

Processes



Stick (SMAW) Welding



MIG (GMAW) Welding



Flux Cored (FCAW) Welding



TIG (GTAW) Welding



Air Carbon Arc (CAC-A)
Cutting and Gouging

With Optional Equipment:



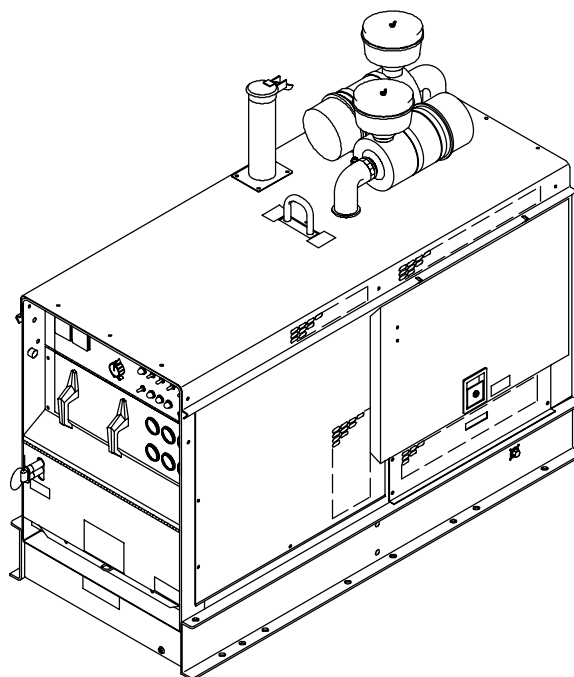
Battery Charging

Description



Engine Driven Welding Generator

PowerPak™



From Hobart to You

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

This Owner's Manual is designed to help you get the most out of your Hobart products. Please take time to read the Safety precautions. They will help you

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



Hobart is registered to the ISO 9001 Quality System Standard.

Hobart Welders manufactures a full line of welders and welding related equipment. For information on other quality Hobart products, contact your local Hobart distributor to receive the latest full line catalog or individual catalog sheets. **To locate your nearest distributor or service agency call 1-877-Hobart1.**



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

HOBART[®]
WELDING PRODUCTS

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WARNING

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

WARNING

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

CALIFORNIA

Proposition 65 Warning

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

The following terms are used interchangeably throughout this manual:

Stick = SMAW
MIG = GMAW
TIG = GTAW

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SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

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1-1. Symbol Usage



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

▲ Marks a special safety message.

☞ Means "Note"; not safety related.



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

1-2. Arc Welding Hazards

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

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

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



ELECTRIC SHOCK can kill.

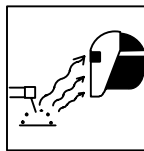
Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel,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

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

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

SIGNIFICANT DC VOLTAGE exists after stopping engine on inverters.

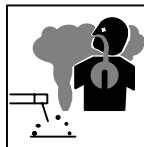
- Stop engine on inverter and discharge input capacitors according to instructions in Maintenance Section before touching any parts.



ARC RAYS can burn eyes and skin.

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

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



FUMES AND GASES can be hazardous.

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

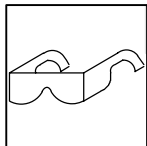
- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
- If ventilation is poor, use an approved air-supplied respirator.
- Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained 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.



WELDING can cause fire or explosion.

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

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



FLYING METAL can injure eyes.

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



BUILDUP OF GAS can injure or kill.

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

1-3. Engine Hazards



FUEL can cause fire or explosion.

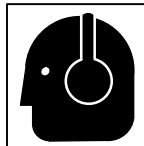
- Stop engine and let it cool off before checking or adding fuel.
- Do not add fuel while smoking or if unit is near any sparks or open flames.

- Do not overfill tank – allow room for fuel to expand.
- Do not spill fuel. If fuel is spilled, clean up before starting engine.
- Dispose of rags in a fireproof container.



HOT PARTS can cause severe burns.

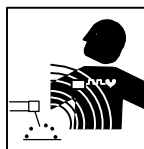
- Allow cooling period before maintaining.
- Wear protective gloves and clothing when working on a hot engine.
- Do not touch hot engine parts or just-welded parts bare-handed.



NOISE can damage hearing.

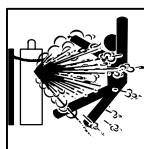
Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.



MAGNETIC FIELDS can affect pacemakers.

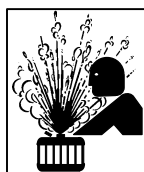
- Pacemaker wearers keep away.
- Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.



CYLINDERS can explode if damaged.

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

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

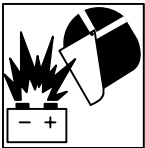


STEAM AND HOT COOLANT can burn.

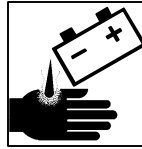
- If possible, check coolant level when engine is cold to avoid scalding.
- Always check coolant level at overflow tank, if present on unit, instead of radiator (unless told otherwise in maintenance section or engine manual).
- If the engine is warm, checking is needed, and there is no overflow tank,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

**MOVING PARTS can cause injury.**

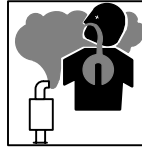
- Keep away from fans, belts, and rotors.
- Keep all doors, panels, covers, and guards closed and securely in place.
- Stop engine before installing or connecting unit.
- Have only qualified people remove guards or covers for maintenance and troubleshooting as necessary.
- To prevent accidental starting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

**BATTERY EXPLOSION can BLIND.**

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

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

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

**ENGINE EXHAUST GASES can kill.**

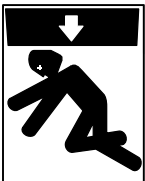
- Use equipment outside in open, well-ventilated areas.
- If used in a closed area, vent engine exhaust outside and away from any building air intakes.

**ENGINE HEAT can cause fire.**

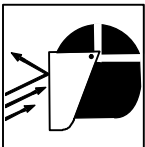
- Do not locate unit on, over, or near combustible surfaces or flammables.
- Keep exhaust and exhaust pipes way from flammables.

**EXHAUST SPARKS can cause fire.**

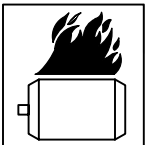
- Do not let engine exhaust sparks cause fire.
- Use approved engine exhaust spark arrestor in required areas – see applicable codes.

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

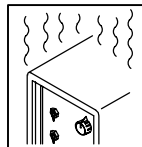
- Use lifting eye to lift unit only, NOT running gear, gas cylinders, trailer, or any other accessories.
- Use equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.

**FLYING SPARKS can cause injury.**

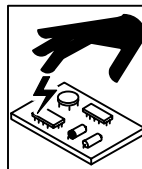
- Wear a face shield to protect eyes and face.
- Shape tungsten electrode only on grinder with proper guards in a safe location wearing proper face, hand, and body protection.
- Sparks can cause fires — keep flammables away.

**OVERHEATING can damage motors.**

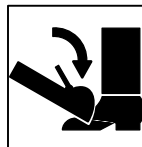
- Turn off or unplug equipment before starting or stopping engine.
- Do not let low voltage and frequency caused by low engine speed damage electric motors.
- Do not connect 50 or 60 Hertz motors to the 100 Hertz receptacle where applicable.

**OVERUSE can cause OVERHEATING.**

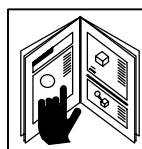
- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.

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

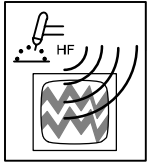
- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.

**TILTING OF TRAILER can cause injury.**

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

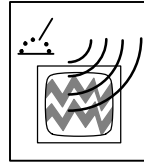
**READ INSTRUCTIONS.**

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



H.F. RADIATION can cause interference.

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



ARC WELDING can cause interference.

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

1-5. Principal Safety Standards

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

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

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

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

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

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

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

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

1-6. EMF Information

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

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

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

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

About Pacemakers:

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

SECTION 1 – CONSIGNES DE SÉCURITÉ – LIRE AVANT UTILISATION

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1-1. Signification des symboles



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

▲ Identifie un message de sécurité particulier.

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



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

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

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

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

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



UN CHOC ÉLECTRIQUE peut tuer.

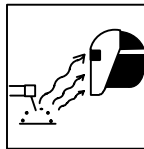
Un simple contact avec des pièces électriques peut provoquer une électrocution ou des blessures graves. L'électrode et le circuit de soudage sont sous tension dès que l'appareil est sur ON. Le circuit d'entrée et les circuits internes de l'appareil sont également sous tension à ce moment-là. En soudage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

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

- 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.

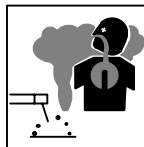
- Couper l'alimentation du poste et décharger les condensateurs d'entrée comme indiqué dans la Section Maintenance avant de toucher des composants.



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



LES FUMÉES ET LES GAZ peuvent être dangereux.

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

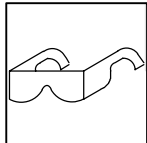
- Eloigner votre tête des fumées. Ne pas respirer les fumées.
- À l'intérieur, ventiler la zone et/ou utiliser un échappement au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage.
- Si la ventilation est insuffisante, utiliser un respirateur à alimentation d'air homologué.
- Lire les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



LE SOUDAGE peut provoquer un incendie ou une explosion.

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

- Se protéger et d'autres personnes de la projection d'étincelles et de métal chaud.
- Ne pas souder dans un endroit où des étincelles peuvent tomber sur des substances inflammables.
- Déplacer toutes les substances inflammables à une distance de 10,7 m de l'arc de soudage. En cas d'impossibilité les recouvrir soigneusement avec des protections homologuées.
- Des étincelles et des matériaux chauds du soudage peuvent facilement passer dans d'autres zones en traversant de petites fissures et des ouvertures.
- Surveiller tout déclenchement d'incendie et tenir un extincteur à proximité.
- Le soudage effectué sur un plafond, plancher, paroi ou séparation peut déclencher un incendie de l'autre côté.
- Ne pas effectuer le soudage sur des conteneurs fermés tels que des réservoirs, tambours, ou conduites, à moins qu'ils n'aient été préparés correctement conformément à AWS F4.1 (voir les normes de sécurité).
- Brancher le câble sur la pièce la plus près possible de la zone de soudage pour éviter le transport du courant sur une longue distance par des chemins inconnus éventuels en provoquant des risques d'électrocution et d'incendie.
- Ne pas utiliser le poste de soudage pour dégeler des conduites gelées.
- En cas de non utilisation, enlever la baguette d'électrode du porte-électrode ou couper le fil à la pointe de contact.
- Porter des vêtements de protection dépourvus d'huile tels que des gants en cuir, une chemise en matériau lourd, des pantalons sans revers, des chaussures hautes et un couvre chef.
- Avant de souder, retirer toute substance combustible de vos poches telles qu'un allumeur au butane ou des allumettes.



DES PARTICULES VOLANTES peuvent blesser les yeux.

- Le soudage, l'écaillage, le passage de la pièce à la brosse en fil de fer, et le meulage génèrent des étincelles et des particules métalliques volantes.

Pendant la période de refroidissement des soudures, elles risquent de projeter du laitier.

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



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

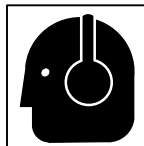
- Fermer l'alimentation du gaz protecteur en cas de non utilisation.

- Veiller toujours à bien aérer les espaces confinés ou se servir d'un respirateur d'adduction d'air homologué.



DES PIÈCES CHAUDES peuvent provoquer des brûlures graves.

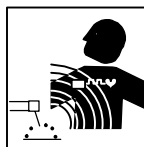
- Prévoir une période de refroidissement avant d'effectuer des travaux d'entretien.
- Porter des gants et des vêtements de protection pour travailler sur un moteur chaud.
- Ne pas toucher à mains nues les parties chaudes du moteur ni les pièces récemment soudées.



LE BRUIT peut affecter l'ouïe.

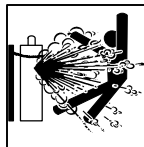
Le bruit des processus et des équipements peut affecter l'ouïe.

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



LES CHAMPS MAGNÉTIQUES peuvent affecter les stimulateurs cardiaques.

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



Si des BOUTEILLES sont endommagées, elles pourront exploser.

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

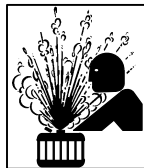
- Protéger les bouteilles de gaz comprimé d'une chaleur excessive, des chocs mécaniques, du laitier, des flammes ouvertes, des étincelles et des arcs.
- Placer les bouteilles debout en les fixant dans un support stationnaire ou dans un porte-bouteilles pour les empêcher de tomber ou de se renverser.
- Tenir les bouteilles éloignées des circuits de soudage ou autres circuits électriques.
- Ne jamais placer une torche de soudage sur une bouteille à gaz.
- Une électrode de soudage ne doit jamais entrer en contact avec une bouteille.
- Ne jamais souder une bouteille pressurisée – risque d'explosion.
- Utiliser seulement des bouteilles de gaz protecteur, régulateurs, tuyaux et raccords convenables pour cette application spécifique; les maintenir ainsi que les éléments associés en bon état.
- Ne pas tenir la tête en face de la sortie en ouvrant la soupape de la bouteille.
- Maintenir le chapeau de protection sur la soupape, sauf en cas d'utilisation ou de branchement de la bouteille.
- Lire et suivre les instructions concernant les bouteilles de gaz comprimé, les équipements associés et les publication P-1 CGA énumérées dans les normes de sécurité.

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.



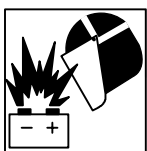
LA VAPEUR ET LE LIQUIDE DE REFROIDISSEMENT CHAUD peuvent provoquer des brûlures.

- 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 suit :
- Mettre des lunettes de sécurité et des gants, placer un torchon sur le bouchon du radiateur.
- Dévisser le bouchon légèrement et laisser la vapeur s'échapper avant d'enlever le bouchon.



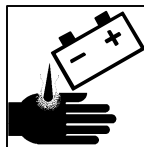
DES ORGANES MOBILES peuvent provoquer des blessures.

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



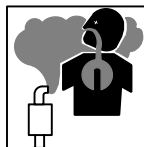
L'EXPLOSION DE LA BATTERIE peut RENDRE AVEUGLE.

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

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



LA CHALEUR DU MOTEUR peut provoquer un incendie.

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



LES ÉTINCELLES À L'ÉCHAPPEMENT peuvent provoquer un incendie.

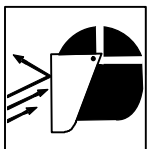
- Empêcher les étincelles d'échappement du moteur de provoquer un incendie.
- Utiliser uniquement un pare-étincelles approuvé – voir codes en vigueur.

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



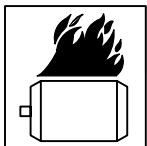
LA CHUTE DE L'APPAREIL peut blesser.

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



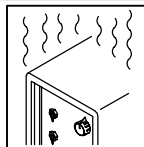
LES ÉTINCELLES VOLANTES risquent de provoquer des blessures.

- Porter un écran facial pour protéger le visage et les yeux.
- Affûter l'électrode au tungstène uniquement à la meuleuse dotée de protecteurs. Cette 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.



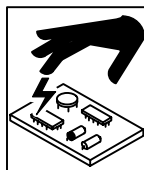
LE SURCHAUFFEMENT peut endommager le moteur électrique.

- 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.



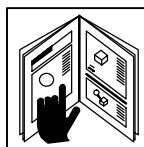
LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

- 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 imprimés.



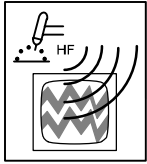
UNE REMORQUE QUI BASCULE peut entraîner des blessures.

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



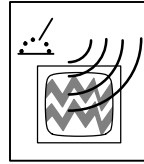
LIRE LES INSTRUCTIONS.

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



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

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



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

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

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

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 :

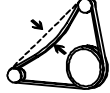
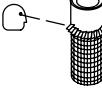
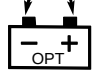
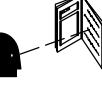
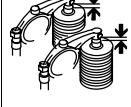
- 1 Garder les câbles ensemble en les torsadant ou en les attachant avec du ruban adhésif.
- 2 Mettre tous les câbles du côté opposé de l'opérateur.
- 3 Ne pas courber pas et ne pas entourer pas les câbles autour de votre corps.
- 4 Garder le poste de soudage et les câbles le plus loin possible de vous.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

Consignes relatives aux stimulateurs cardiaques :

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

SECTION 2 – DEFINITIONS

2-1. Symbols And Definitions

	Stop Engine		Fast (Run, Weld/Power)		Slow (Idle)		Start Engine
	Check engine belt		Check Air Cleaner		Ether Starting Aid		Engine
	Battery (Engine)		Jump start/Battery Charge		Battery Charge		Jump Start
	Do Not Switch Under Load		Read Operator's Manual		Certified/Trained Mechanic		Engine Oil
	Check Injectors/Pump		Check Valve Clearance		Fuel		Engine Coolant Temperature
	Hourmeter (HM)		Air Pressure		Temperature		Circulating Compressor
	Positive		Negative		Wire Feed		Welding Arc
	Amperes		Volts		Panel/Local		Remote
	On		Direct Current (DC)		Alternating Current (AC)		Output
	Stick (SMAW) Welding		Constant Current (CC)		MIG (GMAW) Welding		Constant Voltage (CV)
	Three Phase		Single Phase		Air Carbon Arc Cutting (CAC-A)		Protective Earth (Ground)
	DC Electrode Positive		DC Electrode Negative		Work Connection		Electrode Connection
	Circuit Breaker		Time		Hours		Seconds

SECTION 3 – SPECIFICATIONS

3-1. Weld, Power, And Engine Specifications

Welding Mode	Weld Output Range	Rated Welding Output	Maximum Open-Circuit Voltage (Nominal)	Auxiliary Power Rating	5 kVA/kW Auxiliary Power Plant (Optional)	15 kVA/kW Auxiliary Power Plant	Engine	Fuel Tank Capacity
CC/DC	50 – 500 A	400 A, 36 Volts DC, 100% Duty Cycle	95 (88)	Single-Phase, 3 kVA/kW, 25 A, 120 V AC, 60 Hz	Three-Phase, 5 kVA/kW, 12 A, 240 V AC, 60 Hz	Single Phase, 10 kVA/kW , 42 A, 120/240 V AC, 60 Hz; Three-Phase, 15 kVA/kW, 36 A, 240 V AC, 60 Hz	Deutz F4L-912 Air-Cooled, Four-Cylinder 40 HP Diesel Engine	15 gal (57 L)
CC/AC	45 – 350 A	300 A, 32 Volts DC, 100% Duty Cycle	80 (65)					
CV/DC	14 – 38 V	400 A, 36 Volts DC, 100% Duty Cycle	55 (52)					

3-2. Air Compressor Specifications

Effective Working Pressure	Air Tank Capacity	Tank Pressure Rating	Safety Relief Valve Rating	Air Control Governor Setting
40 SCFM (1.1 SCMM), 90 psig (620 kPa), 100% Duty Cycle	21 gal (79L)	150 psig (1034 kPa)	140 psig (965 kPa)	Cut-in pressure: 105 psig (724 kPa); Cut-out pressure: 125 psig (862 kPa)

3-3. Dimensions, Weights, And Operating Angles

Dimensions	
Height	58 (1473 mm)
Width	32 (813 mm)
Depth	68 in (1727 mm)
A	1-1/16 in (27 mm)
B	29-7/8 in (759 mm)
C	6-1/8 in (156 mm)
D	9-3/4 in (248 mm)
E	13-3/4 in (349 mm)
F	28-3/16 in (716 mm)
G	36 in (914 mm)
H	46-1/2 in (1181 mm)
J	50-1/2 in (1283 mm)
K	62-3/8 in (1584 mm)
L	21/32 in (17 mm) Dia. 16 Holes
Weight	
2250 lb (1021 kg)	

Engine End

A

B

C

D

E

F

G

H

J

K

L

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

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

17.5°

15°

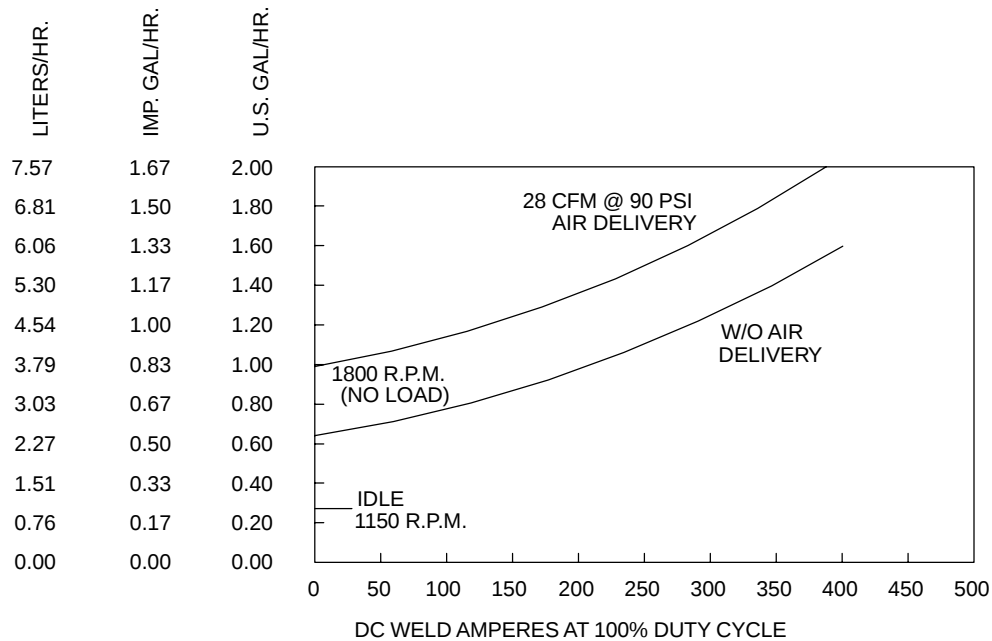
20°

20°

ST-153 650

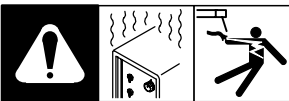
3-4. Fuel Consumption

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

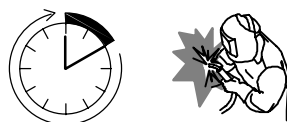


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3-5. Duty Cycle And Overheating



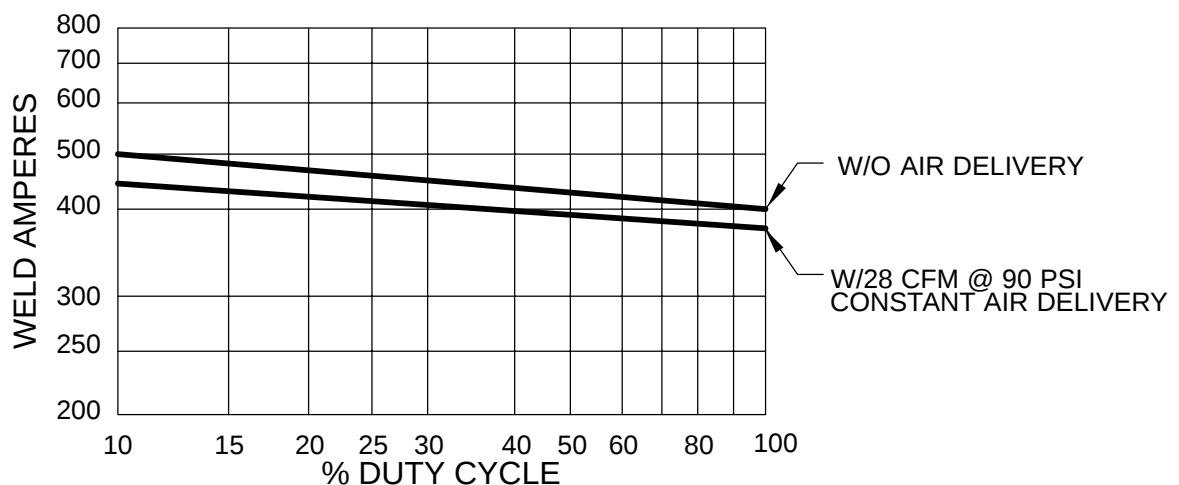
100% Duty Cycle At 400 Amperes



Continuous Welding

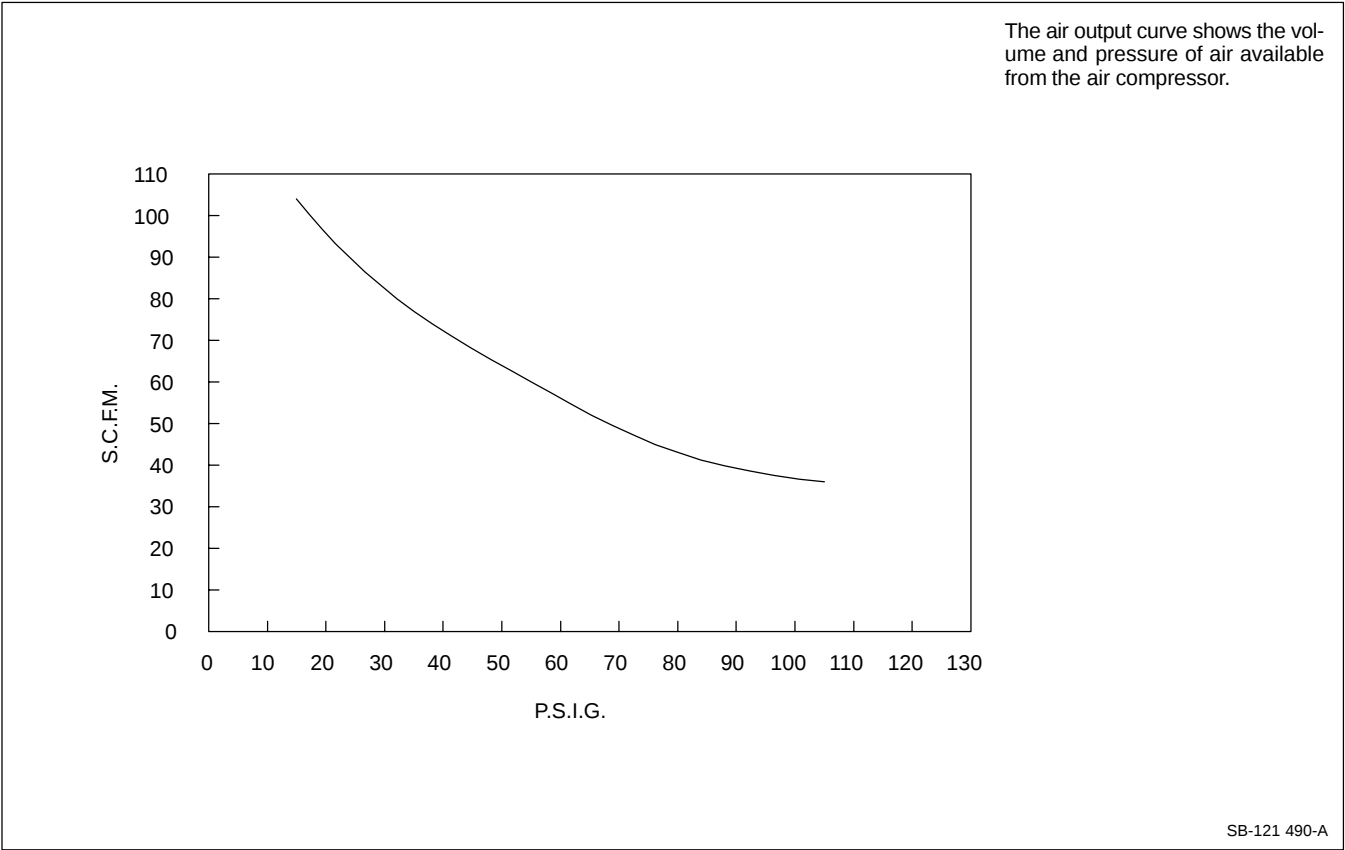
Duty Cycle is percentage of 10 minutes that unit can weld at rated load without overheating.

▲ Exceeding duty cycle can damage unit and void warranty.

