OM-291102D 2024-10

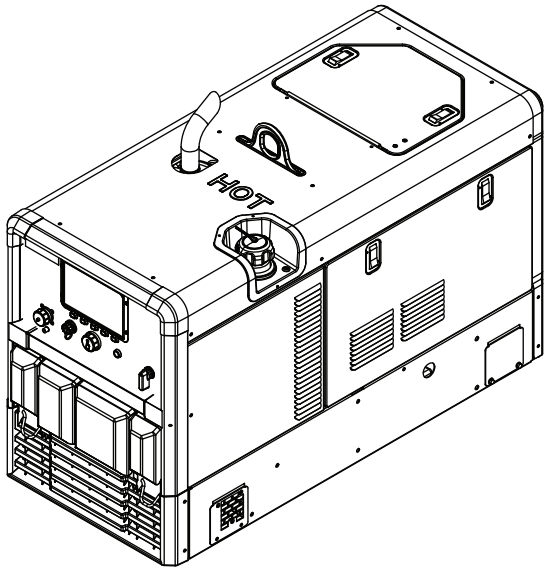
Processes

Multiprocess Welding

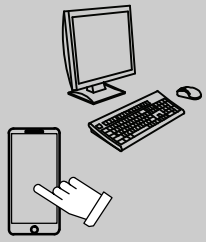
Description

Engine Driven Welder/Generator

Trailblazer® 330 Diesel



OWNER'S MANUAL



For product information, Owner's Manual translations, and more, visit

www.MillerWelds.com

From Miller to You

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

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

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

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety Precautions. They will help you protect yourself against potential hazards on the worksite. We've made installation and operation quick and easy. With Miller, you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is, and our extensive service network is there to help fix the problem. Warranty and maintenance information for your particular model are also provided.

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

TRUE BLUE® WARRANTY

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

CERTIFIED BY SCB ISO 9001™

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

Miller®

TABLE OF CONTENTS

SECTION 1 – SAFETY PRECAUTIONS – READ BEFORE USING. 1
1-1 Symbol Usage 1
1-2 Arc Welding Hazards 1
1-3 Engine Hazards 3
1-4 Compressed Air Hazards 4
1-5 Additional Hazards For Installation, Operation, And Maintenance 4
1-6 California Proposition 65 Warnings 6
1-7 Principal Safety Standards 6
1-8 EMF Information 6
SECTION 2 – CONSIGNES DE SÉCURITÉ - LIRE AVANT UTILISATION 7
2-1 Symboles utilisés 7
2-2 Dangers relatifs au soudage à l'arc 7
2-3 Dangers existant en relation avec le moteur 9
2-4 Dangers liés à l'air comprimé 10
2-5 Symboles de dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance 11
2-6 Proposition californienne 65 Avertissements 13
2-7 Principales normes de sécurité 13
2-8 Informations relatives aux CEM 14
SECTION 3 – DEFINITIONS 15
3-1 Additional Safety Symbol Definitions 15
3-2 Miscellaneous Symbol Definitions 15
SECTION 4 – SPECIFICATIONS 17
4-1 Serial Number And Rating Label Location 17
4-2 Software Licensing Agreement 17
4-3 Information About Default Weld Parameters And Settings 17
4-4 Weld, Power, And Engine Specifications 17
4-5 Optional Battery Charger Specifications 17
4-6 Environmental Specifications 17
4-7 Dimensions, Weights, And Operating Angles 18
4-8 Dimensions For Units With Optional Running Gear 19
4-9 Duty Cycle And Overheating 19
4-10 Fuel Consumption Curves 20
4-11 Stick Mode Volt-Ampere Curves 21
4-12 MIG Mode Volt-Ampere Curves 22
4-13 TIG Mode Volt-Ampere Curves 22
4-14 Generator Power Curve 23
4-15 Battery Charge Curve (Models With Battery Charge Option) 24
4-16 Wireless Remote (Optional) Regulatory Approval 24
SECTION 5 – INSTALLATION. 25
5-1 Installing Welder/Generator 25
5-2 Grounding Generator to Truck or Trailer Frame 26
5-3 Ground Cable Routing 26
5-4 Installing Exhaust Pipe 27
5-5 Engine Prestart Checks 28
5-6 Connecting Or Replacing the Battery 29
5-7 Weld Output Terminals 30
5-8 Connecting Weld Output Cables 30
5-9 Remote Receptacle Information 31
5-10 Spool Gun Receptacle Information 31

⚠ WARNING – Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to www.P65warnings.ca.gov/diesel.

TABLE OF CONTENTS

5-11 Selecting Cable Sizes* 32
SECTION 6 – OPERATION 33
6-1 Front Panel Controls 33
6-2 Main Screen 34
6-3 Menu Screen 35
6-4 System Settings Screen 36
6-5 Weld Lead Calibration 36
6-6 Cable Length Compensation (For CV Process) 37
6-7 Enabling Voltage Reducing Device (VRD) 37
6-8 Process Screen 38
6-9 Weld Settings 39
6-10 Auto-Set Functionality™ 40
6-11 Stick Start Procedure—Scratch Start Technique 41
6-12 Lift-Arc™ TIG With Auto-Stop™ And Auto-Crater™ 41
6-13 Typical Stick Welding Connections And Control Settings 42
6-14 Typical MIG Welding Connections and Settings 43
6-15 Typical Spool Gun Welding Connections And Control Settings 45
6-16 Remote Voltage/Amperage Control 46
6-17 Engine Auto-Speed™ 46
6-18 Engine Cold Weather Starting And Operation 47
6-19 Updating Software 48
SECTION 7 – BATTERY CHARGING 49
7-1 Battery Charging Guidelines 49
7-2 Connecting Uninstalled Battery To Optional Battery Charge Receptacle 49
7-3 Connecting Installed Battery To Optional Battery Charge Receptacle 50
7-4 Setting Battery Charge Controls 51
SECTION 8 – OPERATING AUXILIARY EQUIPMENT 52
8-1 Generator Power Receptacles 52
8-2 GFCI Receptacle Information, Resetting, And Testing 53
8-3 Optional Excel Power 54
8-4 Simultaneous Weld And Power 54
8-5 Wiring Instructions For 240 Volt, Single-Phase Plug (NEMA 14-50P) 55
8-6 Wiring Instructions For 240 Volt, Single-Phase Plug (NEMA 6-50P) 56
SECTION 9 – CAN-BUS CONNECTION 57
9-1 CAN-Bus Connection 57
9-2 Trailblazer J1939 Messages 58
SECTION 10 – GENERATOR/ENGINE MAINTENANCE 61
10-1 Maintenance Screen 61
10-2 Routine Generator/Engine Maintenance 62
10-3 Maintenance Label 63
10-4 Replacing Air Cleaner 64
10-5 Engine Maintenance Activities 65
10-6 Overload Protection 66
10-7 Servicing Optional Spark Arrestor 67
SECTION 11 – TROUBLESHOOTING 68
11-1 Front Panel Display Code Information 68
11-2 Welding Troubleshooting 71
11-3 Generator Power Troubleshooting 72
11-4 Engine Troubleshooting 73
11-5 Battery Charge/Jump Troubleshooting 74
SECTION 12 – PARTS LIST 75
12-1 Recommended Spare Parts 75
SECTION 13 – ELECTRICAL DIAGRAMS 76
SECTION 14 – GENERATOR POWER GUIDELINES 80

SECTION 1 – SAFETY PRECAUTIONS – READ BEFORE USING

⚠ **Protect yourself and others from injury—read, follow, and save these important safety precautions and operating instructions.**

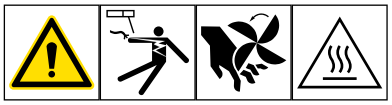
1-1. Symbol Usage

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

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

NOTICE – *Indicates statements not related to personal injury.*

☞ *Indicates special instructions.*



This group of symbols means Warning! Watch Out! ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid these 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 Principal Safety Standards. Read and follow all Safety Standards.**

⚠ **Only qualified persons should install, operate, maintain, and repair this equipment. A qualified person is defined as one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project and has received safety training to recognize and avoid the hazards involved.**

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

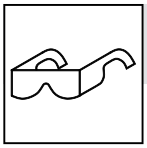
ELECTRIC SHOCK can kill.

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 weld output in damp, wet, or confined spaces, or if there is a danger of falling.
- Do not store or use equipment in standing water.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Additional safety precautions are required when any of the following electrically hazardous conditions are present: in damp locations or while wearing wet clothing; on metal structures such as floors, gratings, or scaffolds; when in cramped positions such as sitting, kneeling, or lying; or when there is a high risk of unavoidable or accidental contact with the workpiece or ground. For these conditions, use the following equipment in order presented: 1) a semiautomatic DC constant voltage (wire) welder, 2) a DC manual (stick) welder, or 3) an AC welder with reduced open-circuit voltage. In most situations, use of a DC, constant voltage wire welder is recommended. And, do not work alone!
- Do not connect to any electrical distribution system normally supplied by utility power unless a proper transfer switch and grounding procedure are employed.
- 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, ground, and operate this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground — check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first—double-check connections.
- Keep cords dry, free of oil and grease, and protected from hot metal and sparks.
- Frequently inspect input power cord and ground conductor for damage or bare wiring — replace immediately if damaged — bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or repaired 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.
- Do not touch electrode holders connected to two welding machines at the same time since double open-circuit voltage will be present.
- 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. Disconnect cable for process not in use.
- Use GFCI protection when operating auxiliary equipment. Test GFCI receptacles at high speed.

HOT PARTS can burn.

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



FLYING METAL OR DIRT can injure eyes.

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

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.
- Ventilate the work area and/or use local forced ventilation at the arc to remove welding fumes and gases. The recommended way to determine adequate ventilation is to sample for the composition and quantity of fumes and gases to which personnel are exposed.
- If ventilation is poor, wear an approved air-supplied respirator.
- Read and understand the Safety Data Sheets (SDSs) and the manufacturer's instructions for adhesives, coatings, cleaners, consumables, coolants, degreasers, fluxes, and metals.
- 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 while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

BUILDUP OF GAS can injure or kill.

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

ARC RAYS can burn eyes and skin.

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

- Wear an approved welding helmet fitted with a proper shade of filter lenses to protect your face and eyes from arc rays and sparks when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash, glare, and sparks; warn others not to watch the arc.
- Wear body protection made from leather or flame-resistant clothing (FRC). Body protection includes oil-free clothing such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.

WELDING can cause fire or explosion.

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

- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Do not weld where flying sparks can strike flammable material.
- Protect yourself and others from flying sparks and hot metal.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not cut or weld on tire rims or wheels. Tires can explode if heated. Repaired rims and wheels can fail. See OSHA 29 CFR 1910.177 listed in Safety Standards.
- Do not weld on containers that have held combustibles, or on closed containers such as tanks, drums, or pipes unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Do not weld where the atmosphere can contain flammable dust, gas, or liquid vapors (such as gasoline).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock, sparks, and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear body protection made from leather or flame-resistant clothing (FRC). Body protection includes oil-free clothing such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.
- After completion of work, inspect area to ensure it is free of sparks, glowing embers, and flames.
- Use only correct fuses or circuit breakers. Do not oversize or bypass them.
- Follow requirements in OSHA 1910.252 (a) (2) (iv) and NFPA 51B for hot work and have a fire watcher and extinguisher nearby.
- Read and understand the Safety Data Sheets (SDSs) and the manufacturer's instructions for adhesives, coatings, cleaners, consumables, coolants, degreasers, fluxes, and metals.

NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.

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

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

CYLINDERS can explode if damaged.

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

- Protect compressed gas cylinders from excessive heat, mechanical shocks, physical damage, slag, open flames, sparks, and arcs.

- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder—explosion will result.
- Use only correct compressed 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. Do not stand in front of or behind the regulator when opening the valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Use the proper equipment, correct procedures, and sufficient number of persons to lift, move, and transport cylinders.
- Read and follow instructions on compressed gas cylinders, associated equipment, and Compressed Gas Association (CGA) publication P-1 listed in Safety Standards.

1-3. Engine Hazards

BATTERY EXPLOSION can injure.

- Always wear a face shield, rubber gloves, and protective clothing when working on a battery.
- Stop engine before disconnecting or connecting battery cables, battery charging cables (if applicable), 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 unless the unit has a battery charging feature designed for this purpose.
- Observe correct polarity (+ and -) on batteries.
- Disconnect negative (-) cable first and connect it last.
- Keep sparks, flames, cigarettes, and other ignition sources away from batteries. Batteries produce explosive gases during normal operation and when being charged.
- Follow battery manufacturer's instructions when working on or near a battery. See Battery Service Manual (listed in Safety Standards) for additional information.

FUEL can cause fire or explosion. ENGINE HEAT can cause fire.

- Stop engine and let it cool off before checking or adding fuel.
- Do not add fuel while smoking or if unit is near any sparks or open flames.
- Do not overfill tank — allow room for fuel to expand.
- Do not spill fuel. If fuel is spilled, clean up before starting engine.
- Dispose of rags in a fireproof container.
- Always keep nozzle in contact with tank when fueling.
- Do not locate unit on, over, or near combustible surfaces or flammables.
- Keep exhaust and exhaust pipes way from flammables.

MOVING PARTS can injure.

- Keep away from moving parts such as 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 persons remove doors, panels, covers, or guards 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 doors, panels, covers, or guards 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.

EXHAUST SPARKS can injure.

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

HOT PARTS can burn.

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

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.

Using a generator indoors CAN KILL YOU IN MINUTES.

- Generator exhaust contains carbon monoxide. This is a poison you cannot see or smell.
- NEVER use inside a home or garage, EVEN IF doors and windows are open.
- Only use OUTSIDE and far away from windows, doors, and vents.

BATTERY ACID can BURN SKIN and EYES.

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

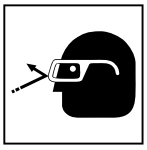
1-4. Compressed Air Hazards

COMPRESSED AIR EQUIPMENT can injure or kill.

- Incorrect installation or operation of this unit could result in equipment failure and personal injury. Only qualified persons should install, operate, and service this unit according to its Owner's Manual, industry standards, and national, state, and local codes.
- Do not exceed the rated output or capacity of the compressor or any equipment in the compressed air system. Design compressed air system so failure of any component will not put people or property at risk.
- Before working on compressed air system, turn off and lockout/tagout unit, release pressure, and be sure air pressure cannot be accidentally applied.
- Do not work on compressed air system with unit running unless you are a qualified person and following the manufacturer's instructions.
- Do not modify or alter compressor or manufacturer-supplied equipment. Do not disconnect, disable, or override any safety equipment in the compressed air system.
- Use only components and accessories approved by the manufacturer.
- Keep away from potential pinch points or crush points created by equipment connected to the compressed air system.
- Do not work under or around any equipment that is supported only by air pressure. Properly support equipment by mechanical means.

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

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



COMPRESSED AIR can injure or kill.

- Before working on compressed air system, turn off and lockout/tagout unit, release pressure, and be sure air pressure cannot be accidentally applied.
- Relieve pressure before disconnecting or connecting air lines.
- Check compressed air system components and all connections and hoses for damage, leaks, and wear before operating unit.
- Do not direct air stream toward self or others.
- Wear protective equipment such as safety glasses, hearing protection, leather gloves, heavy shirt and trousers, high shoes, and a cap when working on compressed air system.
- Use soapy water or an ultrasonic detector to search for leaks — never use bare hands. Do not use equipment if leaks are found.
- Reinstall doors, panels, covers, or guards when servicing is finished and before starting unit.
- If ANY air is injected into the skin or body seek medical help immediately.

BREATHING COMPRESSED AIR can injure or kill.

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

TRAPPED AIR PRESSURE AND WHIPPING HOSES can injure.

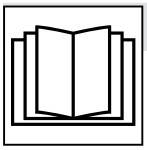
- Release air pressure from tools and system before servicing, adding or changing attachments, or opening compressor oil drain or oil fill cap.

MOVING PARTS can injure.

- Keep away from moving parts such as fans, belts and rotors.
- Keep all doors, panels, covers, and guards closed and securely in place.
- Keep hands, hair, loose clothing, and tools away from moving parts.
- Before working on compressed air system, turn off and lockout/tagout unit, release pressure, and be sure air pressure cannot be accidentally applied.
- Have only qualified people remove guards or covers for maintenance and troubleshooting as necessary.
- Reinstall doors, panels, covers, or guards when servicing is finished and before starting engine.

HOT PARTS can burn.

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



READ INSTRUCTIONS.

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

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

FIRE OR EXPLOSION hazard.

- Do not install or place unit on, over, or near combustible surfaces.
- Do not install unit near flammables.
- Do not overload building wiring — be sure power supply system is properly sized, rated, and protected to handle this unit.

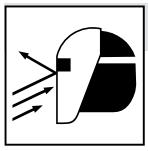
FALLING EQUIPMENT can injure.

- Use lifting eye to lift unit and properly installed accessories only, NOT gas cylinders. Do not exceed maximum lift eye weight rating (see Specifications).
- Use correct procedures and equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.
- Keep equipment (cables and cords) away from moving vehicles when working from an aerial location.

- Follow the guidelines in the Applications Manual for the Revised NIOSH Lifting Equation (Publication No. 94-110) when manually lifting heavy parts or equipment.

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.
- Use only equipment suitable for operation on 60 or 50/60 Hz power.



FLYING SPARKS can injure.

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

MOVING PARTS can injure.

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

BATTERY CHARGING OUTPUT and BATTERY EXPLOSION can injure.

Battery charging not present on all models.

- Always wear a face shield, rubber gloves, and protective clothing when working on a battery.
- Stop engine before disconnecting or connecting battery cables, battery charging cables (if applicable), 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 unless it has a battery charging feature designed for this purpose.
- Observe correct polarity (+ and -) on batteries.
- Disconnect negative (-) cable first and connect it last.
- Keep sparks, flames, cigarettes, and other ignition sources away from batteries. Batteries produce explosive gases during normal operation and when being charged.
- Follow battery manufacturer's instructions when working on or near a battery. See Battery Service Manual (listed in Safety Standards) for additional information.
- Have only qualified persons do battery charging work.
- If battery is being removed from a vehicle for charging, disconnect negative (-) cable first and connect it last. To prevent an arc, make sure all accessories are off.
- Charge lead-acid batteries only. Do not use battery charger to supply power to an extra-low-voltage electrical system or to charge dry cell batteries.
- Do not charge a frozen battery.
- Do not use damaged charging cables.
- Do not charge batteries in a closed area or where ventilation is restricted.
- Do not charge a battery that has loose terminals or one showing damage such as a cracked case or cover.
- Before charging battery, select correct charger voltage to match battery voltage.
- Set battery charging controls to the Off position before connecting to battery. Do not allow battery charging clips to touch each other.
- Keep charging cables away from vehicle hood, door, or moving parts.

HIGH PRESSURE FLUIDS can injure or kill.

- Engine fuel system components can be under high pressure.
- Before working on fuel system, turn off engine to release pressure.
- If any fluid is injected into the skin or body seek medical help immediately.

WELDING WIRE can injure.

- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people, or any metal when threading welding wire.

OVERUSE can cause OVERHEATING.

