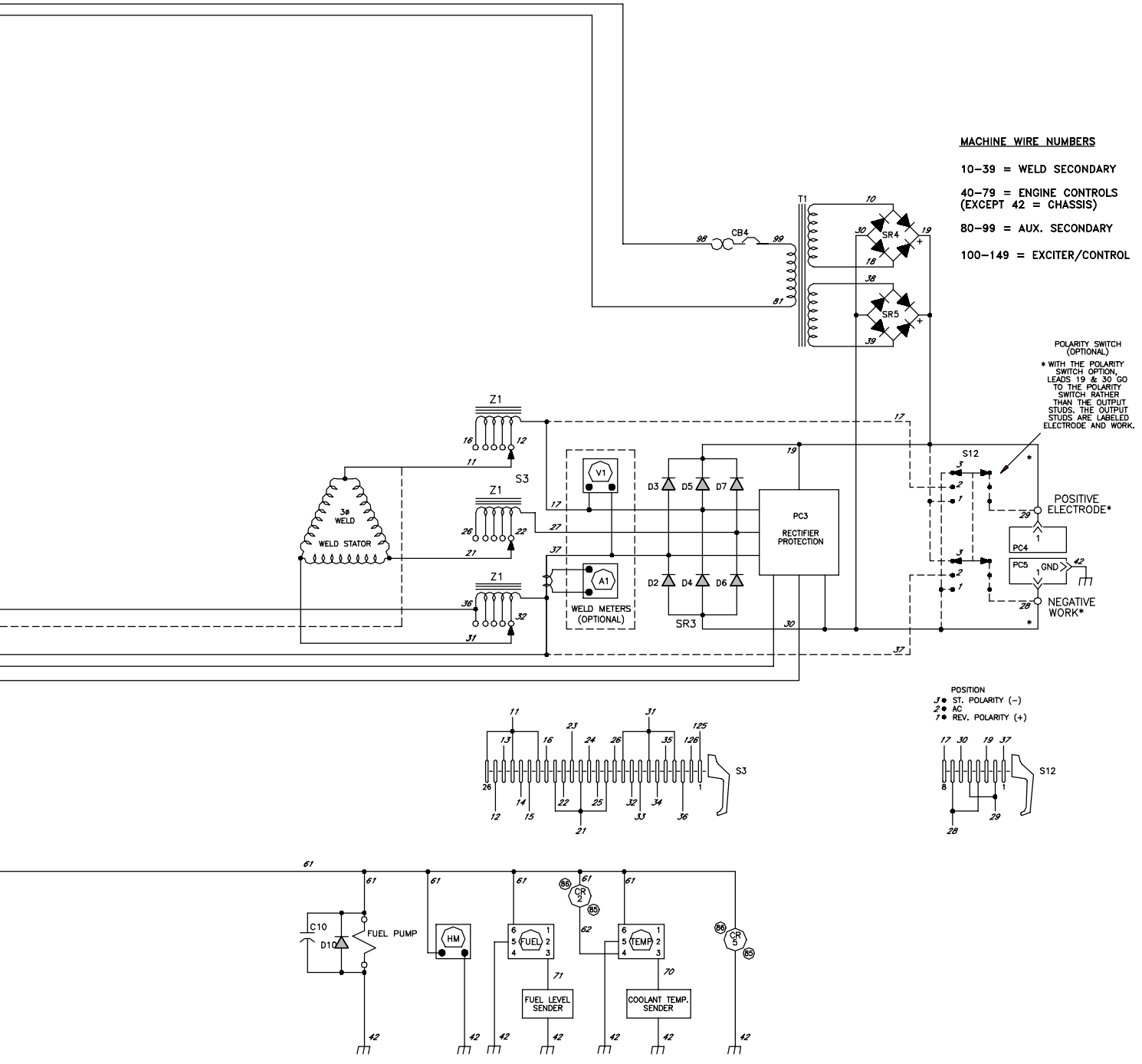
X = CONTACT CLOSED

S1			
LEAD NUMBERS	HEAT	OFF	HEAT START
30–17			X
30–19	X		
30–50			X

X = CONTACT CLOSED

Figure 8-1. Circuit Diagram For Welding Generator

⚠ 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	



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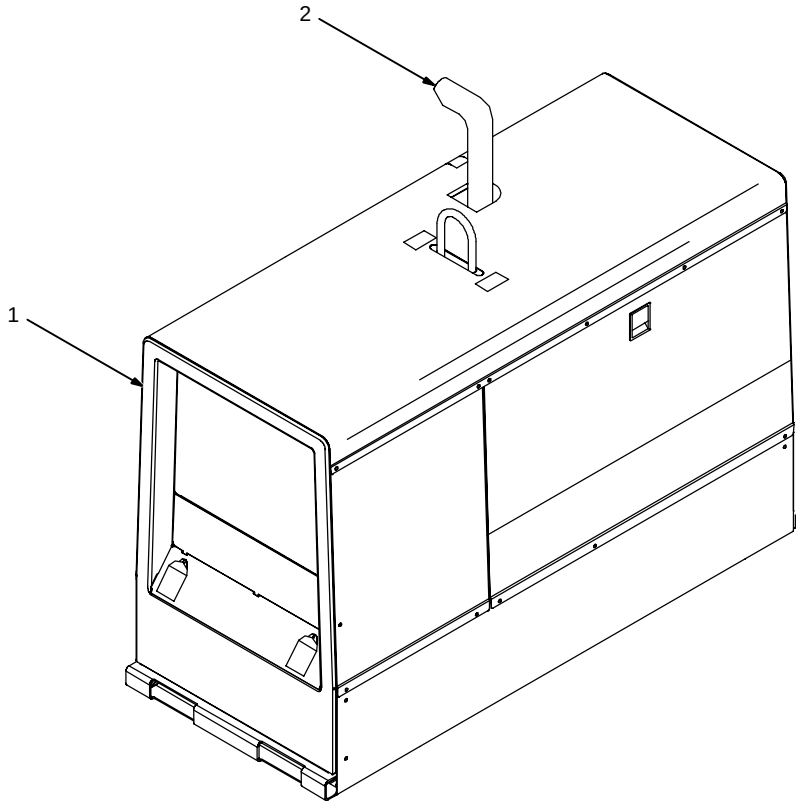
SECTION 9 – RUN-IN PROCEDURE

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 and the welding generator is kept loaded during run-in.*

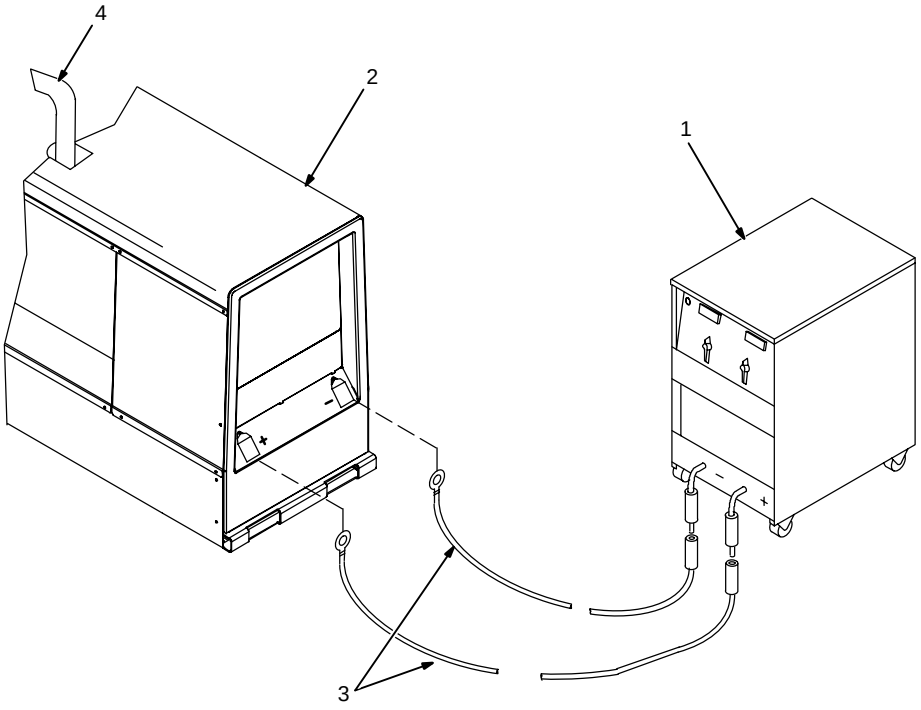
2 Engine Exhaust Pipe

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

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

3 Weld Cables

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

Start engine and run for several minutes.