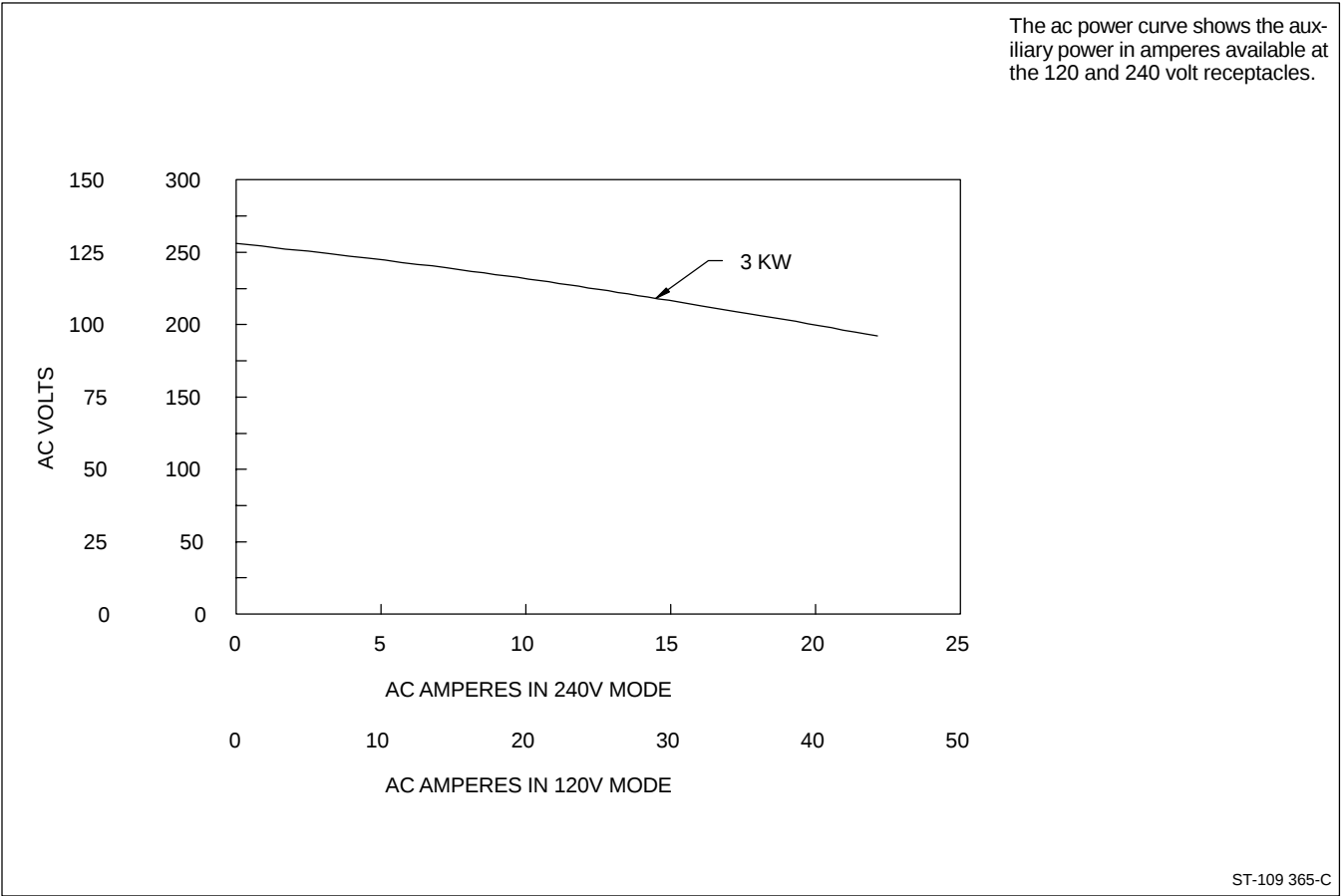


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3-6. Air Compressor Output Curve

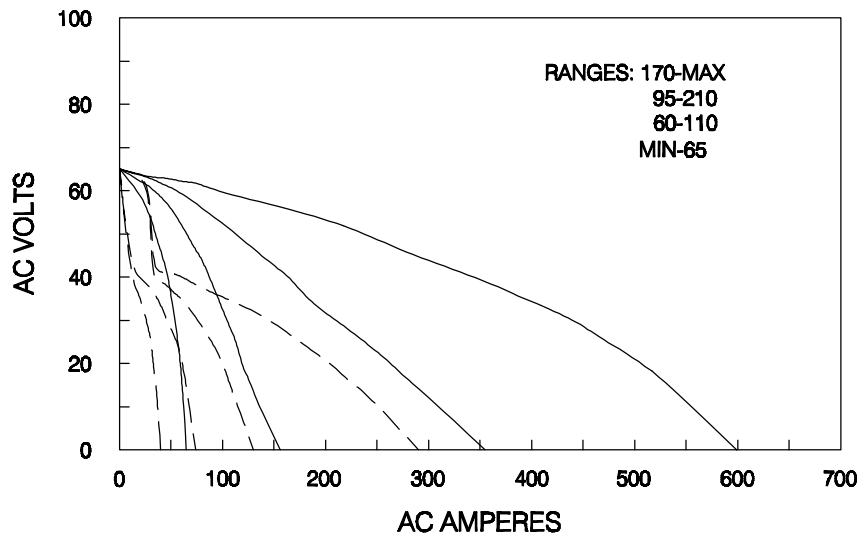


3-7. AC Auxiliary Power



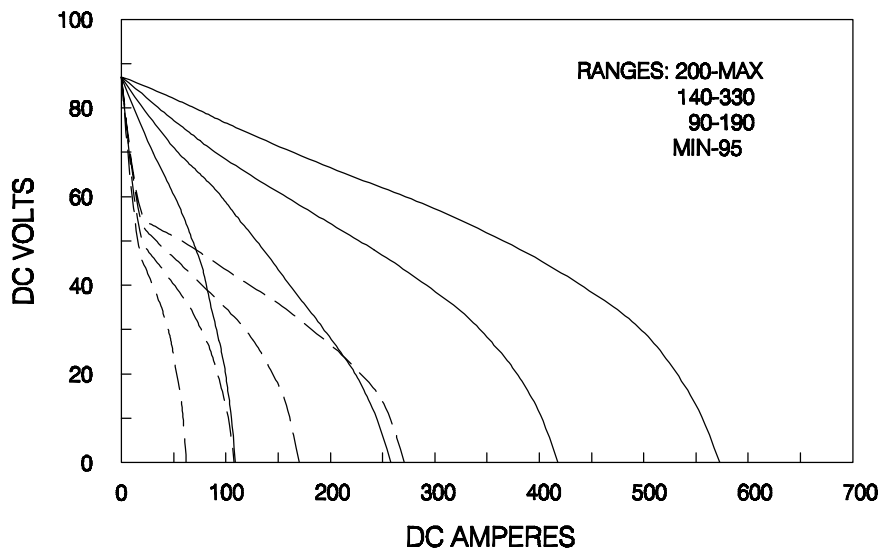
3-8. Volt-Ampere Curves

A. For AC Mode

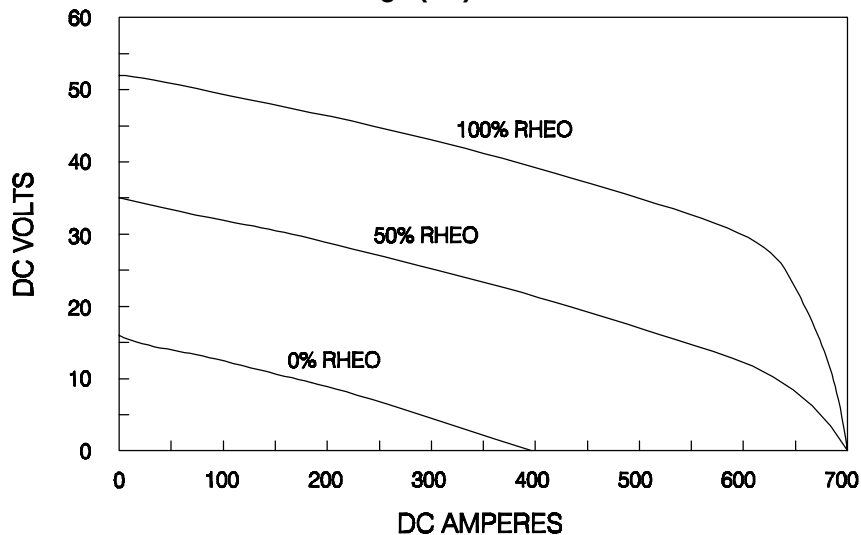


The volt-ampere curve shows the minimum and maximum voltage and amperage output capabilities of the welding generator. Curves of all other settings fall between the curves shown.

B. For Constant Current (CC) DC Mode



C. For Constant Voltage (CV) DC Mode

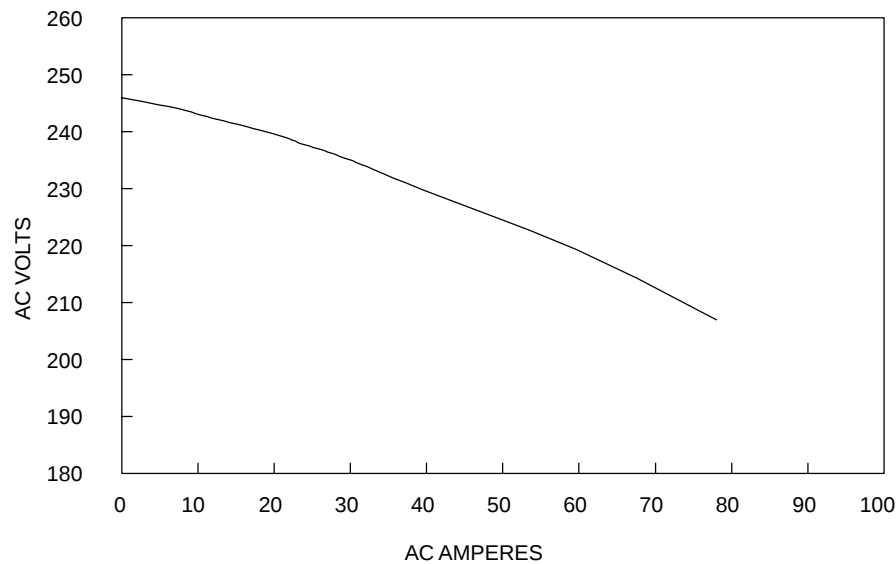


ST-188 211 / ST-188 212 / ST-188 220

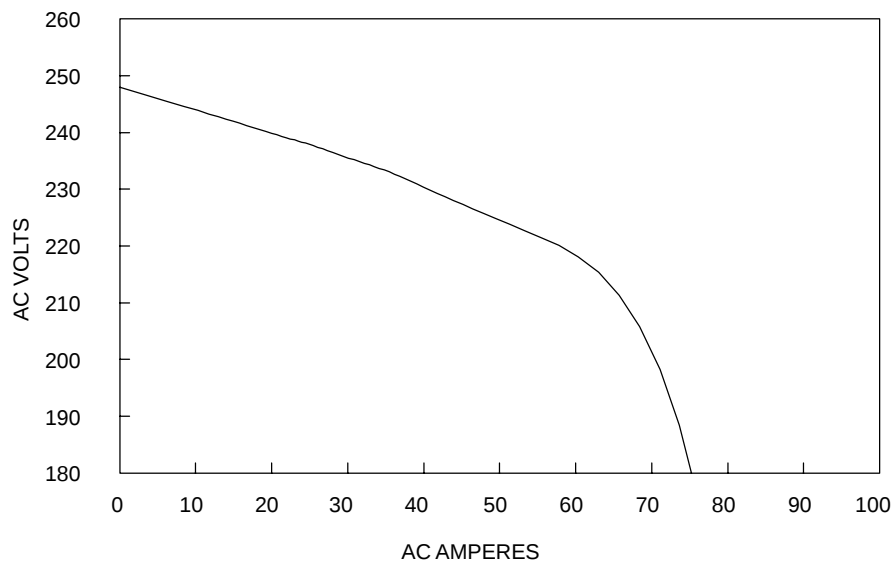
3-9. Optional AC Power Plant Curves

The ac power curves show the auxiliary power in amperes available at the single-phase 120/240 volt or three-phase 240 volt terminals.

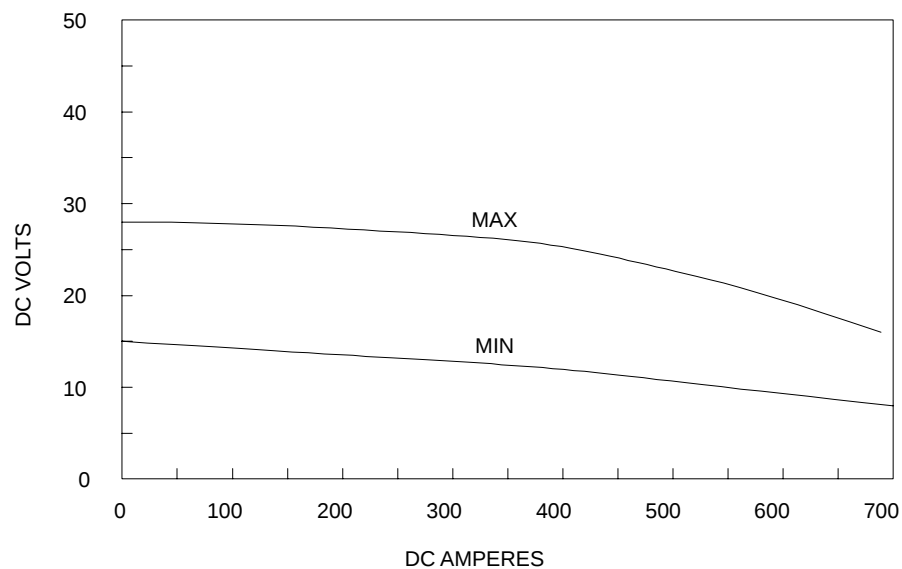
A. 10 KVA/KW Single-Phase Auxiliary Power Plant (No Weld Load)



B. 15 KVA/KW Three-Phase Auxiliary Power Plant (No Weld Load)



3-10. Optional Battery Charging Output Curve



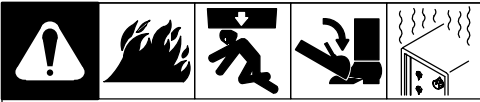
The battery charging curves show the charging amperage and voltage output of the welding generator.

As battery voltage nears the charging voltage, charging current decreases.

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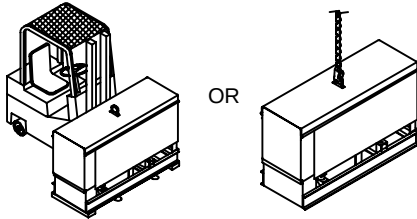
SECTION 4 – INSTALLATION

4-1. Installing Welding Generator

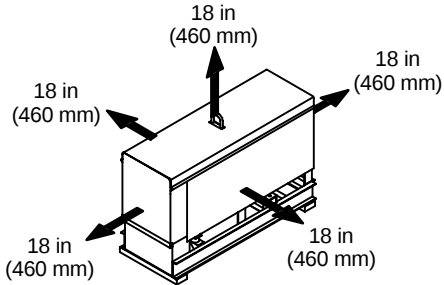


Movement

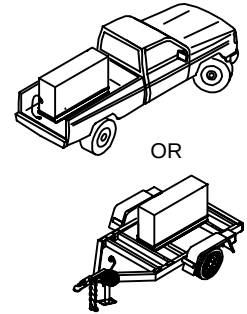
- ▲ Do Not Lift Unit From End



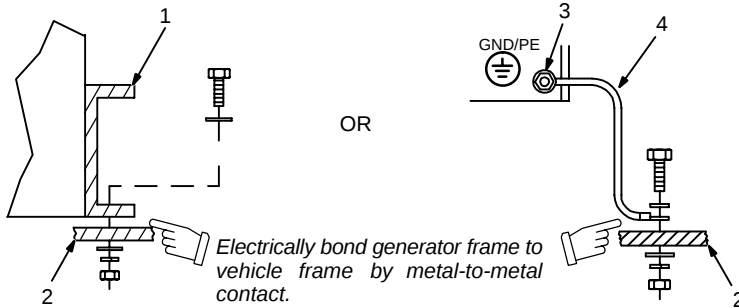
Airflow Clearance



Location



Grounding



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

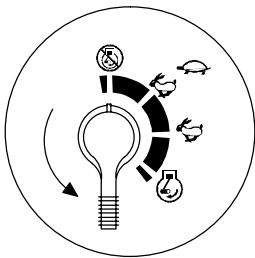
- 1 Generator Base
- 2 Metal Vehicle Frame
- 3 Equipment Grounding Terminal
- 4 Grounding Cable

Use #10 AWG or larger insulated copper wire.

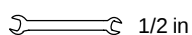
- ▲ If unit does not have GFCI receptacles, use GFCI-protected extension cord.

install1 12/99 – Ref. ST-800 652 / Ref. ST-800 477-A / ST-158 936-A / S-0854

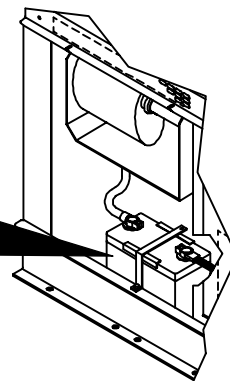
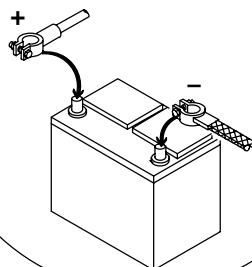
4-2. Connecting The Battery



Tools Needed:

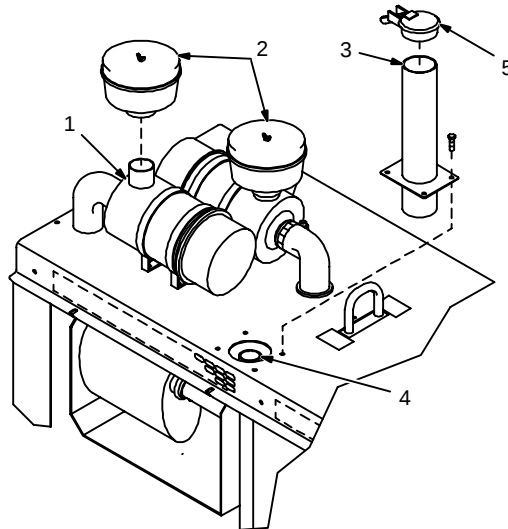


- ▲ Connect Negative (-) Cable Last.

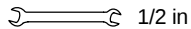


ST-153 654-B / Ref. ST-184 780-C / Ref. S-0756-B

4-3. Installing Precleaners, Exhaust Pipe, And Rain Cap



Tools Needed:



▲ **Stop engine and let cool.**

▲ **Do not blow exhaust toward air cleaner or air intake.**

Remove rear, left side panel.

1 Air Cleaner

2 Precleaner

Remove tape from air cleaner openings. Install precleaners on air cleaners.

3 Exhaust Pipe

4 Muffler Extension

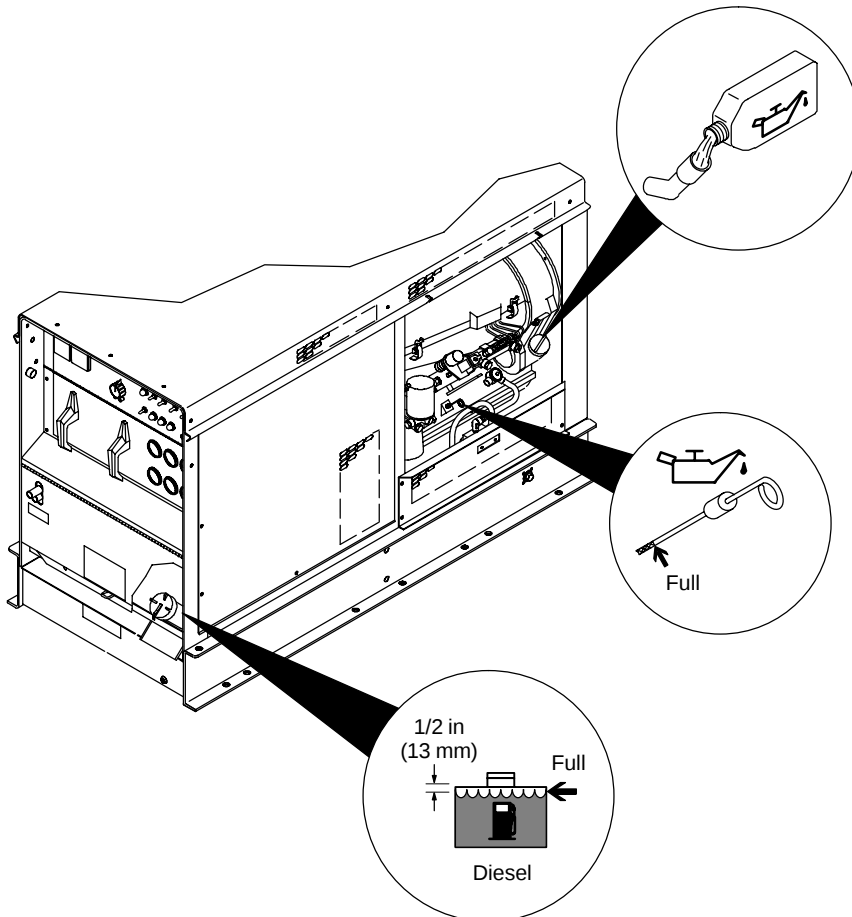
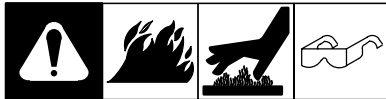
Remove tape from extension. Install exhaust pipe over extension. Secure exhaust pipe to top cover using supplied hardware.

5 Rain Cap

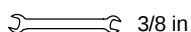
Install cap so it opens toward front of unit.

ST-153 652

4-4. Engine Prestart Checks



Tools Needed:



Check all fluids daily. Engine must be cold and on a level surface.

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

Fuel

Add fresh fuel before starting engine the first time (see maintenance label for specifications). Fill fuel tank up to 1/2 in. (13 mm) from top to allow room for expansion. Check fuel level on a cold engine before use each day.

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

Oil

After fueling, check oil with unit on level surface. If oil is not up to full mark on dipstick, add oil (see maintenance label). Unit stops if oil pressure is too low or oil 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.*

☞ *To improve cold weather starting:*

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

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

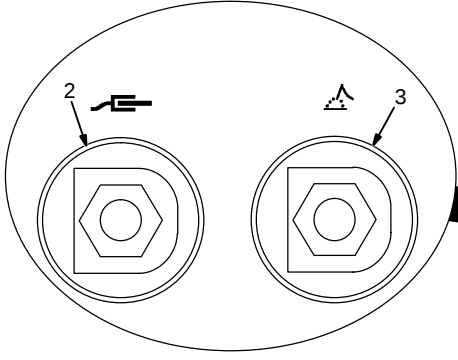
Use correct grade oil for cold weather (see engine manual).

Ref. ST-153 653-A

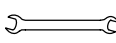
4-5. Connecting To Weld Output Terminals



Location of Terminals



Tools Needed:

 3/8, 3/4 in

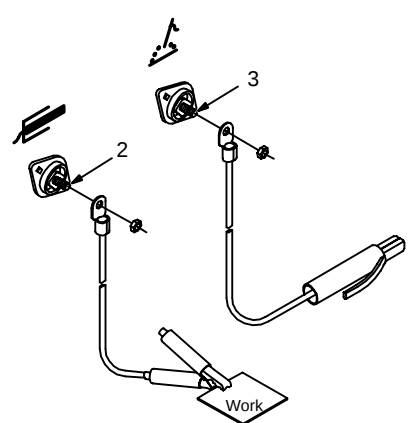
- 1 Access Door
- 2 Work Weld Output Terminal
- 3 Electrode Weld Output Terminal
- 4 Torch Cable Adapter

Adapter connects power and water to torch and cooling system or drain.

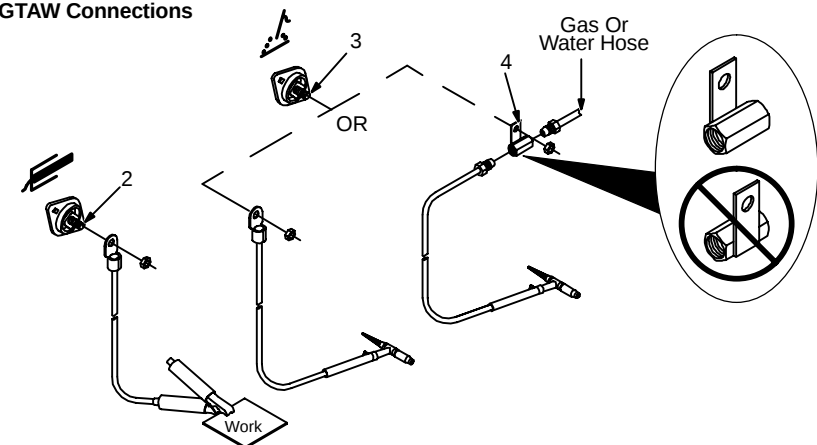
▲ Use only a proper torch cable adapter positioned so it does not hit frame, hardware, or door during operation.

Connect cables as shown.
Close and secure access door.

SMAW Connections



GTAW Connections



Ref. ST-121 578-D / Ref. ST-184 781-A / ST-800 578-F

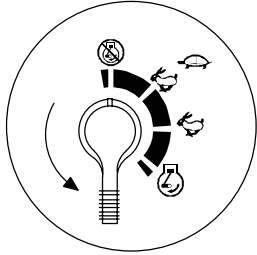
4-6. Selecting Weld Cable Sizes

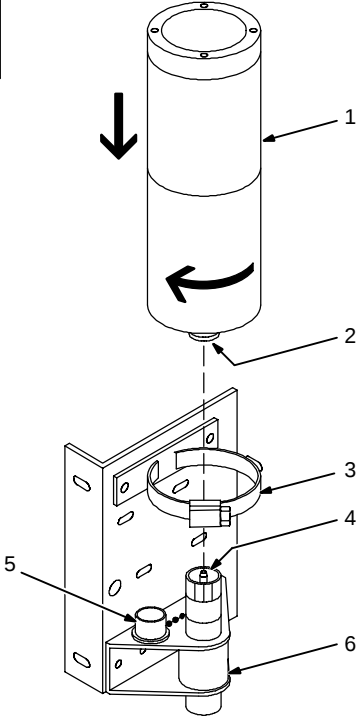
Welding Amperes	Total Cable (Copper) Length In Weld Circuit Not Exceeding							
	100 ft (30 m) Or Less		150 ft (45 m)	200 ft (60 m)	250 ft (70 m)	300 ft (90 m)	350 ft (105 m)	400 ft (120 m)
	10 – 60% Duty Cycle	60 – 100% Duty Cycle	10 – 100% Duty Cycle					
100	4	4	4	3	2	1	1/0	1/0
150	3	3	2	1	1/0	2/0	3/0	3/0
200	3	2	1	1/0	2/0	3/0	4/0	4/0
250	2	1	1/0	2/0	3/0	4/0	2-2/0	2-2/0
300	1	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-3/0
350	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-3/0	2-4/0
400	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-4/0	2-4/0
500	2/0	3/0	4/0	2-2/0	2-3/0	2-4/0	3-3/0	3-3/0
600	3/0	4/0	2-2/0	2-3/0	2-4/0	3-3/0	3-4/0	3-4/0

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

S-0007-E

4-7. Installing Ether Cylinder (Optional Ether Starting Aid)





▲ **Stop engine.**

▲ **Improper handling or exposure to ether can harm your health. Follow manufacturer's safety instructions on cylinder.**

▲ **Do not use Ether Starting Aid while engine is running.**

Open side door(s).

1 Ether Cylinder

2 Nozzle

Remove cover and clean cylinder nozzle.

3 Clamp

4 Fitting

5 Cap

6 Valve

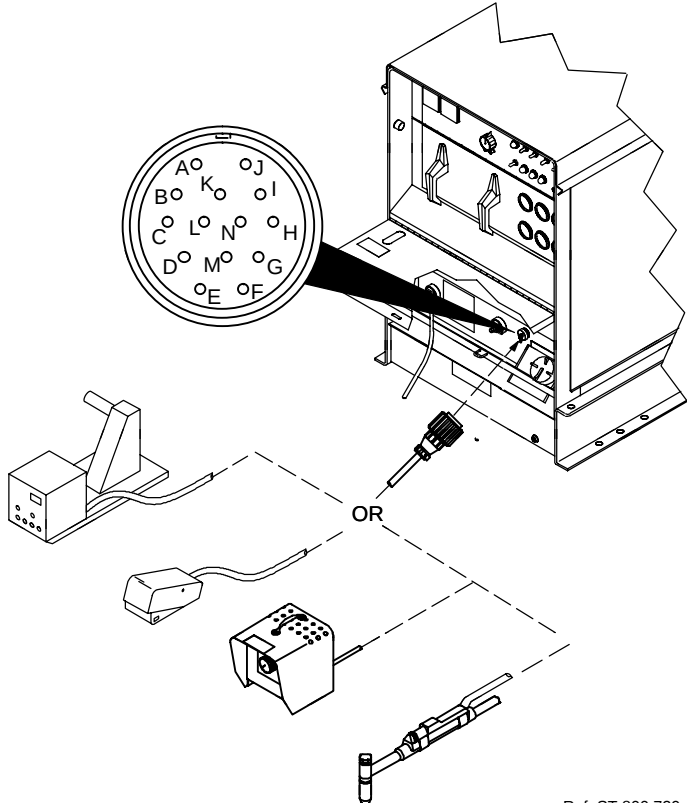
Remove cap and clean fitting. Install cylinder on fitting. Tighten clamp.

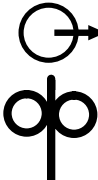
 After installing cylinder, wait at least 10 minutes before using to let ether particles settle and prevent atomizer plugging.