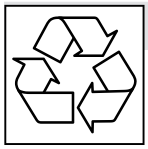
- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.

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.

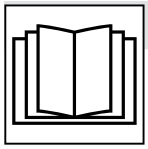
TILTING OF TRAILER can injure.

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



RECYCLE.

- Recycle or dispose of used liquids in an environmentally safe way. This is especially true for engine fluids such as drain oil and used coolant; this is also important for coolant from torch/gun cooling systems.
- Contact your local recycling office or your local distributor for information about how to dispose of parts and equipment in an environmentally safe way.



READ INSTRUCTIONS.

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

H.F. RADIATION can cause interference.

- High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
- Have only qualified persons familiar with electronic equipment perform this installation.
- The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.

- If notified by the FCC about interference, stop using the equipment at once.
- Have the installation regularly checked and maintained.
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.

ARC WELDING can cause interference.

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

1-6. California Proposition 65 Warnings

WARNING – This product can expose you to chemicals including lead, which are known to the state of California to cause cancer and birth defects or other reproductive harm.

For more information, go to www.P65Warnings.ca.gov.

For Diesel Engines:

WARNING – Breathing diesel engine exhaust exposes you to chemicals known to the state of California to cause cancer and birth defects or other reproductive harm.

- **Always start and operate the engine in a well−ventilated area.**
- **If in an enclosed area, vent the exhaust to the outside.**
- **Do not modify or tamper with the exhaust system.**
- **Do not idle the engine except as necessary.**

For more information, go to www.P65Warnings.ca.gov/diesel.

1-7. Principal Safety Standards

Safety in Welding, Cutting, and Allied Processes, American Welding Society standard ANSI Standard Z49.1. Website: www.aws.org.

Safe Practices for the Preparation of Containers and Piping for Welding and Cutting, American Welding Society Standard AWS F4.1. Website: www.aws.org.

National Electrical Code, NFPA Standard 70 from National Fire Protection Association. Website: www.nfpa.org.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1 from Compressed Gas Association. Website: www.cganet.com.

Safety in Welding, Cutting, and Allied Processes, CSA Standard W117.2 from Canadian Standards Association. Website: www.csagroup.org.

Battery Chargers, CSA Standard C22.2 NO 107.2-01 from Canadian Standards Association. Website: www.csagroup.org.

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

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B from National Fire Protection Association. Website: www.nfpa.org.

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910.177 Subpart N, Part 1910 Subpart Q, and Part 1926, Subpart J. Website: www.osha.gov.

OSHA *Important Note Regarding the ACGIH TLV, Policy Statement on the Uses of TLVs and BEIs.* Website: www.osha.gov.

Portable Generator Hazards Safety Alert from U.S. Consumer Product Safety Commission (CPSC). Website: www.cpsc.gov.

Applications Manual for the Revised NIOSH Lifting Equation from the National Institute for Occupational Safety and Health (NIOSH). Website: www.cdc.gov/NIOSH.

For Standards regulating hydraulic systems, contact the National Fluid Power Association. Website: www.nfpa.com.

Battery Service Manual from the Battery Council International. Website: www.batterycouncil.org.

ROM 2024–01

1-8. EMF Information

Electric current flowing through any conductor causes localized electric and magnetic fields (EMF). The current from arc welding (and allied processes including spot welding, gouging, plasma arc cutting, and induction heating operations) creates an EMF field around the welding circuit. EMF fields can interfere with some medical implants, e.g. pacemakers. Protective measures for persons wearing medical implants have to be taken. For example, restrict access for passers −by or conduct individual risk assessment for welders. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

1. Keep cables close together by twisting or taping them, or using a cable cover.
2. Do not place your body between welding cables. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep head and trunk as far away from the equipment in the welding circuit as possible.
5. Connect work clamp to workpiece as close to the weld as possible.
6. Do not work next to, sit or lean on the welding power source.
7. Do not weld whilst carrying the welding power source or wire feeder.

About Implanted Medical Devices:

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

SECTION 2 – CONSIGNES DE SÉCURITÉ - LIRE AVANT UTILISATION

⚠ **Pour écarter les risques de blessure pour vous-même et pour autrui — lire, appliquer et ranger en lieu sûr ces consignes relatives aux précautions de sécurité et au mode opératoire.**

2-1. Symboles utilisés

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

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

AVIS – *Indique des déclarations pas en relation avec des blessures personnelles.*

☞ *Indique des instructions spécifiques.*

Ce groupe de symboles veut dire Avertissement! Attention! DANGER DE CHOC ELECTRIQUE, PIECES EN MOUVEMENT, et PIECES CHAUDES. Reportez-vous aux symboles et aux directives ci-dessous afin de connaître les mesures à prendre pour éviter tout danger.

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

⚠ **Les symboles représentés ci-dessous sont utilisés dans ce manuel pour attirer l'attention et identifier les dangers possibles. En présence de ce symbole, prendre garde et suivre les instructions afférentes pour éviter tout risque. Les consignes de sécurité présentées ci-après ne font que résumer l'information contenue dans les Normes de sécurité principales. Lire et suivre toutes les Normes de sécurité.**

⚠ **L'installation, l'utilisation, l'entretien et les réparations ne doivent être confiés qu'à des personnes qualifiées. Une personne qualifiée est définie comme celle qui, par la possession d'un diplôme reconnu, d'un certificat ou d'un statut professionnel, ou qui, par une connaissance, une formation et une expérience approfondies, a démontré avec succès sa capacité à résoudre les problèmes liés à la tâche, le travail ou le projet et a reçu une formation en sécurité afin de reconnaître et d'éviter les risques inhérents.**

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

UN CHOC ÉLECTRIQUE peut tuer.

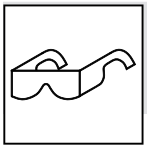
Un simple contact avec des pièces électriques peut provoquer une électrocution ou des blessures graves. L'électrode et le circuit de soudage sont sous tension dès que l'appareil est sur ON. Le circuit d'entrée et les circuits internes de l'appareil sont également sous tension à ce moment-là. En soudage 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 utiliser de sortie de soudage CA dans des zones humides ou confinées ou s'il y a un risque de chute.
- Ne stockez pas et n'utilisez pas l'équipement dans de l'eau stagnante.
- Se servir d'une source électrique à courant électrique UNIQUEMENT si le procédé de soudage le demande.
- Si l'utilisation d'une source électrique à courant électrique s'avère nécessaire, se servir de la fonction de télécommande si l'appareil en est équipé.
- Des précautions de sécurité supplémentaires sont requises dans des environnements à risque comme: les endroits humides ou lorsque l'on porte des vêtements mouillés; sur des structures métalliques au sol, grillages et échafaudages; dans des positions assises, à genoux et allongées; ou quand il y a un risque important de contact accidentel avec la pièce ou le sol. Dans ces cas utiliser les appareils suivants dans l'ordre de préférence: 1) un poste à souder DC semi-automatique de type CV (MIG/MAG), 2) un poste à souder manuel (électrode enrobée) DC, 3) un poste à souder manuel AC avec tension à vide réduite. Dans la plupart des cas, un poste courant continu de type CV est recommandé. Et, ne pas travailler seul!
- Ne brancher aucun système de distribution électrique normalement fourni par un réseau public à moins qu'un commutateur de transfert et une procédure de mise à la terre adéquats ne soient mis en place.
- 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.
- Les câbles doivent être exempts d'humidité, d'huile et de graisse; protégez-les contre les étincelles et les pièces métalliques chaudes.
- Vérifier fréquemment le cordon d'alimentation et le conducteur de mise à la terre afin de s'assurer qu'il n'est pas altéré ou dénudé -, le remplacer immédiatement s'il l'est -. Un fil dénudé peut entraîner la mort.
- Mettre l'appareil hors tension quand on ne l'utilise pas.
- Ne pas utiliser des câbles usés, endommagés, sous dimensionnés ou réparés.
- 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.
- Ne pas toucher des porte électrodes connectés à deux machines en même temps à cause de la présence d'une tension à vide doublée.

- N'utiliser qu'un matériel en bon état. Réparer ou remplacer sur-le-champ les pièces endommagées. Entretenir l'appareil conformément à ce manuel.
- Ne pas toucher aux portes-électrodes qui sont raccordés à deux machines à souder en même temps, car cela entraîne la présence d'une tension de circuit-ouvert double.
- 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.
- Ne pas raccorder plus d'une électrode ou plus d'un câble de masse à une même borne de sortie de soudage. Débrancher le câble pour le procédé non utilisé.
- Utiliser une protection GFCI lors de l'utilisation d'appareils auxiliaires. Testez les prises GFCI à haute vitesse.

LES PIÈCES CHAUDES peuvent provoquer des brûlures.

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



DES PIECES DE METAL ou DES SALETES peuvent provoquer des blessures dans les yeux.

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

LES FUMÉES ET LES GAZ peuvent être dangereux.

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

- Eloigner votre tête des fumées. Ne pas respirer les fumées.
- À l'intérieur, ventiler la zone et/ou utiliser une ventilation forcée au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage. Pour déterminer la bonne ventilation, il est recommandé de procéder à un prélèvement pour la composition et la quantité de fumées et de gaz auxquelles est exposé le personnel.
- Si la ventilation est médiocre, porter un respirateur anti-vapeurs approuvé.
- Lire et comprendre les fiches de données de sécurité et les instructions du fabricant concernant les adhésifs, les revêtements, les nettoyants, les consommables, les produits de refroidissement, les dégraisseurs, les flux et les métaux.
- Travailler dans un espace fermé seulement s'il est bien ventilé ou en portant un respirateur à alimentation d'air. Demander toujours à un surveillant dûment formé de se tenir à proximité. Des fumées et des gaz de soudage peuvent déplacer l'air et abaisser le niveau d'oxygène provoquant des blessures ou des accidents mortels. S'assurer que l'air de respiration ne présente aucun danger.
- Ne pas souder dans des endroits situés à proximité d'opérations de dégraissage, de nettoyage ou de pulvérisation. La chaleur et les rayons de l'arc peuvent réagir en présence de vapeurs et former des gaz hautement toxiques et irritants.
- Ne pas souder des métaux munis d'un revêtement, tels que l'acier galvanisé, plaqué en plomb ou au cadmium à moins que le revêtement n'ait été enlevé dans la zone de soudure, que l'endroit soit bien ventilé, et en portant un respirateur à alimentation d'air. Les revêtements et tous les métaux renfermant ces éléments peuvent dégager des fumées toxiques en cas de soudage.

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

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

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

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

- Porter un casque de soudage approuvé muni de verres filtrants approprié pour protéger visage et yeux pendant le soudage (voir ANSI Z49.1 et Z87.1 énuméré dans les normes de sécurité).
- Porter des lunettes de sécurité avec écrans latéraux même sous votre casque.
- Avoir recours à des écrans protecteurs ou à des rideaux pour protéger les autres contre les rayonnements les éblouissements et les étincelles ; prévenir toute personne sur les lieux de ne pas regarder l'arc.
- Porter une protection corporelle en cuir ou des vêtements ignifuges (FRC). La protection du corps comporte des vêtements sans huile, comme des gants de cuir, une chemise solide, des pantalons sans revers, des chaussures hautes et une casquette.

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.

- Déplacer toutes les substances inflammables à une distance de 10,7 m de l'arc de soudage. En cas d'impossibilité les recouvrir soigneusement avec des protections homologués.
- Ne pas souder dans un endroit là où des étincelles peuvent tomber sur des substances inflammables.
- Se protéger et d'autres personnes de la projection d'étincelles et de métal chaud.
- Des étincelles et des matériaux chauds du soudage peuvent facilement passer dans d'autres zones en traversant de petites fissures et des ouvertures.
- Surveiller tout déclenchement d'incendie et tenir un extincteur à proximité.
- Le soudage effectué sur un plafond, plancher, paroi ou séparation peut déclencher un incendie de l'autre côté.
- Ne pas couper ou souder des jantes ou des roues. Les pneus peuvent exploser s'ils sont chauffés. Les jantes et les roues réparées peuvent défaillir. Voir OSHA 29 CFR 1910.177 énuméré dans les normes de sécurité.

- Ne pas effectuer le soudage sur des conteneurs fermés tels que des réservoirs, tambours, ou conduites, à moins qu'ils n'aient été préparés correctement conformément à AWS F4.1 (voir les Normes de Sécurité).
- Ne pas souder là où l'air ambiant pourrait contenir des poussières, gaz ou émanations inflammables (vapeur d'essence, par exemple).
- Brancher le câble de masse sur la pièce le plus près possible de la zone de soudage pour éviter le transport du courant sur une longue distance par des chemins inconnus éventuels en provoquant des risques d'électrocution, d'étincelles 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 une protection corporelle en cuir ou des vêtements ignifuges (FRC). La protection du corps comporte des vêtements sans huile, comme des gants de cuir, une chemise solide, des pantalons sans revers, des chaussures hautes et une casquette.
- Avant de souder, retirer toute substance combustible de vos poches telles qu'un allumeur au butane ou des allumettes.
- Une fois le travail achevé, assurez-vous qu'il ne reste aucune trace d'étincelles incandescentes ni de flammes.
- Utiliser exclusivement des fusibles ou coupe-circuits appropriés. Ne pas augmenter leur puissance; ne pas les ponter.
- Suivre les recommandations dans OSHA 1910.252 (a) (2) (iv) et NFPA 51B pour les travaux à chaud et avoir de la surveillance et un extincteur à proximité.
- Lire et comprendre les fiches de données de sécurité et les instructions du fabricant concernant les adhésifs, les revêtements, les nettoyants, les consommables, les produits de refroidissement, les dégraisseurs, les flux et les métaux.

Le BRUIT peut endommager l'ouïe.

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

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

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

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

Si des BOUTEILLES sont endommagées, elles pourront exploser.

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

- Protéger les bouteilles de gaz comprimé d'une chaleur excessive, des chocs mécaniques, des dommages physiques, du laitier, des flammes ouvertes, des étincelles et des arcs.
- Placer les bouteilles debout en les fixant dans un support stationnaire ou dans un porte-bouteilles pour les empêcher de tomber ou de se renverser.
- Tenir les bouteilles éloignées des circuits de soudage ou autres circuits électriques.
- Ne jamais placer une torche de soudage sur une bouteille à gaz.
- Une électrode de soudage ne doit jamais entrer en contact avec une bouteille.
- Ne jamais souder une bouteille pressurisée - risque d'explosion.
- Utiliser seulement des bouteilles de gaz comprimé, régulateurs, tuyaux et raccords convenables pour cette application spécifique; les maintenir ainsi que les éléments associés en bon état.
- Tourner le dos à la sortie de vanne lors de l'ouverture de la vanne de la bouteille. Ne pas se tenir devant ou derrière lerégulateur lors de l'ouverture de la vanne.
- Maintenir le chapeau de protection sur la soupape, sauf en cas d'utilisation ou de branchement de la bouteille.
- Utilisez les équipements corrects, les bonnes procédures et suffisamment de personnes pour soulever, déplacer et transporter les bouteilles.
- Lire et suivre les instructions sur les bouteilles de gaz comprimé, l'équipement connexe et le dépliant P-1 de la CGA (Compressed Gas Association) mentionné dans les principales normes de sécurité.

2-3. Dangers existant en relation avec le moteur

L'EXPLOSION DE LA BATTERIE peut provoquer des blessures.

- 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 des câbles de batterie, des câbles de chargeur de batterie (le cas échéant) ou de batterie d'entretien.
- Eviter de provoquer des étincelles avec les outils en travaillant sur la batterie.
- Ne pas utiliser l'appareil de soudage pour charger des batteries ou faire démarrer des véhicules à l'aide de câbles de démarrage, sauf si l'appareil dispose d'une fonctionnalité de charge de batterie destinée à cet usage.
- Observer la polarité correcte (+ et -) sur les batteries.
- Débrancher le câble négatif (–) en premier lieu. Le rebrancher en dernier lieu.
- Les sources d'étincelles, flammes nues, cigarettes et autres sources d'inflammation doivent être maintenues à l'écart des batteries. Ces dernières produisent des gaz explosifs en fonctionnement normal et en cours de charge.
- Suivre les instructions du fabricant de la batterie lors d'opérations sur une batterie ou à proximité de celle-ci. Voir le manuel de service de batterie (indiqué dans Normes de sécurité) pour plus d'informations.

LE CARBURANT MOTEUR peut provoquer un incendie ou une explosion. LA CHALEUR DU MOTEUR peut provoquer un incendie.

- 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.
- Toujours garder le pistolet en contact avec le réservoir lors du remplissage.
- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces inflammables.
- Tenir à distance les produits inflammables de l'échappement.

Les PIÈCES MOBILES peuvent causer des blessures.

- S'abstenir de toucher des parties mobiles telles que des ventilateurs, courroies et rotors.
- Maintenir fermés et verrouillés les portes, panneaux, recouvrements et dispositifs deprotection.
- Arrêter le moteur avant d'installer ou brancher l'appareil.
- Lorsque cela est nécessaire pour des travaux d'entretien et de dépannage, faire retirer les portes, panneaux, recouvrements ou dispositifs de protection uniquement par du personnel qualifié.
- Pour empêcher tout démarrage accidentel pendant les travaux d'entretien, débrancher le câble négatif (-) de batterie delaborne.
- Ne pas approcher les mains, cheveux, vêtements lâches etoutils des organes mobiles.
- Remettre en place les portes, panneaux, recouvrements ou dispositifs de protection à la fin des travaux d'entretien et avant de mettre le moteur en marche.
- 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.

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.

LES PIÈCES CHAUDES peuvent provoquer des brûlures.

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

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

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

L'utilisation d'un groupe autonome à l'intérieur PEUT VOUS TUER EN QUELQUES MINUTES.

- Les fumées d'un groupe autonome contient du monoxyde de carbone. C'est un poison invisible et inodore.
- JAMAIS utiliser dans une maison ou garage, même avec les portes et fenêtres ouvertes.
- Uniquement utiliser à l'EXTERIEUR, loin des portes, fenêtres et bouches aération.

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.

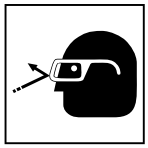
2-4. Dangers liés à l'air comprimé

Un ÉQUIPEMENT PNEUMATIQUE risque de provoquer des blessures ou même la mort.

- Une installation ou une utilisation incorrecte de cet appareil pourrait conduire à des dégâts matériels ou corporels. Seul un personnel qualifié est autorisé à installer, utiliser et entretenir cet appareil conformément à son manuel d'utilisation, aux normes industrielles et aux codes nationaux, d'état ou locaux.
- Ne pas dépasser le débit nominal ou la capacité du compresseur ou de tout équipement du circuit d'air comprimé. Concevoir le circuit d'air comprimé de telle sorte que la défaillance d'un composant ne risque pas de provoquer un accident matériel ou corporel.
- Avant d'intervenir sur le circuit d'air comprimé, couper l'alimentation électrique, verrouiller et étiqueter l'appareil, détendre la pression et s'assurer que le circuit d'air ne peut être mis sous pression par inadvertance.
- Ne pas intervenir sur le circuit d'air comprimé lorsque l'appareil fonctionne. Seul un personnel qualifié est autorisé, et appliquant les consignes du fabricant.
- Ne pas modifier ou altérer le compresseur ou les équipements fournis par le fabricant. Ne pas débrancher, désactiver ou neutraliser les équipements de sécurité du circuit d'air comprimé.
- Utiliser uniquement des composants et accessoires homologués par le fabricant.
- Se tenir à l'écart de tout point présentant un danger de pincement ou d'écrasement créé par l'équipement raccordé au circuit d'air comprimé.
- Ne pas intervenir sous ou autour d'un équipement qui n'est soutenu que par la pression pneumatique. Soutenir l'équipement de façon appropriée par un moyen mécanique.