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

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

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

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

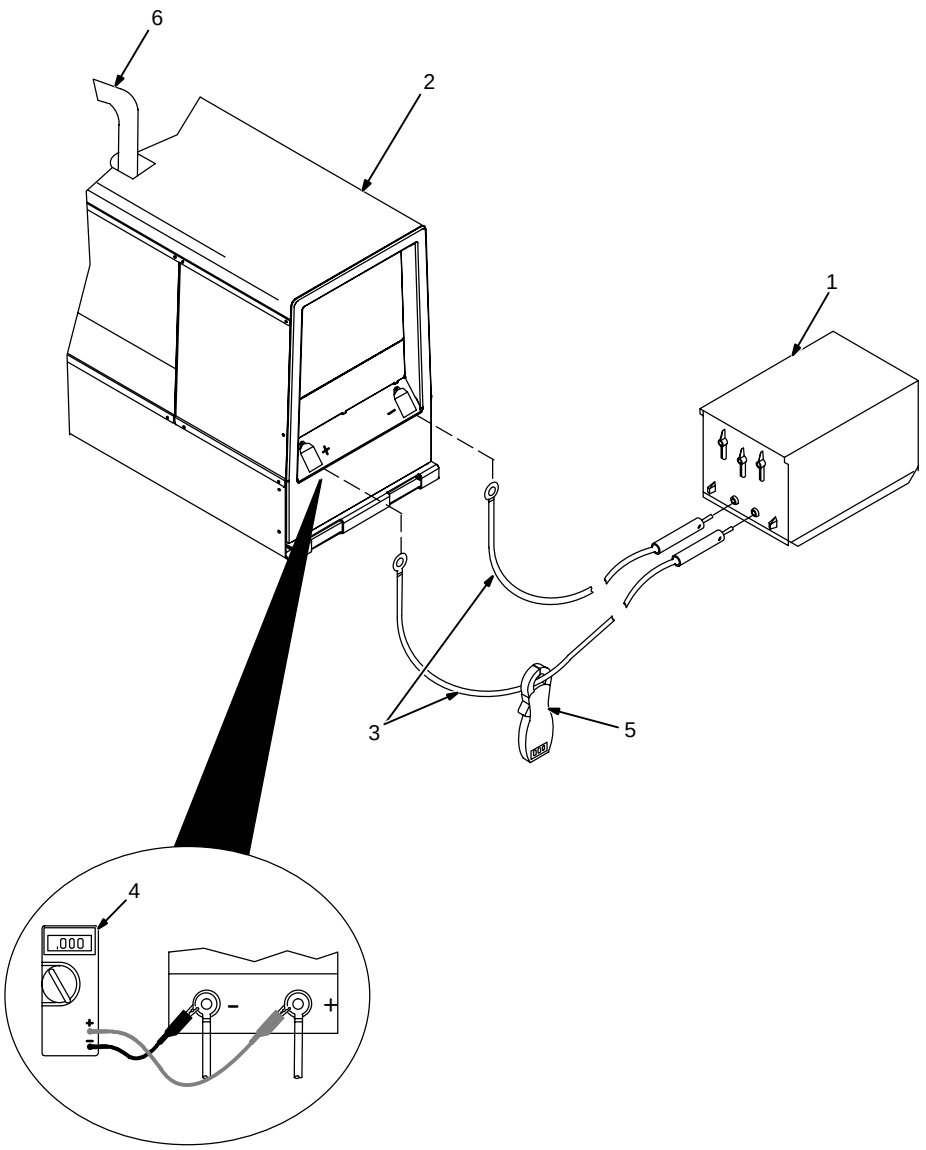
▲ **Stop engine and let cool.**

4 Engine Exhaust Pipe

Repeat procedure if wetstacking is present.

S-0683

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

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

3 Weld Cables

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

4 Voltmeter

5 Clamp-On Ammeter

Connect voltmeter and ammeter as shown, if not provided on generator.

Start engine and run for several minutes.

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

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

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

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

▲ **Stop engine and let cool.**

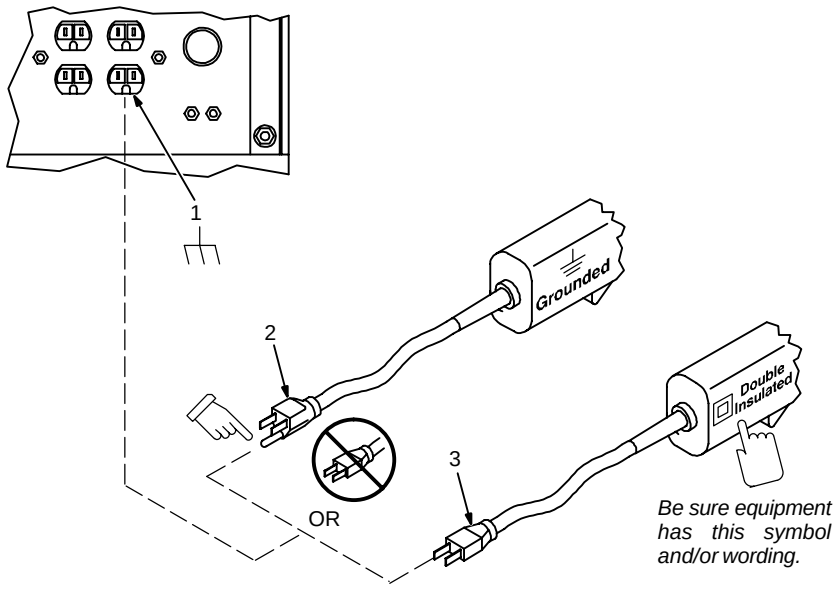
6 Engine Exhaust Pipe

Repeat procedure if wetstacking is present.

S-0684

SECTION 10 – GENERATOR POWER GUIDELINES

10-1. Selecting Equipment



1 Generator Power Receptacles – Neutral Bonded To Frame

2 3-Prong Plug From Case Grounded Equipment

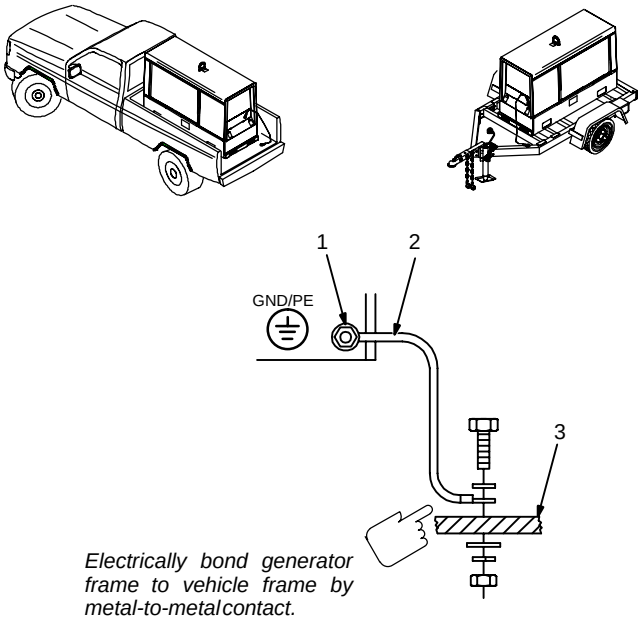
3 2-Prong Plug From Double Insulated Equipment

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

Be sure equipment has this symbol and/or wording.

gen_pwr* 11/02 – Ref. ST-159 730 / ST-800 577

0-2. 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

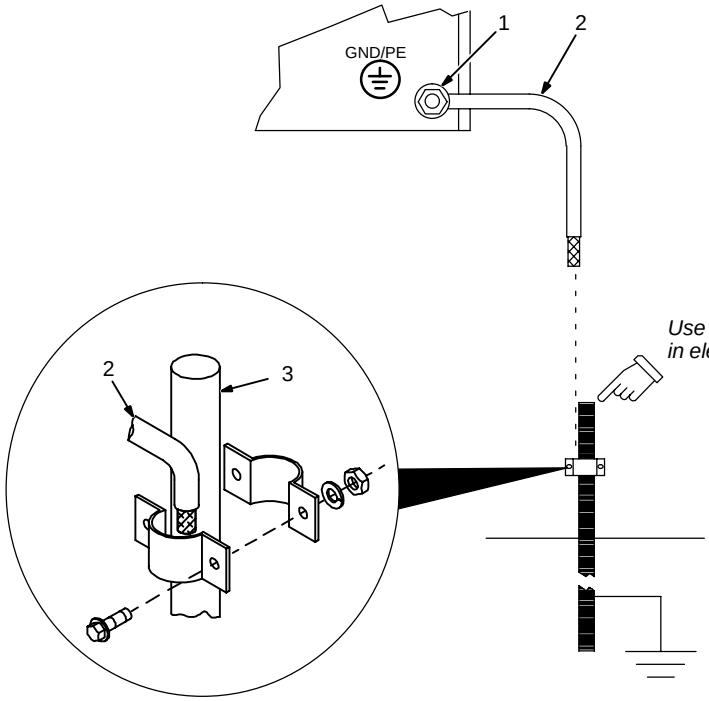
Connect cable from equipment ground terminal to metal vehicle frame. Use #10 AWG or larger insulated copper wire.