Put cap on fitting when cylinder is removed.

ether1 7/96 – ST-153 382-A / ST-180 933

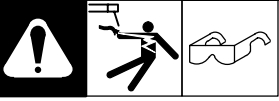
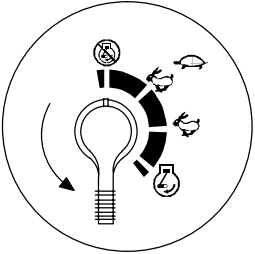
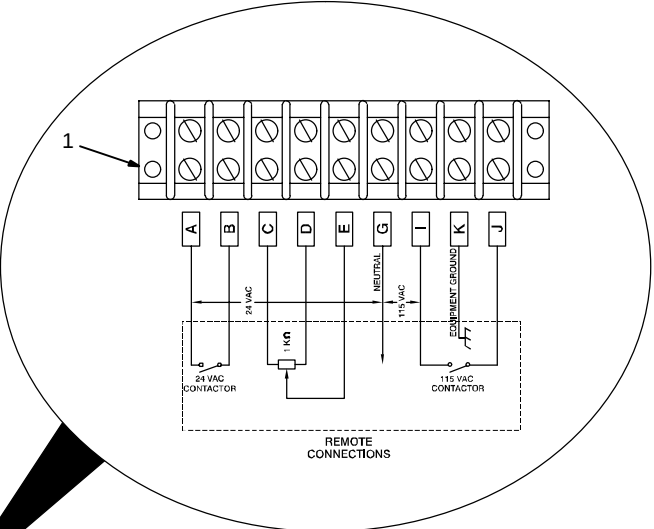
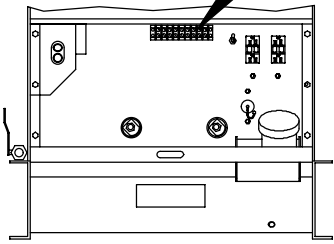
4-8. Remote 14 Receptacle RC3 Information



 REMOTE 14	Socket*	Socket Information
	A	24 volts ac. Protected by circuit breaker CB4.
	B	Contact closure to A completes 24 volts ac contactor control circuit.
	I	115 volts ac. Protected by circuit breaker CB3.
	J	Contact closure to I completes 115 volts ac contactor control circuit.
	G	Circuit common for 24 and 115 volts ac circuits.
A/V	C	0 to +10 volts dc output to remote control from min to max of Amperage/Voltage control R1.
	D	Remote control circuit common.
	E	0 to +10 volts dc input command signal from remote control.
	K	Chassis common.

*The remaining sockets are not used.

4-9. Terminal Strip 3T Connections

▲ Stop engine.

If remote control plug does not fit in receptacle RC3, wire cord directly to terminal strip 3T.

▲ Do not connect to Remote 14 receptacle RC3 and terminal strip 3T at the same time. Use only one remote control method.

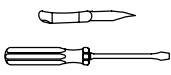
Open lower front door.

1 Terminal Strip 3T

Connect leads to 3T using terminal information shown in Section 4-8.

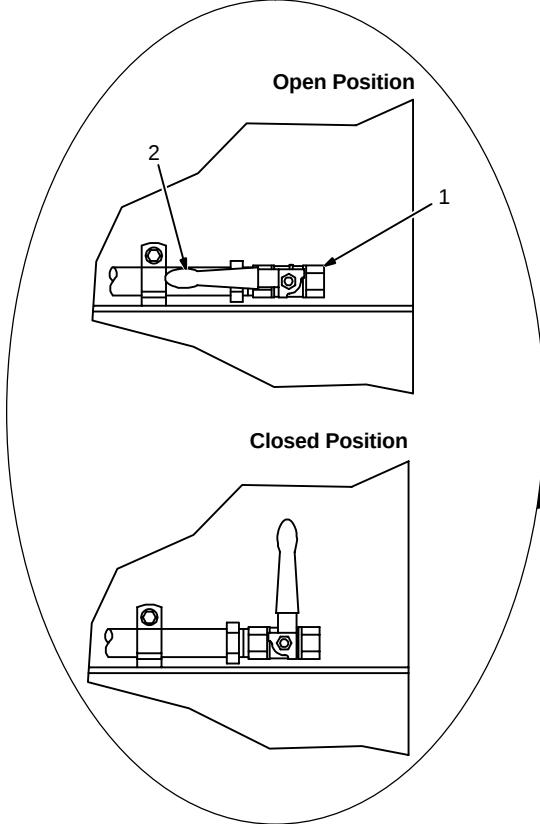
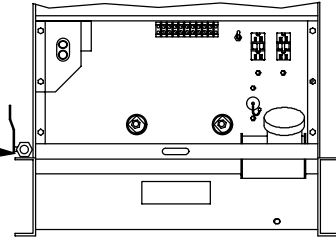
Reinstall cover. Close door.

Tools Needed:



Ref. ST-121 578-F / Ref. S-184 781-A

4-10. Air Compressor Connections

Air compressor operates whenever engine is running.

1 1/2 in NPT Air Compressor Fitting

Connect quick-disconnect air hose to fitting (hose not supplied).

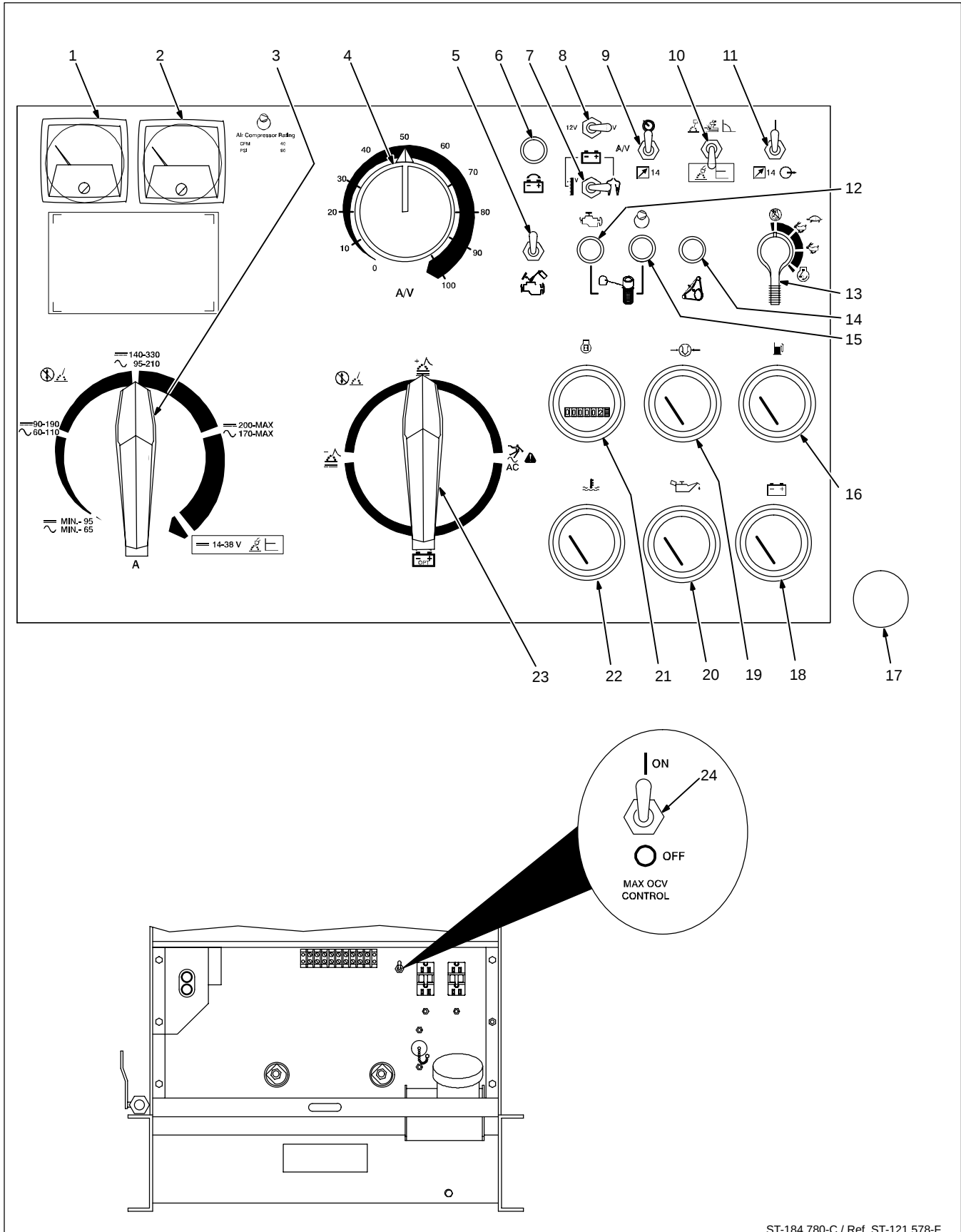
2 Air Shutoff Valve

Be sure valve is in open position when using air compressor.

ST-800 727 / Ref. ST-121 578-F

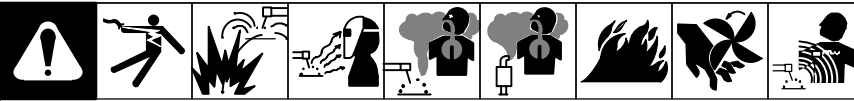
SECTION 5 – OPERATING THE WELDING GENERATOR

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



ST-184 780-C / Ref. ST-121 578-F

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



☞ This unit has a max OCV control circuit that resets the Amperage/Voltage Control to maximum when the arc breaks. When an arc is struck, weld output control returns to the front panel or remote control setting. The Amperage/voltage Control adjusts amperage only when welding and does not adjust open-circuit voltage (see item 24, Max OCV On/Off switch).

- 1 Voltmeter
- 2 Ammeter
- 3 Ampere Range Switch

▲ Do not switch under load.

Use switch to select one of five ampere ranges. Use the lower four ranges for CC welding and the highest range for CV/DC welding. In each CC range, the upper number is for CC/DC and the lower number is for CC/AC. For most welding applications, use the lowest amperage range possible to help prevent arc outages.

- 4 Amperage/Voltage Control

Control adjusts amperage within range selected by Ampere Range switch. Weld output would be 235 A DC with controls set as shown (50% of 140 to 330 A).

- 5 Ether Starting Aid Switch (Optional)

▲ Do not use Ether if engine is running.

Push switch up and release while cranking engine to release ether.

- 6 Check Battery Light (Optional)

Stop engine and check battery if light goes on while charging.

- 7 Battery Charge/Jump Start Selector Switch (Optional)

Use switch to select battery jump start or charging output (see Section 7).

- 8 Battery Charge Voltage Selector Switch (Optional)

Place switch in position matching voltage of battery being charged or jump started (see Section 7).

- 9 Amperage/Voltage Control Switch

Use switch to select front panel or remote amperage control (see Section 5-3).

For front panel control, place switch in Panel position. For remote control, place switch in Remote position and connect remote control to Remote 14 receptacle or terminal strip 3T (see Sections 4-8 and 4-9).

- 10 CC/CV Selector Switch

Use switch to select type of weld output. Use CC for Stick (SMAW) welding and Air Carbon Arc Cutting. Use CV for wire feed processes (MIG, FCAW). If using CV, place Ampere Range switch in maximum position. **To ensure wire feeder reliability and improve arc starting, unit does not run at idle speed when operated in CV mode.**

☞ Place CC/CV switch in CC position when using auxiliary power plant.

- 11 Output (Contactor) Switch

Use switch to control remote contactor connected to receptacle RC3 or terminal strip 3T (see Sections 4-8 and 4-9).

- 12 Service Engine Air Cleaner Light

Service engine air cleaner if light goes on (see Section 8-2).

- 13 Engine Control Switch

Use switch to start engine, select engine speed, and stop engine.

In Run position, engine runs at weld/power speed. In Run/Idle position, engine runs at idle speed at no load and weld speed with load applied. Turn to run position if using auxiliary power plant. Unit does not run at idle speed when operated in CV mode.

To Start: turn Engine Control switch to Start position. Release switch when engine starts.

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

To Stop: turn Engine Control switch to Off position.

- 14 Check Engine Belt Light

Light goes on and engine stops if engine alternator is not working. Check engine belt (see Section 8-8).

- 15 Service Compressor Air Cleaner Light

Service compressor air cleaner if light goes on (see Section 8-2).

- 16 Fuel Gauge

- 17 Air Tank Moisture Drain Control

Before starting engine each day, pull control out to drain moisture from air tank.

Push control in to close valve before operating unit.

- 18 Battery Ampere Gauge

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 until problem is fixed.

- 19 Air Pressure Gauge

Use gauge to check pressure in air storage tank.

- 20 Oil Pressure Gauge/Switch

Use gauge/switch to check oil pressure. Normal operating pressure is about 50 psi (345 kPa). Engine stops if oil pressure is below 22 psi (152 kPa).

- 21 Engine Hour Meter

- 22 Oil Temperature Gauge/Switch

Use gauge/switch to check oil temperature. Normal operating temperature is about 225°F (107° C). Engine stops if oil temperature exceeds 265° F (129° C).

- 23 Output Selector Switch

▲ Do not switch under load.

Use switch to select polarity of weld output.

For Direct Current Electrode Negative (DCEN), use Electrode Negative position. For Direct Current Electrode Positive (DCEP), use Electrode Positive position. For alternating current (AC), use AC position.

Use Jump Start/Battery Charge position to turn on output at Jump Start/Battery Charge receptacle (see Section 7).

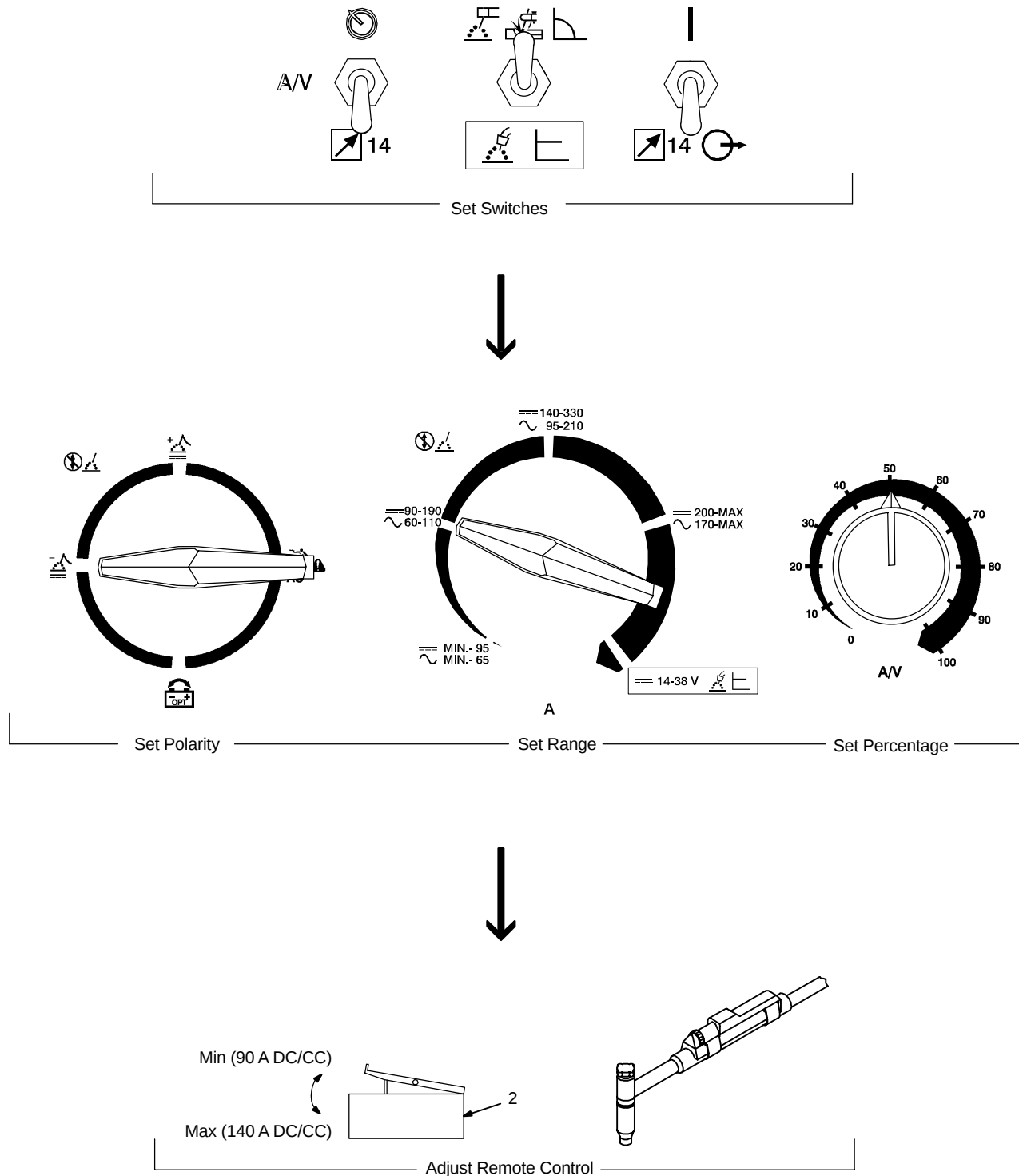
- 24 Max OCV On/Off Switch

Use switch to disable max OCV control circuit. Place switch in On position for most welding processes (see max OCV note at beginning of this section).

☞ If max OCV switch is in Off position, turn Amperage/Voltage control to max for full output from optional auxiliary power plant.

5-3. Example Of Remote Amperage Control

In Example:
 Min = 90 A DC/CC
 Percentage of Range = 50 %
 Max = 140 A DC/CC
 (50% of 90 to 190)



SECTION 6 – OPERATING AUXILIARY EQUIPMENT

6-1. 120 Volt GFCI Duplex Receptacles



1 120 V 15 A AC GFCI Receptacle GFCI1

2 120 V 15 A AC GFCI Receptacle GFCI2

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

3 Circuit Breaker CB1

4 Circuit Breaker CB2

CB1 protects GFCI1 and CB2 protects GFCI2 from overload. If CB1 or CB2 opens, the receptacle does not work.

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

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

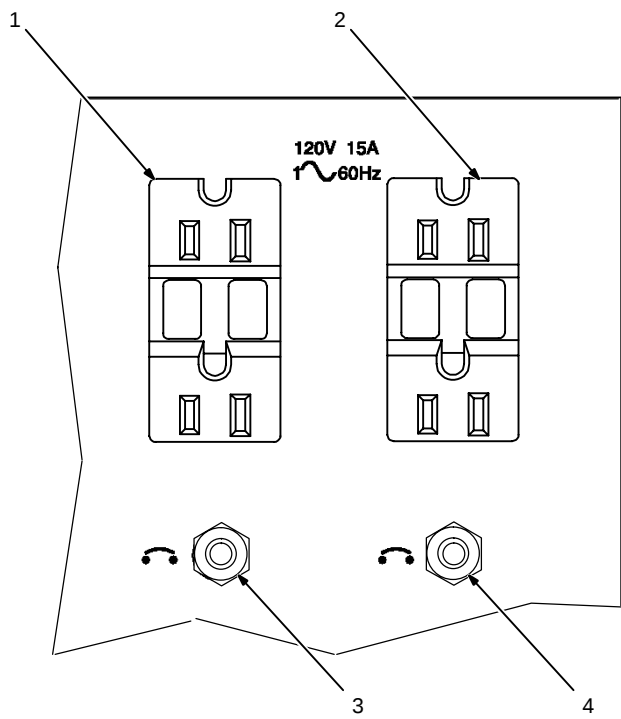
At least once a month, run engine at weld/power speed and press Test button to verify GFCI is working properly.

5 Total Auxiliary Power Output

Maximum output from each duplex receptacle is 1.8 kVA/kW, and 3 kVA/kW from all receptacles. Auxiliary power is not affected by weld output.

EXAMPLE: If 15 A is drawn from GFCI1, only 10 A is available at GFCI2:

$$(120\text{ V} \times 15\text{ A}) + (120\text{ V} \times 10\text{ A}) = 3.0\text{ kVA/kW}$$



Ref. ST-184 781-A

6-2. Optional 230 Volt South African Receptacle



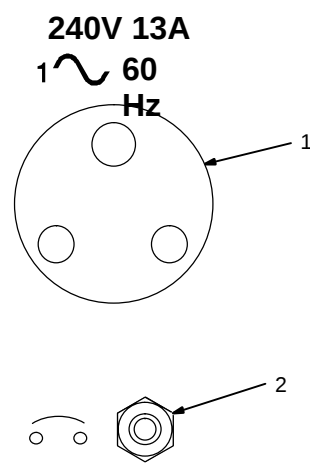
1 230 V 16 A AC Receptacle RC1

RC1 supplies 60 Hz single-phase power at weld/power speed. Maximum output from receptacle is 3 kVA/kW. Auxiliary power is not affected by weld output.

2 Circuit Breaker CB1

CB1 protects RC1 from overload. If the circuit breaker opens, the receptacle does not work. Press button to reset breaker.

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

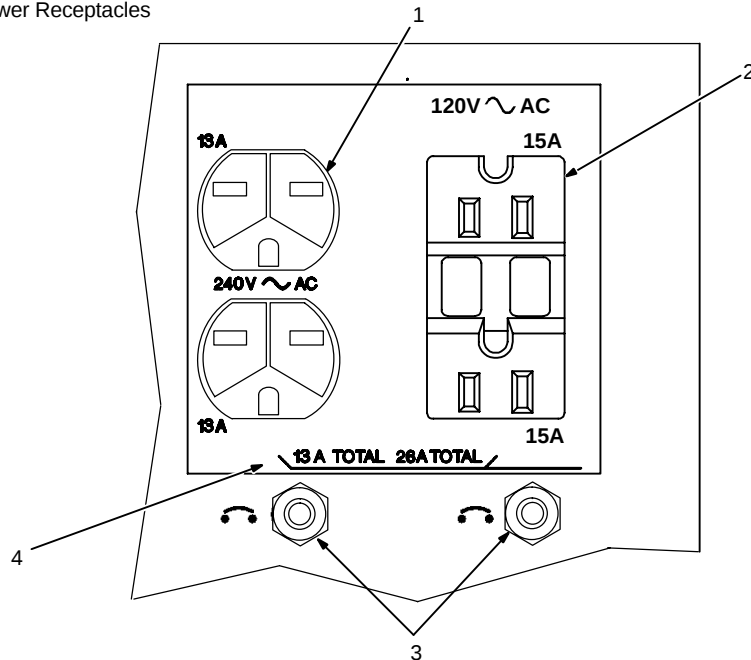


Ref. ST-182 096-A

6-3. Optional 5 kVA/kW Power Plant Receptacles



Single-Phase Power Receptacles



- 1 240 V 13 A AC Duplex Receptacle RC1
- 2 120 V 15 A AC GFCI Receptacle GFCI2

RC1 and GFCI2 supply 60 Hz single-phase power at weld/power speed.

- 3 Circuit Breaker CB1 And CB2

CB1 and CB2 protect RC1 from overload. CB2 also protects GFCI2 from overload. If CB1 or CB2 open, the respective receptacle(s) does not work. Press button to reset breaker.

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

- 4 Total Auxiliary Power Output

Combined output of RC1 and GFCI2 is limited to 3 kVA/kW output of the generator.

EXAMPLE: If 10 A is drawn from GFCI2, only 7.5 A is available at RC1:

$$(120 \text{ V} \times 10 \text{ A}) + (240 \text{ V} \times 7.5 \text{ A}) = 3.0 \text{ kVA/kW}$$

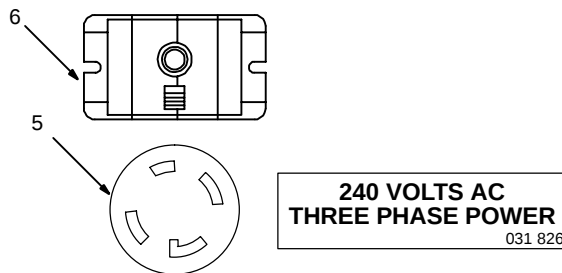
- 5 240 Volts AC Three-Phase Power Receptacle RC4

RC4 supplies 240 V, 12 A, 60 Hz three-phase power at weld/power speed. Maximum output from RC4 is 5 kVA/kW.

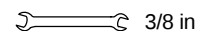
- 6 Circuit Breaker CB5

CB5 protects RC4 from overload. If CB5 opens, the receptacle does not work. Press button to reset breaker.

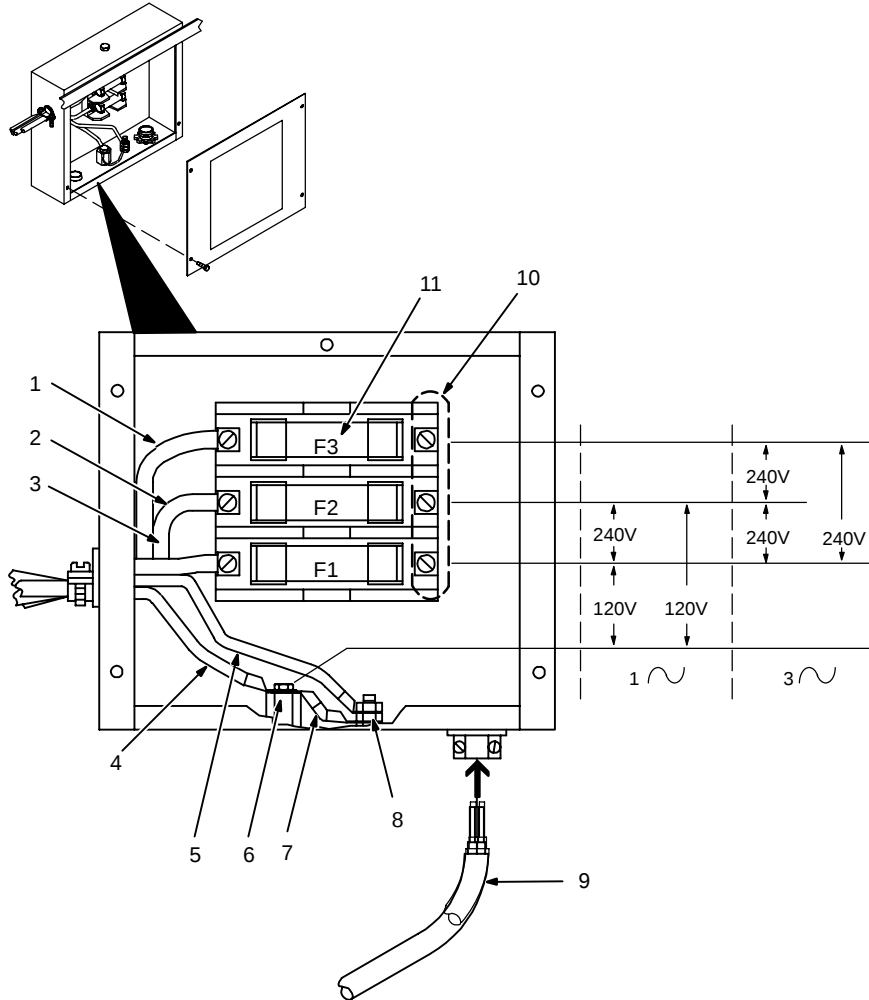
Three-Phase Power Receptacle



Tools Needed:



6-4. Connecting Auxiliary Power Plant



▲ Stop engine.

▲ Power and weld outputs are live at the same time. Disconnect or insulate unused cables.

Have qualified person install according to circuit diagram and Section 12 – Auxiliary Power Guidelines.

☞ Place CC/CV switch in CC position when using auxiliary power plant.

Remove junction box cover.

- 1 Lead 93
- 2 Lead 92
- 3 Lead 91
- 4 Lead 90 (Neutral)
- 5 Lead 42 (Circuit Grounding Lead)

Lead 42 connects to front panel Ground stud.

- 6 Isolated Neutral Terminal
- 7 Jumper Lead 42
- 8 Grounding Terminal

Jumper 42 is connected to lead 90 at factory. Jumper 42 may be disconnected from neutral to meet applicable electrical codes.

- 9 User-Supplied Leads
- 10 Load Terminals

Connect leads to terminals.

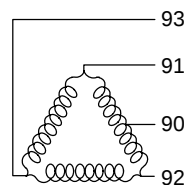
- 11 Fuses F1, F2, And F3

F1, F2, and F3 protect each load line from overload.

☞ Set Engine Control switch to Run when using auxiliary power.

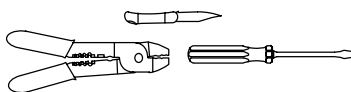
☞ If max OCV switch is in Off position (see Section 5-1), turn Amperage/Voltage control to max for full output from optional auxiliary power plant.

AC ~ Output	Single Phase 1 ~	Three Phase 3 ~
Volts	120/240	240
Amps	42	36
KVA/KW	10	15
Frequency	60 Hz	
Engine Speed	1850 RPM	
Max. Fuse Size	45 Amperes	
Lead 42 connects to GROUND stud on front of unit. Jumper 42 is connected to 90 at factory.		



Generator Windings
(See Section 9 For Complete Circuit)

Tools Needed:

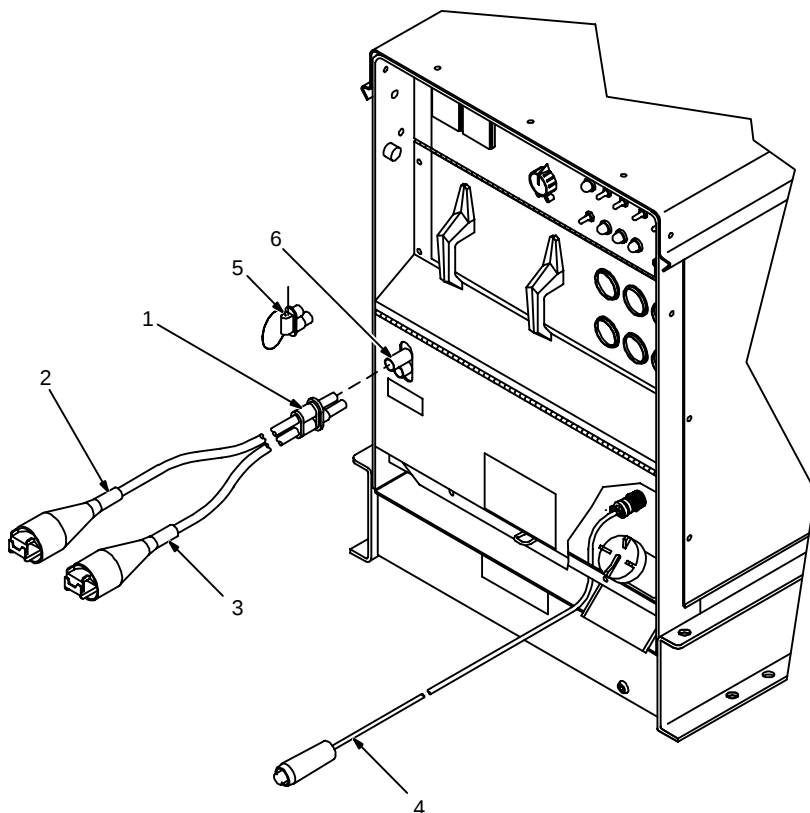


SECTION 7 – OPERATING OPTIONAL BATTERY CHARGER

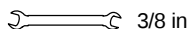
NOTE

Follow jump starting procedure to quickly start equipment having a weak or dead battery. Follow charging procedure to trickle-charge a battery.