MÉTAL CHAUD provenant du découpage ou du gougeage à l'arc risque de provoquer un incendie ou une explosion.

- Ne pas découper ou gouger à proximité de produits inflammables.
- Attention aux risques d'incendie: tenir un extincteur à proximité.



L'AIR COMPRIMÉ risque de provoquer des blessures ou même la mort.

- Avant d'intervenir sur le circuit d'air comprimé, couper l'alimentation électrique, verrouiller etétiqueter l'appareil, détendre la pression ets'assurer que le circuit d'air ne peut être mis sous pression par inadvertance.
- Détendre la pression avant de débrancher ou de brancher des canalisations d'air.
- Avant d'utiliser l'appareil, contrôler lescomposants du circuit d'air comprimé, lesbranchements et les flexibles en recherchant tout signe de détérioration, de fuite et d'usure.
- Ne pas diriger un jet d'air vers soi-même ou vers autrui.
- Pour intervenir sur un circuit d'air comprimé, porter unéquipement de protection tel que des lunettes de sécurité, des gants de cuir, une chemise et un pantalon en tissu résistant, des chaussures montantes et une coiffe.
- Pour rechercher des fuites, utiliser de l'eau savonneuse ou undétecteur à ultrasons, jamais les mains nues. En cas dedétection de fuite, ne pas utiliser l'équipement.
- Remettre les portes, panneaux, recouvrements ou dispositifs deprotection quand l'entretien est terminé et avant de mettre enmarche l'appareil.
- En cas d'injection d'air dans la peau ou le corps, demander immédiatement une assistance médicale.

L'INHALATION D'AIR COMPRIMÉ risque de provoquer des blessures ou même lamort.

- Ne pas inhaler d'air comprimé.
- Utiliser l'air comprimé uniquement pour découper ou gouger ainsi que pour l'outillage pneumatique.

Une PRESSION D'AIR RÉSIDUELLE ETDES FLEXIBLES QUI FOUETTENT risquent de provoquer des blessures.

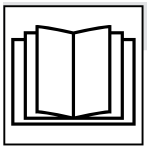
- Détendre la pression pneumatique des outils et circuits avant d'entretenir, ajouter ou changer des accessoires et avant d'ouvrir le bouchon de vidange ou de remplissage d'huile ducompresseur.

Les PIÈCES MOBILES peuvent causer des blessures.

- S'abstenir de toucher des parties mobiles telles que des ventilateurs, courroies et rotors.
- Maintenir fermés et verrouillés les portes, panneaux, recouvrements et dispositifs de protection.
- Ne pas approcher les mains, cheveux, vêtements lâches et outils des organes mobiles.
- Avant d'intervenir sur le circuit d'air comprimé, couper l'alimentation électrique, verrouiller et étiqueter l'appareil, détendre la pression et s'assurer que le circuit d'air ne peut être mis sous pression par inadvertance.
- 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.
- Remettre en place les portes, panneaux, recouvrements ou dispositifs de protection à la fin des travaux d'entretien et avant de mettre le moteur en marche.

DES PIÈCES CHAUDES peuvent provoquer des brûlures graves.

- Ne pas toucher de pièces chaudes du compresseur ou du circuit d'air.
- Prévoir une période de refroidissement avant d'intervenir sur l'équipement.
- Ne pas toucher aux pièces chaudes, utiliser les outils recommandés et porter des gants de soudage et des vêtements épais pour éviter les brûlures.



LIRE LES INSTRUCTIONS.

- Lire et appliquer les instructions sur les étiquettes et le Mode d'emploi avant l'installation, l'utilisation ou l'entretien de l'appareil. Lire les informations de sécurité au début du manuel et dans chaque section.
- N'utiliser que des pièces de remplacement provenant du fabricant.
- Effectuer l'installation, l'entretien et toute intervention selon les manuels d'utilisateurs, les normes nationales, provinciales et de l'industrie, ainsi que les codes municipaux.

2-5. Symboles de dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance

Risque D'INCENDIE OU D'EXPLOSION.

- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces inflammables.
- Ne pas installer l'appareil à proximité de produits inflammables
- Ne pas surcharger l'installation électrique – s'assurer que l'alimentation est correctement dimensionné et protégé avant de mettre l'appareil en service.

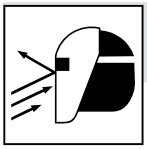
LA CHUTE DE L'ÉQUIPEMENT peut provoquer des blessures.

- Utiliser seulement l'anneau de levage pour soulever l'appareil et des accessoires correctement installés, non pas les bouteilles de gaz. Ne pas dépasser les capacités maximales de l'anneau de levage (voir Spécifications).
- Utilisez les procédures correctes et des équipements d'une capacité appropriée pour soulever et supporter l'appareil.
- En utilisant des fourches de levage pour déplacer l'unité, s'assurer que les fourches sont suffisamment longues pour dépasser du côté opposé de l'appareil.
- Tenir l'équipement (câbles et cordons) à distance des véhicules mobiles lors de toute opération en hauteur.

- Suivre les consignes du Manuel des applications pour l'équation de levage NIOSH révisée (Publication № 94–110) lors du levage manuelle de pièces ou équipements lourds.

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.
- Utiliser uniquement des équipements adéquats pour un fonctionnement avec une alimentation de 50/60 ou de 60 Hz.



LES ÉTINCELLES PROJETÉES peuvent provoquer des blessures.

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

Les PIÈCES MOBILES peuvent causer des blessures.

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

LA SORTIE DE RECHARGE et L'EXPLOSION DE LA BATTERIE peuvent provoquer des blessures.

La recharge de batterie n'existe pas sur tous les modèles.

- 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 des câbles de batterie, des câbles de chargeur de batterie (le cas échéant) ou de batterie d'entretien.
- Eviter de provoquer des étincelles avec les outils en travaillant sur la batterie.
- Ne pas utiliser l'appareil de soudage pour charger des batteries ou faire démarrer des véhicules à l'aide de câbles de démarrage, sauf si l'appareil dispose d'une fonctionnalité de charge de batterie destinée à cet usage.
- Observer la polarité correcte (+ et -) sur les batteries.
- Débrancher le câble négatif (-) en premier lieu. Le rebrancher en dernier lieu.
- Les sources d'étincelles, flammes nues, cigarettes et autres sources d'inflammation doivent être maintenues à l'écart des batteries. Ces dernières produisent des gaz explosifs en fonctionnement normal et en cours de charge.
- Suivre les instructions du fabricant de la batterie lors d'opérations sur une batterie ou à proximité de celle-ci. Voir le manuel de service de batterie (indiqué dans Normes de sécurité) pour plus d'informations.
- Les opérations de charge de batterie ne doivent être effectuées que par des personnes qualifiées.
- Pour enlever la batterie d'un véhicule pour la recharge, débrancher tout d'abord le câble négatif (-) et le rebrancher en dernier lieu. Pour éviter un arc, s'assurer que tous les accessoires sont débranchés.
- Ne charger que des batteries plomb-acide. Ne pas utiliser le chargeur de batterie pour alimenter un autre circuit électrique basse tension ou pour charger des batteries sèches.
- Ne pas charger une batterie gelée.
- Ne pas utiliser de câbles de charge endommagés.
- Ne pas charger des batteries dans un espace fermé ou en l'absence d'une ventilation.
- Ne pas charger une batterie dont les bornes sont desserrées ou présentant une détérioration comme par exemple un boîtier ou un couvercle fissuré.
- Avant de charger une batterie, sélectionner la tension de charge correspondant à la tension de la batterie.
- Régler les commandes de charge de batterie sur la position d'arrêt avant de brancher la batterie. Veiller à ce que les pinces de charge ne se touchent pas.
- Ranger les câbles de charge à distance du capot, des portes et des pièces mobiles du véhicule.

LES LIQUIDES PRESSURISÉS peuvent blesser ou tuer.

- Les composants du système d'alimentation peuvent contenir du carburant sous pression élevée.
- Avant d'intervenir sur le système d'alimentation de carburant, arrêter le moteur pour dépressuriser le système.
- En cas d'injection de tout liquide sous la peau ou dans le corps, solliciter une aide médicale sur le champ.

LES FILS DE SOUDAGE peuvent provoquer des blessures.

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

L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

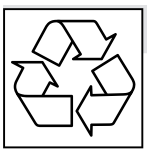
- Laisser l'équipement refroidir ; respecter le facteur de marche nominal.
- Réduire le courant ou le cycle opératoire avant de recommencer le soudage.
- Ne pas obstruer les passages d'air du poste.

LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

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

UNE REMORQUE QUI BASCULE peut provoquer des blessures.

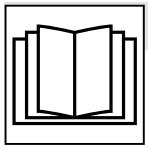
- Utiliser les supports de la remorque ou des blocs pour soutenir le poids.
- Installer convenablement le poste sur la remorque comme indiqué dans le manuel s'y rapportant.



RECYCLER.

- Recycler ou éliminer les liquides usagés d'une manière respectueuse de l'environnement. Cela est particulièrement vrai pour les fluides du moteur tels que l'huile de vidange et le liquide de refroidissement usagés ; ceci est également important pour le liquide de refroidissement provenant des systèmes de refroidissement de la torche/du pistolet.

- Contactez votre bureau de recyclage local ou votre distributeur local pour obtenir des informations sur la manière de mettre au rebut les pièces et l'équipement d'une manière respectueuse de l'environnement.



LIRE LES INSTRUCTIONS.

- Lire et appliquer les instructions sur les étiquettes et le Mode d'emploi avant l'installation, l'utilisation ou l'entretien de l'appareil. Lire les informations de sécurité au début du manuel et dans chaque section.
- N'utiliser que des pièces de remplacement provenant du fabricant.
- Effectuer l'installation, l'entretien et toute intervention selon les manuels d'utilisateurs, les normes nationales, provinciales et de l'industrie, ainsi que les codes municipaux.

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

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

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

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

2-6. Proposition californienne 65 Avertissements

⚠ **AVERTISSEMENT – ce produit peut vous exposer à des produits chimiques tels que le plomb, reconnus par l'État de Californie comme cancérigènes et sources de malformations ou d'autres troubles de la reproduction.**

Pour plus d'informations, consulter www.P65Warnings.ca.gov.

Pour les moteurs diesel :

⚠ **AVERTISSEMENT – les gaz d'échappement de moteurs diesel vous exposent à des produits chimiques, reconnus par l'État de Californie comme cancérigènes et sources de malformations ou d'autres troubles de la reproduction.**

- **Toujours démarrer et faire tourner le moteur dans une zone bien aérée.**
- **Si la zone est fermée, diriger l'échappement vers l'extérieur.**
- **Ne pas modifier ni altérer le système d'échappement.**
- **Ne pas faire tourner le moteur au ralenti, sauf si nécessaire.**

Pour plus d'informations, consulter www.P65Warnings.ca.gov/diesel.

2-7. Principales normes de sécurité

Safety in Welding, Cutting, and Allied Processes, American Welding Society standard ANSI Standard Z49.1. Website: www.aws.org.

Safe Practices for the Preparation of Containers and Piping for Welding and Cutting, American Welding Society Standard AWS F4.1. Website: www.aws.org.

National Electrical Code, NFPA Standard 70 from National Fire Protection Association. Website: www.nfpa.org.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1 from Compressed Gas Association. Website: www.cganet.com.

Safety in Welding, Cutting, and Allied Processes, CSA Standard W117.2 from Canadian Standards Association. Website: www. csagroup.org.

Battery Chargers, CSA Standard C22.2 NO 107.2-01 from Canadian Standards Association. Website: www.csagroup.org.

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

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B from National Fire Protection Association. Website: www.nfpa.org.

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910.177 Subpart N, Part 1910 Subpart Q, and Part 1926, Subpart J. Website: www.osha.gov.

OSHA *Important Note Regarding the ACGIH TLV, Policy Statement on the Uses of TLVs and BEIs.* Website: www.osha.gov.

Portable Generator Hazards Safety Alert from U. S. Consumer Product Safety Commission (CPSC). Website: www.cpsc.gov.

Applications Manual for the Revised NIOSH Lifting Equation from the National Institute for Occupational Safety and Health (NIOSH). Website: www.cdc.gov/NIOSH.

For Standards regulating hydraulic systems, contact the National Fluid Power Association. Website: www.nfpa.com.

Battery Service Manual from the Battery Council International. Website: www.batterycouncil.org.

ROM_fre 2024–01

2-8. Informations relatives aux CEM

Le courant électrique qui traverse tout conducteur génère des champs électromagnétiques (CEM) à certains endroits. Le courant issu d'un soudage à l'arc (et de procédés connexes, y compris le soudage par points, le gougeage, le découpage plasma et les opérations de chauffage par induction) crée un champ électromagnétique (CEM) autour du circuit de soudage. Les champs électromagnétiques produits peuvent causer interférence à certains implants médicaux, p. ex. les stimulateurs cardiaques. Des mesures de protection pour les porteurs d'implants médicaux doivent être prises: par exemple, des restrictions d'accès pour les passants ou une évaluation individuelle des risques pour les soudeurs. Tous les soudeurs doivent appliquer les procédures suivantes pour minimiser l'exposition aux CEM provenant du circuit de soudage:

1. Rassembler les câbles en les torsadant ou en les attachant avec du ruban adhésif ou avec une housse.
2. Ne pas se tenir au milieu des câbles de soudage. Disposer les câbles d'un côté et à distance de l'opérateur.
3. Ne pas courber et ne pas entourer les câbles autour de votre corps.
4. Maintenir la tête et le torse aussi loin que possible du matériel du circuit de soudage.
5. Connecter la pince sur la pièce aussi près que possible de la soudure.
6. Ne pas travailler à proximité d'une source de soudage, ni s'asseoir ou se pencher dessus.
7. Ne pas souder tout en portant la source de soudage ou le dévidoir.

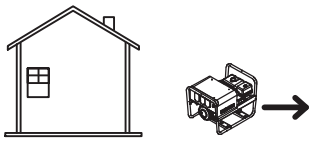
En ce qui concerne les implants médicaux :

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

SECTION 3 – DEFINITIONS

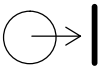
3-1. Additional Safety Symbol Definitions

☞ *Some symbols are found only on CE products.*

	Warning! Watch Out! There are possible hazards as shown by the symbols.
	Moving parts can injure.
	Never use generator inside a home or garage, even if doors and windows are open.
	Only use generator outside and far away from windows, doors, and vents.

3-2. Miscellaneous Symbol Definitions

A	Amperage
V	Voltage
U_0	Rated No-Load Voltage (OCV)
U_2	Load Voltage
I_2	Rated Welding Current
X	Duty Cycle
—	Negative
+	Positive
CC	Constant Current
CV	Constant Voltage

F	Full
E	Empty
	Engine-Driven Generator with Rectifier
	Direct Current (DC)
	Alternating Current (AC)
	Protective Earth (Ground)
	Circuit Breaker Supplementary Protector
	Single Phase Alternator
	Output
	Contactor On/ Electrode Hot

	Do Not Switch While Welding
	Remote
	Read Operator's Manual
	Welding (General)
	Shielded Metal Arc Welding (SMAW)
	Gas Metal Arc Welding (GMAW)
	Gas Tungsten Arc Welding (GTAW) / Tungsten Inert Gas (TIG) Welding
	Touch Start (GTAW)
	Temperature

	Engine Oil
	Fuel
	Battery (Engine)
	Engine
	Engine Start (Engine RPM)
	Engine Stop
	Engine Off

	Engine Choke
	Idle (Slow)
	Run (Fast)
	On
Hz	Hertz
%	Percent

	Air Filter
	Spool Gun
	Push Button
	Press Or Turn Button
	Battery Charge
	USB

SECTION 4 – SPECIFICATIONS

4-1. Serial Number And Rating Label Location

The serial number and rating information for this product is located on the rear panel. Use rating label to determine rated output. For future reference, write serial number in space provided on back cover of this manual.

4-2. Software Licensing Agreement

The End User License Agreement and any third-party notices and terms and conditions pertaining to third-party software can be found at https://www.millerwelds.com/eula and are incorporated by reference herein.

4-3. Information About Default Weld Parameters And Settings

NOTICE – *Each welding application is unique. Although certain Miller Electric products are designed to determine and default to certain typical welding parameters and settings based upon specific and relatively limited application variables input by the end user, such default settings are for reference purposes only; and final weld results can be affected by other variables and application-specific circumstances. The appropriateness of all parameters and settings should be evaluated and modified by the end user as necessary based upon application-specific requirements. The end user is solely responsible for selection and coordination of appropriate equipment, adoption or adjustment of default weld parameters and settings, and ultimate quality and durability of all resultant welds. Miller Electric expressly disclaims any and all implied warranties including any implied warranty of fitness for a particular purpose.*

4-4. Weld, Power, And Engine Specifications

☞ *This equipment will deliver rated output at an ambient air temperature up to 104°F (40°C).*

Welding Mode	Rated Welding Output 100% Duty Cycle	Maximum Open-Circuit Voltage	Weld Output Range	Generator Power Rating	Fuel Capacity	Engine	Fuel Type
CC/DC	314 A, 32.5 V* 330 A, 31 V	107	20 – 330 A	**Peak**: 12kW **Continuous**: 10.5 kVA/kW, 88/44 A, 120/240 V AC, 60 Hz, Single-Phase	11 gal (42 L) Tank	Kubota D902–E4B-MLR-3 18.5kW@3600 rpm Water-Cooled, Three Cylinder, Four-Cycle Diesel	Ultra Low Sulfur Diesel ☞ *See Engine Owners Manual for biodiesel use.*
CV/DC	330 A, 30.5 V*	107	15 – 40 V				

* Meets NEMA and IEC Ratings

4-5. Optional Battery Charger Specifications

Output	Rated Output	Output Range	Maximum Open-Circuit Voltage (Nominal)
Battery Charge	5 to 150 A, 12 V Charge 5 to 150 A, 24 V Charge	12 or 24 V	14/28
Jump Start	300 A, 12 V Jump Start for 20 Seconds 300 A, 24 V Jump Start for 20 Seconds		

4-6. Environmental Specifications

A. IP Rating

IP Rating
IP23S This equipment is designed for outdoor use. It may be stored, but is not intended to be used for welding outside during precipitation unless sheltered.