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

▲ **Bed liners, shipping skids, an 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.**

S-0854

10-3. Grounding When Supplying Building Systems



1 Equipment Grounding Terminal

2 Grounding Cable

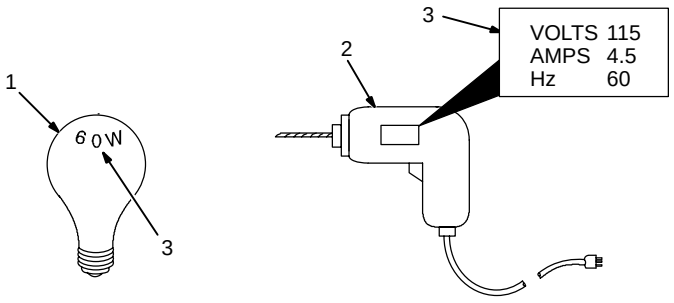
Use #10 AWG or larger insulated copper wire.

3 Ground Device

▲ **Ground generator to system earth ground if supplying power to a premises (home, shop, farm) wiring system.**

ST-800 576-B

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 A x 115 V = 520 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 W + 200 W + 200 W) + 520 W = 1120 W

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

S-0623

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
	5 HP	23300	6800
Capacitor Start-Capacitor Run	1-1/2 HP	8100	2000
	5 HP	23300	6000
	7-1/2 HP	35000	8000
	10 HP	46700	10700
Fan Duty	1/8 HP	1000	400
	1/6 HP	1400	550
	1/4 HP	1850	650
	1/3 HP	2400	800
	1/2 HP	3500	1100

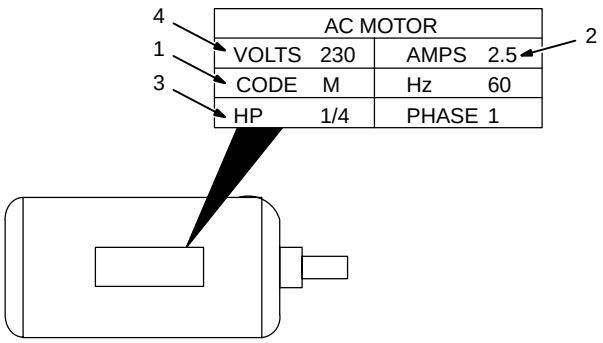
10-6. Approximate Power Requirements For Farm/Home Equipment

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	1400	
	Vapor	1250	1000
Submersible Pump	400 gph	600	200
Centrifugal Pump	900 gph	900	500
Floor Polisher	3/4 HP, 16 in	4500	1400
	1 HP, 20 in	6100	1600
High Pressure Washer	1/2 HP	3150	950
	3/4 HP	4500	1400
	1 HP	6100	1600
55 gal Drum Mixer	1/4 HP	1900	700
Wet & Dry Vac	1.7 HP	900	900
	2-1/2 HP	1300	1300

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

$$\frac{\textbf{kVA/HP x HP x 1000}}{\textbf{VOLTS}} = \textbf{STARTING AMPERAGE}$$

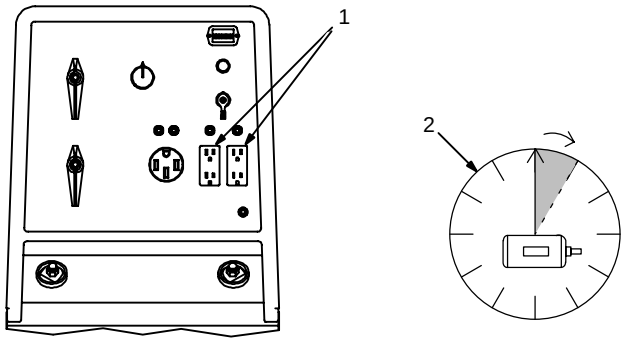
EXAMPLE: Calculate the starting amperage required for a 230 V, 1/4 HP motor with a motor start code of M.

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

$$\frac{11.2 \times 1/4 \times 1000}{230} = 12.2\ \text{A}$$ **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.

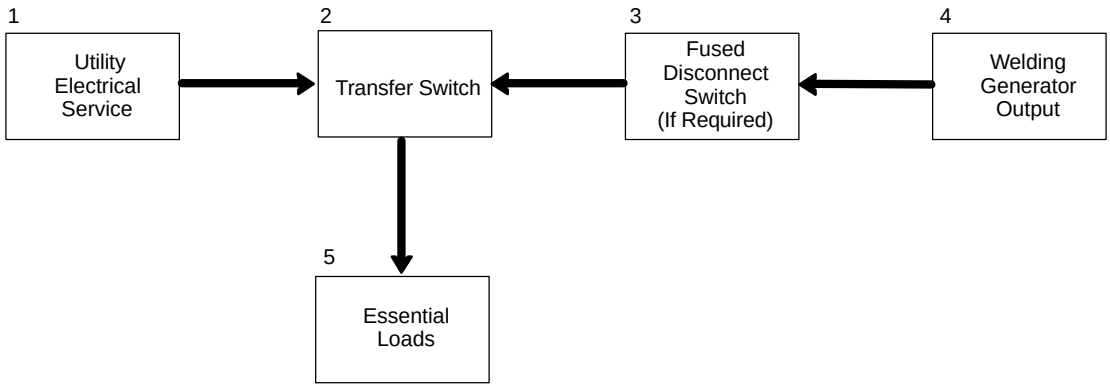
2 5 Second Rule

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

10-10. Typical Connections To Supply Standby Power

▲ **Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.**



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

▲ **Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.**

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

1 Utility Electrical Service

2 Transfer Switch (Double-Throw)

Switch transfers the electrical load from electric utility service to the generator. Transfer load back to electric utility when service is restored.

Install correct switch (customer-supplied). Switch rating must be same as or greater than the branch overcurrent protection.

3 Fused Disconnect Switch

Install correct switch (customer-supplied) if required by electrical code.

4 Welding Generator Output

Generator output voltage and wiring must be consistent with regular (utility) system voltage and wiring.

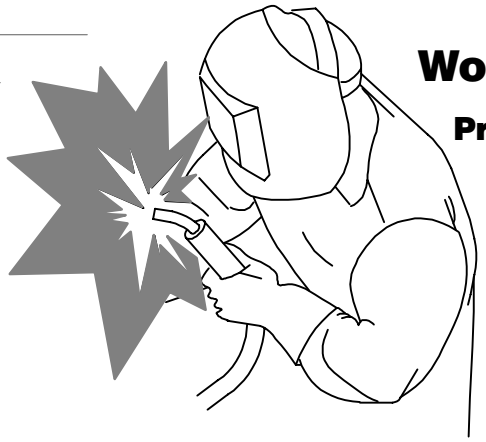
Connect generator with temporary or permanent wiring suitable for the installation.

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

5 Essential Loads

Generator output may not meet the electrical requirements of the premises. If generator does not produce enough output to meet all requirements, connect only essential loads (pumps, freezers, heaters, etc. – See Section 10-4).

Notes



Work like a Pro!

Pros weld and cut safely. Read the safety rules at the beginning of this manual.