7-1. Jump Start/Battery Charge Cable Connections



Tools Needed:



- ▲ Stop engine.
- ▲ Do not charge or jump start a battery which has loose terminals or one showing damage such as a cracked case or cover.
- ▲ Have only qualified persons do battery charging work.
- ▲ Keep cables away from moving parts.
- ▲ Do not use damaged cables.
- ▲ Read supplied BCI Battery Service Manual before charging or jump starting.

1 Jump Start/Battery Charge Plug

2 Red (+) Cable

3 Black (-) Cable

Obtain cable with proper connectors.

4 Remote Momentary-On Switch And Plug

Remote switch is used only for jump starting a battery. Press switch to turn jump starting output on. Release switch to turn output off.

Open lower access door. Route cable as shown. Insert plug into Remote 14 receptacle, and tighten threaded collar. Close door.

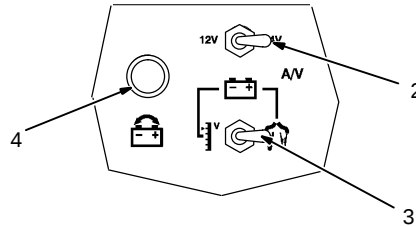
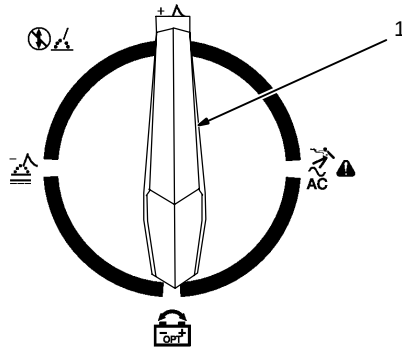
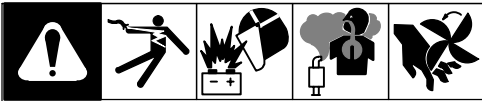
5 Cover

6 Jump Start/Battery Charge Receptacle

Remove cover, and insert plug in receptacle. Connect remaining end of cable to equipment being jump-started or charged. Use correct polarity (+ and -) when making connections.

ST-153 653-A

7-2. Jump Start/Battery Charge Controls



1 Output Selector Switch

▲ Do not switch under load.

Use switch to select weld or battery charge/jump start output. Output automatically stops when terminal voltage is 15 to 25 percent above required battery voltage. Move switch to weld position when done charging/jump starting.

2 Battery Voltage Selector Switch

Place switch in position matching voltage of battery being jump started or charged.

3 Battery Charge/Jump Start Selector Switch

Use switch to select battery jump start or charging output.

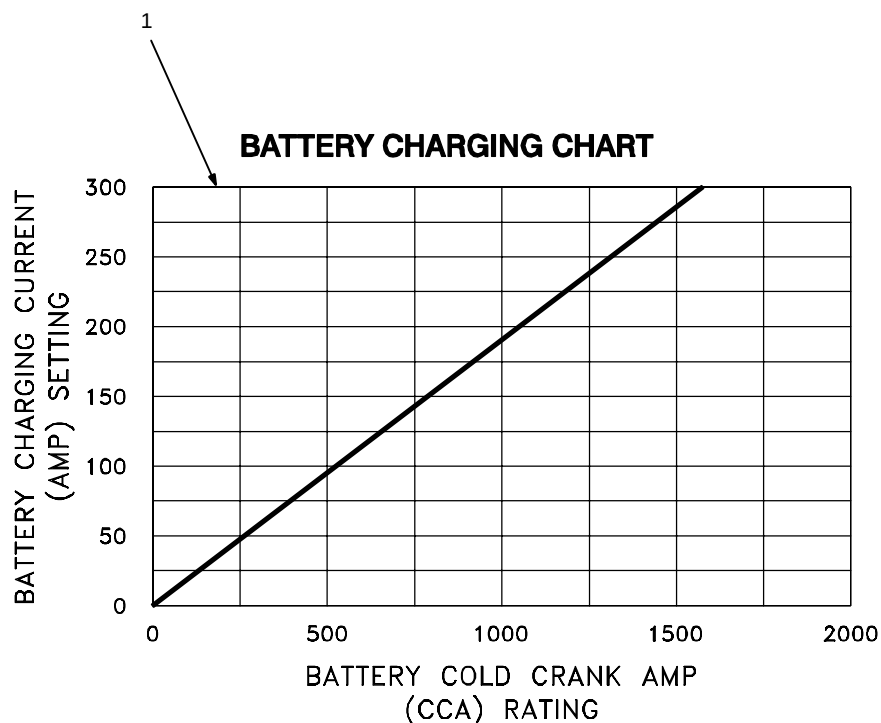
4 Battery Light

If light comes on while charging or jump starting, stop the engine and check the following:

- Polarity of connections (+ and -)
- Battery Voltage switch position
- Output Selector switch position
- Battery voltage.

Ref. ST-184 780-C

7-3. Determining Battery Charging Current



1 Battery Charging Chart

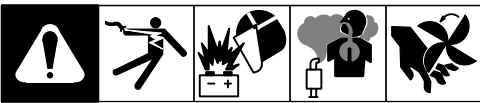
Find battery cold crank amp (CCA) rating on battery. Use CCA rating on chart to find charge current setting for battery.

EXAMPLE: If battery CCA rating is 500, charging current from chart is 100 amperes.

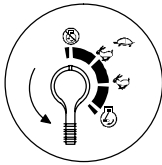
Do not exceed charging current found on chart. For longer battery life, use lowest charge rate possible.

S-115 587-A

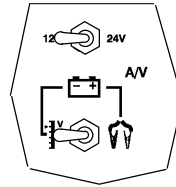
7-4. Battery Charging Procedure



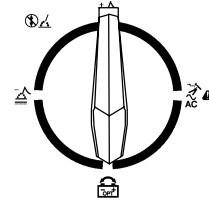
In Example:
 Battery Voltage = 12 Volts
 Battery CCA Rating = 500
 Charge Current = 100 A (See Section 7-3)
 Ampere Range Setting = 90 to 190 A
 A/V Control Setting = 10



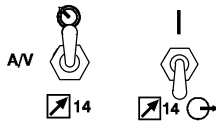
Stop Engine.



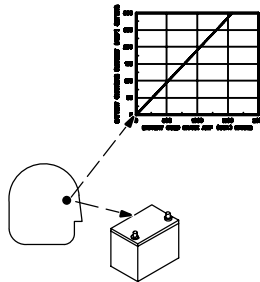
Set Battery Voltage Switch.
 Set Charge/Jump Start
 Switch To Charge.



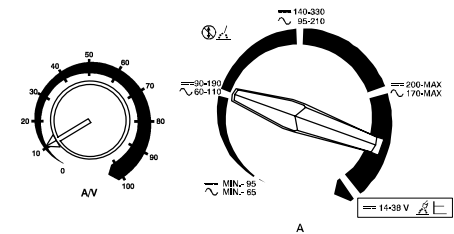
Set Output Selector Switch To Charge.
▲ Do not switch under load.



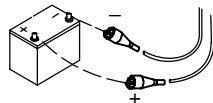
Set Amperage/Voltage
 Switch To Panel And Out-
 put (Contactor) Switch To
 Remote. Turn Off
 Remote Devices.



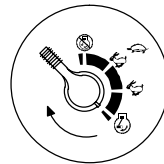
Determine Charge Current From
 Battery CCA Rating And Chart
 (See Section 7-3).



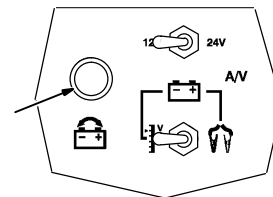
Set Amperage.
**▲ Do not switch Ampere Ranges
 while under load.**



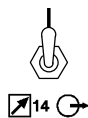
Connect Cables
 (Observe Correct
 Polarity).



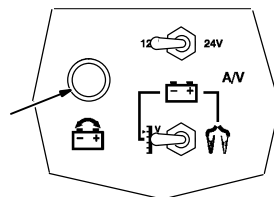
Start Engine.



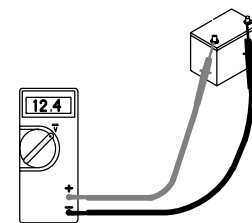
If Battery Light Goes On,
 Stop Engine And Check
 Connections.



Set Output (Contactor)
 Switch To On Or Turn On
 Remote Device.

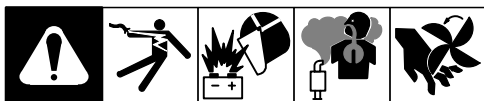


If Battery Light Goes On,
 Stop Engine And Check
 Battery Condition.



Charge 10 minutes. Check Bat-
 tery Voltage. Continue charging
 if necessary.

7-5. Jump Starting Procedure



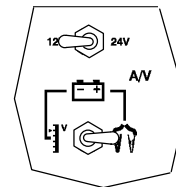
☞ Charge battery for 10 minutes before jump starting battery (see Section 7-4).



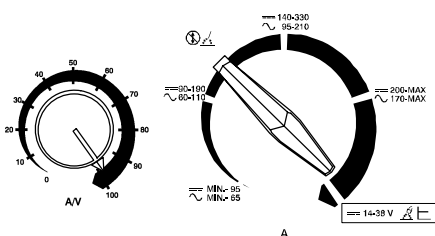
Charge Battery For 10 Minutes (See Section 7-4).



Set Output (Contactor) Switch to Remote. Turn Off Remote Device.

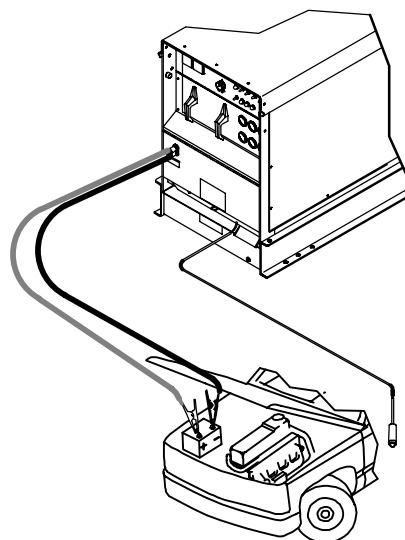


Set Charge/Jump Start Switch To Jump Start.



Set A/V control to max (100) and Ampere Range switch to CV position.

▲ Do not switch Ampere Ranges while under load.



Press switch only while cranking engine of equipment being started.

Press Remote Momentary On Switch While Cranking Engine Of Equipment Being Jump Started. Release Switch When Equipment Starts. Stop Welding Generator And Disconnect Cables.

Ref. ST-184 780-C

SECTION 8 – MAINTENANCE & TROUBLESHOOTING

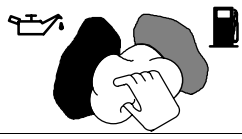
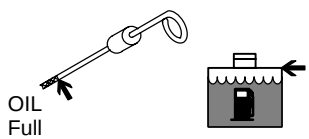
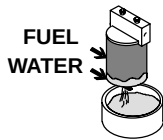
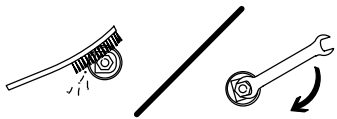
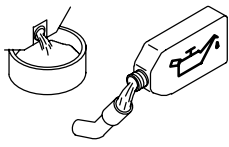
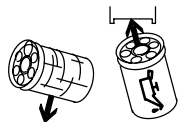
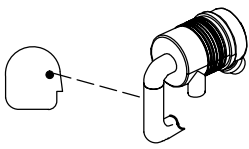
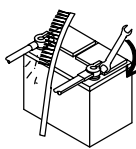
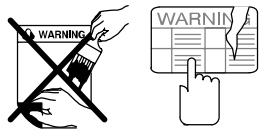
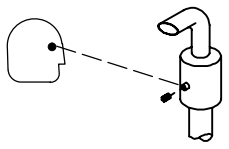
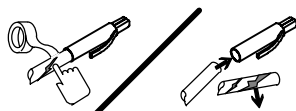
NOTE ☞

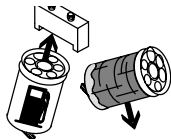
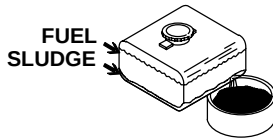
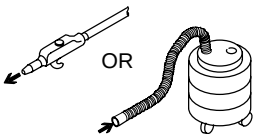
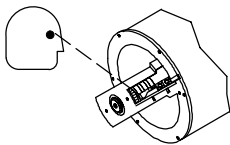
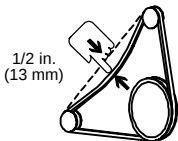
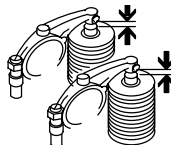
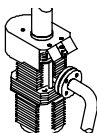
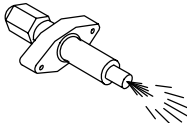
The air compressor normally requires service every 1200 hours of operation if used regularly and operated in a clean, dry environment. The compressor will require service more often if used infrequently or operated in dirty, humid conditions.

To help minimize air compressor maintenance, use sufficient quantities of air to allow compressor to cycle for a minimum of one hour per week.

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

8-1. Routine Maintenance

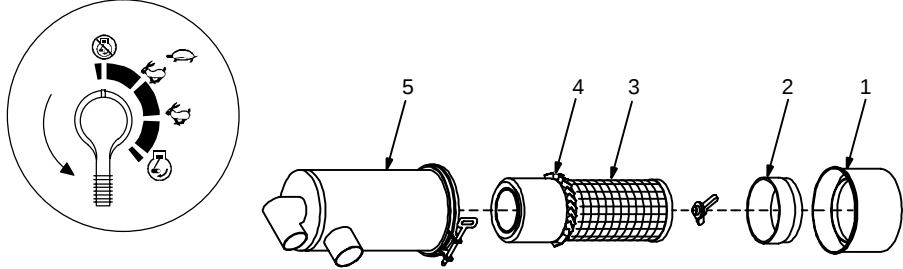
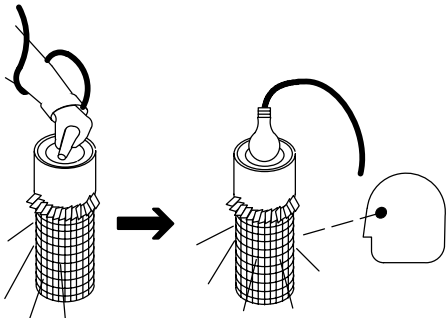
					 Recycle engine fluids.	▲ Stop engine before maintaining. 📖 See also <i>Engine Manual and Maintenance Label</i>. Service engine more often if used in severe conditions. * To be done by Factory Authorized Service Agent.
 8 h						
 Wipe Up Spills.			 OIL Full Check Fluid Levels. See Section 4-4.			
FUEL WATER  Drain Water From Fuel System.			 Drain Water From Air Tank. See Section 5-1			
 50 h						
 Clean Air Filters. See Section 8-2.			 Clean And Tighten Weld Terminals.			
 100 h						
 Change Oil. See Section 8-4.			 Change Oil Filter. See Section 8-4.			
 Check air cleaner hoses for cracks and loose clamps.			 Clean And Tighten Battery Connections.			
 200 h						
 Replace Unreadable Labels.						
 250 h						
 Check And Clean Spark Arrestor. See Section 8-9.						
 500 h						
 Repair Or Replace Cracked Cables.						

🕒 1000 h			
	Change Fuel Filters. See Section 8-4.		Drain Sludge From Fuel Tank. See Section 8-4.
	Blow Out Or Vacuum Inside. During Heavy Service, Clean Monthly.		Service Welding Generator Brushes And Slip Rings. Service More Often In Dirty Conditions.*
	Check Belt Tension. See Section 8-8.		Check Valve Clearance.*
🕒 1200 h			
		Service Air Compressor.*	
🕒 3000 h			
		Clean/Set Injectors.*	

8-2. Servicing Air Cleaner





Blow Inspect

▲ **Stop engine.**

▲ **Do not run engine without air cleaner or with dirty element.**

Clean or replace element if dirty or damaged. Replace element yearly or after six cleanings.

- 1 Dust Cap
- 2 Baffle
- 3 Element
- 4 Plastic Fins
- 5 Housing

To clean air filter:

Wipe off cap and housing. Remove cap and dump out dust. Wipe dust from inside cap and housing with damp cloth. Remove element and reinstall cap.

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

Clean element with compressed air only. Keep nozzle at least 1 in (25 mm) from inside of element. Max. air pressure: 100 psi (690 kPa). Do not remove plastic fins. Replace element if it has holes or damaged gaskets.

Reinstall element and cap (cap arrows pointing up).

aircleaner1 4/96 – ST-153 585 / Ref. ST-184 780-C / Ref. ST-184 780-C / Ref. S-0698-B

DEUTZ F4L912 DIESEL ENGINE



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



Check daily.

Recommended Oil API Service Classification
CD/CE (or better)

Oil And Filter Change . .
dirty conditions 100 hours or less
normal conditions 125 to 150 hours

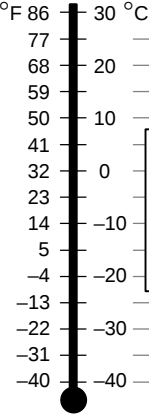
Oil Filter Deutz 117-4418,
Fleetguard LF4056,
Fram PH2842,
Hastings P352 or FP352,
MILLER 064 677

Oil Capacity 11.5 qt (11 L) or 12 qt
(11.4 L) with filter change



Diesel

Fuel Capacity 19 gal (72.8 L)
Fuel Grade 1-D or 2-D Cetane No. 45 min.
Primary Fuel Filter/
Water Separator MILLER 062 342, Fram P1107
Secondary Fuel Filter . . . MILLER 064 686, Deutz 117-4423, Fram P4102
Fill filter with clean fuel before installing – read instructions on filter.



5W/30 (Synthetic)

10W/30

10W/40

15W/30

15W/40

30

40

10W

20W/20

*Only with engine oil preheating



Air Filter Service 50 hours or less – see Owner’s Manual
Air Filter Element MILLER 020 319, Donaldson P181052, Fram CAK 253



Battery BCI Group 31
Cranking Performance at 0°F
(-18°C) 815 Amps



Valve Clearance –Cold
Intake 0.006 in (0.15 mm)
Exhaust 0.006 in (0.15 mm)



Engine RPM – No Load
Weld/Power 1850



Engine Cooling
Avoid recirculation of air from hot air
exit to blower intake.
Blower Belt . . Deutz 223-5256,
Gates 7580



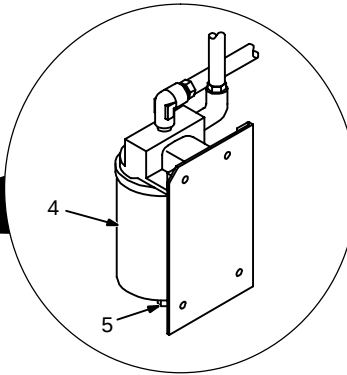
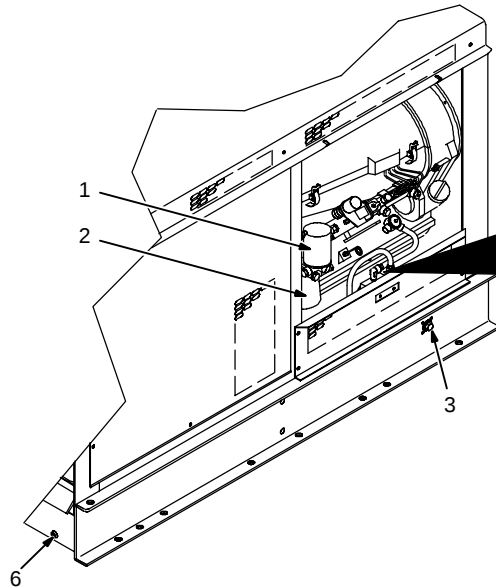
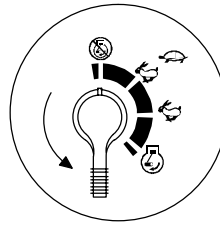
Have only trained technician maintain injection pump and injectors. AIR, WATER, or
GASOLINE will harm the injection system. If engine has run out of fuel or fuel filter is
changed, bleeding of air may be required. Check engine manual for proper
procedure.
Injectors should be checked annually.



Spark Arrestor Inspection And Service 250 operating hours –
see Owner’s Manual

S-120 629-G

8-4. Servicing Engine Fuel And Lubrication Systems



▲ Stop engine.

1 Fuel Filter

See engine manual for fuel filter replacement procedure.

2 Oil Filter

3 Oil Drain

See engine manual for oil change procedure.

4 Fuel/Water Separator

5 Petcock

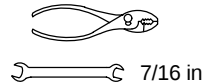
To drain water from fuel system, put metal container under petcock and open petcock. Close petcock when fuel appears.

6 Sludge Drain Plug

To drain sludge, put metal container under drain, and remove plug. Re-install plug when done.

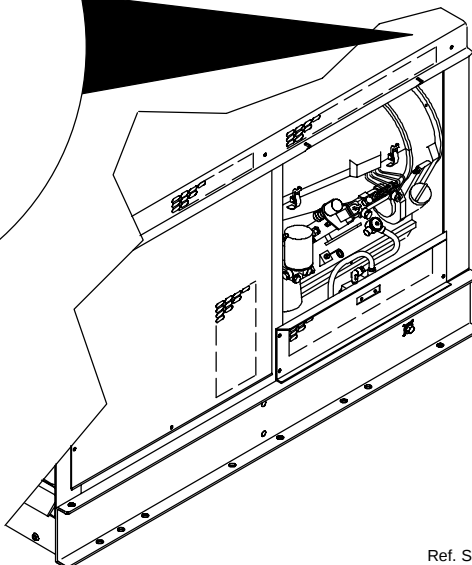
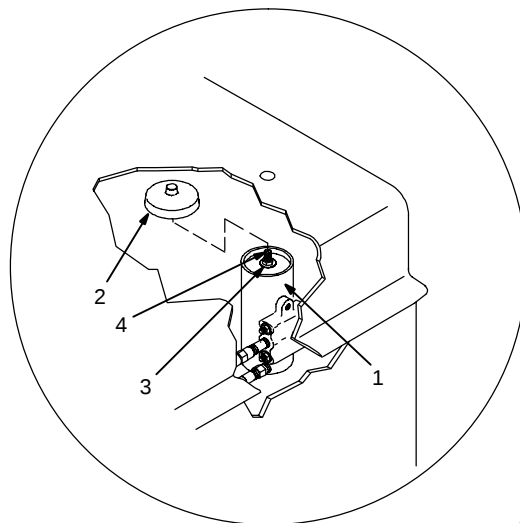
Close side door.

Tools Needed:



Ref. ST-153 653-A / Ref. ST-184 780-C

8-5. Adjusting Air Pressure



Governor cut-in pressure is 105 psi (724 kPa) and cut-out pressure is 125 psi (862 kPa).

☞ *Cut-in and cut-out pressure values are ± 5 psi (34 kPa).*

Check pressure using air pressure gauge on front panel. If necessary, adjust cut-out pressure as follows:

1 Governor

2 Rubber Boot

3 Jam Nut

4 Screw

Remove boot and loosen nut. Turn screw clockwise (increase pressure) or counterclockwise (decrease) until cut-out pressure is 125 psi (862 kPa).

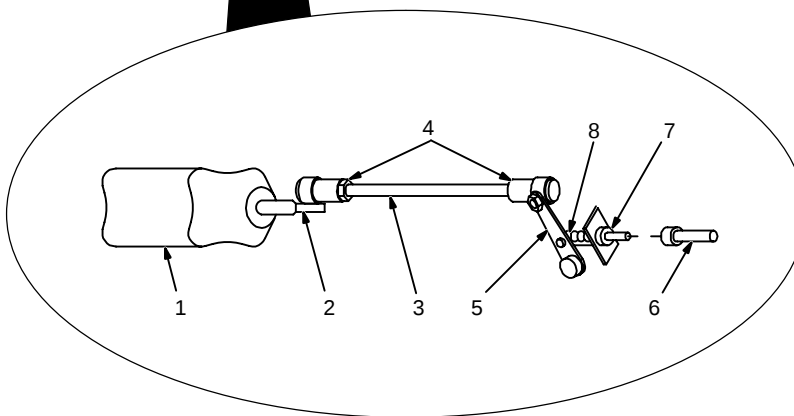
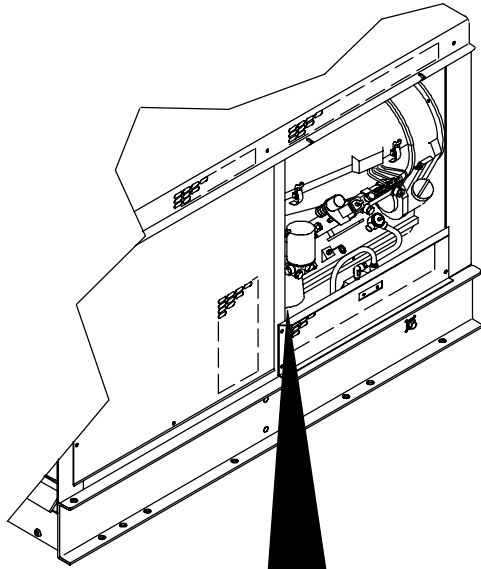
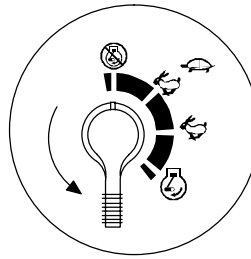
Tighten nut and replace boot.

Tools Needed:



Ref. ST-153 653-A / Ref. ST-801 325-A / Ref. ST-184 780-C

8-6. Adjusting Engine Speed



▲ Stop engine.

Engine speeds have been factory set and should not require adjustment. After tuning engine, check engine speeds with a tachometer. See table for proper no load speeds. If necessary, adjust speeds as follows:

Idle Speed Adjustment

- 1 Throttle Solenoid
- 2 Adjustment Rod
- 3 Throttle Rod

Disconnect throttle rod from adjustment rod.

- 4 Locknut

Loosen locknuts.

Start engine, and place Engine Control switch in Run/Idle position.

- 5 Throttle Lever

Push lever forward until engine runs at idle speed. While holding lever in the idle position, reconnect throttle rod to adjustment rod. Tighten locknuts.

Weld/Power Speed Adjustment

Place Engine Control switch in Run position.

- 6 Protective Cap

- 7 Locknut

Remove cap and loosen locknut.

- 8 Injection Pump Adjustment Rod

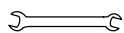
Turn rod until engine runs at weld/power speed. Tighten locknut.

▲ Stop engine.

Reinstall protective cap.

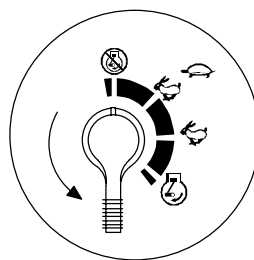
Close side door.

Tools Needed:



3/8, 7/16 in

8-7. Overload Protection



▲ Stop engine.

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

1 Circuit Breaker CB3

CB3 protects the 115 volts ac output to Remote 14 receptacle RC3 or terminal strip 3T. If CB3 opens, the 115 volts ac output stops.

2 Circuit Breaker CB4

CB4 protects the 24 volts ac output to Remote 14 receptacle RC3 or terminal strip 3T. If CB4 opens, the 24 volts ac stops.

Press button to reset breaker.

3 Fuse F11 (See Parts List)

4 Throttle Solenoid

Fuse F11 protects throttle solenoid from overload. If F11 opens, the engine does not run at idle rpm.

Check F11 and replace if open. Check movement of solenoid and adjustment of weld speed throttle link (see Section 8-6). If F11 continues to open, replace throttle solenoid.