B. Temperature Specifications

Operating Temperature Range*	Storage/Transportation Temperature Range
-20 to 104°F (-29 to 40°C)	-40 to 131°F (-40 to 55°C)

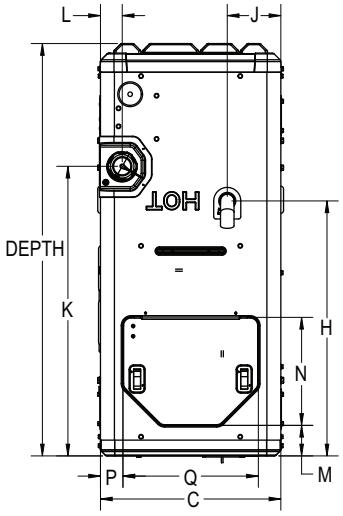
*Output is derated at temperatures above 104°F (40°C).

C. Information On Electromagnetic Compatibility (EMC)

⚠ **This Class A equipment is not intended for use in residential locations where the electrical power is provided by the public low-voltage supply system. There can be potential difficulties in ensuring electromagnetic compatibility in those locations, due to conducted as well as radiated disturbances.**

4-7. Dimensions, Weights, And Operating Angles

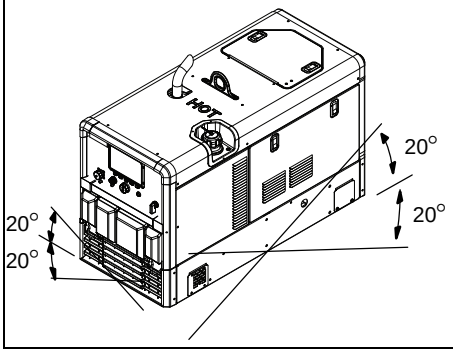
Dimensions	
External Dimensions	
Height	(With Exhaust) 32.41 in. (823 mm)
Width	20.6 in. (523 mm)
Depth	45.72 in. (1161 mm)
A	27.02 in. (686 mm)
B	44.67 in. (1135 mm)
C	20 in. (508 mm)
D	29.63 in. (753 mm)
E	(Top Door Clearance) 11.91 in. (303 mm)
F	(Output Cover Clearance) 6.4 in. (163 mm)
G	(Side Door Clearance) 10.15 in. (258 mm)
Exhaust Pipe Location	
H	28.27 in. (718 mm)
J	5.94 in. (151 mm)
Fuel Fill Location	
K	32.05 in. (814 mm)
L	2.39 in. (60.7 mm)
Top Door Location	
M	3.39 in. (86.1 mm)
N	11.98 in. (304 mm)
P	2.49 in. (63.2 mm)
Q	15.01 in. (381 mm)
Mounting Hole Location	
R	6.56 in. (167 mm)
S	30.5 in. (775 mm)
T	1.67 in. (42.42 mm)
U	16.56 in. (421 mm)
V	Ø 0.41 in. (10.41 mm)
Weight	
611 lb (277 kg)	
Lifting Eye Weight Rating: 1,100 lb (499 kg)	

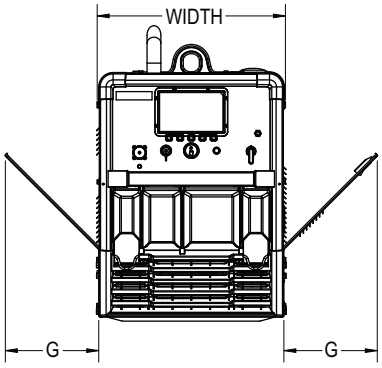


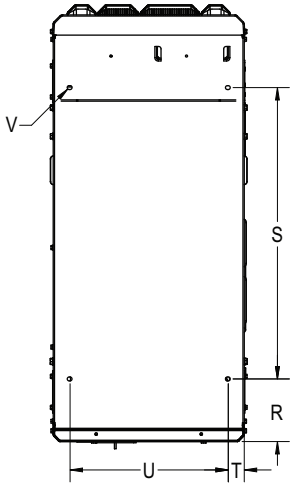
⚠ **Do not exceed tilt angles or engine could be damaged or unit could tip.**

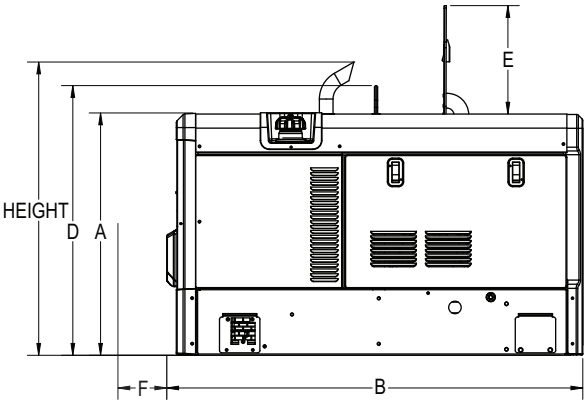
⚠ **Do not move or operate unit where it could tip.**

⚠ **Do not operate suspended from lifting eye.**





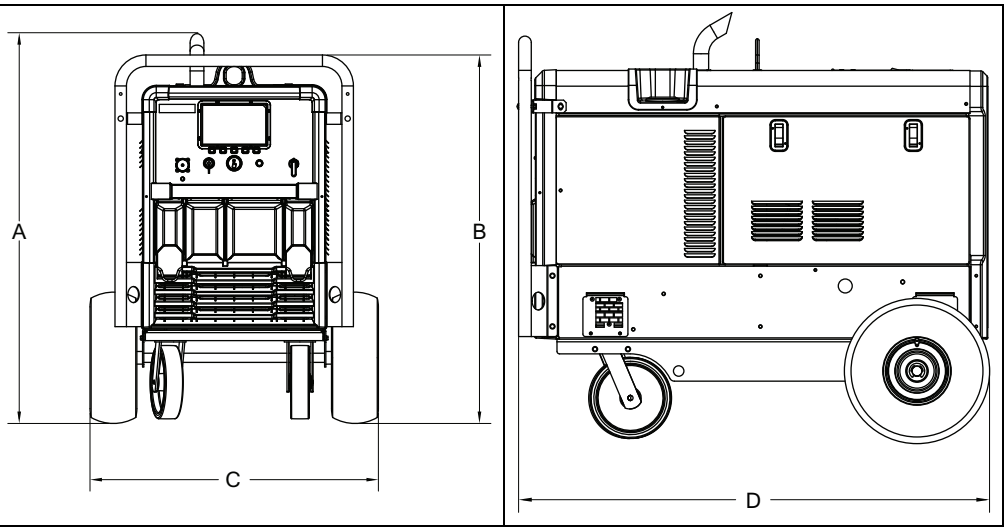




4-8. Dimensions For Units With Optional Running Gear

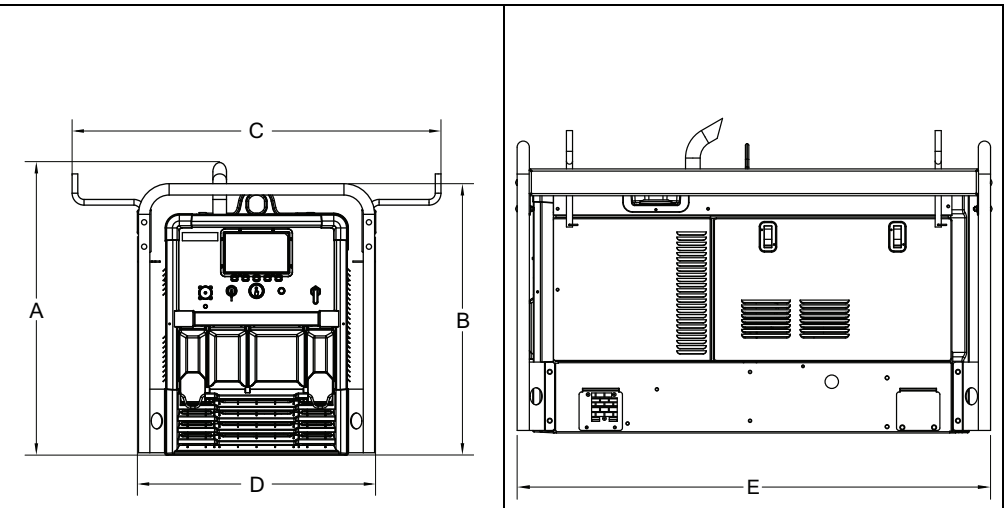
A. Running Gear

Dimensions	
A	Height To Top Of Exhaust Pipe: 42.61 in. (108.23 cm)
B	Height To Top Of Handle: 40.18 in. (102.06 cm)
C	Width: 31.45 in. (79.88 cm)
D	Length: 46.45 in. (117.98 cm)



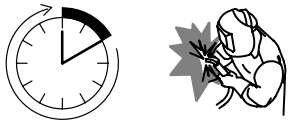
B. Protective Cage with Cable Holders

Dimensions	
A	Height To Top Of Exhaust Pipe: 32.32 in. (82.09 cm)
B	Height To Top Of Handle: 29.87 in. (75.87 cm)
C	Width With Cable Holders: 40.62 in. (103.17 cm)
D	Width Without Cable Holders: 26.23 in. (66.62 cm)
E	Length: 48.47 in. (123.11 cm)



4-9. Duty Cycle And Overheating

100% Duty Cycle at 330 Amperes DC



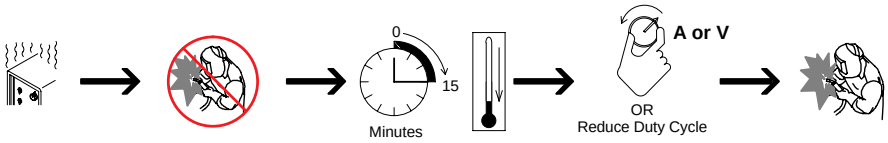
Continuous Welding

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

☞ *This unit is rated for welding at 330 amperes continuously.*

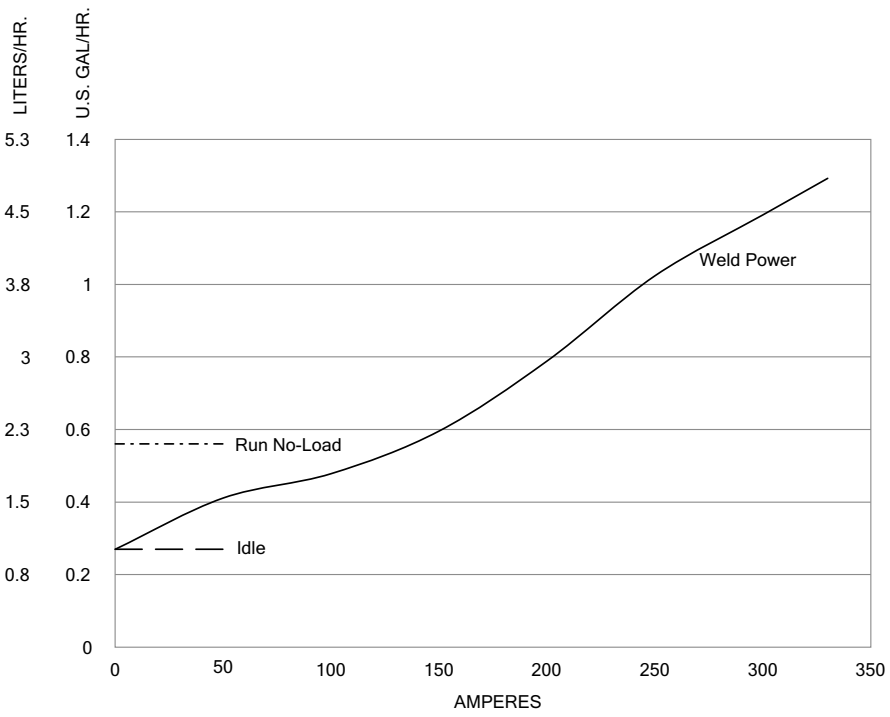
***NOTICE** – Exceeding duty cycle can damage unit and void warranty.*

Overheating

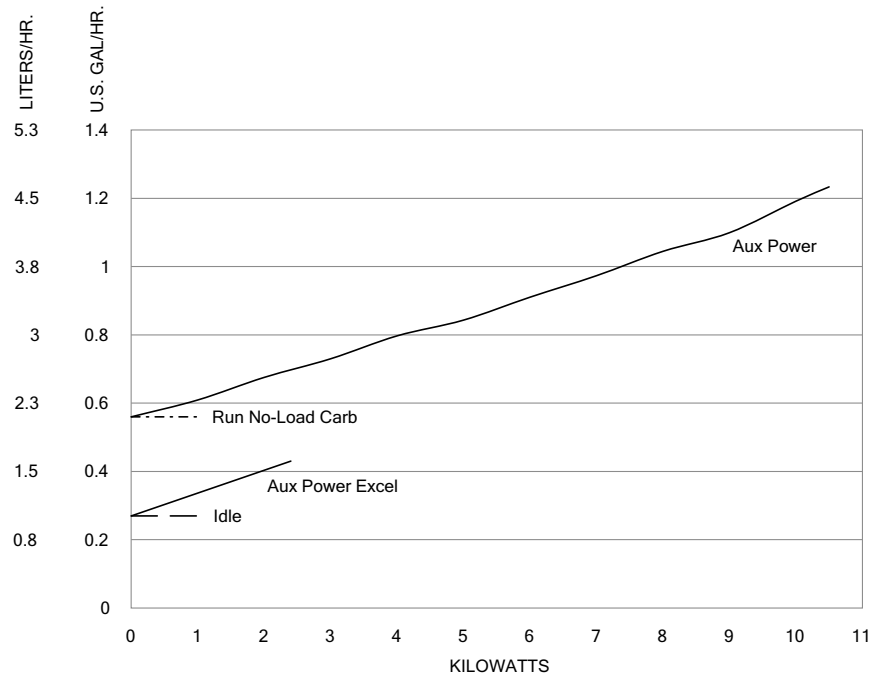


4-10. Fuel Consumption Curves

Weldlng

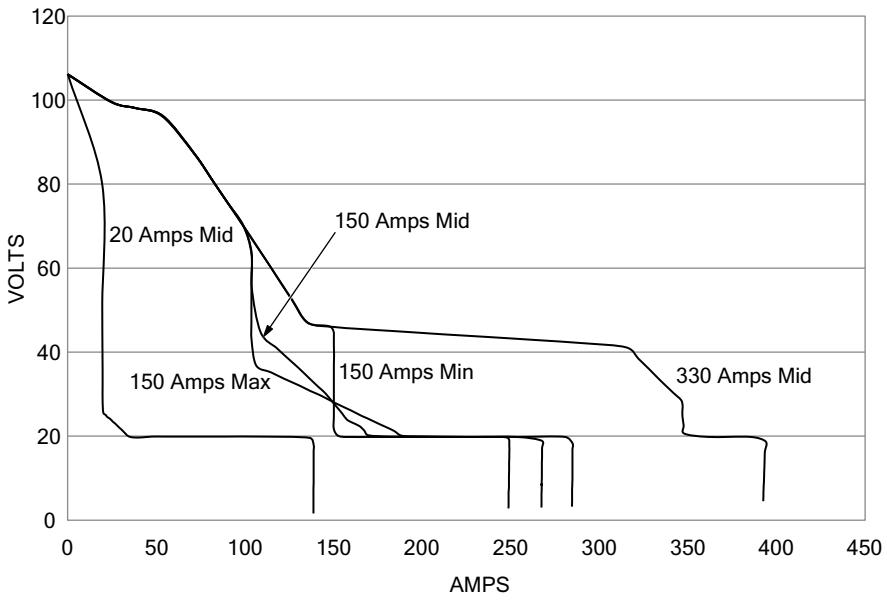


Auxiliary Power

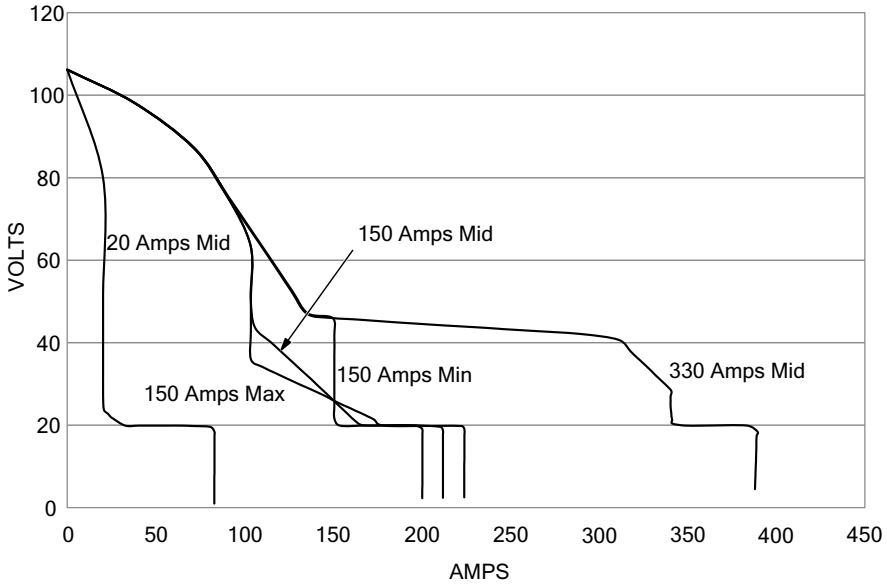


4-11. Stick Mode Volt-Ampere Curves

XX10 Electrode

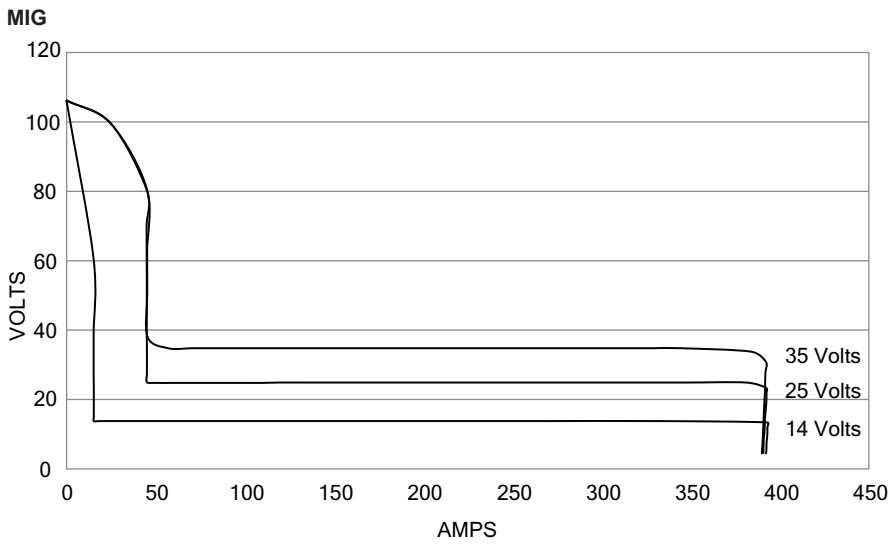


XX18 Electrode



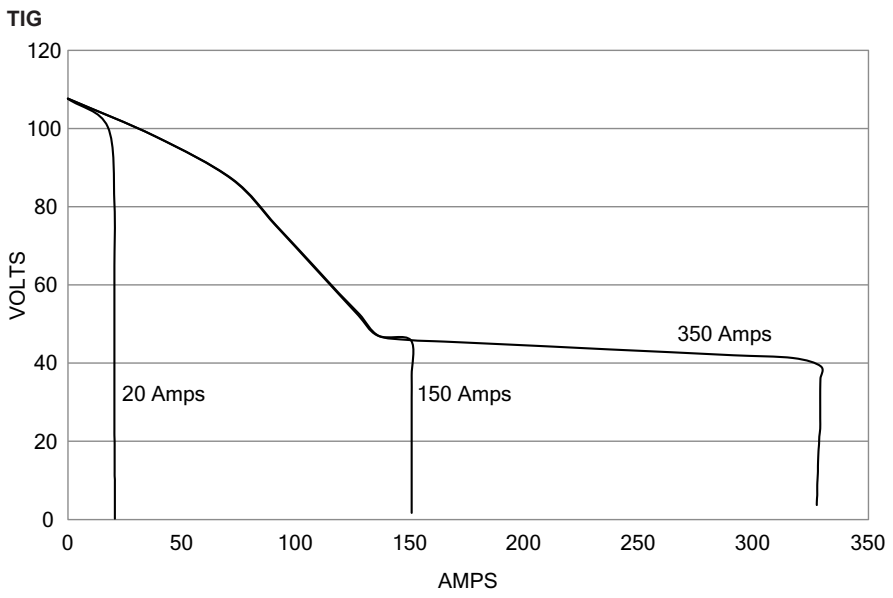
The volt-ampere curves show the minimum and maximum voltage and amperage output capabilities of the welder/generator. Curves of other settings fall between the curves shown.