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.*

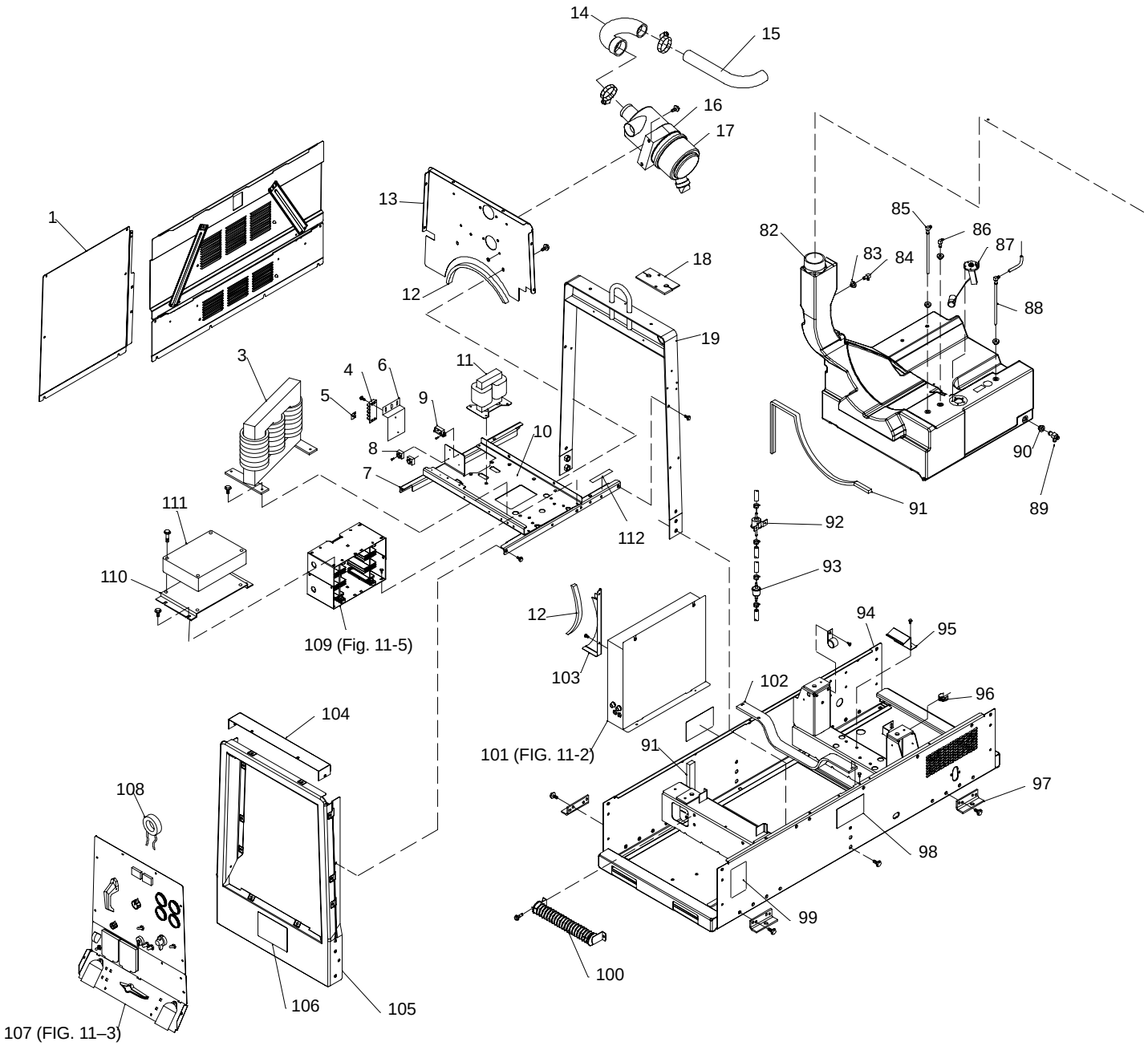
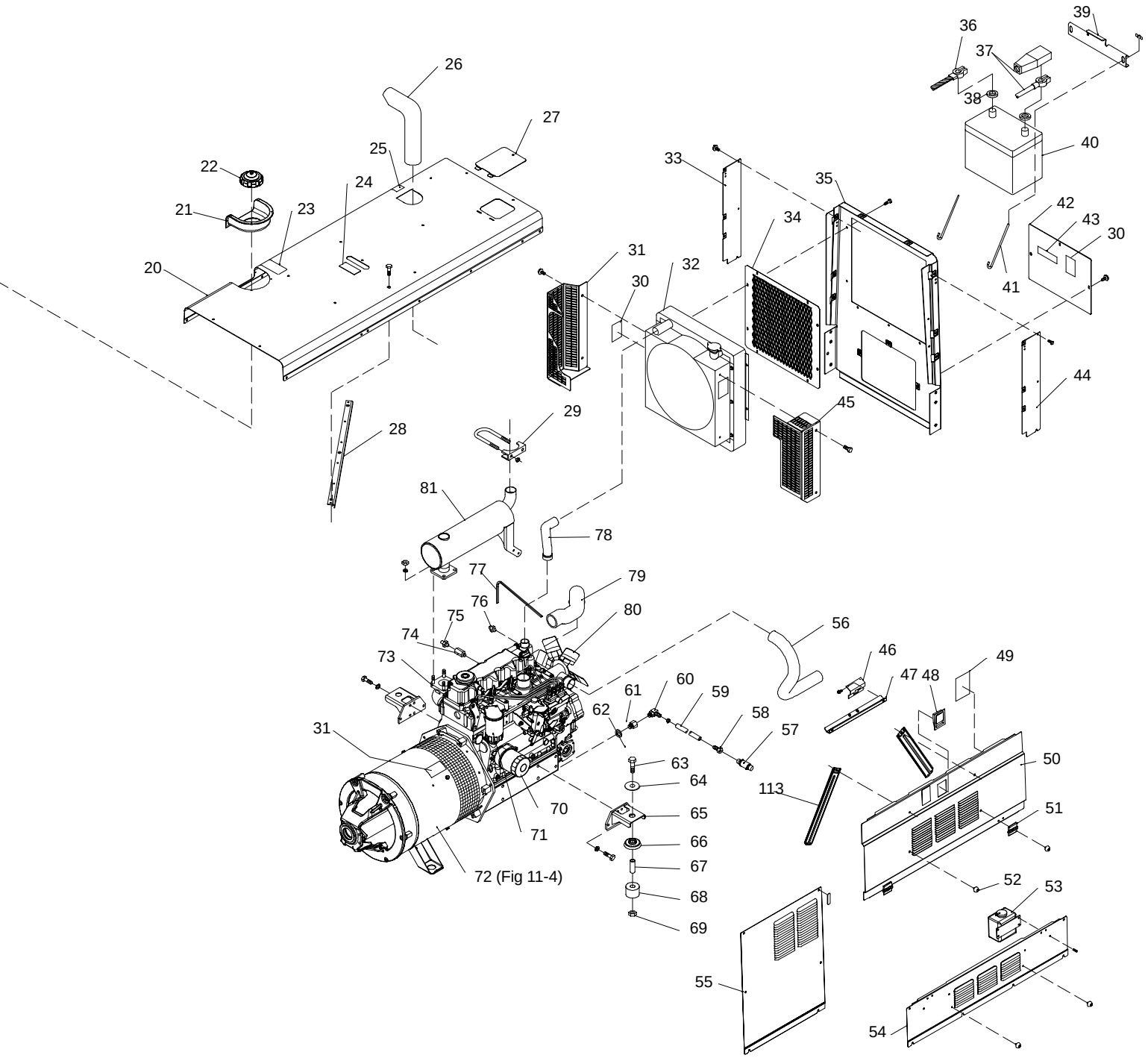


Figure 11-1. Main Assembly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803 201-B

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 11-1. Main Assembly

1		+199294	Panel, Gen Lh Stainless	1
2		+199301	Panel, Engine Side Stainless Stl	1
3	Z1	202647	Reactor, AC Environmental	1
4	1T	038621	Block, Term 30 Amp 4 Pole Frict Term Str Both Side	1
5		038620	Link, Jumper Term Blk 30 Amp	1
6		081499	Bracket, Mtg Terminal Strip	1
7		206352	Brace, Front To Center Upright	2
8	SR4, SR5	035704	Rectifier, Integ Bridge 40 Amp 800v	2
9	CB4	045061	Circuit Breaker, Auto Reset 24vdc 7 Amp	1
10		201697	Pan, Reactor & rectifier	1
11	T1	205636	Transformer, W/Brkt Environmental	1
12		173352	Extrusion, Rubber Clamp/Bulb	2.75 ft
13		189708	Firewall, Top	1
14		206697	Hose, Elbow Air Cleaner	1
15		206393	Pipe, Air Cleaner Intake Kubota V3300	1
16		189763	Bracket, Mtg Air Cleaner	1
17		189764	Air Cleaner, Intake (consisting of)	1
		192938	Filter, Air Element Primary	1
		♦192939	Filter, Air Element Safety	1
18		189464	Seal, Weather Lift Eye	1
19		206351	Upright, Center Assy	1
20		+206541	Cover, Top Stainless Steel	1
21		189052	Grommet, Plastic Neck Filler Fuel	1
22		190198	Cap, Tank Screw–on 3.500 In W/Vent W/Lanyard (included w/tank)	1
23		176103	Label, Use Diesel Fuel Only	1
24		176104	Label, Warning Falling Equipment Can Cause Serious	1
25		176230	Label, Hot Exhaust Parts Do Not Touch	1
26		105734	Pipe, Muffler Extension Elbow 1.750 Od	1
27		202629	Cover, Radiator Access Stainless	1
28		202633	Support, Cover E-Coat	1
29		010875	Clamp, Muffler 2.000 Dia U Pld	1
30		176106	Label, Warning Moving Parts Can Cause Serious	6
31		210725	Guard, Fan (Left)	1
32		206517	Radiator, W/Shroud & 7# Cap 4row Core Assy Rda (consisting of)	1
		206518	Radiator, Big Blue Air Pak	1
		605982	Cap, Radiator Pressure 7 Lb	1
		206384	Shroud, Radiator Kubota	1
33		207192	Panel, Engine Extension L.h. Stainless	1
34		207005	Grill, Rear Panel Stainless Kubota	1
35		207188	Upright, Rear Radiator Stainless	1
36		190206	Cable, Bat Neg 42 In Lg 2 Awg W/Clamp & .375 Rng	1
37		190207	Cable, Bat Pos 45 In Lg No 1 Awg W/Clamp & .406 Rng	1
38		108081	Terminal Protector, Battery Post Mtg	2
39		203430	Bracket, Battery Holddown	1
40	BATT	190896	Battery, Stor 12v 650 Crk 110 Rsv Gp 24 Low Mainte (Dry)	1
41		201006	Bolt, J Stl .312–18 X 7.750 Pld	2
42		+202639	Cover, Battery Access Stainless	1
43		176108	Label, Warning Battery Explosion Can Blind	1
44		207193	Panel, Engine Extension R.h. Stainless	1
45		206387	Guard, Fan (Right)	1
46		190992	Keeper, Latch Engine Access Door	2
47		206604	Channel, Stiffener Engine Access	2
48		190126	Latch, Paddle Series 20 Stainless	2
49		206999	Label, Maintenance D502k 5+4 Kubota	1
50		210736	Door, Engine Access Stainless	2