5 Magnetic Shutdown Switch MS1

6 Fuse F (See Parts List)

7 Fuse F6 (See Parts List)

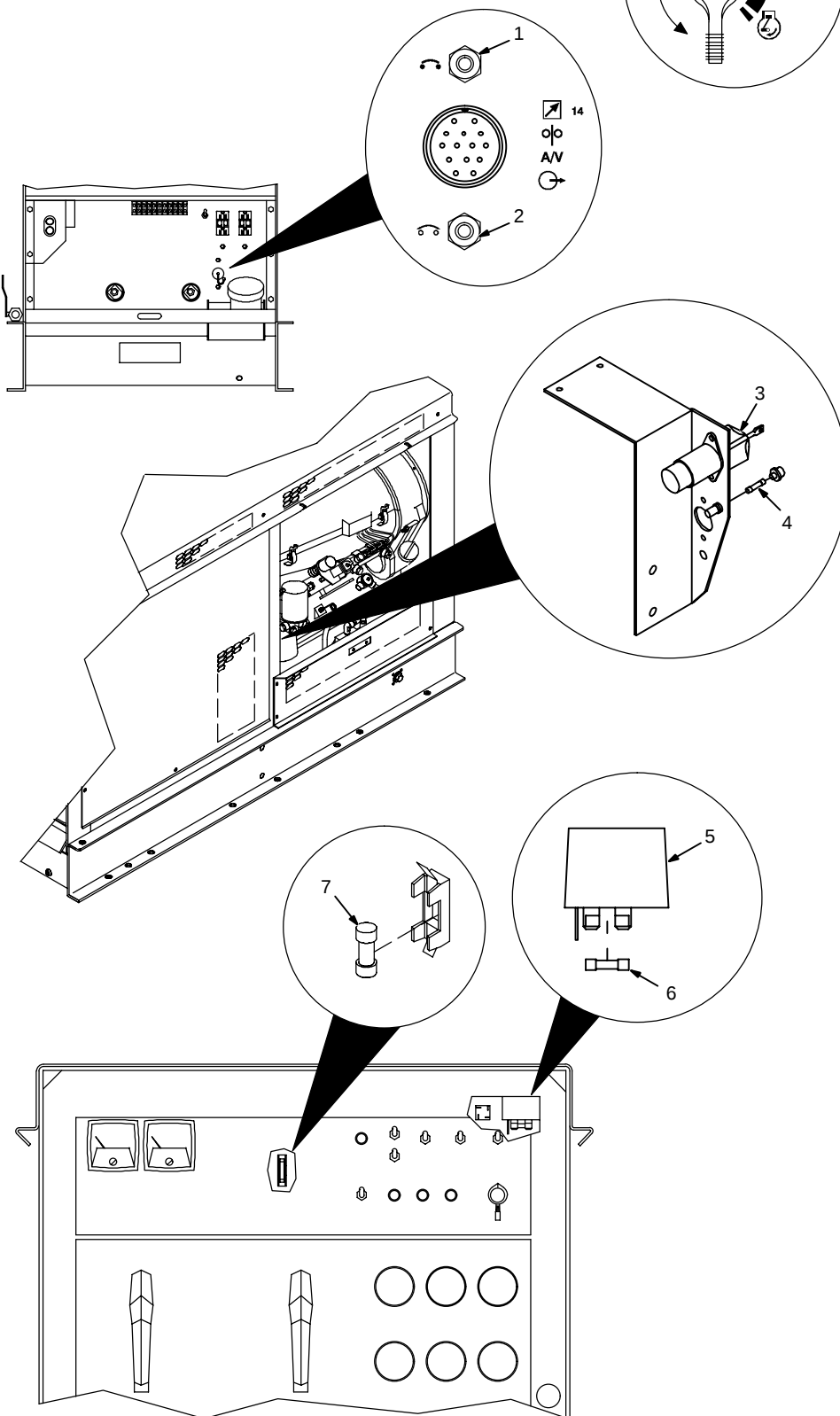
Remove screw to open upper front panel access door.

Fuse F protects the magnetic shutdown switch MS1 from damage due to overload. If F opens, the engine stops. Do not run engine until problem is corrected.

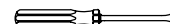
Check fuse, and replace if open.

Fuse F6 protects the excitation circuit from damage due to overload. If F6 opens, there will be low/no weld and auxiliary power output.

Check fuse, and replace if open.

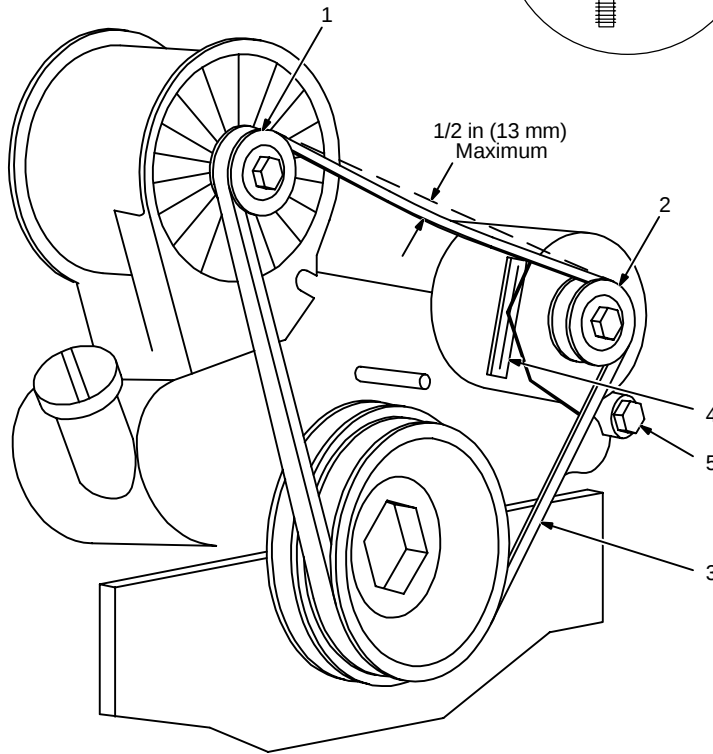
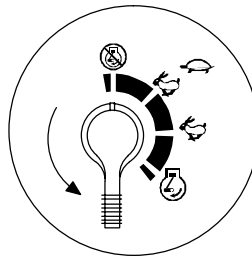


Tools Needed:

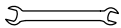


Ref. ST-184 780-F / Ref. ST-184 781-A / Ref. ST-153 653-A / ST-153 702-A

8-8. Checking And Replacing Engine Belt



Tools Needed:



1/2 in, 13 mm, 17mm

▲ Stop engine.

A V-belt drives the engine cooling fan and alternator. To check tightness of belt, proceed as follows:

Remove rear panel and guard from engine pulley.

- 1 Fan Pulley
- 2 Alternator Pulley
- 3 Engine Belt

Position straight edge along top of pulleys. Pull down belt as far as it will go, and measure distance from belt to straight edge.

If less than 1/2 in (13 mm), belt is okay. If not okay, adjust belt as follows:

- 4 Alternator Bracket
- Loosen hex nut on bracket.
- 5 Alternator Pivot Hex Nut

Loosen hex nut. Pivot alternator clockwise until belt is tight. Tighten hex nuts.

Recheck tightness of belt. Readjust if necessary.

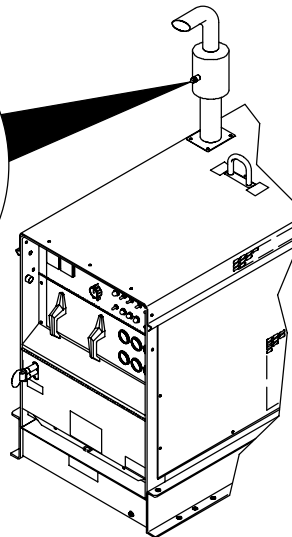
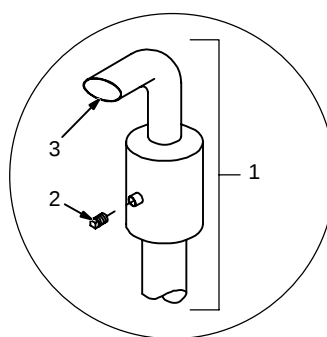
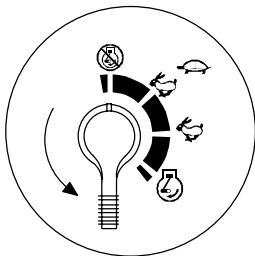
Replace belt if damaged or cracked. Replace belt as follows:

Loosen hex nuts, pivot alternator counterclockwise, and remove belt. Install new belt, pivot alternator clockwise, adjust tightness, and tighten hex nuts. Recheck tightness of belt after operating engine 15 minutes.

Reinstall guard and rear panel.

Ref. ST-121 577-B / Ref. ST-184 781-A

8-9. Servicing Optional Spark Arrestor



Tools Needed:



3/8 in

▲ Stop engine and let cool.

- 1 Spark Arrestor
- 2 Cleanout Plug

Remove plug and remove any dirt covering cleanout hole.

- 3 Exhaust Pipe

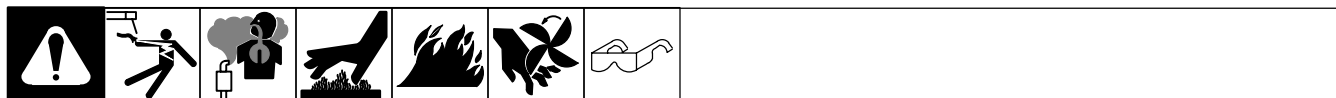
Start engine, and run at idle speed to blow dirt out cleanout hole. If nothing blows out of hole, briefly cover end of exhaust pipe.

▲ Stop engine and let cool.

Reinstall cleanout plug.

ST-157 313-A / Ref. ST-184 781-A

8-10. Troubleshooting



A. Welding

Trouble	Remedy
No weld output.	Check position of Ampere Range and Output Selector switches.
	Place Output/Contactor Control switch in On position, or place switch in Remote position and connect remote contactor to optional Remote 14 receptacle RC3 or terminal strip 3T (see Sections 4-8 and 4-9).
	Disconnect equipment from auxiliary power receptacles during start-up.
	Check connections to Remote 14 receptacle RC3 and terminal strip 3T (see Sections 4-8 and 4-9).
	Reset circuit breaker CB3 and/or CB4 (see Section 8-7).
	Check fuse F6, and replace if necessary (see Section 8-7).
	Have Factory Authorized Service Agent check brushes and slip rings, and circuit boards PC1 and PC2.
Erratic weld output.	Check and tighten connections both 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.
	Tighten lead connections to Ampere Range switch.
	Have Factory Authorized Service Agent check circuit boards PC1 and PC2.
High or low weld output.	Check engine speed, and adjust if necessary (see Section 8-6).
	Check CC/CV switch position.
	If low weld output, check fuse F6, and replace if necessary (see Section 8-7).
Low open-circuit voltage.	Check engine speed, and adjust if necessary (see Section 8-6).
	Check CC/CV switch position.
	Have Factory Authorized Service Agent check circuit boards PC1 and PC2.
Maximum weld output only in each ampere range.	Have Factory Authorized Service Agent check Amperage/Voltage control R1, capacitor C8, diode D8, integrated rectifier SR5, control relay CR8, and CV regulator board PC2.
Wire feeder does not work.	Reset circuit breaker CB3 and/or CB4 (see Section 8-7).
	Check connections to Remote 14 receptacle RC3 and terminal strip 3T (see Sections 4-8 and 4-9).
	Repair or replace wire feeder.
No amperage control.	Place Amperage/Voltage Control switch in correct position.
	Check connections to Remote 14 receptacle RC3 and terminal strip 3T (see Sections 4-8 and 4-9).
	Repair or replace remote control device.
	Have Factory Authorized Service Agent check controls.
No CV weld output.	Check and secure connections to optional Remote 14 receptacle RC3 or terminal strip 2T (see Section 4-8 or 4-9).
	Repair or replace remote control device.
	Have Factory Authorized Service Agent check CV regulator board PC2 and connector board PC30 and connections, and replace if necessary.
Low CV weld output.	Set Ampere Range switch to highest range.

Min or max CV weld output only.	Check position of Amperage/voltage control and Amperage/Voltage Control switch.
	Repair or replace remote control device.
	Have Factory Authorized Service Agent check optional CV regulator board PC2.
Tungsten electrode oxidizing and not remaining bright at end of weld.	Shield weld zone from drafts.
	Increase postflow time.
	Check and tighten all gas fittings.
	Properly prepare tungsten.
Wandering arc – poor control of direction of arc.	Reduce gas flow rate.
	Select proper size tungsten.
	Properly prepare tungsten.

B. Auxiliary Power Trouble

Trouble	Remedy
No output at ac receptacles.	Reset circuit breakers (see Section 6-1, 6-2, or 6-3).
	Press GFCI reset button on GFCI receptacles (see Section 6-1).
	Check fuse F6, and replace if necessary (see Section 8-7).
	Have Factory Authorized Service Agent check brushes and slip rings.
No or low output at single or three-phase auxiliary power plant.	Place Output(Contactor) or Amperage/Voltage switch in Panel position, or connect remote contactor to Remote 14 receptacle or terminal strip 3T (see Sections 4-8 and 4-9).
	Place CV/CC switch in CC position.
	Place Output Selector switch in Electrode Positive, Electrode Negative, or AC position.
	Check and replace fuse F1, F2, and/or F3 if necessary (see Section 6-4).
	Check engine speed, and adjust if necessary (see Section 8-6).
	Have Factory Authorized Service Agent check brushes and slip rings, and circuit boards PC1 and PC2.
	Check position of max OCV On/Off switch. If switch is in Off position, turn Amperage/Voltage control to max for full output from auxiliary power plant.
High auxiliary power output voltage.	Check engine speed, and adjust if necessary (see Section 8-6).
Low auxiliary power output voltage.	Check fuse F6, and replace if necessary (see Section 8-7).

C. Engine

Trouble	Remedy
Engine does not start.	Check fuel level (see Section 4-4).
	Check battery, and replace if necessary.
	Check magnetic shutdown switch fuse F, and replace if necessary (see Section 8-7).
	Check engine battery charging system according to engine service manual.
Engine suddenly stops.	If Check Cooling System/Alternator light is on, check engine belt.
	Check engine oil level (see Section 4-4). Engine stops if oil pressure is too low or oil temperature is too high.
	Check magnetic shutdown switch fuse F, and replace if necessary (see Section 8-7).
Engine remains at idle rpm when Engine Control switch is in the Run or Run/ Idle position and a load is applied.	Have Factory Authorized Service Agent check continuity and connections of current transformer CT1 and idle module.

Engine remains at weld rpm when Engine Control switch is in the Run/Idle position and load is removed.	Check fuse F11, and replace if open (see Section 8-7).
	Move CC/CV switch to CC position. Unit does not run at idle speed in CV mode.
	Have Factory Authorized Service Agent check continuity and connections of current transformer CT1 and idle module.
Engine does not stop when Engine Control switch is placed in Off position.	Have Factory Authorized Service Agent check diode D9
Air compressor does not build up pressure or builds pressure slowly.	Have Factory Authorized Service Agent check air compressor.
Engine uses oil during run-in period; wetstacking occurs.	Dry engine.

D. Optional Battery Charging System

Trouble	Remedy
Battery discharges between uses.	Be sure Engine Control switch is in Off position when unit is not being used.
	Clean top of battery with baking soda and water solution; rinse with clear water.
	Recharge or replace battery if necessary.
No battery charge output; Battery light is On.	Place Output Selector switch in Jump Start/Battery Charge position.
	Check and tighten battery connections if necessary.
	Battery being charged is bad. Properly dispose of battery.
No battery charge output; Battery light is Off.	Place Output Selector switch in Jump Start/Battery Charge position.
	Place Output (Contactor) switch in Remote position, and connect remote push button to Remote 14 receptacle.

E. Air Compressor

Trouble	Remedy
Air compressor fails to build pressure or builds pressure slowly.	Have Factory Authorized Service Agent check air compressor components.
Low air pressure.	Check for leaks in air lines and hoses.
	Disconnect air line at air control valve, and start engine to run air compressor. If air blows out of disconnected line, check air control valve. If air does not blow out of line, have Factory Authorized Service Agent check air compressor.
	Have Factory Authorized Service Agent check compressor for rated output.
Pneumatic tools freeze up because of moisture in compressed air.	Install optional Turbo 2000 air dryer/filter kit (Miller part no. 043 249).
	Induce an antifreeze solution into the air supply.
Oil in air lines.	Install optional Turbo 2000 air dryer/filter kit (Miller part no. 043 249).

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



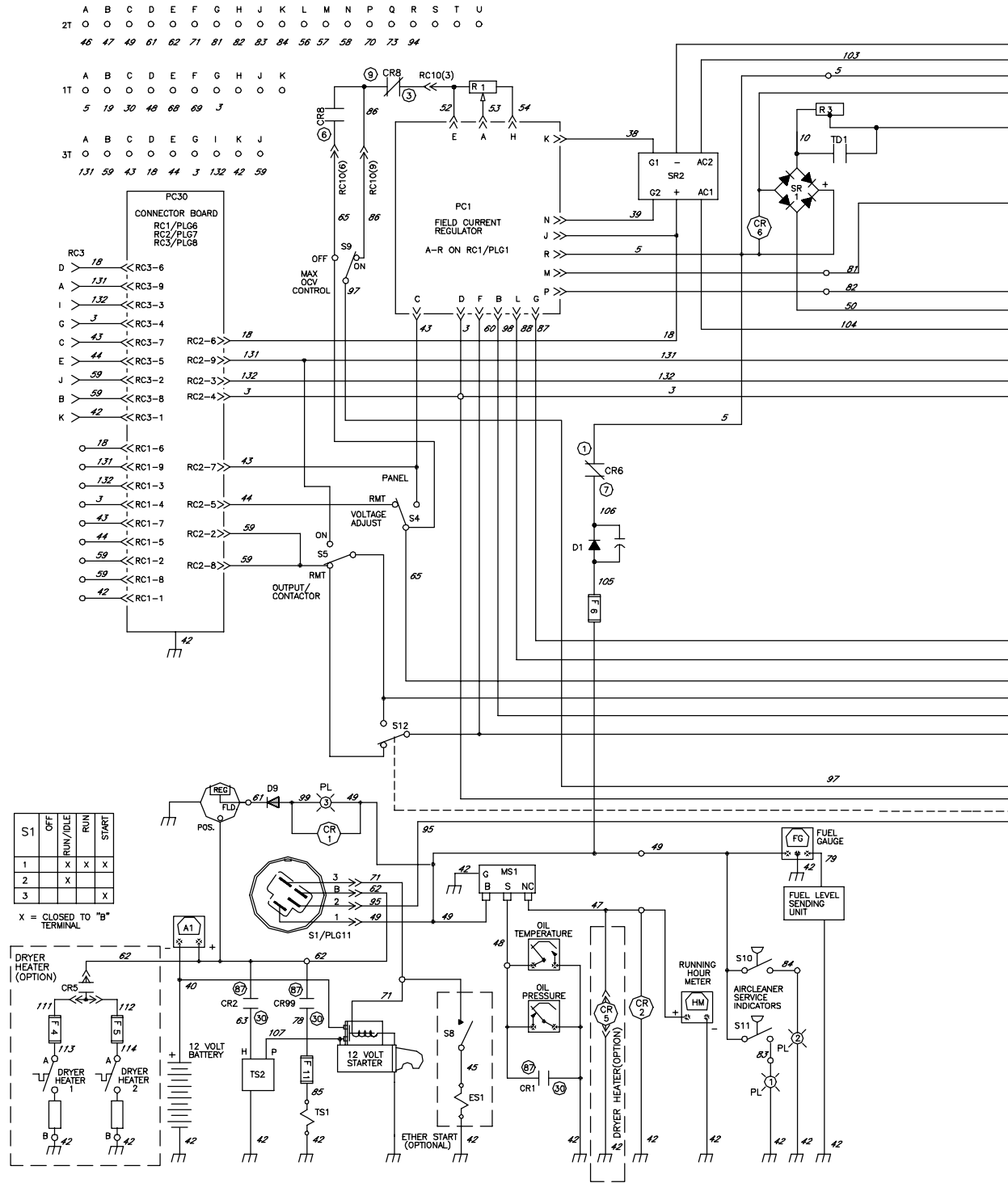
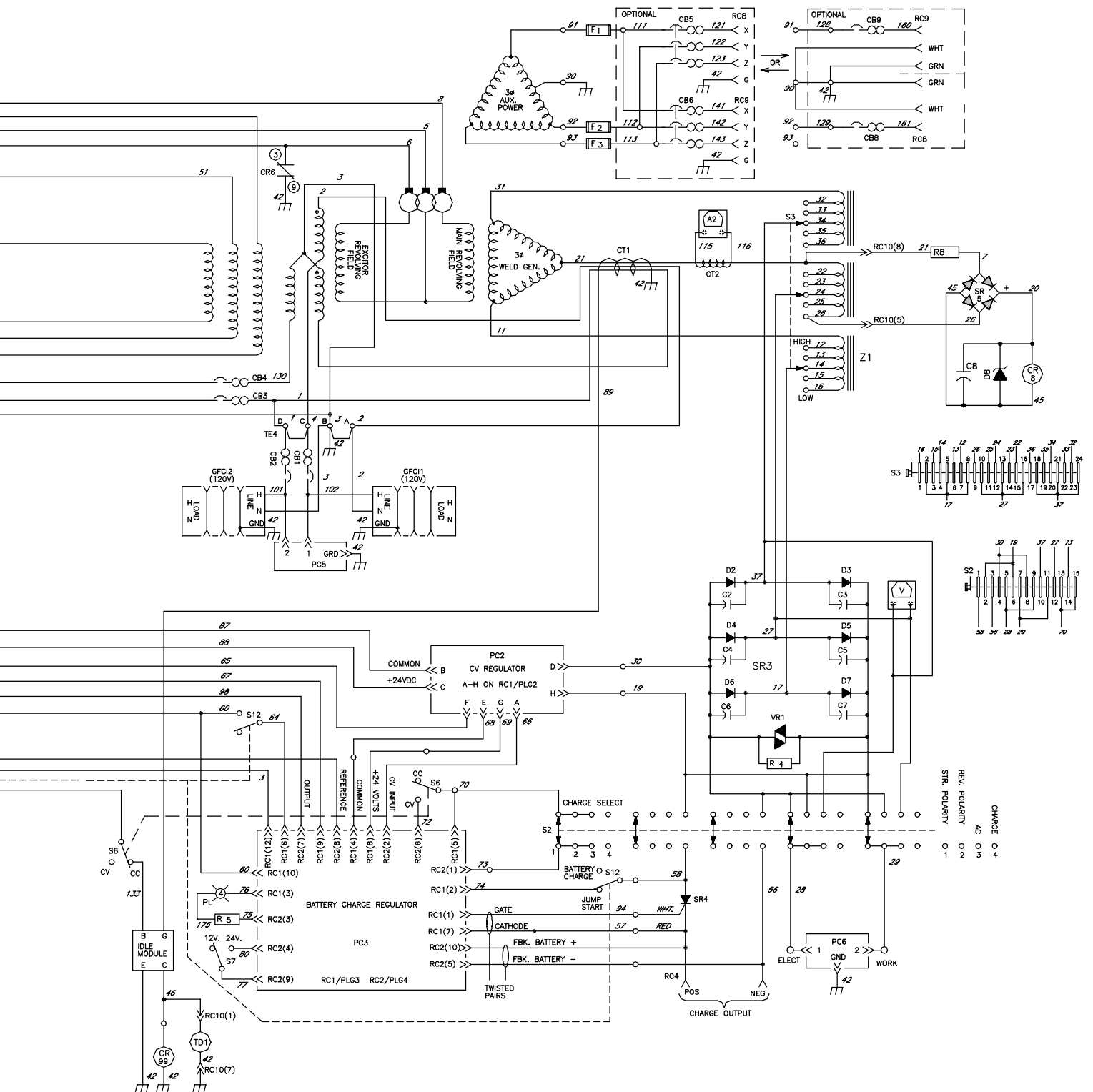
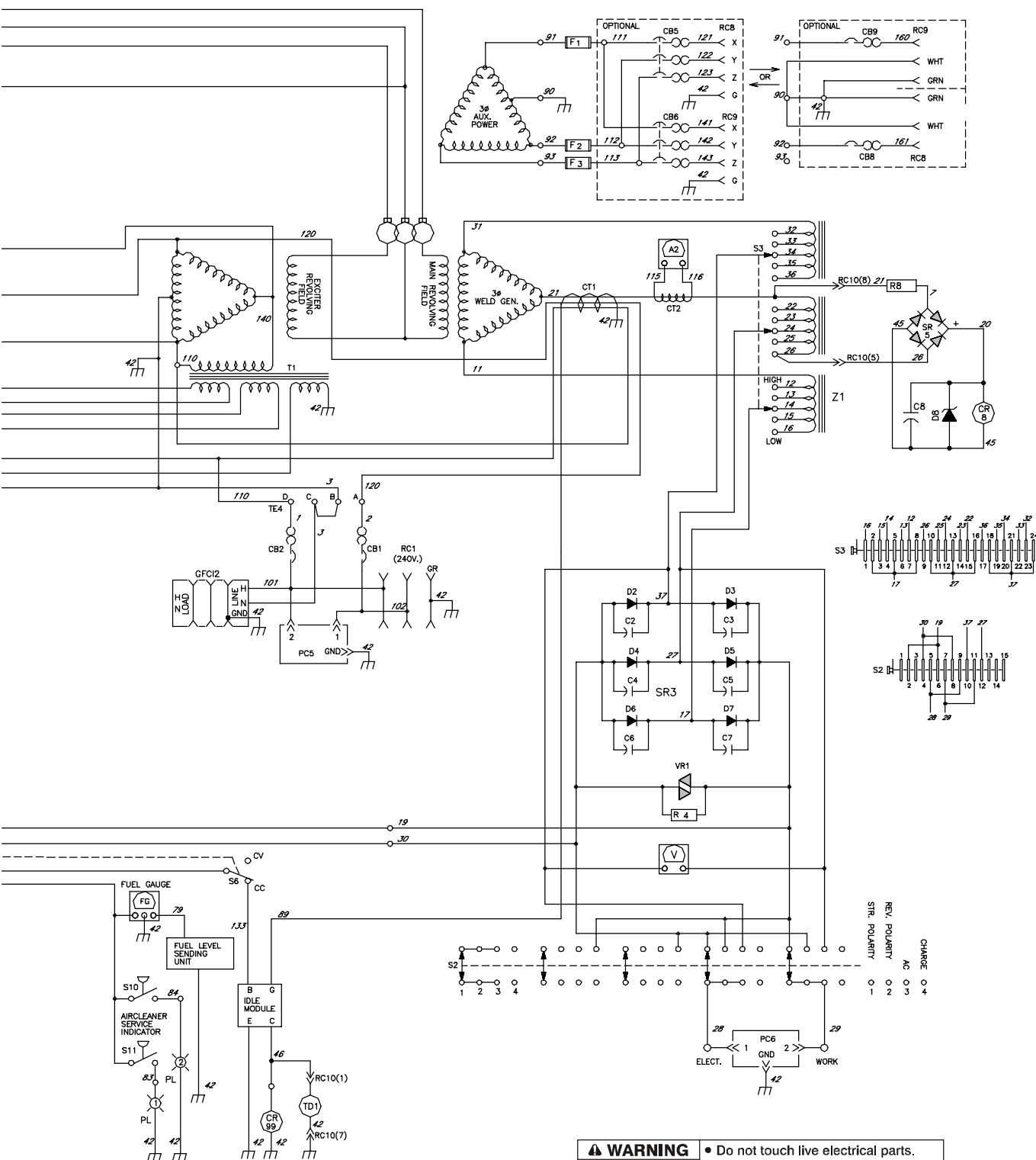


Figure 9-2. Circuit Diagram For Welding Generator With Optional Battery Charger

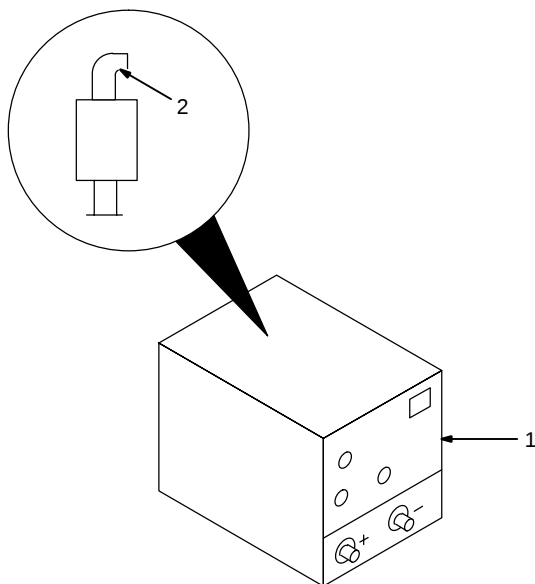




SECTION 10 – RUN-IN PROCEDURE

run_in1 6/96

10-1. Wetstacking



1 Welding Generator

Run diesel engines near rated output during run-in period to properly seat piston rings and prevent wetstacking. See nameplate or rating label to find rated output.

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

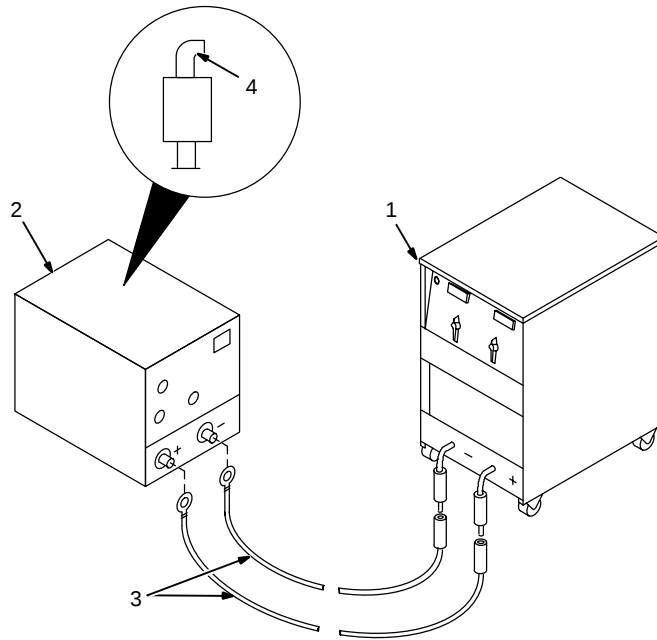
2 Engine Exhaust Pipe

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

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

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

10-2. Run-In Procedure Using Load Bank



▲ Stop engine.