4-12. MIG Mode Volt-Ampere Curves



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

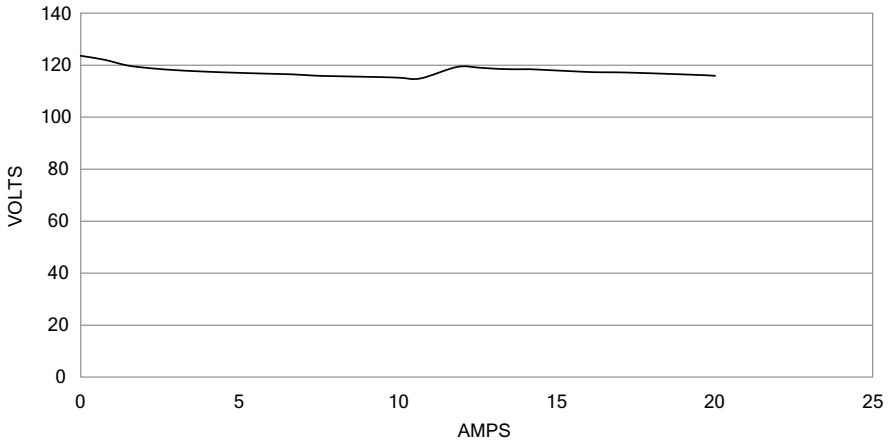
4-13. TIG Mode Volt-Ampere Curves



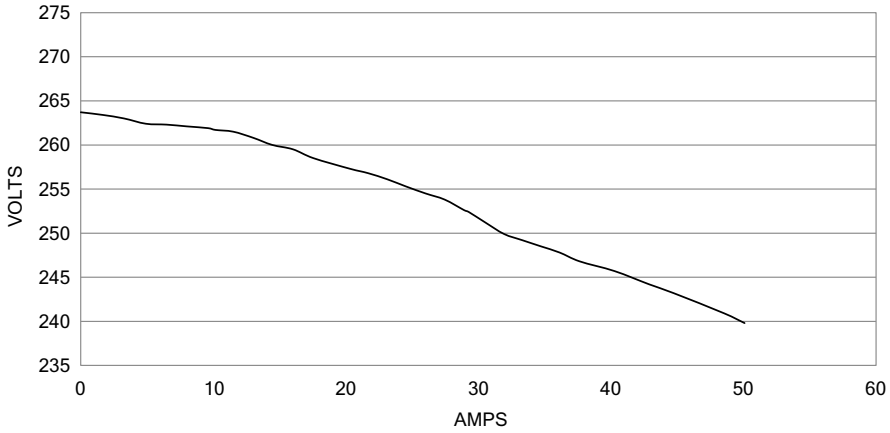
The volt-ampere curves show the minimum and maximum voltage and amperage output capabilities of the welder/generator. Curves of other settings fall between the curves shown.

4-14. Generator Power Curve

120 Volt Excel



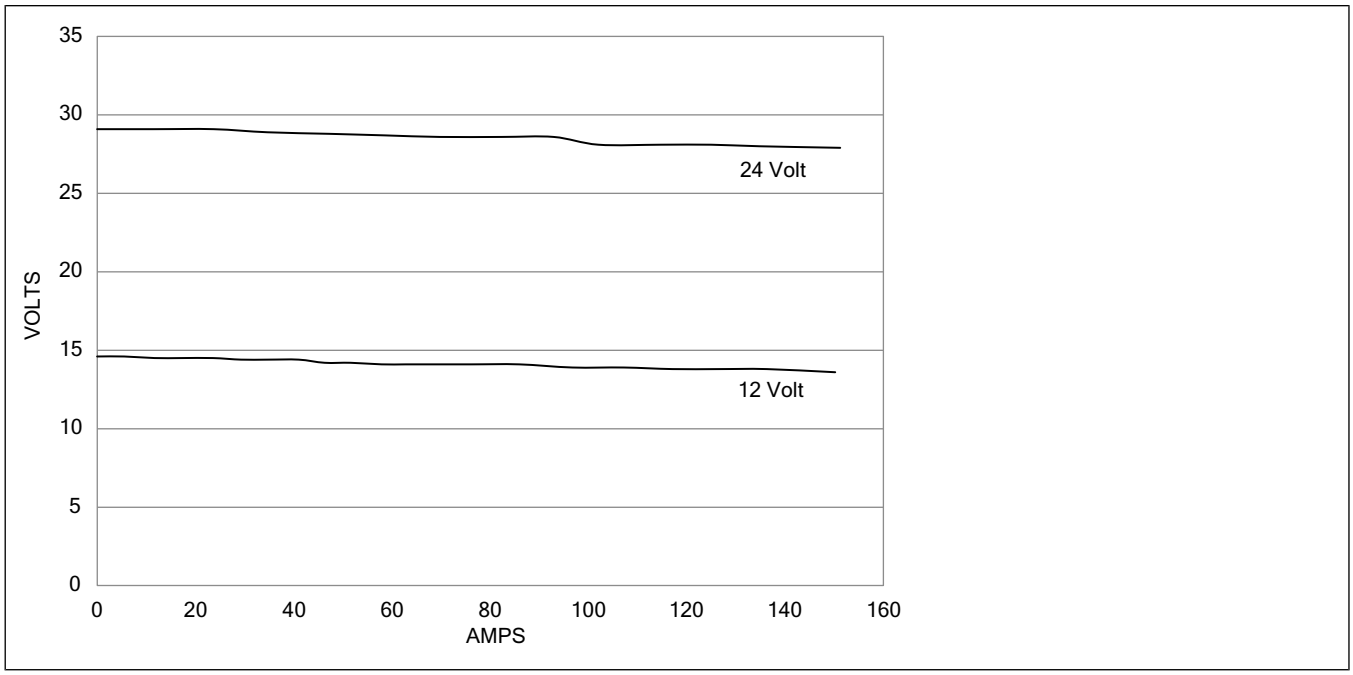
240 Volt



The AC generator power curve shows the generator power available in amperes at the receptacles.

Tools and motors are designed to operate within 10% of 120/240 VAC.

4-15. Battery Charge Curve (Models With Battery Charge Option)



4-16. Wireless Remote (Optional) Regulatory Approval

This device complies with Part 15 of the FCC rules. Operation is subject to the following conditions:

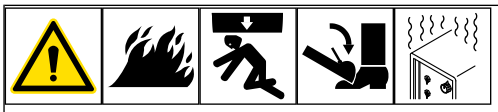
1. This device may not cause harmful interference, and
2. This device may accept any interference received, including interference that may cause undesired operation.

WARNING! Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this device.

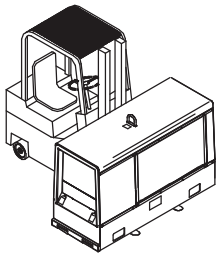
Reception of the fob and receiver signal can be affected by the weather, environment, and/or area conditions.

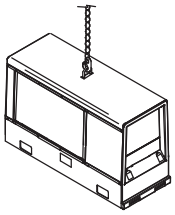
SECTION 5 – INSTALLATION

5-1. Installing Welder/Generator



Movement





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

⚠ **Do not lift unit from end.**

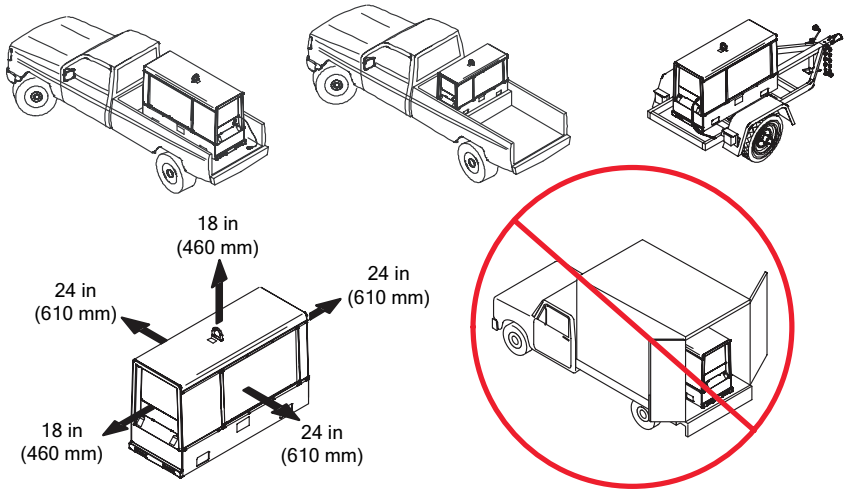
⚠ **Do not weld on base. Welding on base can cause fuel tank fire or explosion. Bolt unit down using holes provided in base.**

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

NOTICE – *Do not install unit where airflow is restricted or engine may overheat.*

☞ *See Specifications for lifting eye rating.*

Location/Airflow Clearance



Mounting:

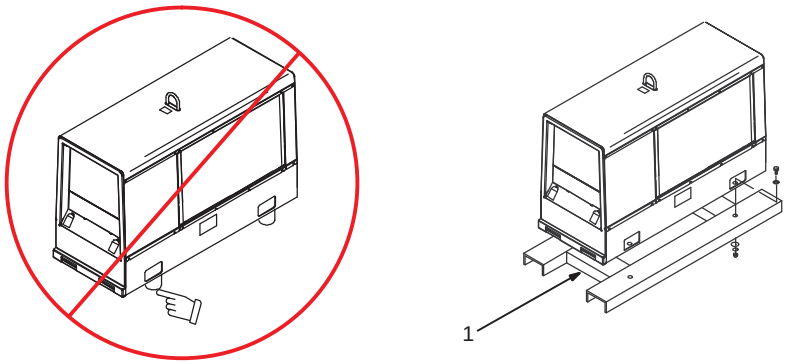
⚠ **Do not mount unit by supporting the base only at the four mounting holes. Do not use flexible mounts. Use cross-supports to adequately support unit and prevent damage to base.**

1 Cross-Supports

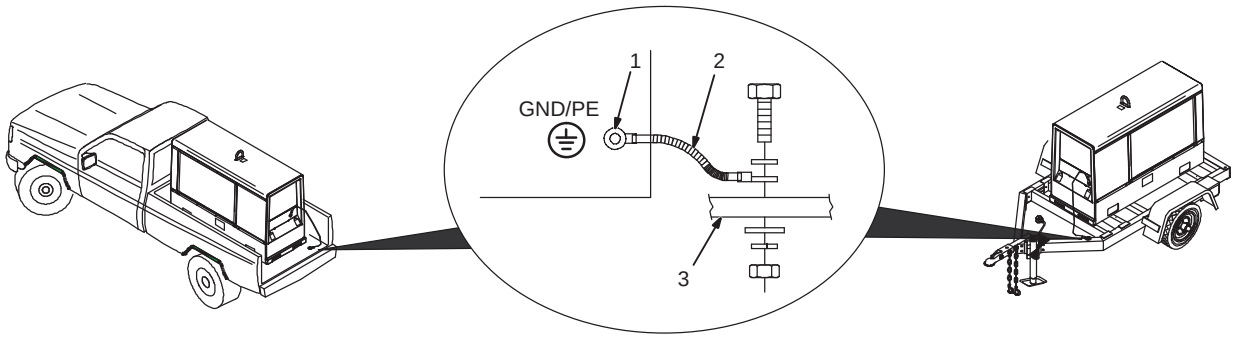
Mount unit on flat surface or use cross-supports to support base.

☞ *Go to MillerWelds.com for more information on truck installations.*

Mounting



5-2. Grounding Generator to Truck or Trailer Frame



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

⚠ **Also see AWS Safety & Health Fact Sheet No. 29, Grounding of Portable And Vehicle Mounted Welding Generators.**

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

1 Equipment Grounding Terminal (On Front Panel)

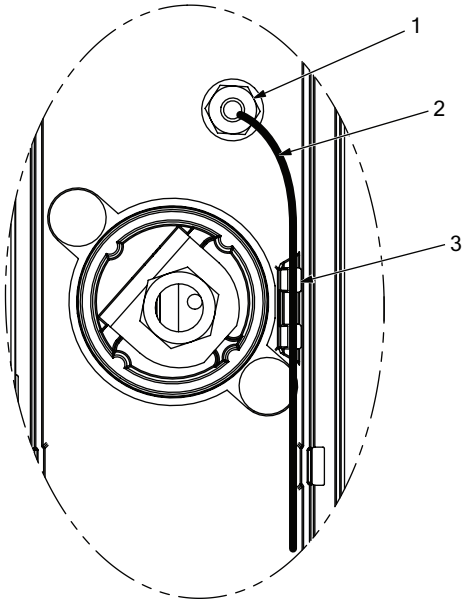
2 Grounding Cable (Not Supplied)

3 Metal Vehicle Frame

Connect cable from equipment ground terminal to metal vehicle frame. Use #8 AWG or larger insulated copper wire.

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

5-3. Ground Cable Routing



☞ *See Section 5-2 prior to routing grounding wire.*

1 Equipment Grounding Stud

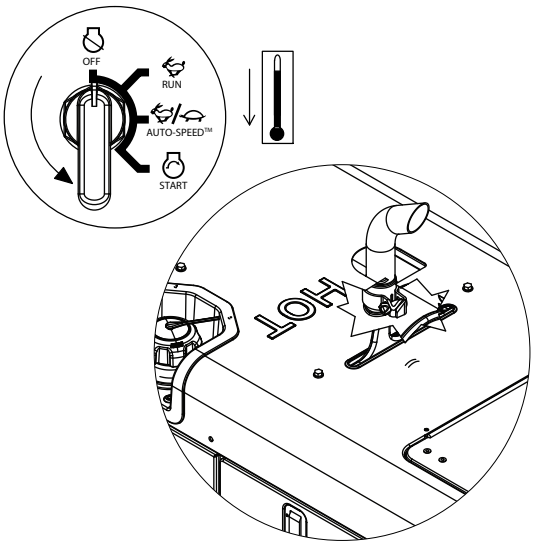
2 Grounding Cable

3 Grounding Cable Retention Clip

Route cable from equipment grounding terminal to metal frame through cable retention clip.

Use #8 AWG insulated copper wire.

5-4. Installing Exhaust Pipe



9/16 in.

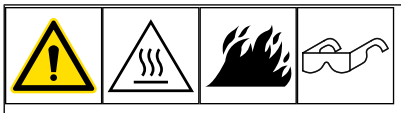
⚠ **Stop engine and let cool.**

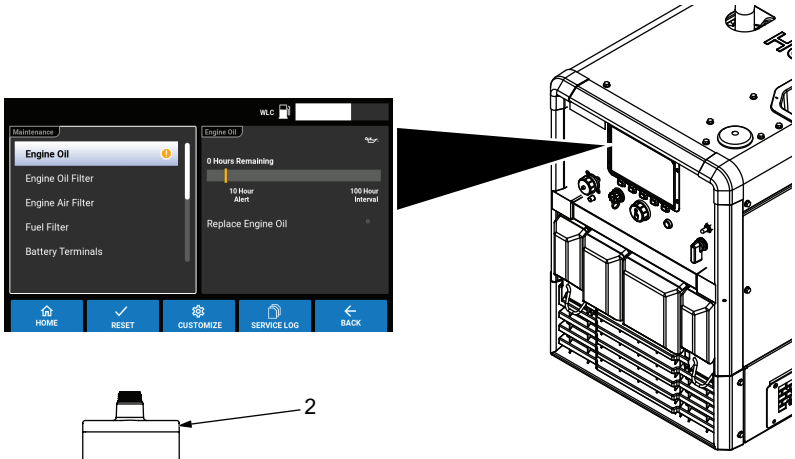
⚠ **Engine backfire can cause severe burns or other injuries. Do not point exhaust pipe toward control panel. Keep away from exhaust outlet.**

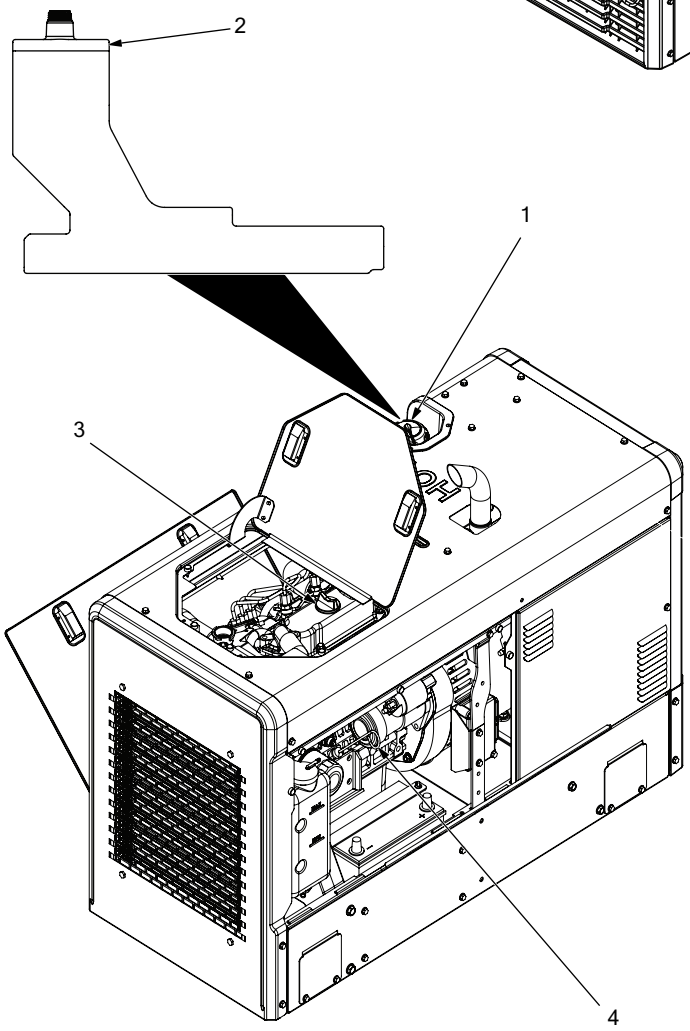
⚠ **Do not point exhaust pipe toward LP fuel tank (if equipped). Do not point exhaust pipe towards shielding gas tank (if equipped).**

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

5-5. Engine Prestart Checks







Check all fluids daily. Engine must be cold and on a level surface. Unit is shipped with 10W-30 synthetic blend engine oil.