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 11-1. Main Assembly (Continued)

51		189975	Hinge, Door Access 180 Deg.	4
52		208141	Bumper, Door	8
53		190190	Tank, Coolant Recovery	1
54		199298	Panel, Rocker Stainless	2
		191626	Bumper, Door Engine Access	4
55		199300	Panel, Gen Rh Stainless	1
56		206391	Hose, Radiator Lower	1
		199507	Hose Assy, Oil Drain 20”lg (consisting of)	1
57		165271	Valve, Oil Drain 3/8–18 Nptf	1
58		176529	Ftg, Hose Brs Barbed Fem 1/2 Tbg X 3/8 Npt	1
59		113854	Hose, Sae .500 Id X .780 Od Xcoil	1.666
60		176528	Ftg, Hose Brs Barbed Elbow M 1/2 Tbg X 1/2 Npt	1
61		206906	Adapter, Oil Drain Fitting	1
62			Washer, Oil Drain (Available Through Engine Manufacturer)	1
63		199849	Screw, 625–11x4.00 Hex Hd–pln Gr5 Pld	4
64		071731	Washer, Flat .656idx2.250odx.187t Stl Pld	4
65		206396	Bracket, Mtg Engine Kubota V3300	2
66		071890	Retainer, Mount Eng/Gen	4
67		071730	Tubing, Stl .875 Od X12ga Wall X 2.500	4
68		083476	Mount, Eng/Gen Nprn .875id X 2.500od X 2.000 60 Dur	4
69		135205	Nut, 625–11 .94hex .77h Stl Pld Elastic Stop Nut	4
70		*207717	Filter, Oil (Spin-On Cartridge Type)	1
71		*207715	Filter, Fuel Secondary (Spin–on, Cartrige Type)	1
72		Figure 11-4	Generator	1
73		206399	Engine, Kubota Dsl Elec V3300 (Consisting Of)	1
		206380	Adapter, Engine Kubota V3300 (See Figure 11-4)	1
		206907	Plug Assy, W/Leads Elec Kubota	1
		*207713	Thermostat, 170f (76.5c) W/Gasket	1
		206379	Flywheel, Kubota V3300	1
74		198990	Adapter, Oil Pressure Sender	1
75	S12	187542	Switch, Pressure Oil 11psi No Cont Frict Term	1
76	TEMP SNDR	193231	Sender, Coolant Temp 300 Deg F 1/2–14 Npt	1
77		*207712	Belt, Fan 13 X 1200mm V–belt	1
78		206390	Hose, Radiator Upper	1
79		206392	Hose, Air Cleaner Intake Kubota V3300	1
80		207719	Fan, Engine Cooling 430mm, 6 Blade Pusher	1
81		206383	Manifold, Exhaust Muffler Kubota V3300	1
		207722	Gasket, Exhaust Manifold Metal	1
82		189245	Tank, Fuel 23.0 Gal (includes fuel cap) (consisting of)	1
83		124253	Bushing, Tank Fuel	4
84		189912	Ftg, Stl Barbed Elbow W/.047in Orifice Zinc Pld	1
85		189909	Ftg, Stand Pipe Hose .250 X 9.265lg 90 Deg Zinc	1
86		189913	Ftg, Stl Barbed Elbow Zinc Pld	1
87		190142	Sender, Fuel Gauge 9.750 Deep Tank	1
88		189910	Ftg, Stand Pipe Hose .3125 X 9.260lg 90 Deg Zinc	1
89		189908	Valve, Drain Fuel 180 Deg Zinc Pld	1
90		181572	Bushing, Tank Fuel	1
		107816	Hose, Sae .250 Id X .500 Od Xcoil	4.1 ft
91		191446	Extrusion, Rubber W/Adhesive 1.000 X 1.000 ”d”	4.6 ft
92	FUEL PUMP	207721	Pump, Fuel Electric 12vdc 1.5a 400 Cc/Min 5psi	1
93		*207714	Filter, Fuel Pre (In–line)	1
94		+206350	Base	1
95		196220	Bracket, Holddown Fuel Tank Rear	1
96		192362	Bracket, Mtg Nyl 1/2 Conduit	1
97		191897	Bracket, Mtg Unit	4
98		200864	Label, Do Not Weld On Base CE	2
99		206998	Label, Manufacturing Rating D502k 5+4 Kubota	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 11-1. Main Assembly (Continued)

. . 100	.... R3	..... 189699 . .	Resistor, WW Tap 375 W 10 Ohm W/Mtg Bkt	1
. . 101	..... Figure 11-2 . .		Control Box	1
. . 102	.....	191512 . .	Bracket, Holddown Fuel Tank	1
. . 103	.....	189731 . .	Firewall, Bottom	1
. . 104	.....	199305 . .	Cover, Top Front Upright Stainless	1
. . 105	.....	202637 . .	Upright, Front Stainless	1
. . 106	.....	200910 . .	Label, Warning Electric Shock And Moving Parts CE	1
. . 107	..... Figure 11-3 . .		Panel, Front w/Components	1
. . 108	..... ♦ . .		Transformer, Current	1
. . 109	... SR3 . Figure 11-5 . .		Main Rectifier Assembly	1
. . 110	.....	193453 . .	Bracket, Mtg Box Fcr	1
. . 111	... PC1	207397 . .	Module, Field Current Regulator	1
. . 112	.....	203260 . .	Label, Caution Do Not Use Ether	1
. . 113	.....	210726 . .	Stiffener, engine access door	4
.....		191819 . .	Hose, Sae .312 Id X .560 Od X 14.000	1
.....		095636 . .	Hose, Sae .187 Id X .410 Od X 30.000	1
.....		198584 . .	Hose, Sae .312 Id X .560 Od X 4.500	1
.....		049525 . .	Nut, 312–18 U–nut Multi–thread	10
.....		190058 . .	Nut, 250–20 U–nut Multi–thread	2
.....		210740 . .	Kit, Label (Includes safety and informational labels)	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 210 740.

*Recommended Spare Parts.

♦Optional

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.