▲ Do not touch hot exhaust pipe, engine parts, or load bank/grid.

▲ Keep exhaust and pipe away from flammables.

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 generator output (see nameplate).

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

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

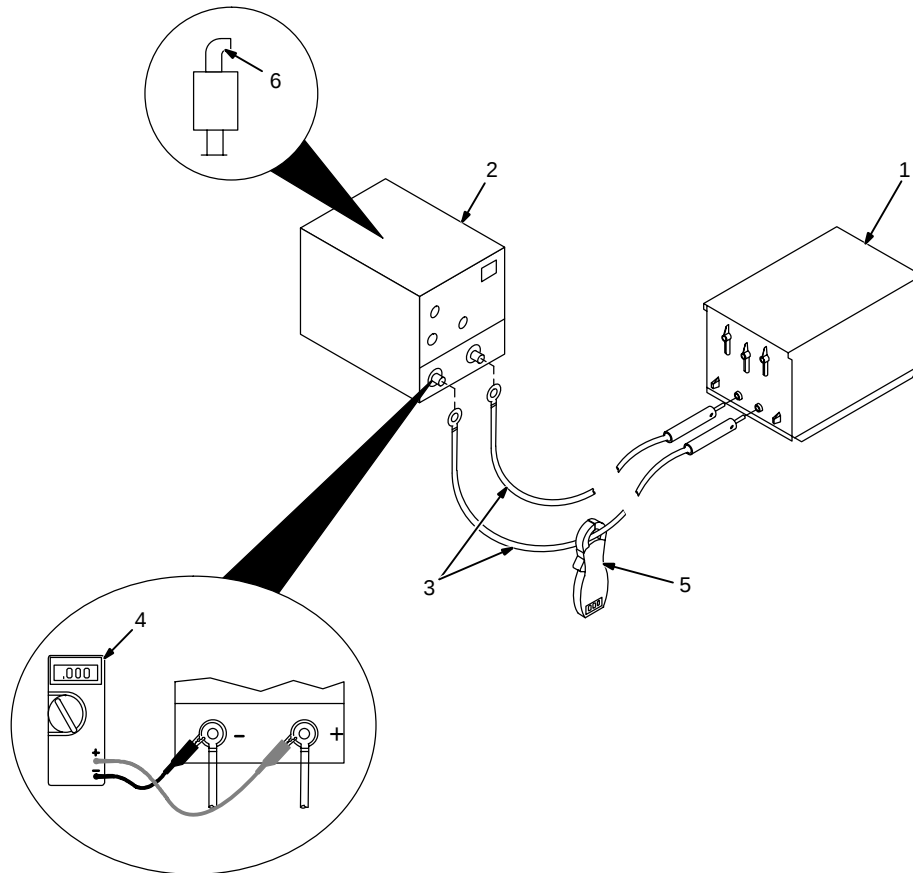
After one hour (minimum) place A/V control in minimum position, then turn off load bank to remove load. Run engine several minutes at no load.

▲ Stop engine and let cool.

4 Engine Exhaust Pipe

Repeat procedure if wetstacking is present.

10-3. Run-In Procedure Using Resistance Grid



▲ Stop engine.

▲ Do not touch hot exhaust pipe, engine parts, or load bank/grid.

▲ Keep exhaust and pipe away from flammables.

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 generator output (see nameplate).

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

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

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

▲ Stop engine and let cool.

6 Engine Exhaust Pipe

Repeat procedure if wetstacking is present.

SECTION 11 – AIR COMPRESSOR TABLES

11-1. Flow Of Free Air (CFM) Through Orifices Of Various Diameters

Gauge Pressure In Receiver (lb)	Orifice Diameter (in) And Free Air Flow (CFM)							
	1/64	1/32	3/64	1/16	3/32	1/8	3/16	1/4
1	0.027	0.107	0.242	0.430	0.97	1.72	3.86	6.85
2	0.038	0.153	0.342	0.607	1.36	2.43	5.42	9.74
3	0.046	0.188	0.471	0.750	1.68	2.98	6.71	11.9
5	0.059	0.242	0.545	0.965	2.18	3.86	8.71	15.4
10	0.084	0.342	0.77	1.36	3.08	5.45	12.3	21.8
15	0.103	0.418	0.94	1.67	3.75	6.65	15.0	26.7
20	0.119	0.485	1.07	1.93	4.25	7.7	17.1	30.8
25	0.133	0.54	1.21	2.16	4.75	8.6	19.4	34.5
30	0.156	0.632	1.40	2.52	5.6	10.0	22.5	40.0
35	0.173	0.71	1.56	2.80	6.2	11.2	25.0	44.7
40	0.19	0.77	1.71	3.07	6.8	12.3	27.3	49.1
45	0.208	0.843	1.9	3.36	7.6	13.4	30.3	53.8
50	0.225	9.14	2.05	3.64	8.2	14.5	32.8	58.2
60	0.26	1.05	2.35	4.2	9.4	16.8	37.5	67.0
70	0.295	1.19	2.68	4.76	10.7	19.0	43.0	76.0
80	0.33	1.33	2.97	5.32	11.9	21.2	47.5	85.0
90	0.364	1.47	3.28	5.87	13.1	23.5	52.5	94.0
100	0.40	1.61	3.66	6.45	14.5	25.8	58.3	103.0
110	0.43	1.76	3.95	7.00	15.7	28.0	63.0	112.0
120	0.47	1.90	4.27	7.58	17.0	30.2	68.0	121.0
130	0.50	2.04	4.57	8.13	18.2	32.4	73.0	130.0
140	0.54	2.17	4.87	8.68	19.5	34.5	78.0	138.0
150	0.57	2.33	5.2	9.20	20.7	36.7	83.0	147.0
175	0.66	2.65	5.94	10.6	23.8	42.1	95.0	169.0
200	0.76	3.07	6.90	12.2	27.5	48.7	110.0	195.0

11-2. Approximate Air Consumption (Cubic Feet) To Operate Pneumatic Equipment At 70-90 P.S.I.G.

MISCELLANEOUS PORTABLE TOOLS	Percent Use Factor And Compressed Air Consumption (CF)				MISCELLANEOUS PORTABLE TOOLS	Percent Use Factor And Compressed Air Consumption (CF)			
	9 sec	15 sec	21 sec	1 min		9 sec	15 sec	21 sec	1 min
Drill, 1/18" to 3/8"	3.75	6.25	8.75	25	Burring Tool, Large	3.6	6.0	8.4	24
Drill, 3/8" to 5/16"	5.25	8.75	12.25	35	Rammers, Small	3.9	3.25	9.1	13
Screwdriver, #2 to #6 Screw	1.8	3.0	4.2	12	Rammers, Medium	5.1	8.5	11.9	34
Screwdriver, #6 to 5/16" Screw	3.6	6.0	8.4	24	Rammers, Large	6.0	10.0	14.0	40
Tapper, to 3/8"	3.0	5.0	7.0	20	Backfill Tamper	3.75	6.25	8.75	25
Nutsetters, to 3/8"	3.6	6.0	8.4	24	Compression Riveter	0.2 cu. ft. per cycle			
Nutsetters, to 3/4"	4.5	7.5	10.5	30	Air Motor, 1 Horsepower	3.75	6.3	8.75	25
Impact Wrench, 1/4"	2.25	3.75	5.3	15	Air Motor, 2 Horsepower	7.5	12.5	17.5	50
Impact Wrench, 3/8"	3.0	5.0	7.0	20	Air Motor, 3 Horsepower	11.25	18.75	26.3	75
Impact Wrench, 5/8"	4.5	7.5	10.5	30	Air Motor Hoist 1000#	1 cu. ft. per foot of lift			
Impact Wrench, 3/4"	5.25	8.75	12.25	35	Air Motor Hoist, 2000#	1 cu. ft. per foot of lift			
Impact Wrench, 1"	6.75	11.25	15.75	45	Paint Spray Gun (Production)	3.0	5.00	7.00	20
Impact Wrench, 1-1/4"	8.25	13.75	19.2	55	HAMMERS				
Die Grinder, Small	2.25	3.75	5.3	15	Scaling Hammer	1.3	3.0	4.2	12
Die Grinder, Medium	3.6	6.0	8.4	24	Chipping Hammer	4.5	7.5	10.5	30
Horizontal Grinder, 2"	3.0	5.0	7.0	20	Riveting Hammer, Light	2.25	3.75	5.25	15
Horizontal Grinder, 4"	9.0	15.0	21.0	60	Riveting Hammer, Heavy	4.5	7.5	10.5	30
Horizontal Grinder, 6"	9.0	15.0	21.0	60	SAWS				
Horizontal Grinder, 8"	12.0	20.0	28.0	80	Circular, 8"	6.75	11.25	15.75	45
Vertical Grinders and Sanders, 5" Pad	5.25	8.75	12.25	35	Circular, 12"	9.75	16.25	23.8	65
Vertical Grinders and Sanders, 7" Pad	9.0	15.0	21.0	60	Chain, Lightweight	4.20	7.0	9.8	28
Vertical Grinders and Sanders, 9" Pad	10.5	17.5	24.5	70	Chain, Heavy Duty	13.1	21.8	30.5	87
Burring Toll, Small	2.25	3.75	5.3	15					

Always check with tool manufacturers for actual air consumption of tools being used. The above is based on averages and should not be considered accurate for any particular make of tool.

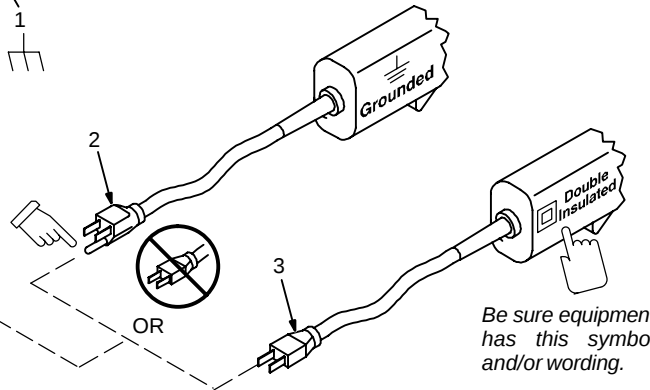
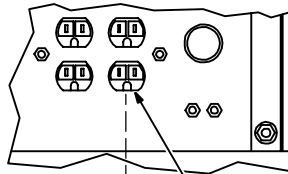
Above tools are rated based upon typical "on-load" performance characteristics.

For other values, adjust the C.F. air consumption on a proportional basis.

The cubic feet (C.F.) air consumption for 1 minute may also be expressed as air consumption in cubic feet per minute (C.F.M.)

SECTION 12 – AUXILIARY POWER GUIDELINES

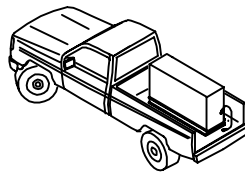
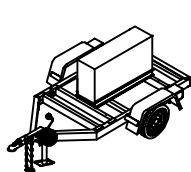
12-1. Selecting Equipment



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

aux_pwr 2/99 – Ref. ST-159 730 / ST-800 577

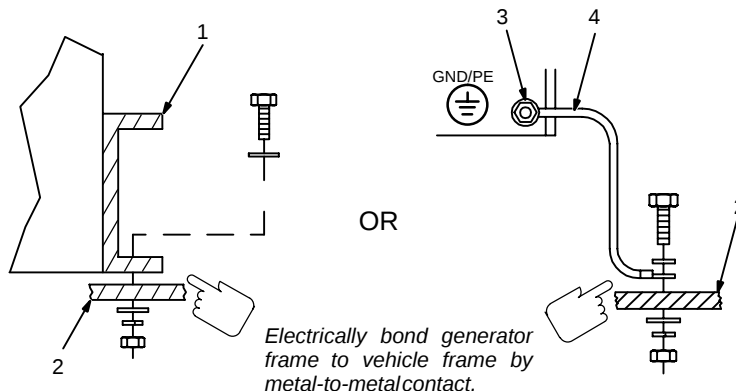
12-2. Grounding Generator To Truck Or Trailer Frame



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

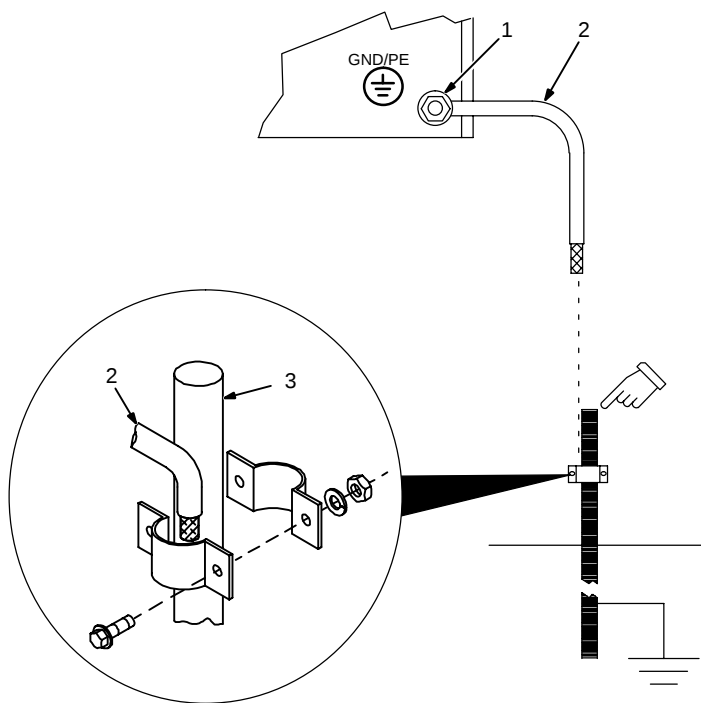
Use #10 AWG or larger insulated copper wire.

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



S-0854

12-3. Grounding When Supplying Building Systems



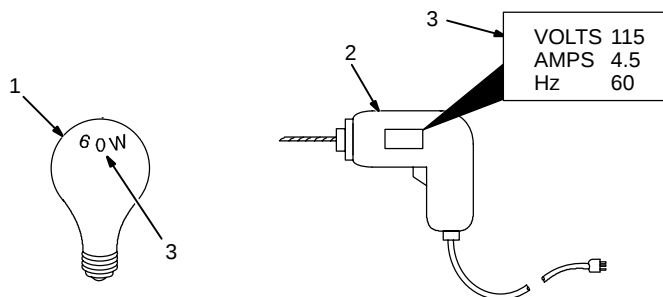
- 1 Equipment Grounding Terminal
- 2 Grounding Cable
- Use #10 AWG or larger insulated copper wire.
- 3 Ground Device

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

Use ground device as stated in electrical codes.

ST-800 576-B

12-4. 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 12-8).

- 3 Rating Data

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

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

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

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

The load applied by the drill is 520 watts.

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

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

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

S-0623

12-5. 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
	1-1/2 HP	8100	2000
Capacitor Start-Capacitor Run	5 HP	23300	6000
	7-1/2 HP	35000	8000
	10 HP	46700	10700
	1/8 HP	1000	400
Fan Duty	1/6 HP	1400	550
	1/4 HP	1850	650
	1/3 HP	2400	800
	1/2 HP	3500	1100

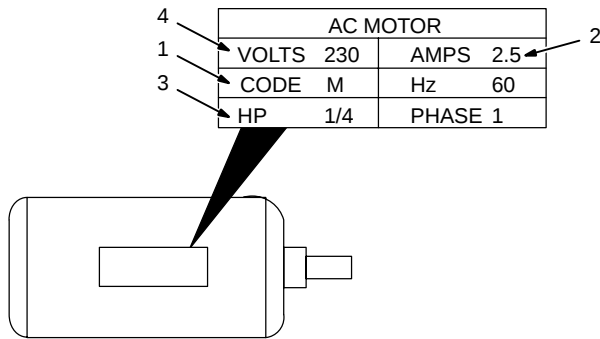
12-6. Approximate Power Requirements For Farm/Home Equipment

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

12-7. 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

12-8. Power Required To Start Motor



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

To find starting amperage:

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

Step 2: Find Motor HP and Volts.

Step 3: Determine starting amperage (see example).

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

Single-Phase Induction Motor Starting Requirements

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

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

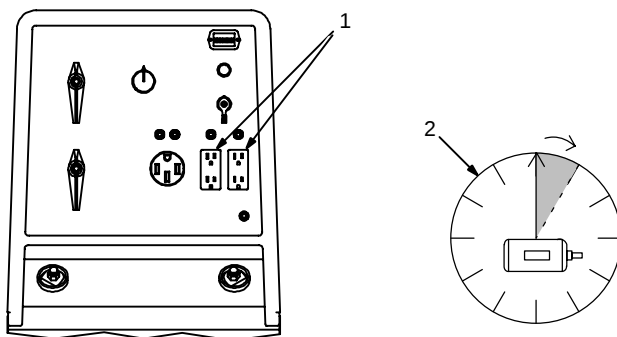
EXAMPLE: Calculate the starting amperage required for a 230 V, 1/4 HP motor with a motor start code of M.

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

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

S-0624

12-9. 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.

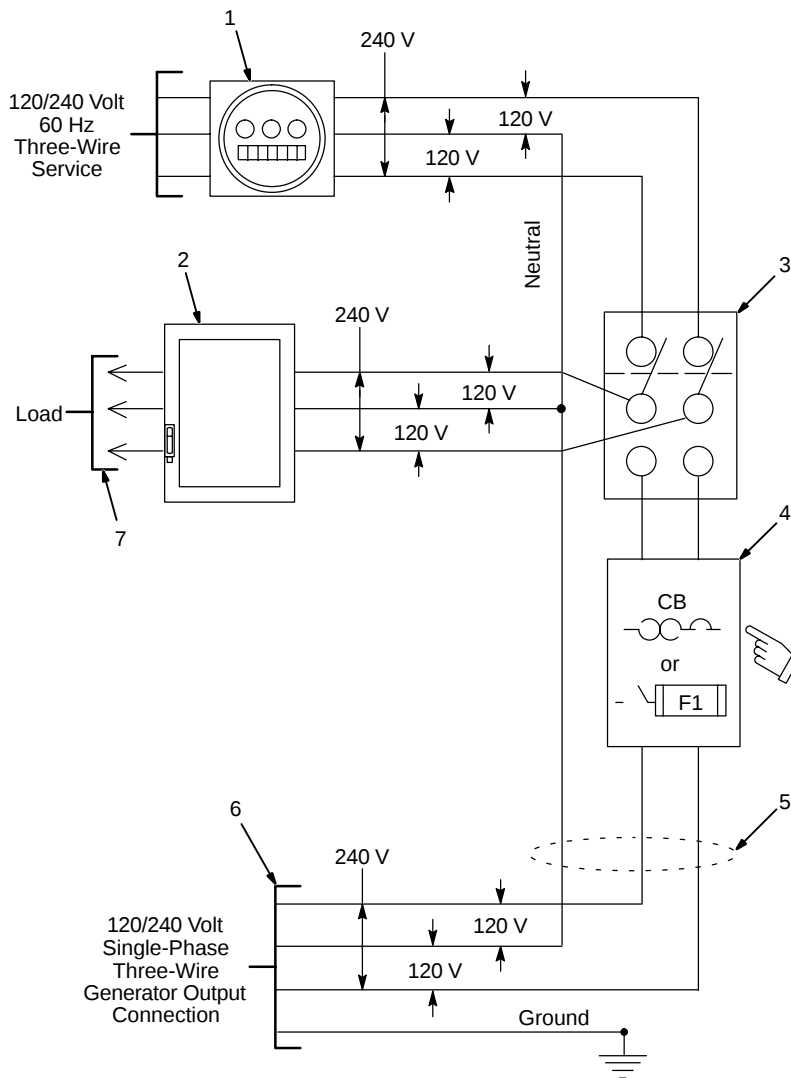
- 2 5 Second Rule

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

12-10. Typical Connections To Supply Standby Power



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



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

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

- 4 Circuit Breakers or Fused Disconnect Switch

Obtain and install correct circuit breakers or switch.

- 5 Extension Cord

Select as shown in Section 12-11.

- 6 Generator Connections

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

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

- 7 Load Connections

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

S-0405-A

12-11. 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 13 – SELECTING AND PREPARING TUNGSTEN ELECTRODE

gtaw 7/97

NOTE

For additional information, see your distributor for a handbook on the Gas Tungsten Arc Welding (GTAW) process. Wear clean gloves to prevent contamination of tungsten electrode.

13-1. Selecting Tungsten Electrode

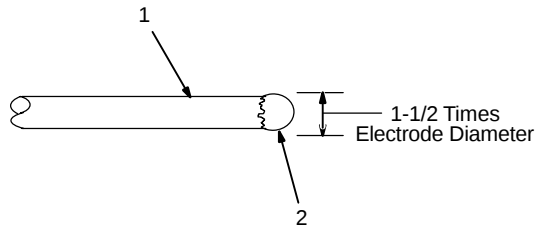
Electrode Diameter	Amperage Range - Gas Type♦ - Polarity			
	DC – Argon – Electrode Negative/Straight Polarity	DC – Argon – Electrode Positive/Reverse Polarity	AC – Argon – Using High Frequency	AC – Argon – Balanced Wave Using High Freq.
Pure Tungsten (Green Band)				
.010"	Up to 15	*	Up to 15	Up to 10
.020"	5-20	*	5-20	10-20
.040"	15-80	*	10-60	20-30
1/16"	70-150	10-20	50-100	30-80
3/32"	125-225	15-30	100-160	60-130
1/8"	225-360	25-40	150-210	100-180
5/32"	360-450	40-55	200-275	160-240
3/16"	450-720	55-80	250-350	190-300
1/4"	720-950	80-125	325-450	250-400
2% Thorium Alloyed Tungsten (Red Band)				
.010"	Up to 25	*	Up to 20	Up to 15
.020"	15-40	*	15-35	5-20
.040"	25-85	*	20-80	20-60
1/16"	50-160	10-20	50-150	60-120
3/32"	135-235	15-30	130-250	100-180
1/8"	250-400	25-40	225-360	160-250
5/32"	400-500	40-55	300-450	200-320
3/16"	500-750	55-80	400-500	290-390
1/4"	750-1000	80-125	600-800	340-525
Zirconium Alloyed Tungsten (Brown Band)				
.010"	*	*	Up to 20	Up to 15
.020"	*	*	15-35	5-20
.040"	*	*	20-80	20-60
1/16"	*	*	50-150	60-120
3/32"	*	*	130-250	100-180
1/8"	*	*	225-360	160-250
5/32"	*	*	300-450	200-320
3/16"	*	*	400-550	290-390
1/4"	*	*	600-800	340-525

♦ Typical argon shielding gas flow rates are 15 to 35 cfh (cubic feet per hour).

*Not Recommended.

The figures listed are intended as a guide and are a composite of recommendations from American Welding Society (AWS) and electrode manufacturers.

13-2. Preparing Tungsten For AC Or DC Electrode Positive (DCEP) Welding



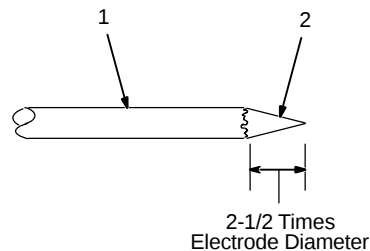
- 1 Tungsten Electrode
- 2 Balled End

▲ Understand and follow safety symbols at start of Section 14-1 before preparing tungsten.

Ball end of tungsten before welding by applying either an ac amperage slightly higher than what is recommended for a given electrode diameter (see Section 13-1), or a dc electrode positive amperage.

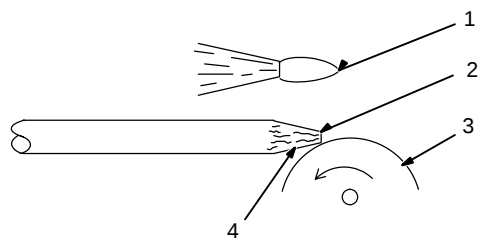
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13-3. Preparing Tungsten For DC Electrode Negative (DCEN) Welding



- 1 Tungsten Electrode
- 2 Tapered End

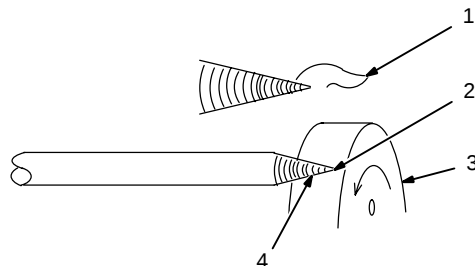
Grind end of tungsten on fine grit, hard abrasive wheel before welding. Do not use wheel for other jobs or tungsten can become contaminated causing lower weld quality.



Ideal Tungsten Preparation – Stable Arc

- 1 Stable Arc
- 2 Flat
- 3 Grinding Wheel
- 4 Straight Ground

Diameter of this flat determines amperage capacity.



Wrong Tungsten Preparation – Wandering Arc

- 1 Arc Wander
- 2 Point
- 3 Grinding Wheel
- 4 Radial Ground

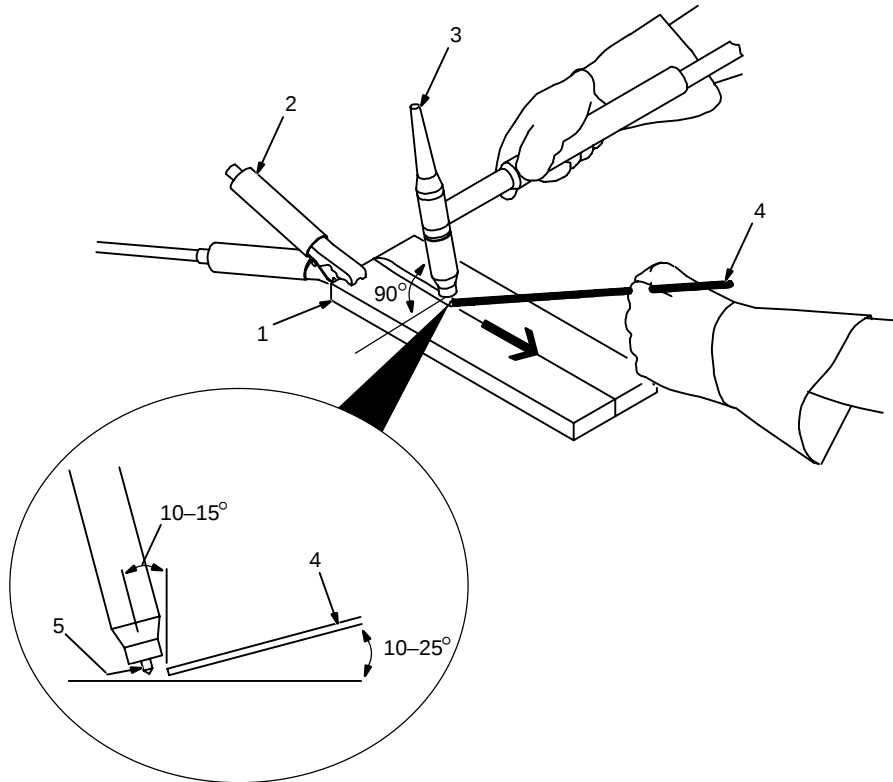
Ref. S-0161 / Ref. S-0162

SECTION 14 – GUIDELINES FOR TIG WELDING (GTAW)

14-1. Positioning The Torch



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



1 Workpiece

Make sure workpiece is clean before welding.

2 Work Clamp

Place as close to the weld as possible.

3 Torch

4 Filler Rod (If Applicable)

5 Tungsten Electrode

Select and prepare tungsten according to Sections 13-1, and 13-2 or 13-3.

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

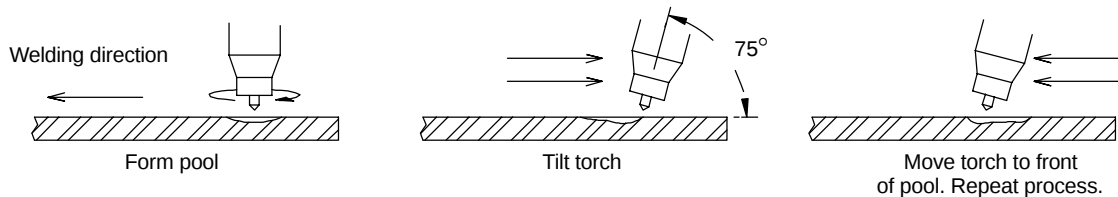
Arc length is the distance from the tungsten to the workpiece.

As a general guide, start with an extension and arc length equal to diameter of tungsten.