☞ *Follow run-in procedure in engine manual.*

☞ *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.*

Fuel

1 Fuel Fill Cap

2 Air Gap

Add fresh diesel fuel to bottom of filler neck. Do not overfill. Be sure to leave air on top for expansion.

Engine will shutdown if fuel level is low. Air in fuel system causes starting problems.

Oil

Open top and side service door.

3 Oil Fill

4 Oil Check

☞ *Do not exceed the "Full" mark on the oil level dipstick.*

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

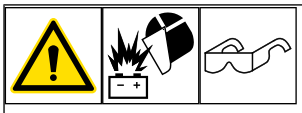
Use maintenance screen to determine hours until next recommended oil change (see Menu-Maintenance).

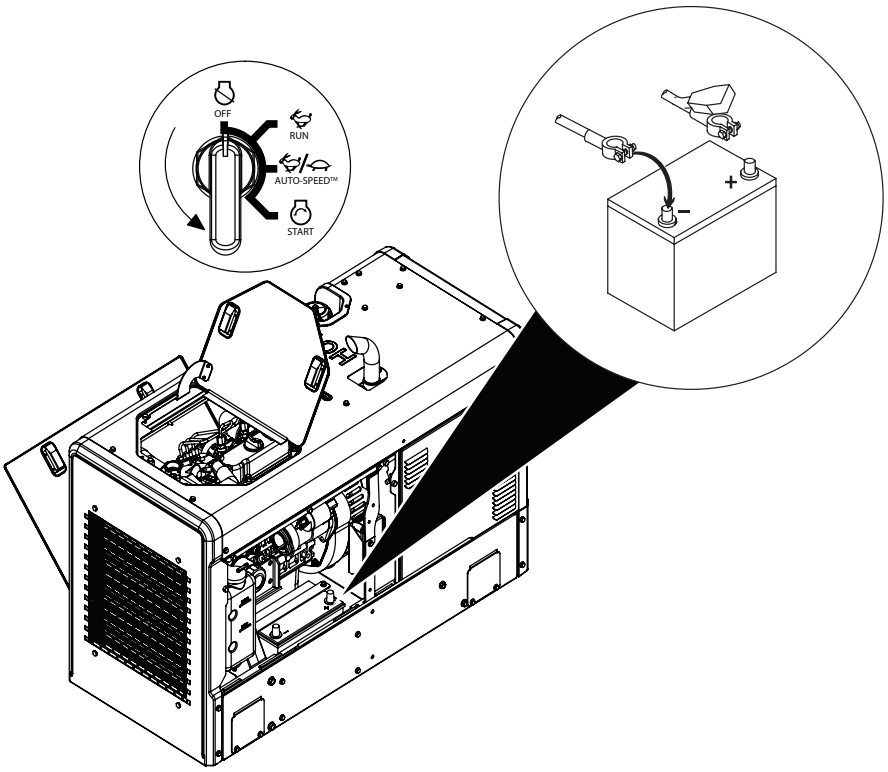
Close top and side service door.

To improve cold weather starting:

- Keep battery in good condition. Store battery in warm area.
- Use fuel formulated for cold weather (diesel fuel can gel in cold weather).
- Contact local fuel supplier for fuel information.
- Use correct grade oil for cold weather.
- Incorporate block heater.
- Do not use ether or starting aids. Damage caused by these is not covered by warranty.

5-6. Connecting Or Replacing the Battery





1/2 in.

⚠ **Connect negative (-) battery cable last.**

Battery is most easily accessed by opening left rear side panel.

- Do not allow the battery cables to touch opposing terminals. When connecting the battery cables attach the positive (+) cable to the positive (+) battery terminal first, followed by negative (−) cable to negative (−) battery terminal.
- Never start the engine when the cables are loose or poorly connected to the battery terminals.
- Never disconnect the battery while the engine is running.
- Never use a quick battery charger to start the engine.
- Do not charge battery with Engine Control switch On.
- Always disconnect the negative (−) battery cable before charging battery.
- Be sure to close and/or replace all panels after connecting battery and starting machine.

Replacing Battery:

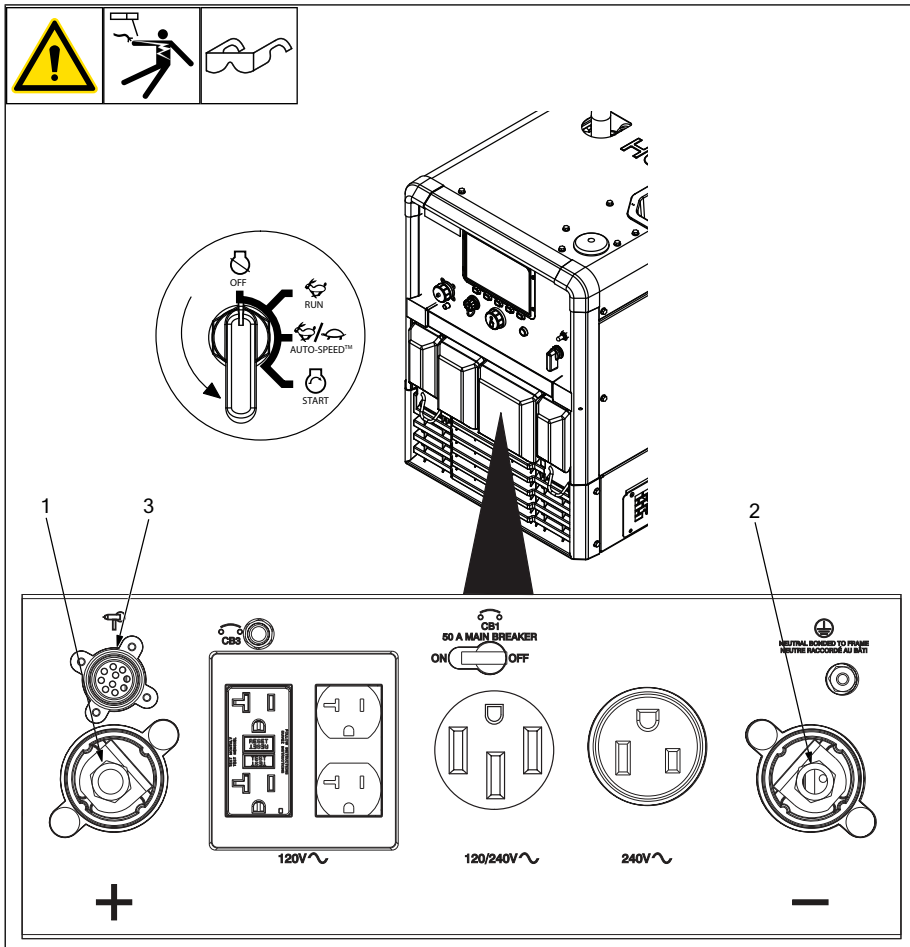
Remove left rear side panel and battery holddown.

☞ *Be sure there are no hoses or wires pinched when installing the battery.*

☞ *Be sure to close and/or replace all panels after connecting the battery and before starting the machine.*

Battery Information	
Nominal Voltage	12V
BCI Group Size	51R
Cold Crank Rating	450 Amperes Min.
Reserve Capacity	70 Minutes Min.
Approximate Weight	28 lbs Wet

5-7. Weld Output Terminals



⚠ **Stop engine.**

⚠ **Turn off power before connecting to weld output terminals.**

⚠ **Do not use worn, damaged, undersized, or repaired cables.**

1 Positive Weld Output Terminal Electrode Output Terminal (Polarity Reversing Models)

2 Negative Weld Output Terminal Work Output Terminal (Polarity Reversing Models)

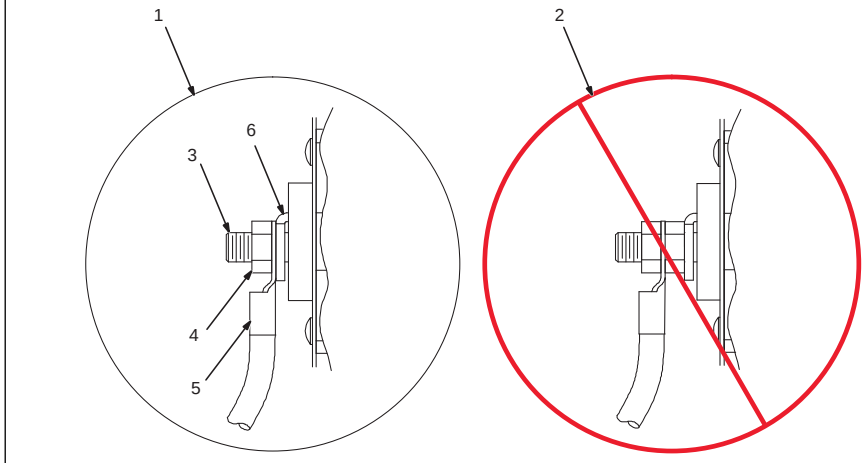
3 Spool gun receptacle

Connect electrode or torch cable to positive terminal for Direct Current Electrode Positive (DCEP) or the negative terminal for Direct Current Electrode Negative (DCEN).

☞ *Polarity Reversing Models:*

Electrode or torch will always be connected to electrode terminal. Polarity reversing feature will change polarity automatically when process is selected.

5-8. Connecting Weld Output Cables



3/4 in. (19 mm)

⚠ **Stop engine.**

⚠ **Failure to properly connect weld cables may cause excessive heat and start a fire, or damage your machine.**

☞ *Do not place anything between weld cable terminal and copper bar. Make sure that the surfaces of the weld cable terminal and copper bar are clean.*

1 Correct Weld Cable Connection

2 Incorrect Weld Cable Connection

3 Weld Output Terminal

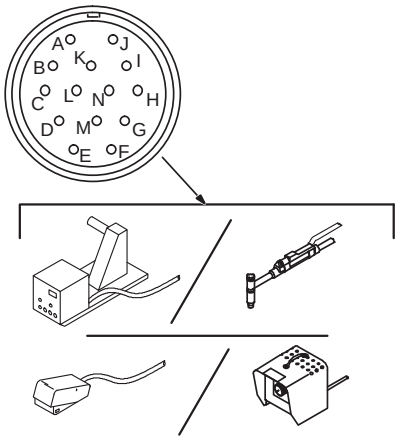
4 Supplied Weld Output Terminal Nut

5 Weld Cable Terminal

6 Copper Bar

Remove supplied nut from weld output terminal. Slide weld cable terminal onto weld output terminal and secure with nut so that weld cable terminal is tight against copper bar.

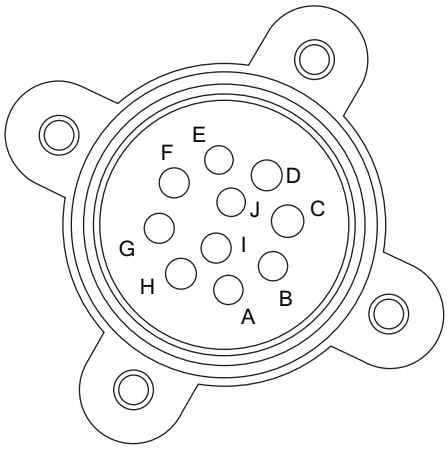
5-9. Remote Receptacle Information



Remote 14	Socket*	Socket Information
24 Volts AC Output (Contactor)	A	24 volts AC. Protected by supplementary protector CB4.
	B	Contact closure to A completes 24 volt AC contactor control circuit and keeps engine at Run speed in all modes.
Remote Output Control	C	+10 volts DC output to remote control.
	D	Remote control circuit common.
	E	0 to +10 volts DC input command signal from remote control.
A/V Amperage Voltage	F	Current feedback: 1 volt per 100 amperes.
	H	Voltage feedback: 1 volt per 10 arc volts.
GND	G	Circuit common for 24 and 115 volts AC circuits.
	K	Chassis common.

*The remaining sockets are not used.

5-10. Spool Gun Receptacle Information



Socket*	Socket Information
C	Motor Positive (+) 0 to 24 volts DC
B	Motor Negative (-) 0 volts
D	Spool Gun Trigger 15 volts DC
G	Spool Gun Trigger 0 volts
E	10V Reference
F	WFS Potentiometer 0 to 10 volts DC
H	Common

* The remaining sockets are not used.

5-11. Selecting Cable Sizes*

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

	Weld Cable Size and Total Cable (Copper) Length in Weld Circuit Not Exceeding*****							
	100 ft (30 m) or Less		**150 ft (45 m)**	**200 ft (60 m)**	**250 ft (70 m)**	**300 ft (90 m)**	**350 ft (105 m)**	**400 ft (120 m)**
Welding Amperes	**10 - 60% Duty Cycle AWG (mm^2)**	**60 - 100% Duty Cycle AWG (mm^2)**	**10 - 100% Duty Cycle AWG (mm^2)**					
100	4 (20)	4 (20)	4 (20)	3 (30)	2 (35)	1 (50)	1/0 (60)	1/0 (60)
150	3 (30)	3 (30)	2 (35)	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	3/0 (95)
200	3 (30)	2 (35)	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	4/0 (120)
250	2 (35)	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2x2/0 (2x70)	2x2/0 (2x70)
300	1 (50)	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2x2/0 (2x70)	2x3/0 (2x95)	2x3/0 (2x95)
350	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2x2/0 (2x70)	2x3/0 (2x95)	2x3/0 (2x95)	2x4/0 (2x120)
400	1/0 (60)	2/0 (70)	3/0 (95)	4/0 (120)	2x2/0 (2x70)	2x3/0 (2x95)	2x4/0 (2x120)	2x4/0 (2x120)

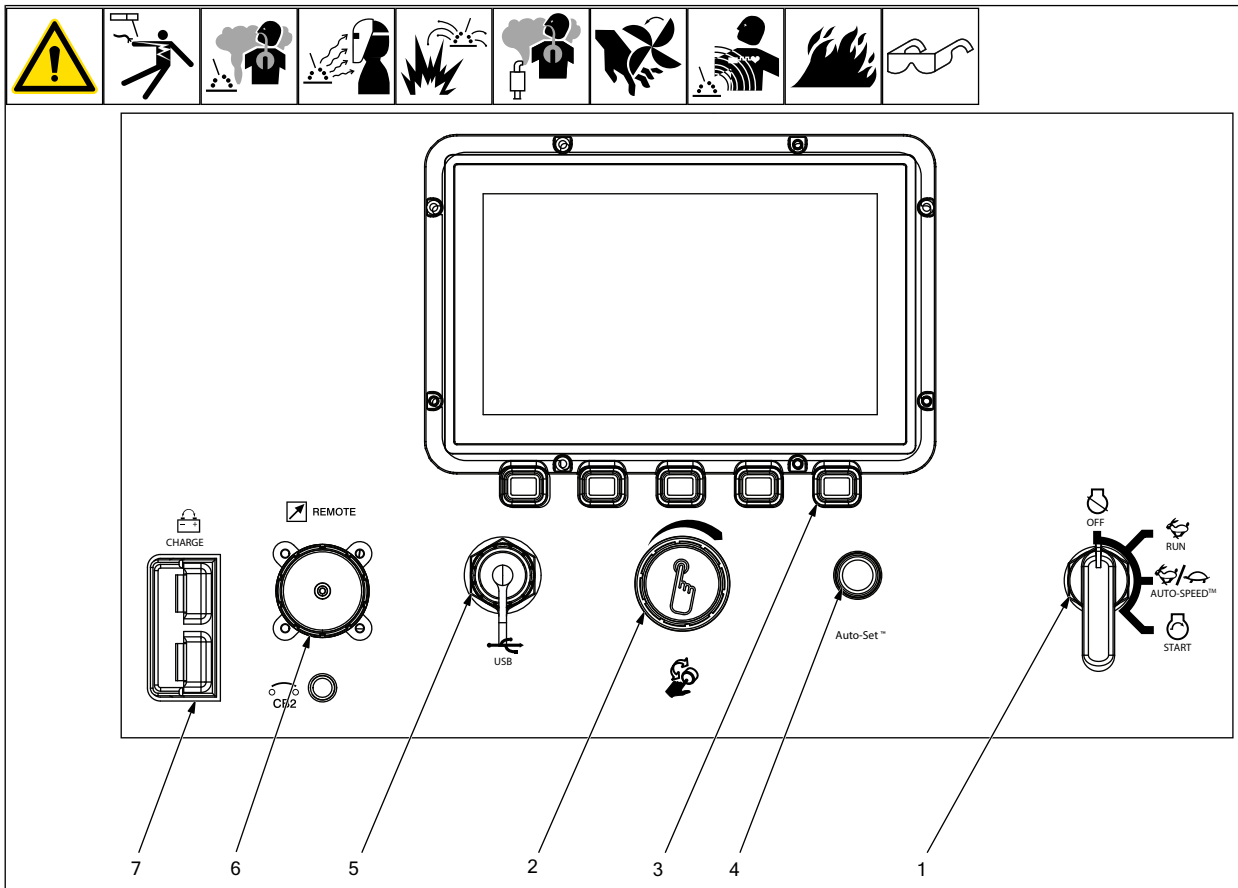
* This chart is a general guideline and may not suit all applications. If cable overheats, use next size larger cable.

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

***For distances longer than those shown in this guide, see AWS Fact Sheet No. 39, Welding Cables, available from the American Welding Society at http://www.aws.org.

SECTION 6 – OPERATION

6-1. Front Panel Controls



1 Engine Control Switch

Use switch to start engine, select speed, and stop engine. In Auto-Speed engine will run from 2400 RPM to 3600 RPM depending on weld load. In run position unit runs at 3600 RPM.

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.

2 Adjust Control/Select Knob

Push to select and rotate to navigate menus and adjust values.

Sets weld command and arc control.

3 Soft Buttons

Push to navigate screens/parameters.

4 Auto-Set

Push to set parameters based on pre-defined values.

5 USB

Use for software upgrade and collecting error codes.