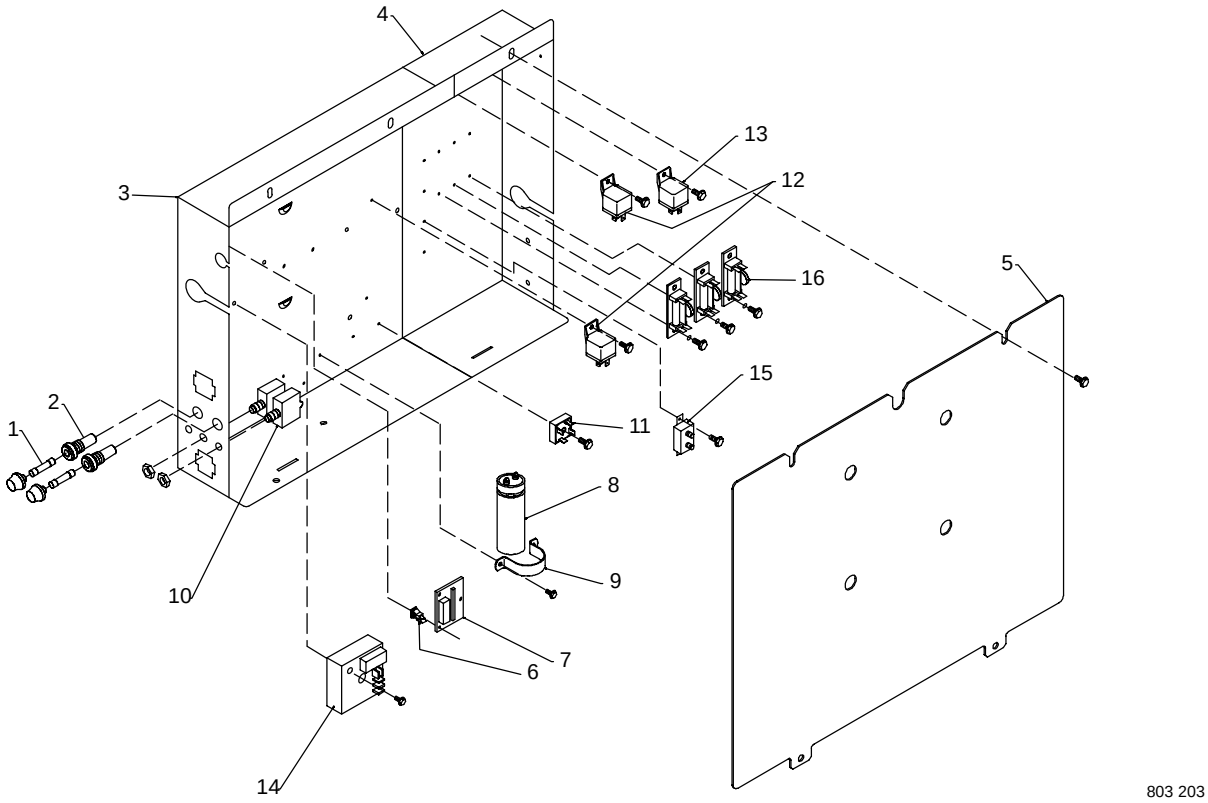

Figure 11-2. Control Box Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
1	F1, F2	085874	Fuse, Mintr Cer Slo–blo 10. Amp 250 Volt	2
2		046432	Holder, Fuse Mintr .250 X 1.250 Panel Mtg	2
3		201077	Control Box, Lh	1
4		201078	Control Box, Rh	1
5		201079	Cover, Control Box	1
6		134201	Stand–off Support, Pc Card .312/.375w/Post&lock .43	3
7	PC9	192224	Circuit Card Assy, Display	1
8	C9	087110	Capacitor, Elctlt 240 Uf 200 Vdc Can 1.39 Di	1
9		177136	Clamp, Capacitor 1.375 Dia	1
		206736	Harness, Control Box,Weld Control L.h. (consisting of)	1
10	CB11, CB12	139266	Circuit Breaker, Man Reset 1p 15a 250vac Frict	2
11	SR1	035704	Rectifier, Integ Bridge 40. Amp 800v	1
	RC3	158466	Conn, Rect Univ 084 12p/S 3row Rcpt Cable/Panel Lkg	1
	RC1	135133	Conn, Rect Univ 084 9p/S 3row Rcpt Cable/Panel Lkg	1
12	CR1, CR5	090104	Relay, Encl 12vdc Spst 30a/15vdc 5pin Flange Mtg	2
13	CR2	173069	Relay, Encl 12vdc Spdt 30a/20a 5pin Flange Mtg	1
14	T	207139	Timer, Delay On Make/Break Open 3–60 Sec 12vdc	1
		206398	Harness, Engine Kubota V3300 (consisting of)	1
	S7	199691	Switch, Tgl Spdt 6a 125vac On–none–mc Spd Term (located on front panel, see Figure 11-3)	1
15	CB10	190374	Circuit Breaker, Auto Reset 12vdc 40 Amp	1
		148850	Socket, Relay 5 Pin	3
	PLG10	150316	Conn, Rect Univ 039 6p/S 3row Plug Cable Lkg	2
16	D8/C8 D9/C9 D10/C10	189701	Diode/Capacitor Board	3

Figure 11-2. Control Box Assembly (Figure 11-1 Item 101)

*Recommended Spare Parts.