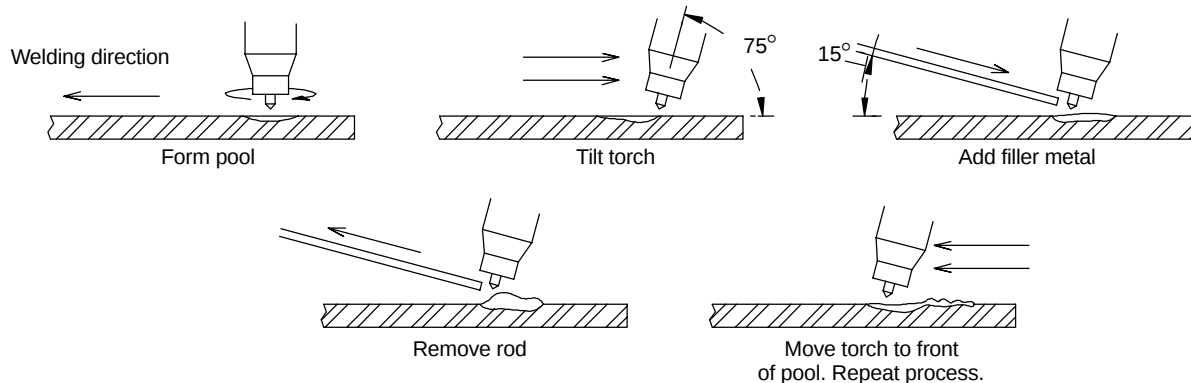
ST-161 892

14-2. Torch Movement During Welding

Tungsten Without Filler Rod



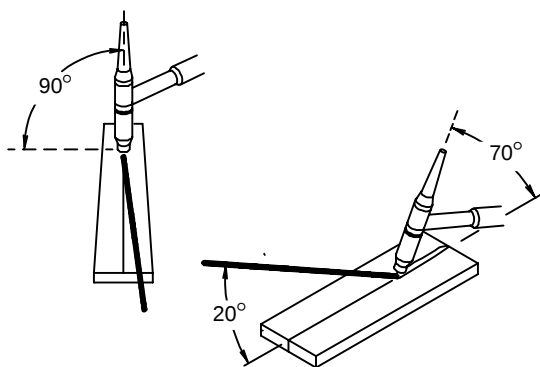
Tungsten With Filler Rod



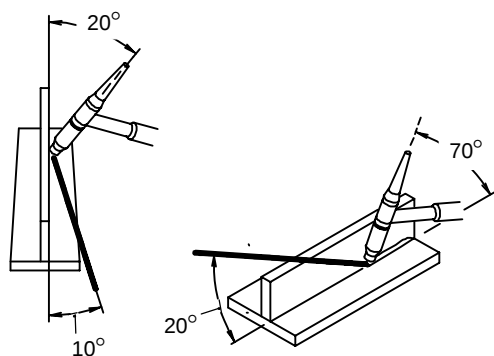
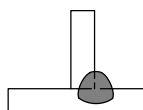
ST-162 002-B

14-3. Positioning Torch Tungsten For Various Weld Joints

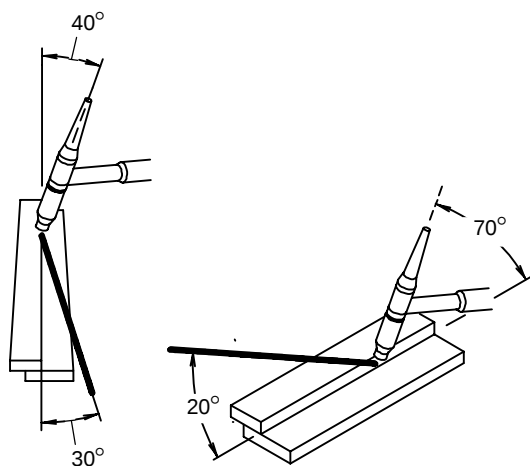
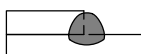
Butt Weld And Stringer Bead



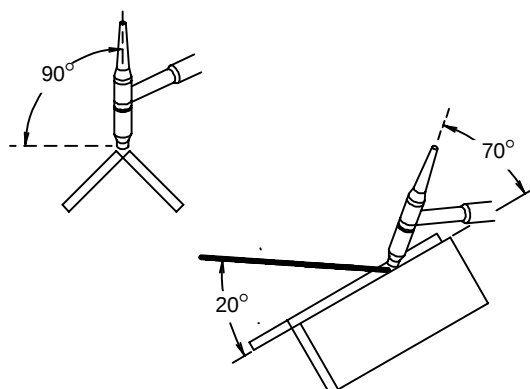
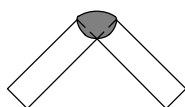
"T" Joint



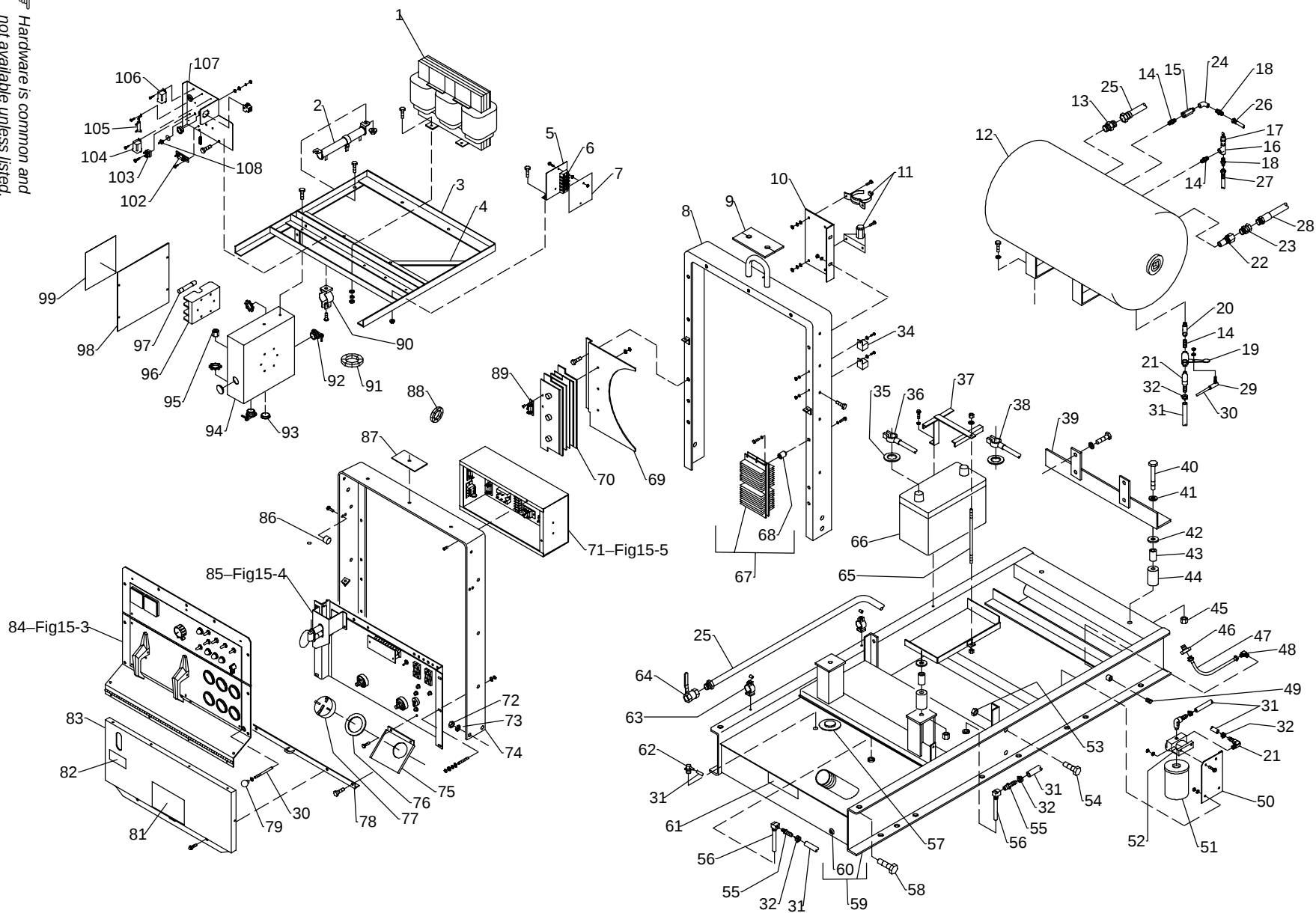
Lap Joint



Corner Joint



SECTION 15 – PARTS LIST



ST-121 286-H (Part 1 of 2)

Hardware is common and not available unless listed.

Figure 15-1. Main Assembly (Part 1 Of 2)

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
Figure 15-1. Main Assembly (Part 1 Of 2)				
1	Z1	186 907	REACTOR	1
		049 525	NUT, speed push-on-type .312-18 U type	8
2	R3	128 862	RESISTOR, WW adj 375W 50 ohm	1
3		118 642	FRAME, mtg air tank/reactor	1
4		135 290	BRACKET, support valve drain	1
5		145 023	BRACKET, mtg strip terminal	1
6	TE4	038 621	BLOCK, term 30A 4P	1
		038 620	LINK, jumper term blk 30A	2
7		145 035	INSULATOR, strip terminal voltage changeover	1
8		118 643	UPRIGHT, center	1
9		017 479	SEAL, weather lift eye	1
		♦041 480	STARTING AID, diesel (consisting of)	1
	ES1	046 410	ATOMIZER, .125 L elbow orf 180deg	1
		113 342	ADAPTER, atomizer	1
		020 185	FITTING, pipe brs elbow st 1/8NPT	1
			See Fig 15-3 for additional parts	
10		083 859	BRACKET, mtg fuel filter/quick start	1
11		034 074	STARTING AID KIT	1
12		118 068	TANK, air (consisting of)	1
		195 832	TANK, air 21 gal 2.8 cubic ft 225PSI max	1
		173 438	FITTING, pipe plug recessed sq 1.500NPT	2
13		118 132	FITTING, pipe stl nipple hex 3/4NPT	1
14		010 830	FITTING, pipe brs nipple hex 1/4NPT	3
15		135 448	FILTER, air inline 1/4FNPT inlet 1/4MNPT outlet	1
16		602 936	FITTING, pipe galv tee .250NPT	1
17		088 683	VALVE, relief 1/4NPT	1
18		106 394	FITTING, brs flrd conn M hd 1/4tbg x 1/4NPT	2
19		134 959	VALVE	1
20		010 678	FITTING, pipe brs elbow st 1/4NPT LH	1
21		145 282	FITTING, hose brs barbed elbow 5/16tbg x 1/4NPT	1
22		195 831	VALVE, check air 450PSI 3/4FNPT inlet 3/4MNPT outlet	1
23		118 136	FITTING, pipe stl adapter swivel M 3/4NPSM x 3/4NPT	1
24		076 357	FITTING, pipe brs elbow 1/4NPT	1
25		118 706	AIR LINE, tank to exit	1
26		175 456	HOSE, air SAE .250 ID x .500 OD x 41 in (See Fig 15-2 Item 68)	1
27		120 303	HOSE, pressure air gauge	1
28		138 098	HOSE, sst 20.750 lg 3/4NPT M ftg & 3/4NPT M inv	1
29		024 799	BALL JOINT, .250-28thd	1
30		135 195	STUD, stl .250-20 x 22 .500	1
31		134 835	HOSE, SAE .312 ID x .560 OD (order by ft)	12ft
32		172 071	CLAMP, hose .520-.605clp dia slftng	7
33		Deleted		
34	CR2,9	090 104	RELAY, encl 12VDC SPST	2
35		108 081	TERMINAL PROTECTOR, battery post	2
36		032 453	CABLE, bat neg w/clamp	1
37		118 644	HOLD DOWN, bat	1
38		182 276	CABLE, battery pos	1
39		116 707	SUPPORT, front engine	1
40		601 945	SCREW, cap stl hexhd .625-18 x 4.00	4
41		071 731	WASHER, flat stl .656 ID x2.250 OD x .187thk pld	4
42		071 890	RETAINER, mount engine/generator	4
43		071 730	TUBING, stl .875 ID x 12ga wall x 2.375	4
44		083 476	TUBING, nprn .875 ID x 2.500 OD x 2.000	4
45		601 851	NUT, stl slfkg hex reg .625-18	4
46		118 452	FITTING, adapter oil drain	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
Figure 15-1. Main Assembly (Part 1 Of 2) (Continued)				
47		159 012	HOSE, oil drain 11.000 3/4 swivel fem 1/2MNPT	1
48		159 013	FITTING, pipe stl elbow M 1/2tbg x .500NPT	1
49		089 351	FITTING, pipe brs plug hexhd 1/2NPT	1
50		117 227	BRACKET, mtg fuel filter	1
51		062 342	SEPARATOR, fuel filter & water	1
52		083 553	BASE, filter fuel w/adaptor	1
53		135 205	NUT, .625-11 stl elastic stop	4
54		092 434	SCREW, .625-11 x 1.250hexhd	4
55		039 599	FITTING, brs barbed M 5/16tbg x 1/4NPT	2
56		119 486	TUBE, pick up fuel	2
57		146 358	SENDER, fuel gauge	1
58		601 965	SCREW, .375-16 x 1.000hexhd	4
59		+159 014	BASE, (consisting of)	1
60		602 887	FITTING, pipe brs plug hexhd 1/4NPT	1
61		121 823	LABEL, warning do not lift frame	1
62		167 298	VENT, fuel tank	1
63		010 876	HANGER, minerallic No. 1	2
		059 875	TUBING, stl .375 OD x .256 ID x .437	2
64		088 684	VALVE, ball bronze 1/2 F	1
65		010 460	BOLT, L stl .312-18 x 10.000	1
66	BAT	012 724	BATTERY, 12V 95A	1
67	SR4 ♦♦	118 757	RECTIFIER, SCR main (consisting of)	1
		121 430	THYRISTOR, SCR 865A 300V	1
		117 572	CLAMP, thyristor	1
		028 516	PIN, spring .125 x .250	2
68		118 754	STAND-OFF, insul .312-16 x 2.000 lg	2
		118 755	HEAT SINK	2
69		116 981	BRACKET, rect	1
70	SR3	142 507	RECTIFIER, si 3ph 450A	1
71		Fig 15-5	CONTROL BOX	1
72		601 872	NUT, stl hex jam .375-16	4
73		602 213	WASHER, lock stl split .375	4
74		118 640	UPRIGHT, front	1
75		122 354	GUARD, splash fuel	1
76		107 343	GROMMET, rbr neck filter fuel	1
77		024 035	CAP, fuel tank	1
78		118 790	ANGLE, strain relief	1
79		019 603	KNOB, ball 1.250 OD w/.250-20thd	1
80		Deleted		
81		134 792	LABEL, warning general precautionary	1
82	♦♦	115 588	LABEL, warning battery charging precautionary	1
83		+127 304	DOOR, front lower	1
83	+♦♦	127 305	DOOR, front lower	1
84		Fig 15-3	PANEL, front w/components	1
85		Fig 15-4	PANEL, front lower w/components	1
86		087 341	BUMPER, door 1.000 in OD x .750	6
87		121 699	SPACER, cover	3
88	CT1	105 370	TRANSFORMER, current	1
89	R4,VR1	046 819	SUPPRESSOR	1
90		010 083	HANGER, minerallic No. 6	1
91	CT2	110 924	TRANSFORMER, current 500/5	1
92		604 102	CONNECTOR, clamp cable 1.000	2
93		057 360	BLANK, snap-in nyl 1.375mtg hole	2
94		134 903	FUSE BOX	1
95		026 947	STAND-OFF, insul .250-20 x 1.000 lg x.312thd	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
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Figure 15-1. Main Assembly (Part 1 Of 2) (Continued)

96		149 541	HOLDER, fuse crtg 60A 250V	1
97	F1-3	*012 625	FUSE, crtg 45A 250V	3
98		+132 116	COVER, junction box	1
99		160 620	LABEL, warning 3ph auxiliary pwr	1
100		Deleted		
101		Deleted		
102	C8	170 674	CAPACITOR BOARD	1
103	SR5	035 704	RECTIFIER, integrated 40 A	1
104	TD1	178 252	RELAY, 12 VDC SPST	1
105	R8	030 844	RESISTOR, WW fixed 25 W	1
		605 741	CLIP, mtg resistor	2
106	CR8	044 588	RELAY, encl 12 VDC 3PDT 10 A	1
107		186 679	PANEL, mtg components	1
	RC10	168 071	CONNECTOR & PINS	1
	PLG10	168 071	CONNECTOR & SOCKETS	1
108	D8	192 307	KIT, diode w/washers	1
		030 170	BUSHING, snap-in nylon .750	1

♦OPTIONAL

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

♦♦Part of 042 182 Optional Jump Start/Battery Charging *Recommended Spare Parts

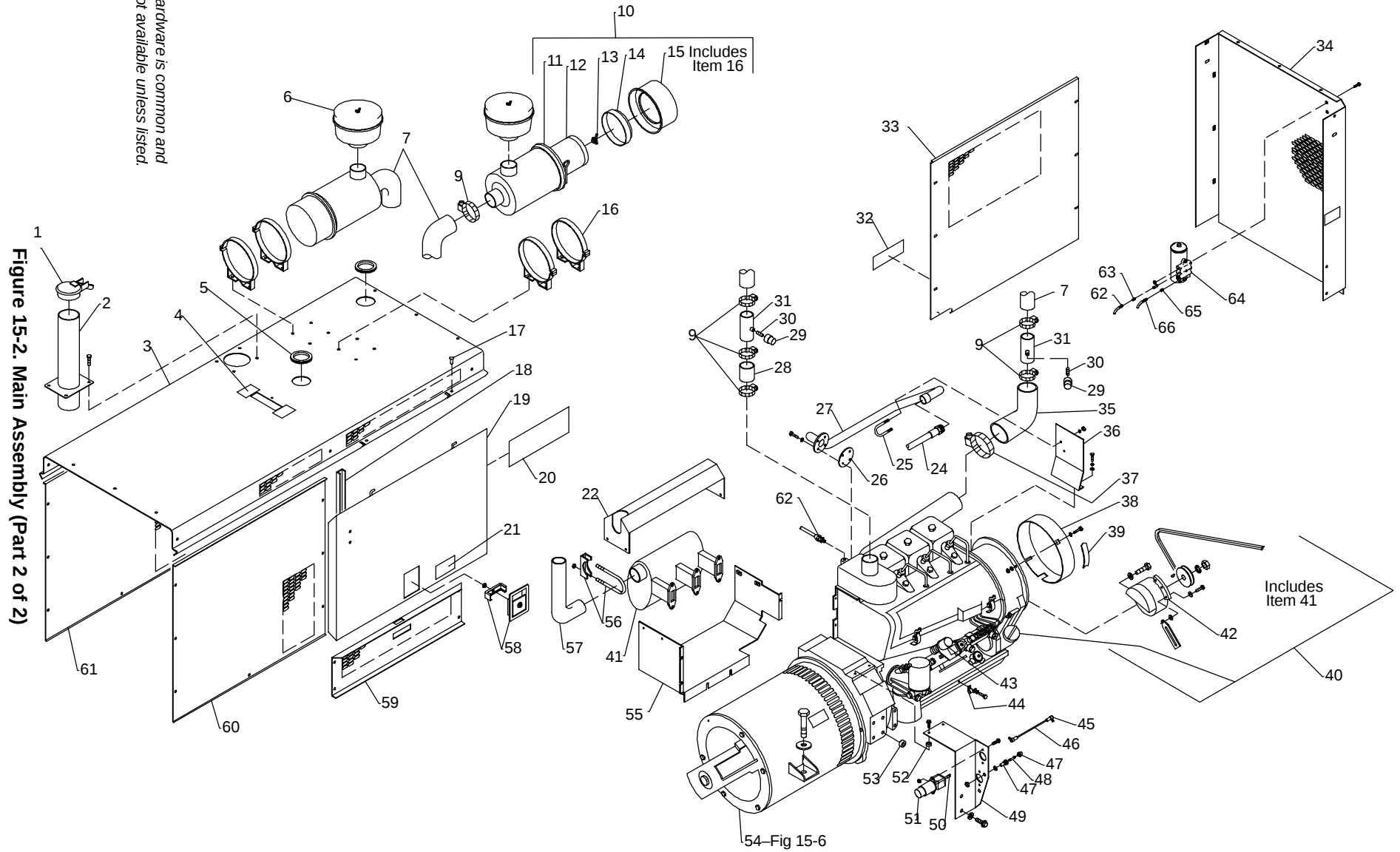
To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
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Figure 15-2. Main Assembly (Part 2 Of 2)

1		118 073	CAP, rain 3 in ID	1
2		117 486	PIPE, exhaust	1
3		+123 475	COVER, top	1
		186 678	BRACKET, air line support	1
		015 714	GROMMET, rbr 1.5 id X 1.625	1
4		108 487	LABEL, warning falling equipment etc	2
5		089 178	GROMMET, rbr 3.000 ID x 3.500mtg hole	2
6		046 544	PRECLEANER	2
7		121 418	HOSE, elb air cleaner	2
8		Deleted		
9		010 863	CLAMP, hose 2.062-3.000clp dia	7
10		045 657	AIR CLEANER, intake (consisting of)	2
11		021 114	CLAMP ASSEMBLY	1
12		*020 319	ELEMENT	1
13		021 117	NUT, wing	1
14		004 115	BAFFLE, dust cap	1
15		021 116	CAP, dust	1
16		021 115	BAND, mtg	2
17		089 343	RIVET, nyl .250dia x 1.000 lg	2
18		004 130	BRACKET, door support	1
19		+119 987	DOOR, side	1
		087 341	BUMPER, door 1.000 OD x .750 high	6
20		120 629	LABEL, diesel engine maintenance	1
21		158 610	LABEL, warning electric shock and moving parts	2
22		119 797	BAFFLE, air manifold exhaust	1

Hardware is common and not available unless listed.



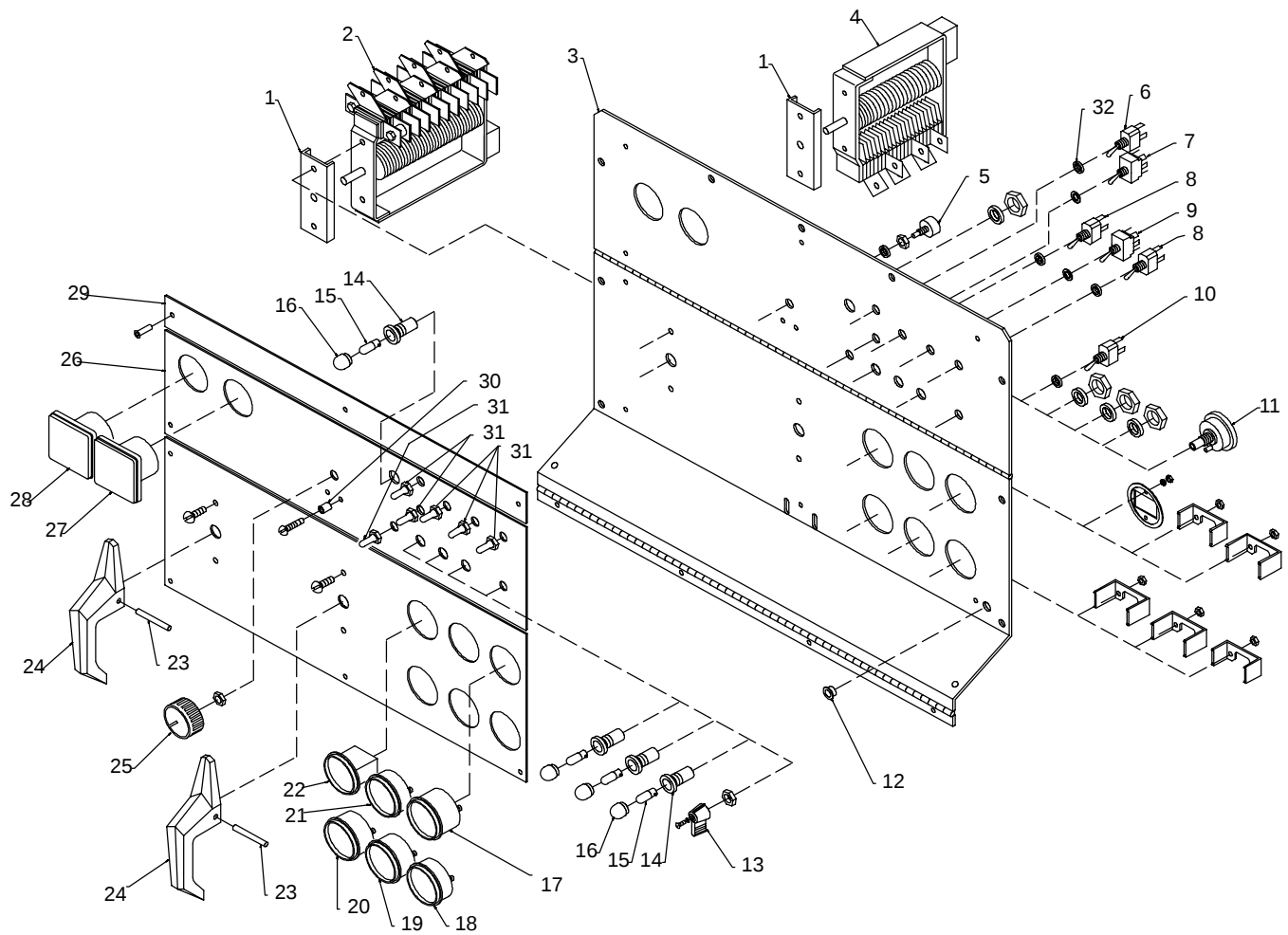
Item No.	Dia. Mkgs.	Part No.	Description	Quantity
Figure 15-2. Main Assembly (Part 2 Of 2) (Continued)				
24		138 098	HOSE, sst 20.750 lg 3/4NPT M ftg & 3/4NPT M inv	1
25		089 973	BOLT, U stl .250-20 x 1.125 wide x 2.250 deep	1
26		118 075	GASKET, flanged air pressure	1
27		118 349	AIR LINE, compressor to tank	1
28		121 417	HOSE, air cleaner	1
29	S10,11	118 067	SWITCH, vacuum air flow	2
30		073 655	FITTING, pipe brs nipple hex 1/8NPT	2
31		089 129	PIPE, air cleaner	2
32		168 385	LABEL, warning battery explosion can blind	1
33		+117 457	PANEL, engine LH	1
34		+117 257	PANEL, engine end	1
35		121 416	HOSE, elb air cleaner	1
36		117 228	BRACKET, mtg air line	1
37		023 313	CLAMP, hose 3.250-3.000clp dia	1
38		048 213	BAFFLE, air intake	1
39		095 970	STRIP, nprn wsl eng firewall	2
40		117 017	ENGINE, diesel electric (consisting of)	1
		Fig 15-5	COMPRESSOR, air	1
41		065 554	MUFFLER	1
42			ALTERNATOR, (included w/engine see engine parts list)	1
		065 556	PIPE CLIP	1
		064 744	GASKET, exhaust	1
		064 432	STUD	1
		065 557	BOLT	1
		066 145	WASHER/DISC/PLATE	1
		064 520	NUT	1
		065 559	NUT	1
		065 129	NUT, exhaust	1
43		141 346	SHUT DOWN KIT, engine	1
44		137 180	CLAMP, stl cush .875dia x .343mtg hole	2
		172 071	CLAMP, hose .520-.605clp dia	1
45		119 956	BALL JOINT	2
46		191 718	ROD, throttle	1
47		046 432	HOLDER, fuse mintr	1
48	F11	*085 874	FUSE, mintr gl slo blo 10A	1
49		117 225	BRACKET, mtg solenoid	1
50		107 333	LINK, throttle	2
51	TS1	183 030	SOLENOID, 12VDC 44A	1
52		159 184	TUBING, stl .875 OD x .563 ID x .312 lg	2
53		119 836	TUBING, stl .875 OD x .563 ID x .875 lg	2
54		Fig 15-6	GENERATOR	1
55		166 805	BAFFLE, air manifold exhaust	1
56		010 875	CLAMP, muffler 2.000	1
57		119 664	PIPE, muffler extension elb	1
58		119 861	LATCH	1
59		193 050	PANEL, rocker	1
60		170 549	PANEL, side RH	1
61		170 550	PANEL, side LH	1
		120 304	BLANK, snap-in nyl .250mtg hole black	3
62		186 177	HOSE, air 43 in	1
63		110 743	FITTING, flrd brs conn m hd 1/4 tbg	1
64		174 582	GOVERNOR, air control	1
65		010 289	FITTING, flrd brs invt conn m 1/4	1
66		175 456	HOSE, air SAE .250ID x .500 OD x 41 in (See Fig 15-1 Item 18)	1

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

*Recommended Spare Parts

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

☞ Hardware is common and not available unless listed.