☞ *Do not use USB receptacle on welder/generator to charge electronic devices.*

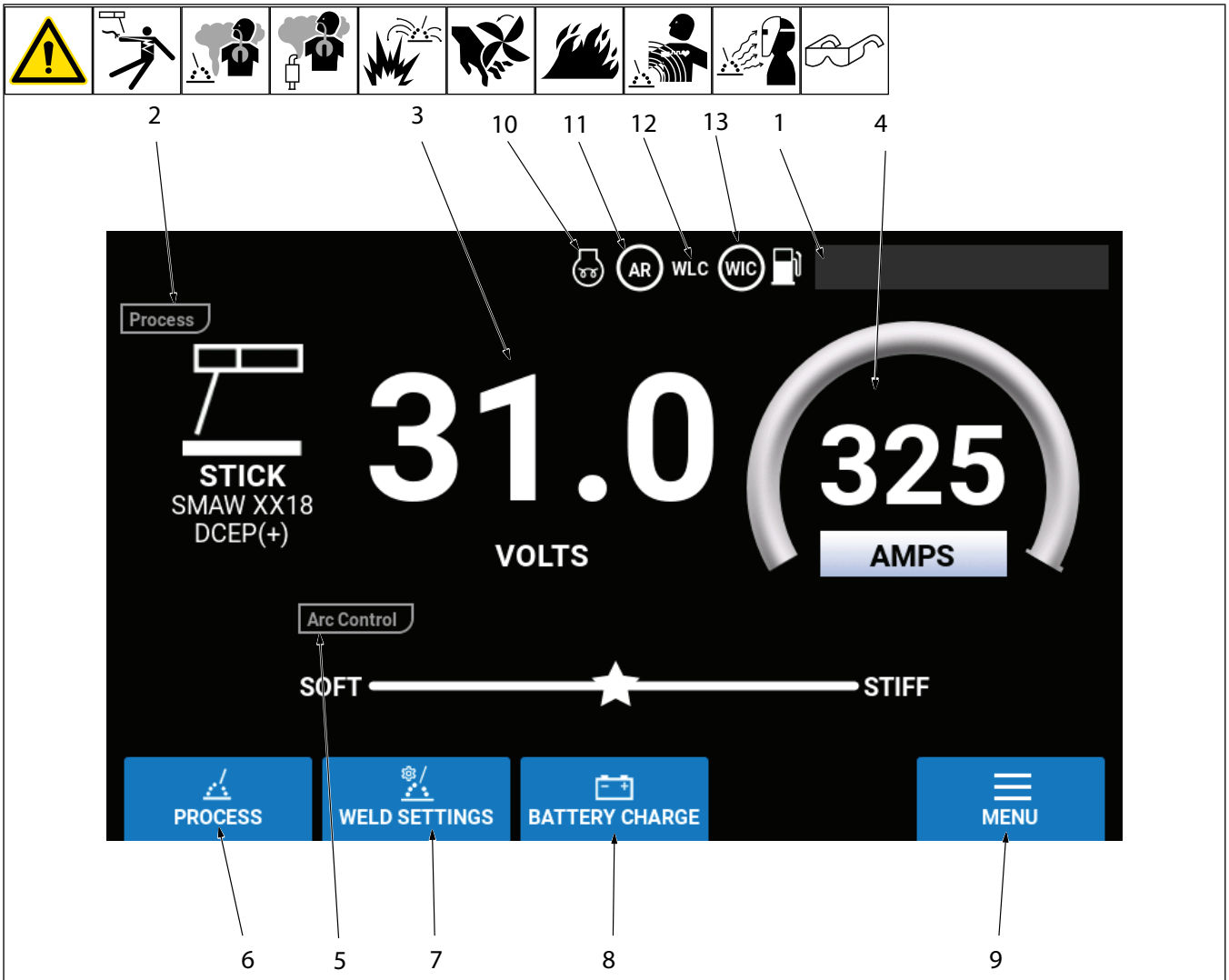
6 14 Pin Remote Receptacle

Used to connect remote accessories.

7 Battery Charge Receptacle (Optional)

Used to charge 12V or 24V battery.

6-2. Main Screen



1 Fuel Level

Displays current fuel level.

2 Weld Process

Displays current weld process.

3 Volt Setting

Displays open circuit voltage (CC).

Displays current volt setting (CV).

4 Amp Setting

Displays current amp setting (CC).

Displays welding current (CV).

5 Arc Control

Displays arc control setting.

6 Process Selection Button

Opens process selection screen.

7 Weld Settings Button

Opens weld settings screen.

8 (Optional) Battery Charge Button

Opens battery charge screen.

9 Menu Button

Opens Main Menu Screen.

10 Glow Plug

Indicates if glow plug is on.

11 ArcReach (AR)

Power source is connected to an ArcReach accessory.

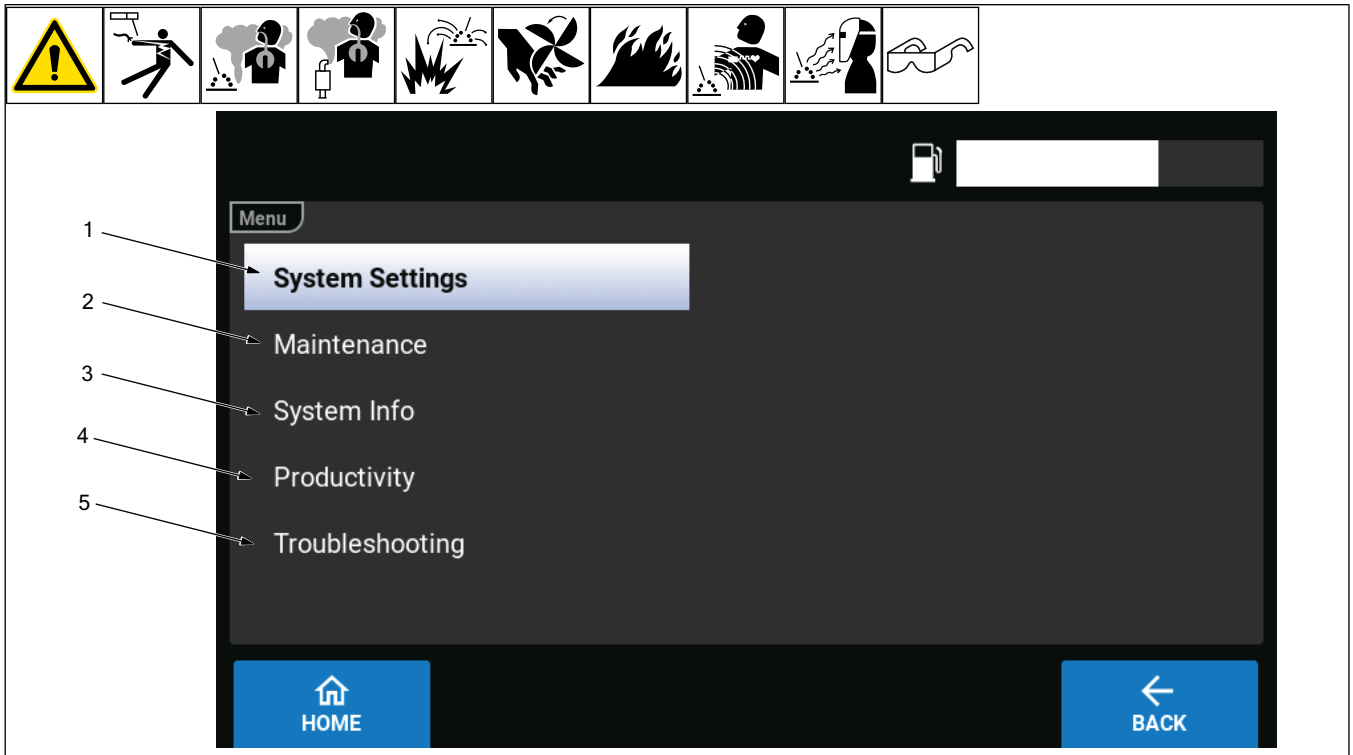
12 Weld Lead Compensation (WLC)

Power Source is adjusting output to compensate for long weld cables. See Section 10-6 for setting WLC parameters

13 Wireless Interface Control (WIC)

Indicates if WIC is active.

6-3. Menu Screen



1 System Settings

Select to change unit operation parameters. See Section 6-4.

2 Maintenance Menu

Select to check, change, or reset the maintenance interval schedule. See Section 10-1.

3 System Info

Select to check and update software, check and download summary file, and restore unit to factory defaults (see Section 6-19).

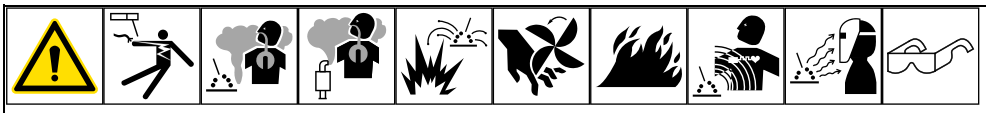
4 Productivity

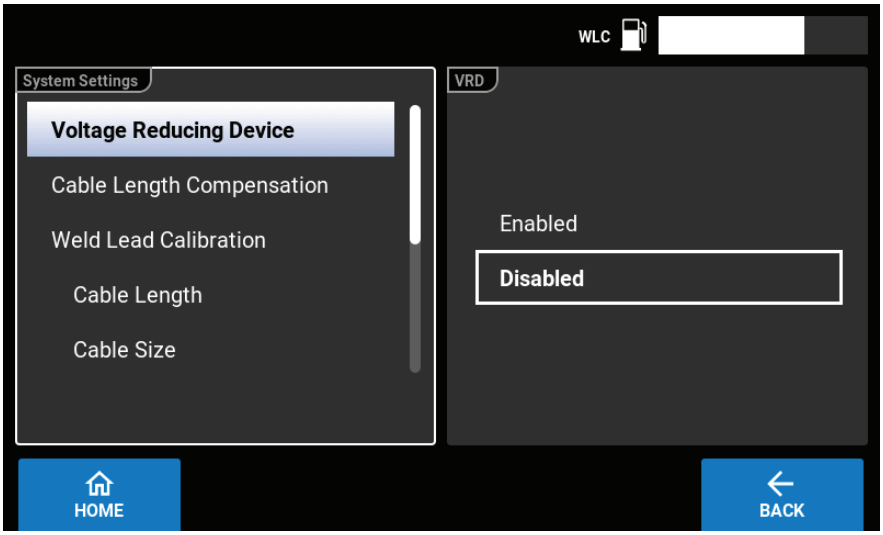
Select to check unit usage hours.

5 Troubleshooting

Displays live unit data for troubleshooting purposes.

6-4. System Settings Screen





To change System Settings:

- Rotate Adjust Control/Select button to select a setting.
- Press Adjust Control/Select button on desired setting.
- Rotate Adjust Control/Select button to update the setting.
- Press Adjust Control/Select button to save the setting, or press the Back button to discard setting change.
- Press Back button to return to Home screen.

System Settings Item	Selectable Item Option	Default Setting	Description
Voltage Reducing Device	Enabled / Disabled	Disabled	Enable/Disables voltage reducing device (see Section 6-7).
Cable Length Compensation	Enabled / Disabled	Disabled	Enables the Cable Length Compensation (see Section 6-6).
Weld Lead Calibration	Enabled / Disabled	Enabled	Enables the Weld Lead Calibration (see Section 6-5).
Cable Size*	2, 1, and 1/0 to 4/0	2/0	Sets the cable size for Weld Lead Calibration.
Cable Length*	10 to 500	250	Sets the total length of positive and negative cables for Weld Lead Calibration.
Screen Brightness	1–10	10	Sets screen brightness.

* Only visible if WLC is Enabled.

☞ *Weld Lead Calibration provides an increase in arc voltage to help offset the voltage drop based off of inputs of weld cable length and diameter.*

6-5. Weld Lead Calibration

☞ *Refer to Section 6-4 for enabling Weld Lead Calibration (WLC)*

☞ *Use of Auto-Set requires WLC or CLC to be enabled.*

WLC is a method for overcoming voltage drop when using long cable runs. WLC uses estimated values for the voltage drop based on the cable size and total length of the positive and negative cables. It provides a voltage increase from the power source to achieve a voltage at the wire feeder near the display set point.

Factors that affect WLC are the age and condition of your weld cables and the amount of connections used.

6-6. Cable Length Compensation (For CV Process)

☞ *Refer to Section 6-4 for enabling Cable Length Calibration (CLC)*

☞ *Use of Auto-Set requires WLC or CLC to be enabled.*

CLC is a another method for overcoming voltage drop when using long cable runs and the CV process. CLC uses a test weld to measure the exact voltage drop from your weld cables. It provides a voltage increase from the power source to achieve a voltage on the electrode at the display set point.

A new test weld will be performed each time the feeder binds with the unit. This happens when the unit is first powered on and each time the cables are disconnected and reconnected. The test well will be the first weld performed after binding. The voltage may be higher than the set point on the first test weld.

CLC and WLC can each be used on their own, but to get the best results with overcoming voltage drop use the two features together. The power source will first use the data entered from WLC to apply the voltage drop offset to the first weld. This will eliminate the need for a separate test weld, as WLC will compensate for the voltage during this weld. After the first weld CLC will be used for the remaining welds. The actual voltage at the wire feeder will be even more accurate than using each of the features separately.

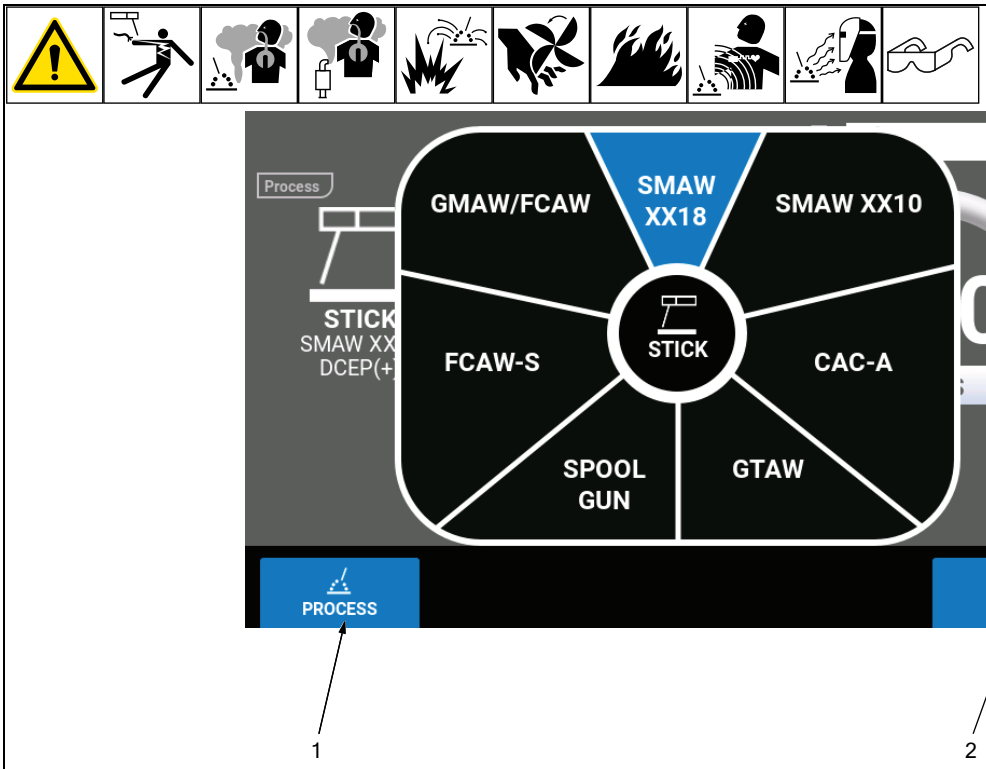
CLC will compensate for the age and condition of cables and the amount of connections used.

6-7. Enabling Voltage Reducing Device (VRD)

Unit can be configured for low open circuit voltage (OCV) operation by enabling Voltage Reducing Device (VRD). When VRD is enabled, a low sensing voltage (approximately 18VDC) is present between electrode and workpiece prior to electrode touching workpiece.

Feature can be turned on by accessing Settings Screen by pressing Menu button, then selecting System Settings. In System Settings Screen, select VRD, then select Enabled. When enabled, display shows 18V OCV instead of normal OCV. Feature can be used when welding in confined areas.

6-8. Process Screen



To change weld process, rotate Adjust Control/Select button to desired process and press button to select.

1 Process Button

Press to open process selection screen.

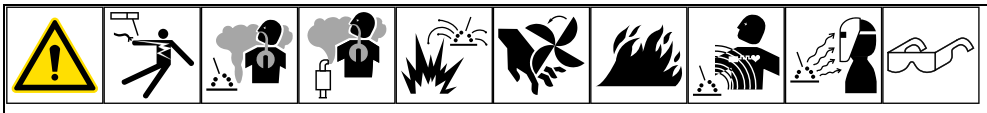
2 Menu Button

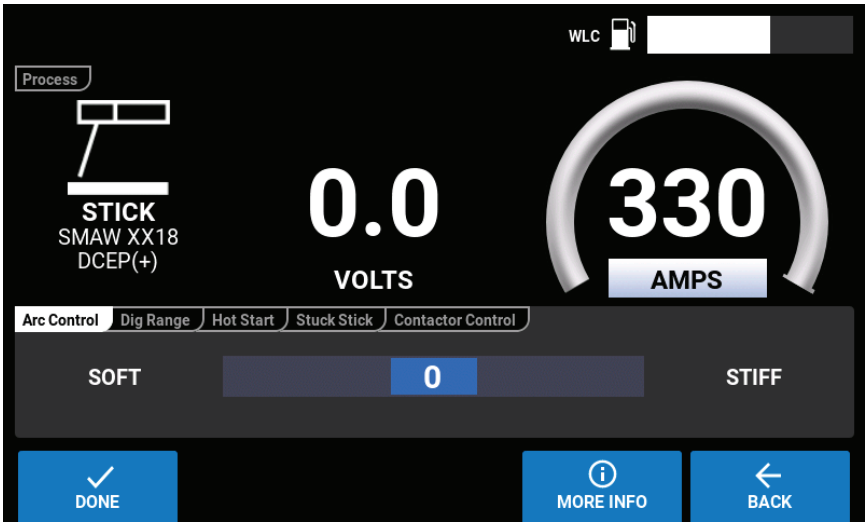
Press to open Menu.

Process	Typical Process Application	Polarity*
SMAW XX18 (STICK)	Constant current process. Use this process for 7018, 6013, 7024 (308, 309 316), and any other stainless-steel electrodes.	DCEP(+)
SMAW XX10 (STICK)	Constant current process. Use this process for 6010, 7010, 8010, and 6011.	DCEP(+)
CAC-A (GOUGE)	Gouging with or without remote amperage control. Strike an arc to start gouging.	DCEP(+)
GTAW (TIG)	Lift-Arc TIG: Touch tungsten to work and lift to start welding. Circuitry internal to welder/ generator aids arc start.	DCEN(-)
GMAW/FCAW (GAS)	MIG solid wire and dual shield flux core use a voltage sensing (VS) feeder that does not require a control cable back to the welder/generator.	DCEP(+)
FCAW-S (NO GAS)	Constant voltage process used with self-shielding flux core without use of shielding gas.	DCEN(-)
SPOOL GUN (SPOOL)	Constant voltage process used for aluminum/FCAW-s wire types. Requires spool gun with 10 pin connection.	DCEP(+)

*Polarity Reversing model will default to specified polarity.

6-9. Weld Settings





To access the weld settings, press Settings button.