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

☞ *Hardware is common and not available unless listed.*

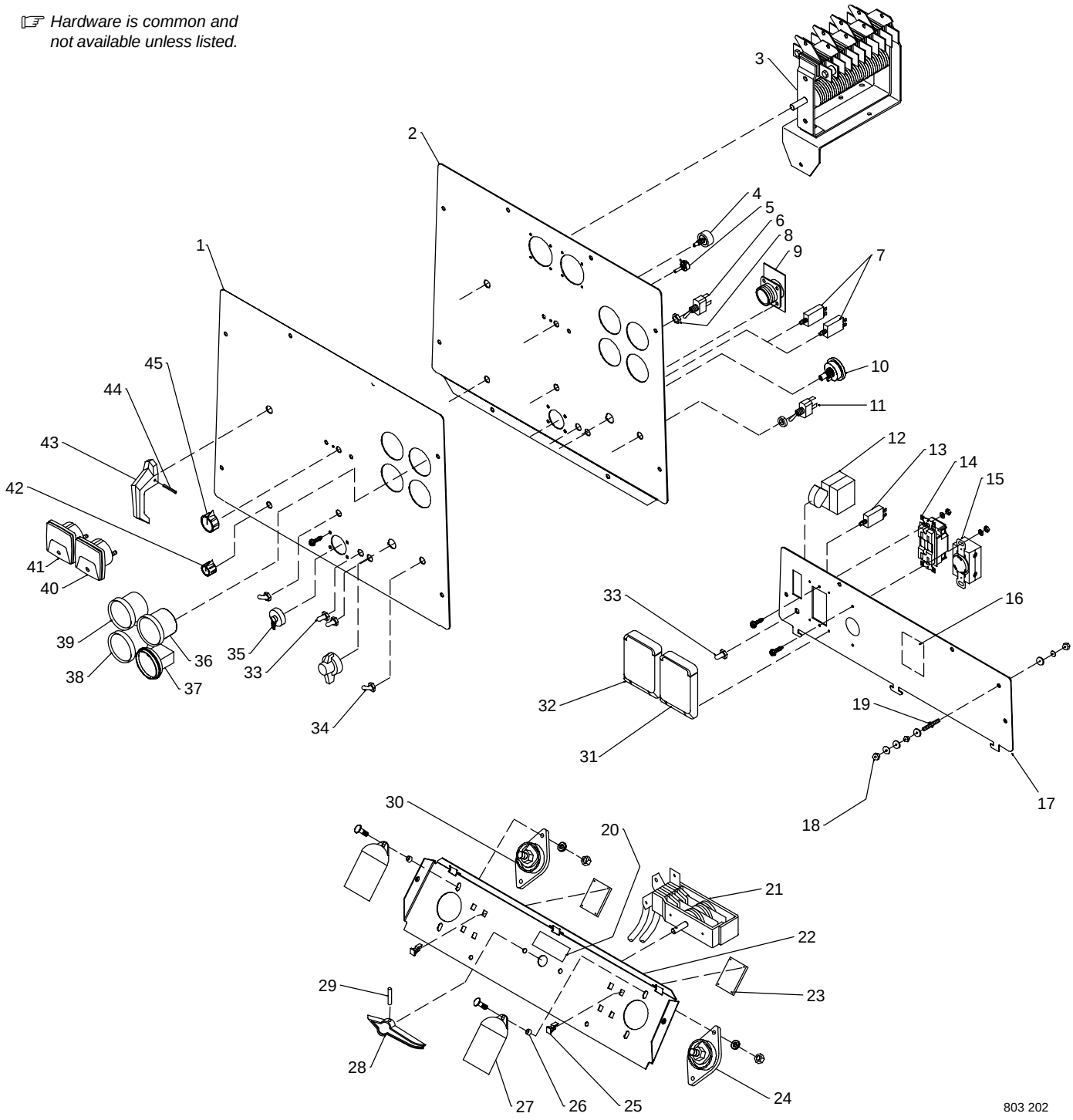

Figure 11-3. Panel, Front w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
Figure 11-3. Panel, Front w/Components (Figure 11-1 Item 107)				
1		206212	Plate, Screened Ident Control	1
2		206382	Panel, Engine/Weld Control Stainless	1
3	S3	208278	Switch, Range/Changeover	1
		192558	Harness, Range Switch (consisting of)	1
	RC6	148389	Conn,Rect Univ 084 4p/S 1row Rcpt Cable/Panel Lkg	1
4	R1	193118	Pot, Cp Flat 1t 2. W 1k Ohm Linear	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 11-3. Panel, Front w/Components (Continued)	
		206809	Harness, Weld Control (consisting of)	1
5	S6	193234	Switch, Rotary 6 Position Gold Contacts	1
6	S5	011609	Switch, Tgl Spdt 15a 125vac On–none–on Spd Term Chr	1
	PLG9	193183	Conn, Rect Cinch 18 Pin	1
		196603	Seal, Switch 6 Position Rotary .250 Shaft	1
	PLG14	141450	Conn, Rect Metrmate 10skt 1row Plug Cable Lkg	1
		164617	Clip, Wiring Straight	2
	RC10	150316	Conn, Rect Univ 039 6p/S 3row Plug Cable Lkg	1
7	CB5	139266	Circuit Breaker, Man Reset 1p 15a 250vac Frict	1
	CB13	139266	Circuit Breaker, Man Reset 1p 10a 250vac Frict	1
8		202209	Spacer, Nylon	2
9	PC6	192995	Circuit Card Assy, Connector/Receptacle	1
10	S1	207720	Switch, Ignition 3 Position (Mom–off–mom) W/Handle	1
11	S7	199691	Switch, Tgl Spdt 6a 125vac On–none–mc Spd Term (included in engine harness, see Figure 11-2)	1
12	CB1	201083	Circuit Breaker, Man Reset 2p 20a 250vac	1
		201553	Clip, Retaining Circuit Breaker	1
		201109	Harness, Receptacle Auxillary Power (consisting of)	1
13	CB2	093996	Circuit Breaker, Man Reset 1p 20a 250vac Frict	1
14	GFCI-1	151981	Rcpt, Str Dx Grd 2p3w 15/20a 125v *5–20r Gfi	1
15	RC1	147632	Rcpt, Tw Lk Grd 2p3w 30a 250v *L6–30r	1
		010146	Clamp, Nyl .625 Clamp Dia X.500 Wide .203 Mtg Hole	2
16		200910	Label, Warning Electric Shock And Moving Parts CE	1
17		+202641	Panel, Auxiliary Power Stainless	1
18		601836	Nut, 250–20 .50hex .19h Brs	3
19		083030	Stud, Brs .250–20 X 1.750 W/Hex Collar	1
20		♦196073	Label, Do Not Switch While Welding	1
21		♦	Switch, Polarity	1
22		199303	Panel, Mtg Terminal Power Output Stainless	1
23	PC4, PC5	189744	Circuit Card Assy, Filter Hf	2
24	NEGATIVE	039046	Terminal, Pwr Output Black	1
25		134201	Stand–off Support, Pc Card .312/.375w/Post&lock .43	8
26		181169	Spacer, Output Stud	2
27		186621	Boot, Generic Output Stud	2
28		♦	Handle, Switch	1
29		♦	Pin, Spring cs .156 x 1.250	1
30	POSITIVE	039047	Terminal, Pwr Output Red	1
31		193260	Cover, Receptacle 2.250 Dia. Lexan	1
32		193258	Cover, Receptacle Gfci Lexan	1
33		190323	Boot, Circuit Breaker Clear Hex Nut	3
34		021385	Boot, Toggle Switch Lever	2
35		170391	Conn, Circ Ms Protective Cap Size 20 Nylon	1
36	FUEL	192265	Gauge, Fuel Elec Switch W/O Switchgage Sensor	1
37	HM	118058	Meter, Hour 12–24vdc 2.25 Dia High Profile Stainles	1
38	AM	118060	Meter, Amp Dc 60–0–60 2.250 Dia High Profile Stainl	1
39	TEMP	193229	Gauge, Coolant Temp 0– 300 Deg F Electric Switch	1
40		♦	Meter, Weld Amps	1
41		♦	Meter, Weld Volts	1
42		097922	Knob, Pointer .875 Dia X .250 Id W/Set Screwsplstc	1
43		189161	Handle, Switch Range	1
44		010647	Pin, Spring Cs .156 X 1.250	1
45		097924	Knob, Pointer 1.625 Dia X .250 Id W/Set Screwsplstc	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 11-3. Panel, Front w/Components (Continued)

. . . . .		193158 . .	Harness, Unit Weld Control – CV (consisting of)	1
. . . . . PLG6		114063	Conn, Rect Univ 084 4p/S 1row Plug Cable Lkg	1
. . . . . PLG8		193184	Conn, Rect Cinch 30 Pin	1
. . . . . PLG13 . . .		147992	Conn, Rect Univ 039 10p/S 2row Plug Cable Lkg	1
. . . . . PLG3		158465	Conn, Rect Univ 084 12p/S 3row Plug Cable Lkg	1
. . . . .		088731	Bushing, Snap–in Nyl .375 Id X .500 Mtg Hole	1
. . . . .		135873	Clip, Conduit Convoluted 1/2 In 6.35mm Mtg Hole	2
. . . . .		187654	Seal, Wire Univ 12p/S 3row	1
. . . . .		196602	Plug, Cavity 18, 30 Position Cinch Connector	10
. . . . .		024103 . .	Blank, Snap–in Nyl .750 Mtg Hole Black	1
. . . . .		120304 . .	Blank, Snap–in Nyl .250 Mtg Hole Black	2

♦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 210 740.

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.*

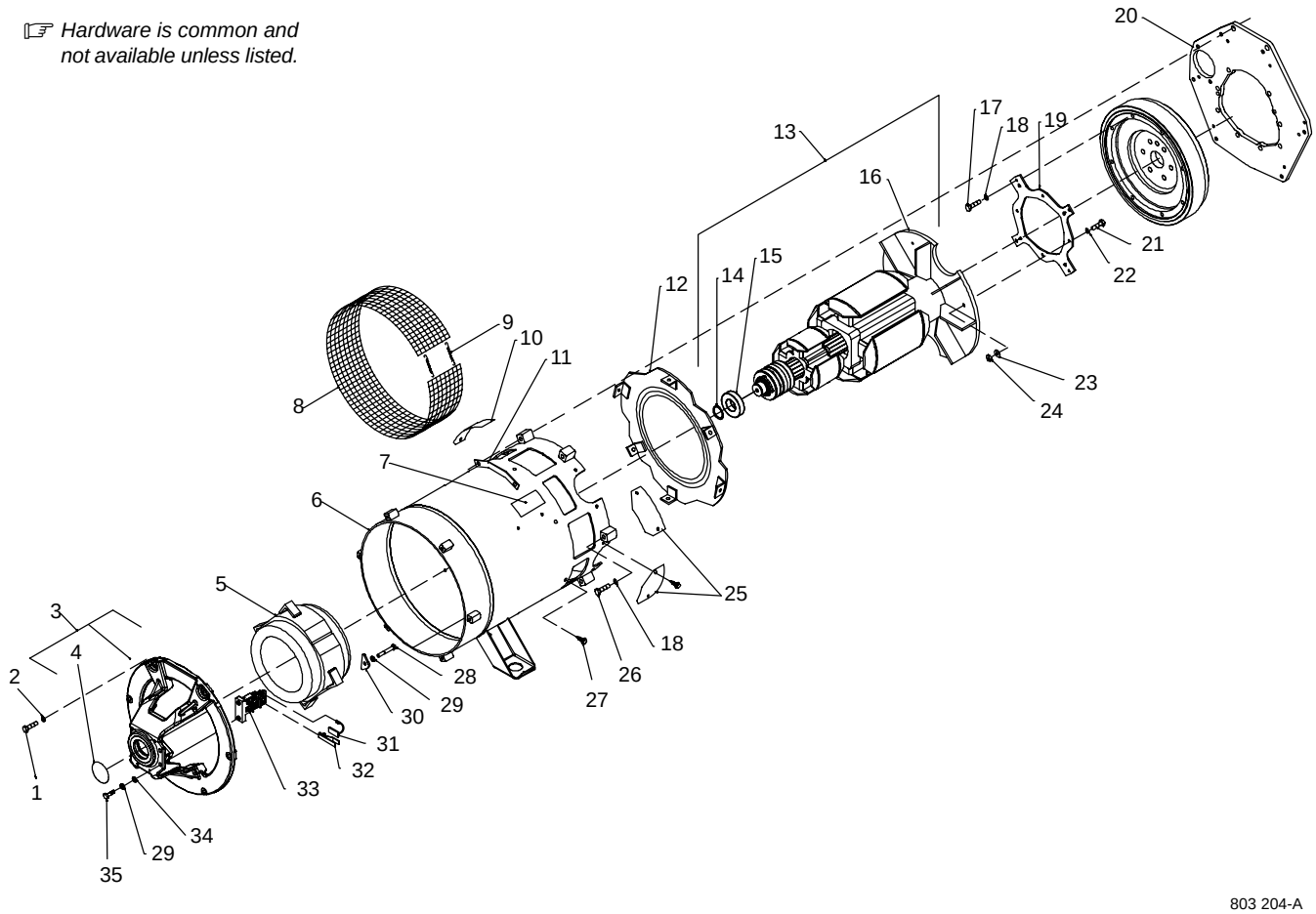

Figure 11-4. Generator

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 11-4. Generator (Figure 11-1 Item 72)