ST-121 288-D

Figure 15-3. Panel, Front w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
Figure 15-3. Panel, Front w/Components (Fig 15-1 Item 84)				
... 1		086 706	.. SPACER, range switch	2
... 2	S3	119 850	.. SWITCH, range/changeover	1
... 3		118 340	.. PANEL, front upper	1
... 4	S2	113 483	.. SWITCH, selector	1
... 5	R1	072 623	.. POTENTIOMETER, C 1/T 2W 1000 ohm	1
... 6	S7	♦011 609	.. SWITCH, tgl SPDT 15A 125VAC	1
... 7	S12	♦011 622	.. SWITCH, tgl 3PDT 15A 125VAC	1
... 8	S4,5	011 609	.. SWITCH, tgl SPDT 15A 125VAC	2
... 9	S6	011 611	.. SWITCH, tgl DPDT 15A 125V	1
... 10	S8	♦♦021 467	.. SWITCH, tgl SPST MC 3A 250V	1
... 11	S1	176 606	.. SWITCH, ignition 4 position	1
...	PLG11	177 859	.. CONNECTOR, body 5 terminal	1
... 12		088 731	.. BUSHING, snap-in nyl .375 ID x .500mtg hole	1
... 13		119 014	.. LEVER	1
... 14		082 788	.. HOLDER, light	3
... 14		♦082 788	.. HOLDER, light	1
... 15	PL1-3	*048 155	.. BULB, indicator 12V	3
... 15	PL4	♦048 155	.. BULB, indicator 12V	1
... 16		082 789	.. LENS, red	3
... 16		♦082 789	.. LENS, red	1
... 17	FG	118 066	.. GAUGE, fuel elec 12V	1
... 18	A1	118 060	.. METER, A DC 60-0-60	1
... 19		129 870	.. GAUGE, pressure oil 25-30PSI	1
...		128 829	.. KIT, oil line 44.000 in c 1/8NPT x 10mm	1
... 20		129 837	.. GAUGE/SWITCH, temp oil mech 250deg	1
... 21		118 069	.. GAUGE, air pressure mech 0-150PSI	1
... 22	HM	118 058	.. METER, hour 8-24VDC	1
... 23		010 647	.. PIN, spring CS .156 x 1.250	2
... 24		090 231	.. HANDLE, range switch	2
... 25		097 926	.. KNOB, pointer	1
... 26			.. PLATE, ident control rating (order by model and serial number)	1
... 27	A2	164 873	.. METER, amp AC/DC 0-500 0-600 DC scale	1
... 28	V	164 874	.. METER, volt AC/DC 0-100 scale	1
... 29			.. NAMEPLATE, (order by model and serial number)	1
... 30		022 289	.. TUBING, stl .312 OD x .187 ID x .437	2
... 31		021 385	.. BOOT, tgl switch lever	3
... 31		♦♦021 385	.. BOOT, tgl switch lever	1
... 31		♦021 385	.. BOOT, tgl switch lever	2
...		♦♦♦042 188	.. COVER, locking nameplate (consisting of)	1
...		123 205	.. HINGE, cover front	1
...		123 207	.. COVER, panel front	1
...		136 474	.. STRIP, reinforcing panel	1
...		087 341	.. BUMPER, door 1.000 OD x .750 high	2
...		122 613	.. BOLT, U stl .38-18 1.500 wide	1
... 32		189 404	.. SPACER, nylon	3

♦ Part of 042 182 Optional Jump Start/Battery Charging

♦♦ Part of 041 480 Optional Ether Starting Aid

*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.

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
Figure 15-4. Panel, Front Lower w/Components (Fig 15-1 Item 85)				
... 1	...	039 047	.. TERMINAL, pwr output (consisting of)	2
... 2	...	601 880	 NUT, hex jam .500-13	2
... 3	...	039 044	 BUS BAR	1
... 4	...	039 049	 TERMINAL BOARD, red	1
... 5	...	601 976	 SCREW, cap hexhd .500-13 x 1.50	1
... 6	...	150 267	.. PANEL, front lower	1
...	...	603 107	.. HOSE, nprn slit bk .156 ID x .343 OD (order by ft)	2ft
... 7	.. GFCI1,2	168 068	.. RECEPTACLE, GFCI str dx grd 2P3W 15A 125V	2
...	...	073 690	.. PLUG, str grd armd 2P3W 15A 125V P&S 5266DF	
... 8	... CB1,2	139 266	.. CIRCUIT BREAKER, man reset 1P 15A 250VAC	2
... 9	... CB3,4	083 432	.. CIRCUIT BREAKER, man reset 1P 10A 250V	2
... 10	... RC3	143 976	.. CONNECTOR w/SOCKETS	1
...	...	134 734	.. CONNECTOR, circ 14 pin plug Amp 213571-2	
...	...	134 731	.. CONNECTOR, circ pin push-in 14-18ga Amp 213603-1	
...	...	079 739	.. CONNECTOR, circ clamp str rlf sz 17-20 Amp 206322-2	
... 11	... PC5	152 966	.. CIRCUIT CARD, filter HF	1
... 12	...	097 132	.. STAND-OFF, 6-32 x .375 lg	7

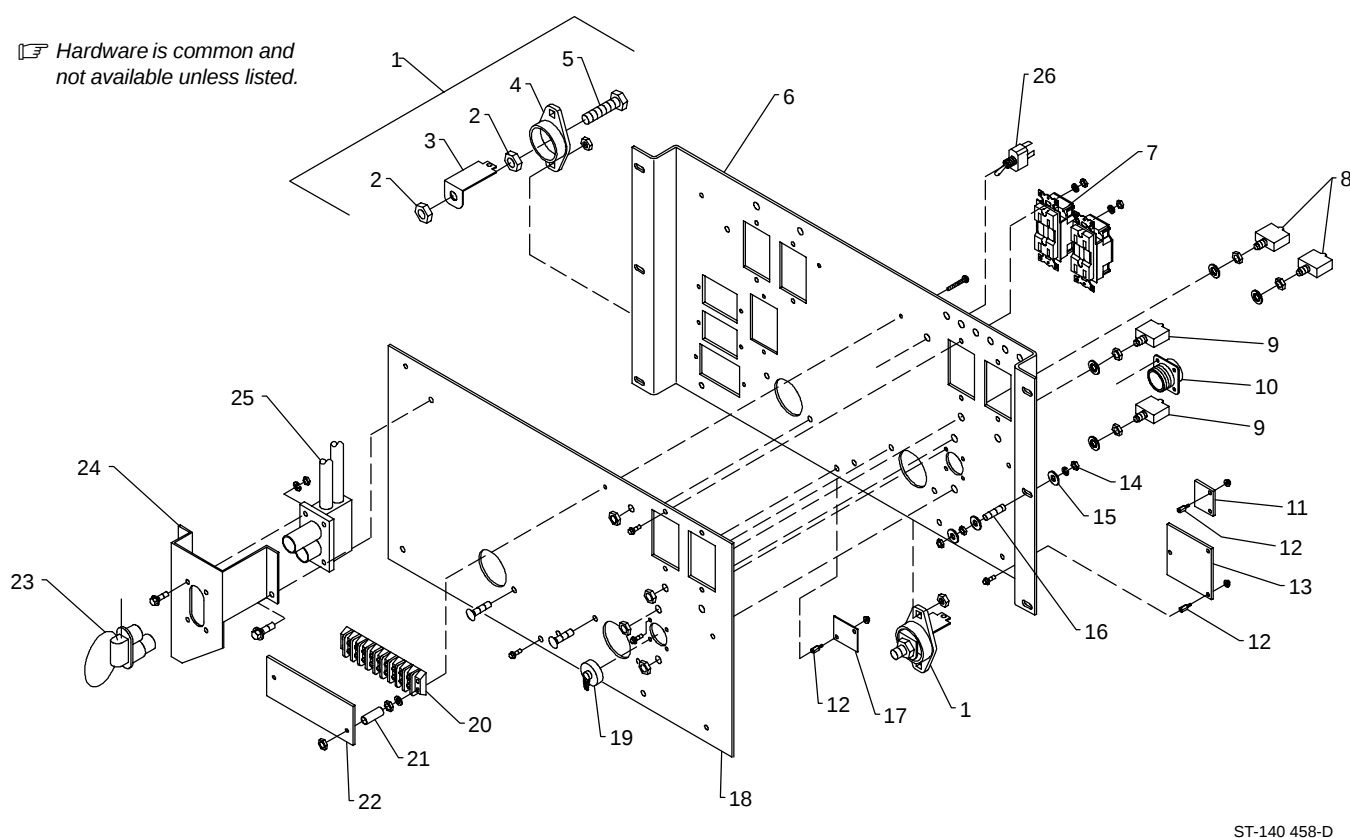


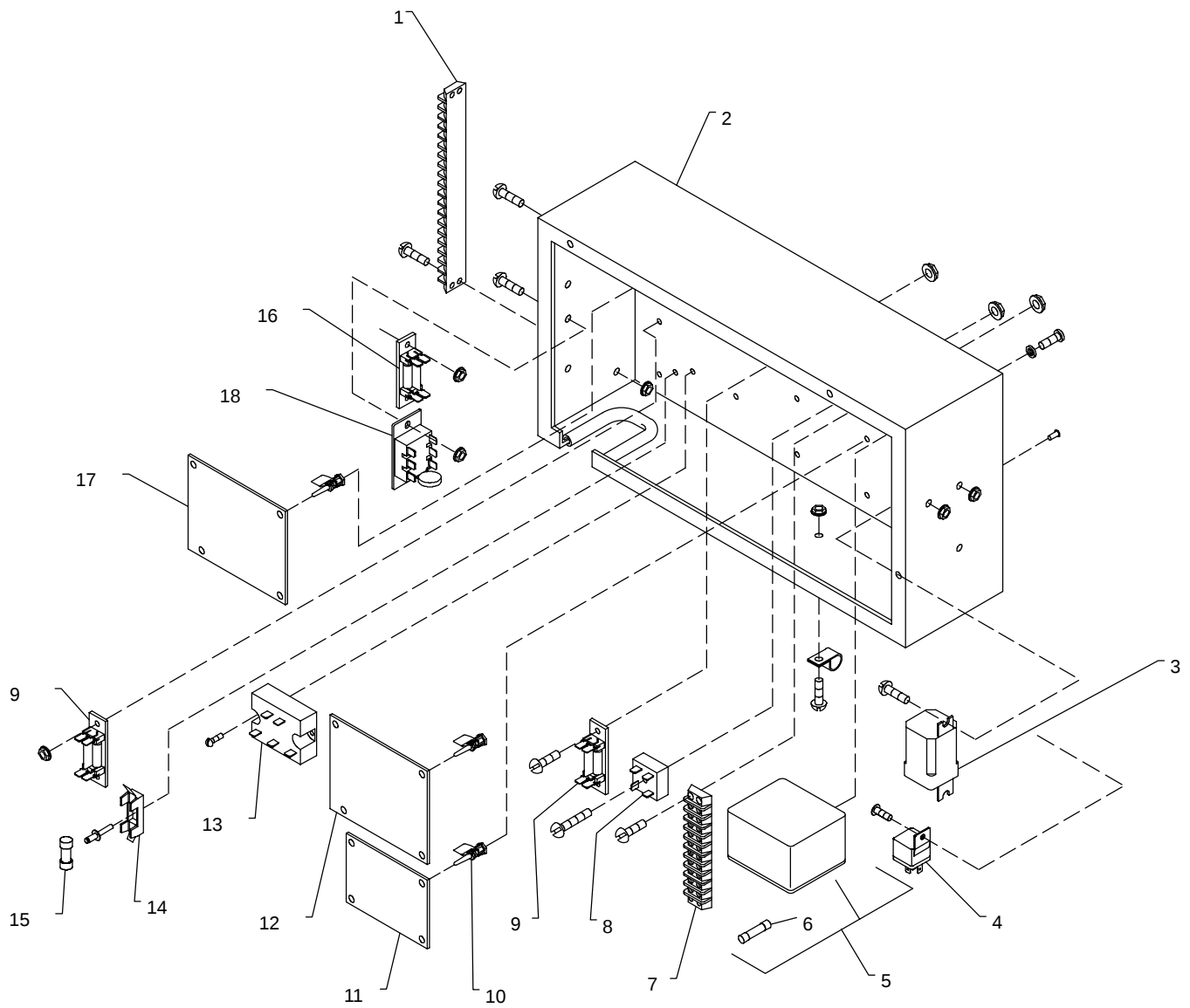
Figure 15-4. Panel, Front Lower w/Components

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
Figure 15-4. Panel, Front Lower w/Components (Fig 15-1 Item 85) (Continued)				
... 13 ...	PC30 ..	150 415 ..	CIRCUIT CARD, connector	1
.....	PLG6-8 ..	165 668 ..	CONNECTOR & SOCKETS	3
... 14		601 836 ..	NUT, brs hex .250-20	13
... 15		010 915 ..	WASHER, flat brs .250 ID x .625 OD x .031thk	10
... 16		083 030 ..	STUD, brs .250-20 x 1.750	1
... 17	PC6 ...	148 608 ..	CIRCUIT CARD, filter HF	1
... 18			PLATE, ident lower panel (order by model and serial number)	1
... 19		170 391 ..	CONNECTOR, circ protective cap	1
.....		020 279 ..	CLAMP, stl cush .750dia x .281mtg hole	1
... 20	3T	038 601 ..	BLOCK, term 30A 9P	1
... 21		022 289 ..	TUBING, stl .312 OD x .187 ID x .437	2
... 22		150 270 ..	COVER, terminal	1
... 23		♦092 681 ..	CONNECTOR, plug	1
... 24		♦118 341 ..	BRACKET, mtg receptacle	1
... 25	RC4 ..	♦119 863 ..	CONNECTOR, receptacle battery boost	1
... 26	S9	011 609 ..	SWITCH, toggle SPDT 15A 125 VAC	1
.....		♦136 102 ..	REMOTE CONTROL, starter (consisting of)	1
.....		046 433	SWITCH, PB MC No 36VDC w/black cap	1
.....		010 291	WASHER, flat .625 ID x 1.250 OD x .125thk nylafil	1
.....		603 588	WASHER, fbr .468 ID x 1.000 OD x .031thk	1
.....		008 014	HANDLE, grip	1
.....		600 340	CABLE, port No. 16 2/c (order by ft)	30ft
.....		141 162	CONNECTOR & PINS	1
.....	♦♦♦	042 242 ..	5 KVA/KW THREE PHASE AC POWER, (consisting of)	1
.....	CT3 ...	123 529	TRANSFORMER, current	1
.....	SR4 ...	131 828	RECTIFIER, integ 100A 1200V	1
.....	T1	123 572	TRANSFORMER, 1/2 kva	1
.....	1T	038 602	BLOCK, term 30A 3P	1
.....		153 496	BRACKET, mtg transformer	1
.....		123 581	BRACKET, mtg components	1
.....	GFCI2 ..	147 939	RECEPTACLE, gfci str dx grd 2P3W 15A 125V	1
.....	RC1 ...	604 103	RECEPTACLE, str dx grd 2P3W 15A 250V	1
.....	RC4 ...	007 469	RECEPTACLE, twlk grd 2P4W 30A 250V	1
.....	CB5 ...	123 879	CIRCUIT BREAKER, man reset 3P 20A	1
.....		042 240 ..	SOUTH AFRICAN RECEPTACLE KIT (consisting of)	1
.....	RC1 ...	131 274	RECEPTACLE, str grd 2P3W 16A 250V	1
.....	CB1 ...	139 266	CIRCUIT BREAKER	1

♦ Part of 042 182 Optional Jump Start/Battery Charging

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.



ST-140 459-A

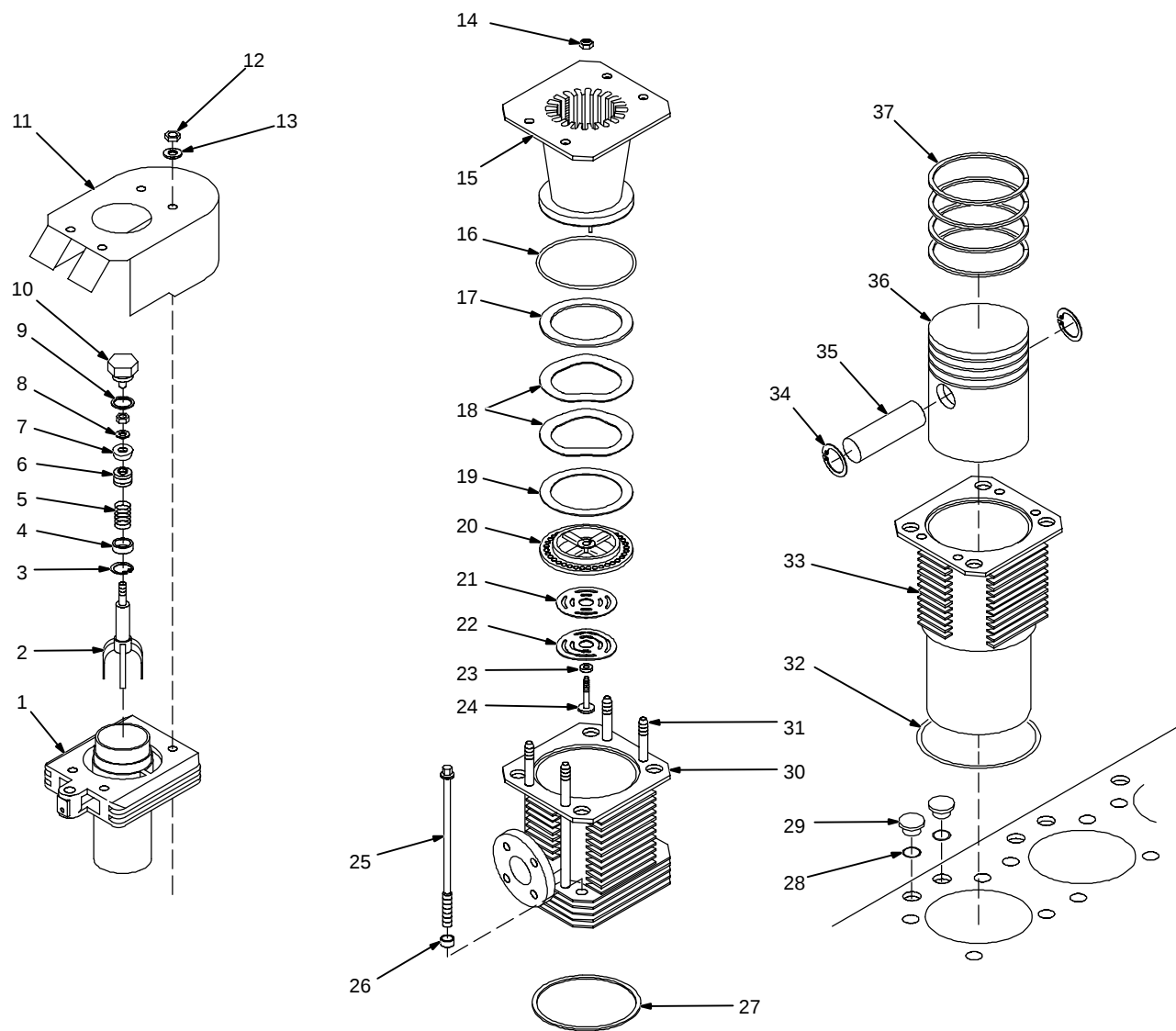
Figure 15-5. Control Box

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
Figure 15-5. Control Box (Fig 15-1 Item 71)				
... 1	2T	129 939	BLOCK, term 10A 19P	1
		122 216	CONNECTOR, blk 15A	3
... 2		131 339	ENCLOSURE, circuit card	1
... 3	CR6	052 603	RELAY, encl 110VDC DPDT	1
... 4	CR1	173 069	RELAY, encl 12 VDC SPDT	1
... 5	MS1	118 072	SWITCH, magnetic shutdown (consisting of)	1
... 6	F	*073 426	FUSE, mintr gl 5A 250V	1
... 7	1T	098 828	BLOCK, term 10A 10P	1
... 8	SR1	035 704	RECTIFIER, integ 40A 800V	1
... 9	D1, D9	189 701	DIODE/CAPACITOR BOARD	2
... 10		134 201	STAND-OFF SUPPORT, PC card	12
... 11	PC2	185 747	CIRCUIT CARD, voltage regulator	1
	PLG2	115 092	CONNECTOR & SOCKETS	1
... 12	PC3	♦166 685	CIRCUIT CARD, battery charger	1
	PLG4	♦148 439	CONNECTOR & SOCKETS	1
	PLG3	♦158 720	CONNECTOR & SOCKETS	2
... 13	IM	189 742	MODULE, pull to idle 5 pin	1
... 14		172 731	HOLDER, fuse	1
... 15	F6	*073 426	FUSE, mintr gl slo-blo 5A 250V	1
... 16	R5	♦121 137	RESISTOR, WW fxd 5W 33 ohm	1
... 17	PC1	185 746	CIRCUIT CARD, field current regulator	1
	PLG1	135 275	CONNECTOR & SOCKETS, (consisting of)	1
... 18	SR2	097 353	DIODE/SCR, bridge	1

♦ Part of 042 182 Optional Jump Start/Battery Charging

*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.

Ref. ST-143 803-B

Figure 15-6. Compressor, Air

Item No.	Part No.	Description	Quantity
Figure 15-6. Compressor, Air			
... 1	066 133	HOUSING INSERT	1
... 2	066 134	GRIPPING DEVICE	1
... 3	066 135	CIRCLIP	1
... 4	066 136	GUIDE RING	1
... 5	066 137	SPRING	1
... 6	066 138	PISTON	1
... 7	066 139	SEAL/SLEEVE	1
... 8	066 140	WASHER/DISC/PLATE	1
... 9	066 142	SEALING RING	1
... 10	066 143	NIPPLE	1
... 11	139 406	COVER, compressor air	1
...	066 681	CLAMPING SECTION	1
... 12	066 141	HEX NUT	4
... 13	066 145	WASHER/DISC/PLATE	4
... 14	066 131	LOCKING NUT	2
... 15	066 130	INSERT PIECE	1
... 16	066 132	O-SEAL	1
... 17	066 129	COVER PLATE	1
... 18	066 128	SPRING WASHER	2
... 19	066 127	VALVE PLATE	1
... 20	066 126	VALVE SEAT	1
...	066 123	NOTCHED PIN	1
... 21	066 125	VALVE PLATE	1
... 22	066 124	SPRING PLATE	1
... 23	066 122	SPACER RING	1
... 24	066 121	VALVE SCREW	1
... 25	066 153	WAISTED BOLT	4
... 26	066 154	WASHER	4
... 27	066 119	GASKET	1
... 28	066 152	SEALING RING	2
... 29	066 115	NIPPLE	2
... 30	066 120	CYLINDER HEAD	1
... 31	066 144	STUD	4
... 32	066 116	SHIM, 1.0mm	4
... 32	066 159	SHIM, .5mm	1
... 33	066 117	CYLINDER LINER	1
... 34	066 149	CIRCLIP	2
... 35	066 148	PISTON PIN	1
... 36	066 118	PISTON	1
... 37	066 510	SET OF RINGS	1

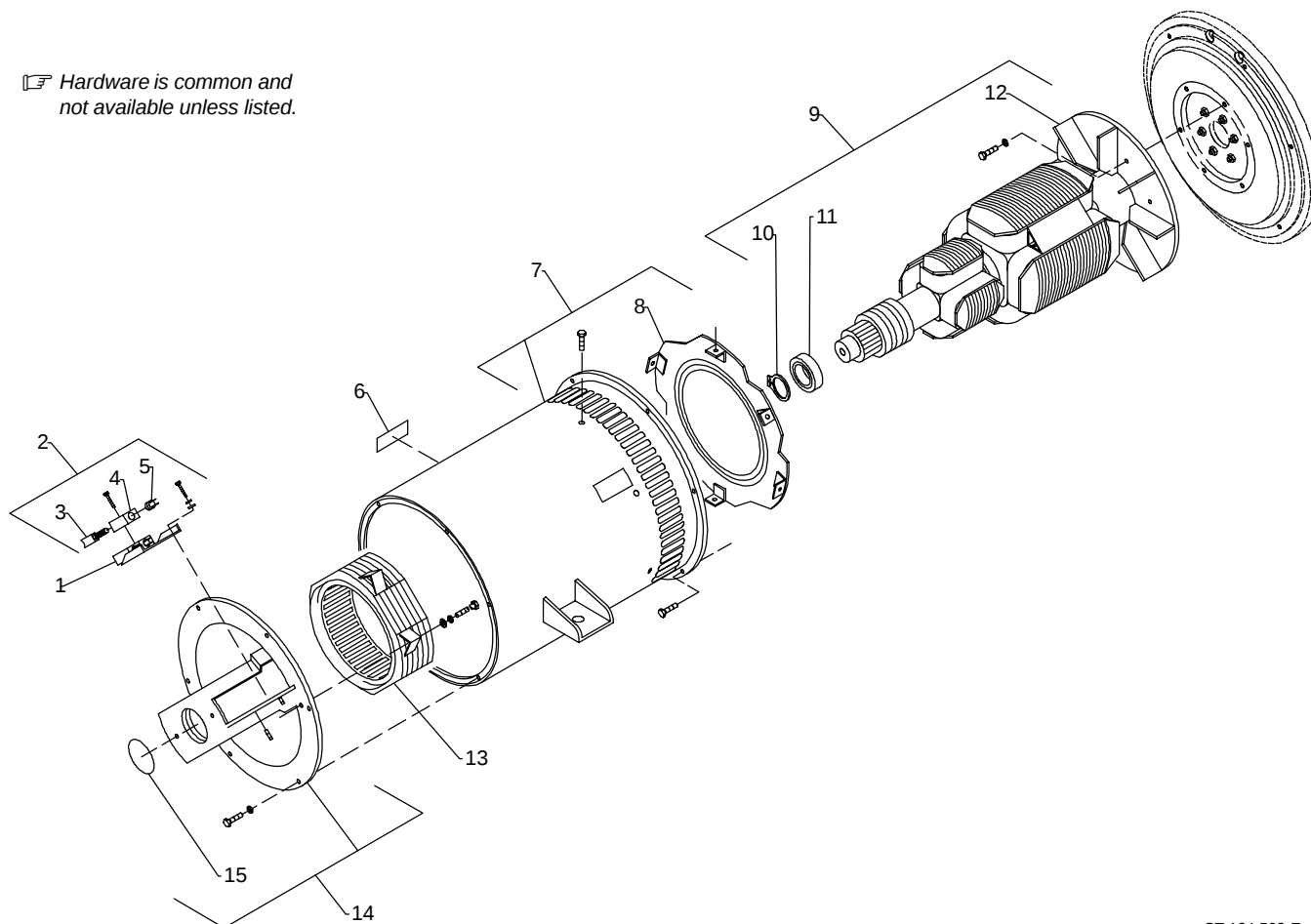
To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Item No.	Part No.	Description	Quantity
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Figure 15-7. Generator (Fig 15-2 Item 54)

...	1	...	173 066	..	BRACKET, mtg brush holder	...	1
...	2	...	018 614	..	BRUSH SET, (consisting of)	...	1
...	3	...	*151 299	...	BRUSH, contact	...	1
...	4	...	600 270	...	HOLDER, brush	...	1
...	5	...	152 044	...	CAP, holder brush	...	1
...	6	...	013 367	..	LABEL, warning moving parts etc	...	2
...	7	...	+170 496	..	STATOR, generator (consisting of)	...	1
...	8	...	039 207	...	BAFFLE, air generator	...	1
...	9	...	083 751	..	ROTOR, (consisting of)	...	1
...	10	...	024 617	...	RING, retaining external	...	1
...	11	...	053 390	...	BEARING, ball	...	1
...	12	...	083 748	...	FAN, rotor	...	1
...	13	...	180 684	..	STATOR, excitor	...	1
...	13	...	♦123 687	..	STATOR, excitor	...	1
...	14	...	173 068	..	ENDBELL, generator (consisting of)	...	1
...	15	...	143 220	...	O-RING, 2.859 ID x .139CS	...	1

 Hardware is common and not available unless listed.



ST-134 503-E

Figure 15-7. Generator

*Recommended Spare Parts.

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

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor. BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

HOBART WARRANTY

Effective January 1, 2000

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

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

Warranty Questions?

Call

1-877-HOBART1
for your local
Hobart distributor.

Service

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

Support

Need fast answers to the tough welding questions? Contact your distributor or call 1-800-332-3281. The expertise of the distributor and Hobart is there to help you, every step of the way.

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

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

1. 5 Years Parts – 3 Years Labor
 - * Original main power rectifiers
 - * Inverters (input and output rectifiers only)
2. 3 Years — Parts and Labor
 - * Transformer/Rectifier Power Sources
 - * Plasma Arc Cutting Power Sources
 - * Semi-Automatic and Automatic Wire Feeders
 - * Inverter Power Supplies
 - * Intellitig
 - * 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 185 & Spoolmate 250)
 - * Process Controllers
 - * Positioners and Controllers
 - * Automatic Motion Devices
 - * RFCS Foot Controls
 - * Induction Heating Power Sources
 - * Water Coolant Systems
 - * HF Units
 - * Grids
 - * Maxstar 140
 - * Spot Welders
 - * Load Banks
 - * Hobart Cyclomatic Equipment
 - * Running Gear/Trailers
 - * Plasma Cutting Torches (except APT & SAF Models)
 - * Field Options
(NOTE: Field options are covered under True Blue® for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
4. 6 Months — Batteries
5. 90 Days — Parts
 - * MIG Guns/TIG Torches
 - * Induction Heating Coils and Blankets

- * APT, ZIPCUT & PLAZCUT Model Plasma Cutting Torches
- * Remote Controls
- * Accessory Kits
- * Replacement Parts (No labor)
- * Spoolmate 185 & Spoolmate 250
- * Canvas Covers

HOBART's Limited Warranty shall not apply to:

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

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

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



Resources Available

Always provide Model Name and Serial/Style Number.

To locate a Distributor, retail or service location:

Call 1-877-Hobart1 or visit our website at
www.HobartWelders.com

For technical assistance:

Call 1-800-332-3281

Contact your Distributor for:

Welding Supplies and Consumables

Options and Accessories

Personal Safety Equipment

Service and Repair

Replacement Parts

Training (Schools, Videos, Books)

Technical Manuals (Servicing Information
and Parts)

Circuit Diagrams

Welding Process Handbooks

Contact the Delivering Carrier for:

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

File a claim for loss or damage during
shipment.

Hobart Welding Products

An Illinois Tool Works Company
600 West Main Street
Troy, OH 45373 USA

For Technical Assistance:

Call 1-800-332-3281

For Literature Or Nearest Dealer:
Call 1-877-Hobart1