1		132053	Screw, 375-16 X 1.50hexhd Pln Gr 5pld	6
2		183387	Washer, Conical Spring .406 Id X .875 Od Pltd	6
3		195911	Endbell, Gen (Consisting Of)	14
4		143220	O-ring, 2.859 Id X .139cs	1
5	AUX STATOR	201099	Stator, Exciter/Aux Pwr	1
6	WELD STATOR	+208287	Stator, Weld Assembly Complete	1
7		013367	Label, Warning Moving Parts	2
8		190197	Guard, Generator Wire Mesh	1
9		172674	Spring, Ext .240 Od X .041 Wire X 3.500pld	2
10		191580	Cover, Starter Hole	1
11		208216	Spacer, Stl Kubota V3300 18ga Generator	1
12		039207	Baffle, Air	1
13	REV FLD	202452	Rotor, Gen (Consisting Of)	1
14		024617	Ring, Rtng Ext 1.375 Shaft X .050thk	1
15		053390	Bearing, Ball Rdl Sgl Row 1.370 X 2.830 X .6	1
16		195547	Fan, Rotor Gen	1
17		049026	Screw, M10-1.5 X 25hexhd Pln 8.8pln	8
18		083883	Washer, Lock .042 Id X 0.709 Od	8
19		202302	Plate, Flex	1
20		206380	Adapter, engine	1
21		605231	Screw, M10-1.5 X 35hexhd Pln 8.8pln	4
22		194512	Washer, Flat 1.250 Od X .406 Id X 7 Ga Thk Stal Pld	4
23		183387	Washer, Cone .380 Id X .860od X .109t Stl Pld 4000lbs	4
24		198631	Nut, M10 Hex Lock Nut Stl Pld	4
25		191579	Cover, Starter Hole	2
26		172555	Screw, M10-1.5 X 50hexhd Pln 8.8pld	6
27		602159	Screw, .312-18 X .75hexwhd	2
28		604950	Screw, .312-18 X 2.25hexhd Pln Gr 5pld	4
29		602211	Washer, Lock .318 Id X 0.586	4
30		139341	Washer, Exciter	4
31		*190823	Brush, Contact	3
32		188560	Clip, Spring	3
33		189142	Brushholder Assembly, Gen	1
34		602242	Washer, Flat .375idx0.875odx.083t Stl Pld	2
35		604534	Screw, 312–18x1.25 Hex Hd–pln Gr5 Pld	2
		190259	Harness, Brush (Consisting Of)	1
	PLG1	168071	Connector, (Kit) Rect Univ 084 9p/S 3 Row Plug Cable Lkg	1
		187651	Seal, Wire Univ 9p/S 3 Row	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 210 740.

*Recommended Spare Parts.

♦Optional

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.*

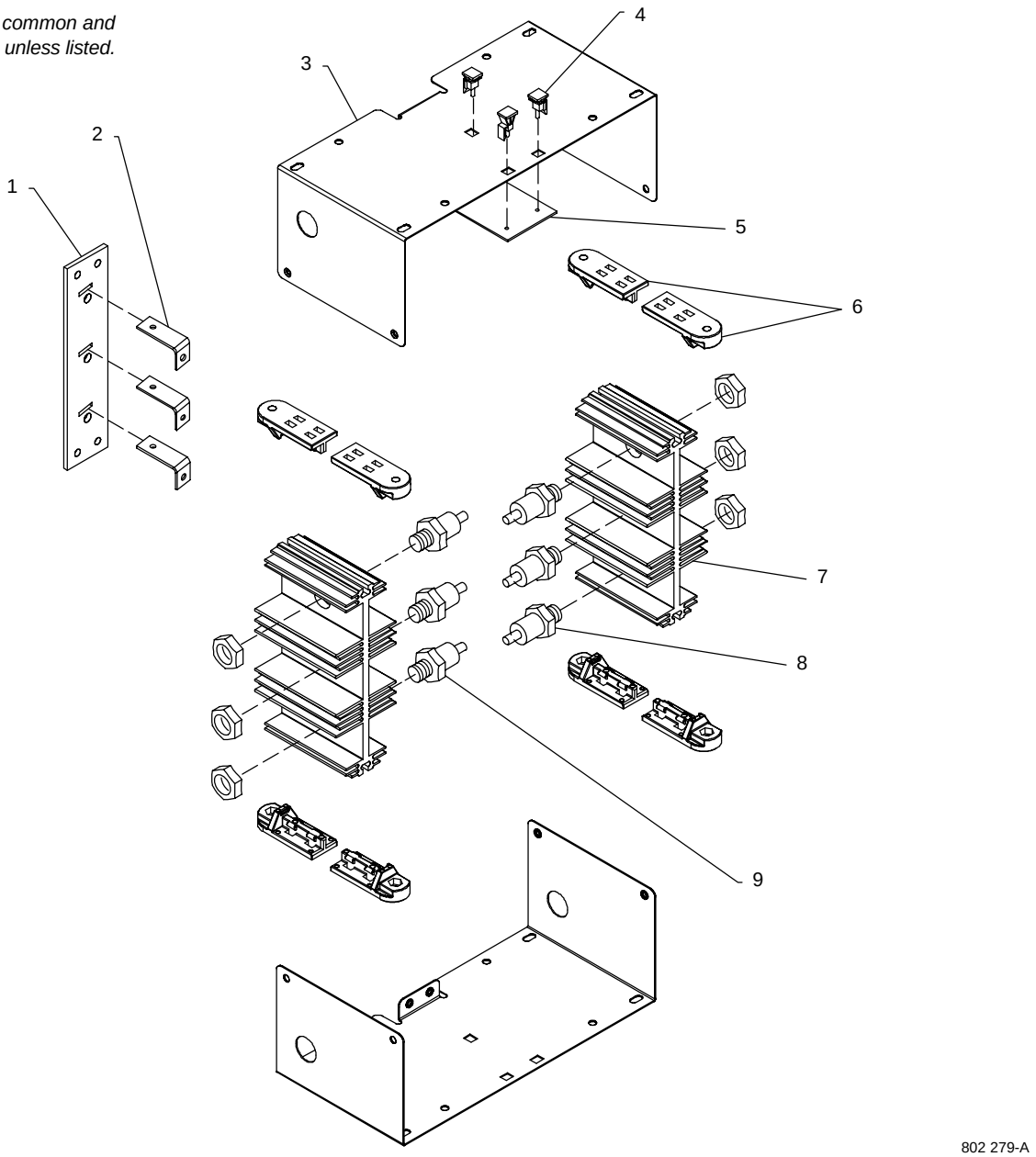

Figure 11-5. Main Rectifier Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 11-5. Main Rectifier Assembly (Figure 11-1 Item 109)	
. . . . .	SR3	208279	RECTIFIER, environmental (consisting of)	1
. . . 1	. . . . .	188137	CONNECTION BOARD, rectifier AC	1
. . . 2	. . . . .	188517	BUS BAR, connection board	3
. . . 3	. . . . .	188135	ENCLOSURE, rectifier	2
. . . 4	. . . . .	134201	STAND-OFF, support	3
. . . 5	PC3	201449	CIRCUIT CARD ASSEMBLY, protection	1
. . . 6	. . . . .	188136	INSULATOR, heat sink	8
. . . 7	. . . . .	188493	HEAT SINK, rectifier al	2
. . . 8	D3, D5, D7	208334	DIODE, rect 275A 300V SP	3
. . . 9	D2, D4, D6	208335	DIODE, rect 275A 300V RP	3

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.
Base Group

Warranty

Effective January 1, 2001
(Equipment with a serial number preface of “LB” or newer)

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

LIMITED WARRANTY – Subject to the terms and conditions below, warrants to its original retail purchaser that new equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped from factory. 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, manufacturer will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Manufacturer must be notified in writing within thirty (30) days of such defect or failure, at which time manufacturer will provide instructions on the warranty claim procedures to be followed.

Manufacturer 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 the distributor.

1. 5 Years Parts – 3 Years Labor
   * Original main power rectifiers
2. 3 Years — Parts and Labor
   * Transformer/Rectifier Power Sources
   * Plasma Arc Cutting Power Sources
   * Semi-Automatic and Automatic Wire Feeders
   * Engine Driven Welding Generators
     (NOTE: Engines are warranted separately by the engine manufacturer.)
3. 1 Year — Parts and Labor
   * 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
   * HF Units
   * Grids
   * Spot Welders
   * Load Banks
   * Running Gear/Trailers
   * Field Options
     (NOTE: Field options are covered under the limited warranty 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 and Labor
   * MIG Guns/TIG Torches
   * Induction Heating Coils and Blankets
   * Plasma Cutting Torches
   * Remote Controls
   * Accessory Kits
   * Replacement Parts
   * Spoolmate Spoolguns
   * Canvas Covers

Limited Warranty shall not apply to:

1. **Consumable components; such as contact tips, cutting nozzles, contactors, relays, brushes, slip rings, or parts that fail due to normal wear.**

2. Items furnished by manufacturer, 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 manufacturer, 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.

MANUFACTURER’S 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 manufacturers option: (1) repair; or (2) replacement; or, where authorized in writing by manufacturer in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized 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. manufacturer’s option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at an authorized service facility as determined by manufacturer. 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 MANUFACTURER 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 MANUFACTURER IS EXCLUDED AND DISCLAIMED BY MANUFACTURER.

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

RED-D-ARC®
Welderentals
1-800-245-3660

www.red-d-arc.com

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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