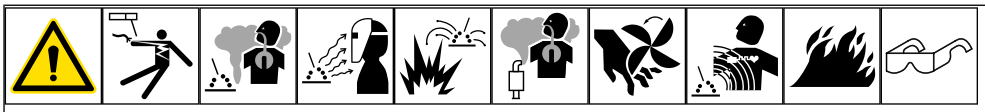
To change a particular parameter (parameters change based on current process):

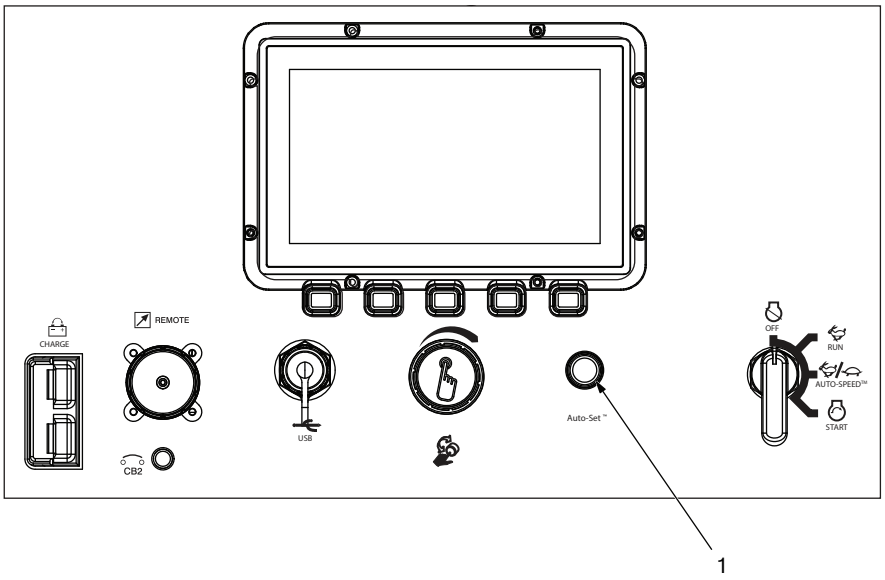
- Rotate the Adjust Control/Select knob to specific parameter.
- Press the Adjust Control/Select knob to select.
- Rotate the Adjust Control/Select knob to change value.
- Press the Adjust Control/Select knob to save value, or press back button to cancel.

Weld Process	Selectable Parameter	Description
SMAW XX18 and XX10 (STICK)	Arc Control	Arc control adjusts puddle characteristics. 0 to 25 results in stiffer/faster reacting puddle. 0 to -25 results in softer, more fluid puddle.
	Dig Range	Increase for less electrode sticking and more penetration/drive. Reduce for softer arc that will penetrate less.
	Hot Start	Provides additional amperage to assist in starting electrode. Adjust in .1 second increments to increase or decrease time it takes to transition from hot start current to preset current.
	Stuck Stick	When enabled, welding output turns off when stick electrode becomes dead shorted or stuck to the workpiece. This allows for easy removal of electrode and will eliminate overheating of flux.
CAC-A (GOUGE)	Arc Control	Arc control adjusts reactivity of arc. 0 to 25 results in stiffer, faster reacting arc. 0 to –25 results in softer, slower reacting arc.
GTAW (TIG)	Auto Stop	Adjusts arc length required to terminate arc.
	Auto Crater	Modified auto stop that terminates arc over a period of time. This reduces chance for craters, as puddle solidifies more slowly.
	Pulses Per Second	Pulsing can be used to reduce heat input/distortion and aid in welding of dissimilar thickness. 1-10 PPS produces distinct ripple pattern and to time filler addition. 100+ PPS helps focus arc, increase arc stability, and travel speed.
	Peak Time	Increasing raises average amperage and creates more fluid puddle. Decreasing lowers average amperage and creates less fluid puddle.
	Background Amps	Increasing raises average amperage and creates more fluid puddle. Decreasing lowers average amperage and creates less fluid puddle.
SPOOL GUN (SPOOL)	Arc Control	This adjusts inductance. Settings from 0 to -25 result in softer, more fluid puddle. Settings from 0 to 25 will result in stiff, fast responding arc.
	Run In	The speed of wire prior to arc initiation. When enabled, welder determines the optimal run-in speed for each start. When set to disabled, run-in speed is same as weld wire feed speed.
	Spool Gun Selection	Select correct spool gun being used. If wrong model is selected, wire feed speed could be inaccurate.
	Wire Type	Select wire type used in spool gun. Each wire type selection has process parameters optimized for that wire.
	Calibration	Calibration ensures wire feed speed (WFS) is accurate. See Section 6-15 for spool gun calibration instruction.
FCAW-S (NO GAS)	Arc Control	This adjusts inductance. Settings from 0 to -25 result in softer, more fluid puddle. Settings from 0 to 25 will result in stiff, fast responding arc.
GMAW/FCAW (GAS)		

Weld Process	Selectable Parameter	Description
All	Contactor Control	Auto Detect – Automatically detects most remotes for contactor control. If remote is not detected, the process defaults to output on. Remote ON/OFF – Controls weld output with a remote connected. Use this mode for remotes that are not auto detected for contactor control. Output ON – Weld Output On.

6-10. Auto-Set Functionality™





1 Auto-Set Button

Press to turn Auto-Set On or Off.

2 Auto-Set Option 1

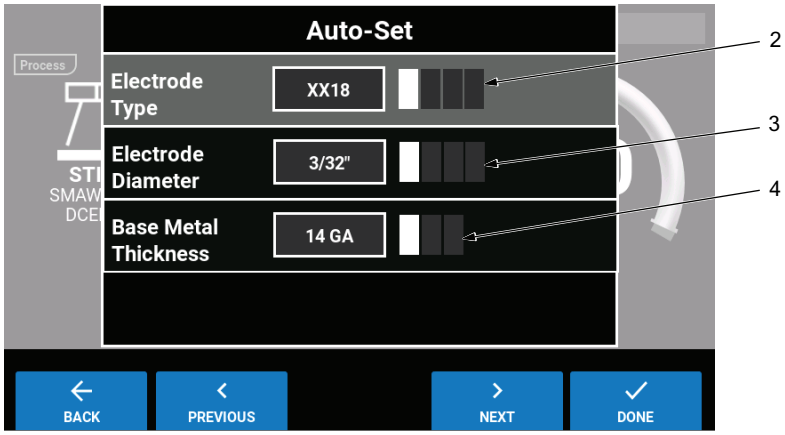
3 Auto-Set Option 2

4 Auto-Set Option 3

Rotating knob clockwise moves cursor left, rotating counterclockwise moves cursor right.

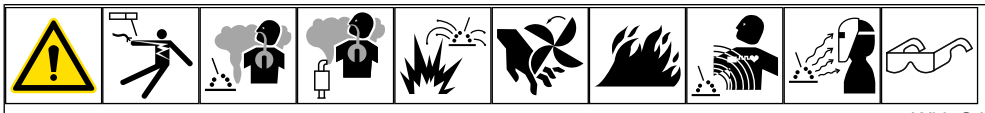
Press knob or NEXT button to select option and move to next selection. PREVIOUS button returns to previous option.

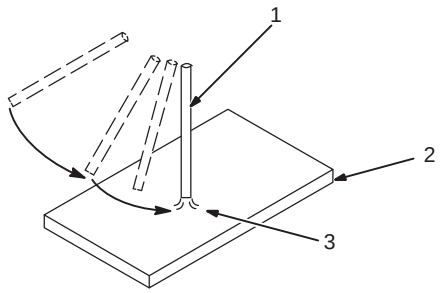
To use Auto-Set with GMAW/FCAW, FCAW-S, or SPOOL GUN processes, WLC or CLC will need to be enabled. See Sections 6-4 through 6-6.



Process	Auto-Set Option 1	Auto-Set Option 2	Auto-Set Option 3
SMAW	Electrode Type	Electrode Diameter	Material Thickness
CAC-A	Rod Diameter		
GTAW	Tungsten Diameter	Material Thickness	
GMAW/FCAW and FCAW-S and SPOOL GUN	Wire Type	Wire Diameter	Material Thickness

6-11. Stick Start Procedure—Scratch Start Technique





With Stick selected, start arc as follows:

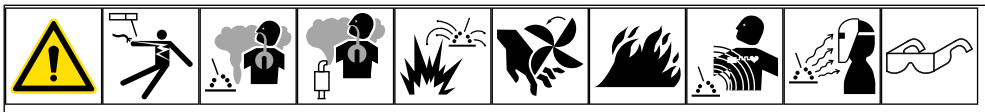
1 Electrode
2 Workpiece
3 Arc

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

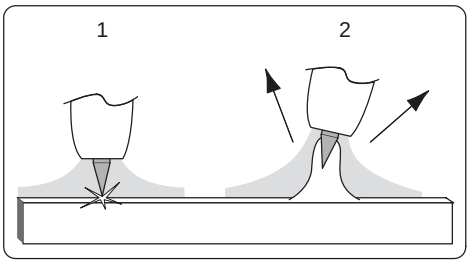
VRD Enabled: Normal open-circuit voltage is not present before electrode touches workpiece; only a low sensing voltage is present between electrode and workpiece. For optimal starting performance, a good clean contact must be made between the electrode and workpiece.

☞ *Miller recommends Hobart filler metals.*

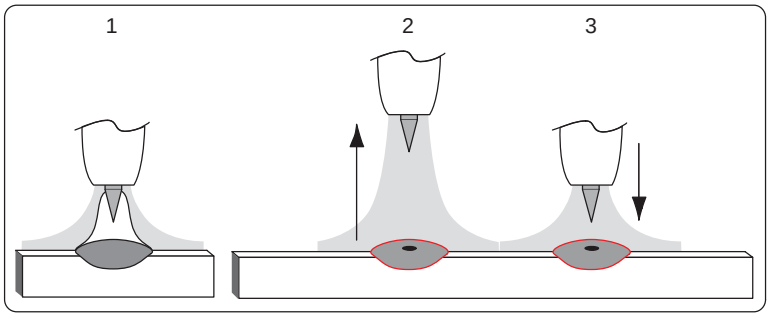
6-12. Lift-Arc™ TIG With Auto-Stop™ And Auto-Crater™



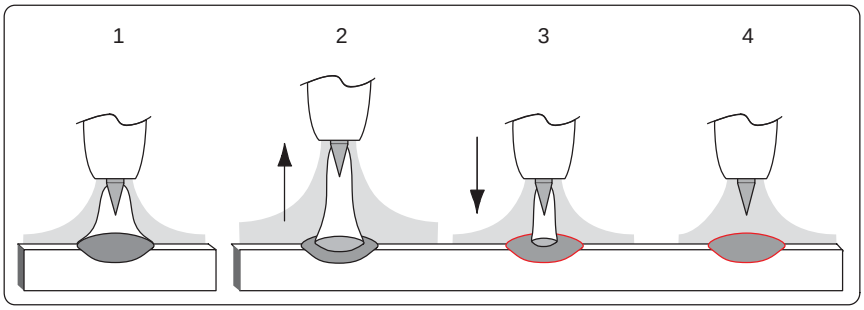
Arc Start With Lift-Arc



Arc End With Auto-Stop



Arc End With Auto-Crater



Arc Start With Lift-Arc TIG

Lift-Arc is used for the DCEN GTAW process when HF Start method is not permitted.

Select Process button and select GTAW (TIG) process.

Turn gas on.

1. Touch or scratch.
2. Lift at any angle.

Touch tungsten electrode to workpiece at weld start point. Slowly lift electrode. Arc is started when electrode is lifted.

Maintain shielding gas coverage and eliminate tungsten and workpiece contamination by using Auto-Crater or Auto-Stop to end the arc.

Arc End With Auto-Stop

1. While welding.
2. Lift torch to start Auto-Stop. Arc stops.
3. Move torch back down to maintain gas coverage and prevent contamination.

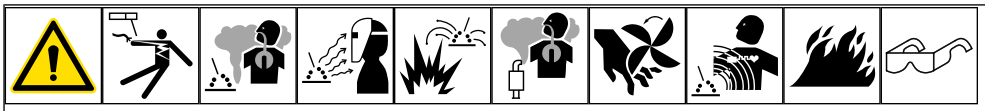
Arc End With Auto-Crater

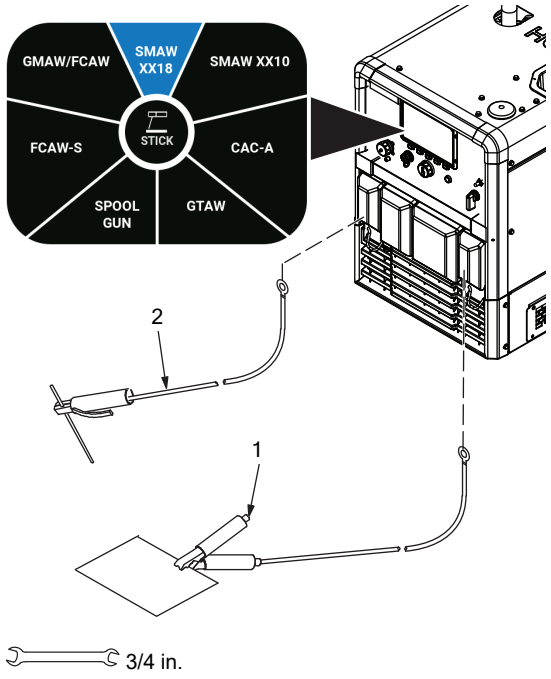
☞ *Remote control is not needed when using Auto-Crater.*

1. While welding.
2. Lift torch slightly to start Auto-Crater end (current is reduced).
3. Lower torch. Weld current ramps down.
4. Shielding gas continues until shut off.

☞ *Miller recommends Hobart filler metals.*

6-13. Typical Stick Welding Connections And Control Settings





Stop engine.

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

1 Work Clamp

2 Electrode Holder

Be sure to use the correct size weld cables (see Section 5-11).

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

Connect Work cable to Negative terminal and Electrode holder cable to Positive terminal on welding generator.

Polarity Reversing Models: Work cable connects to work terminal. Electrode connects to electrode terminal.

- Select **SMAW XX18** weld process
- Use Autoset to select electrode type (XX18), size (1/8 IN), and material thickness (1/8 IN – 1/2 IN).
- Adjust amperage within auto-set range as needed.

Recommended Process Stick Electrodes:

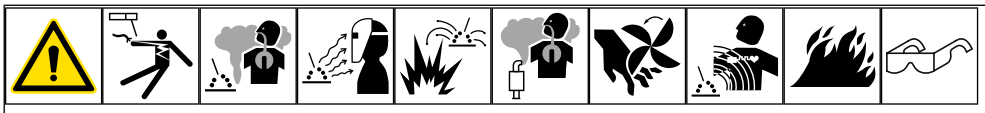
XX10 Process: 6010, 7010, 8010, 6011, or any other cellulose electrodes not mentioned.

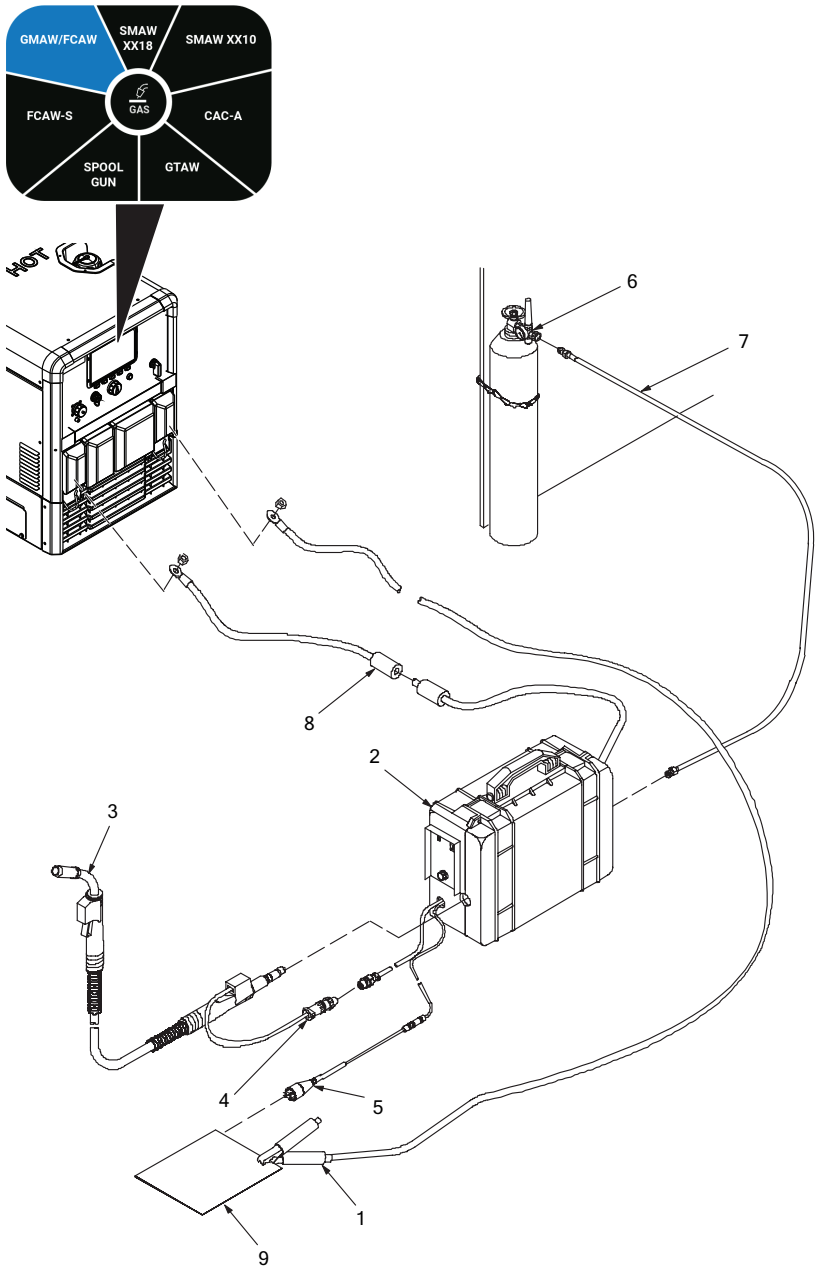
XX18 Process: 6013, 7018, 7024, all stainless steel electrodes, and any other low hydrogen electrodes not mentioned.

Miller recommends Hobart filler metals.

6-14. Typical MIG Welding Connections and Settings

A. Solid Wire Applications





3/4 in.

Stop engine.

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

1 Work Clamp

2 Wire Feeder

3 MIG Gun

4 Gun Trigger Plug

5 Voltage Sensing Clamp

6 Gas Cylinder:
75/25 Argon-Based Gas for Short Circuit Transfer; 80% Argon (Or Higher) for Spray Transfer

7 Gas Hose

8 Quick Connector

9 Workpiece

Connect work cable to welding generator Negative terminal. Connect cable from wire feeder to cable from welding generator Positive terminal.

Polarity Reversing Models: Work cable connects to work terminal. Wire feeder connects to electrode terminal.

Be sure to use the correct size weld cables (see Section 5-11).

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

See wire feeder manual for wire threading procedure.

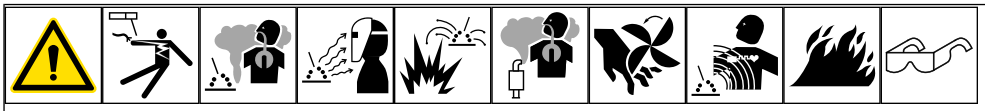
Insert gun trigger plug (item 4) into matching receptacle and tighten threaded collar.

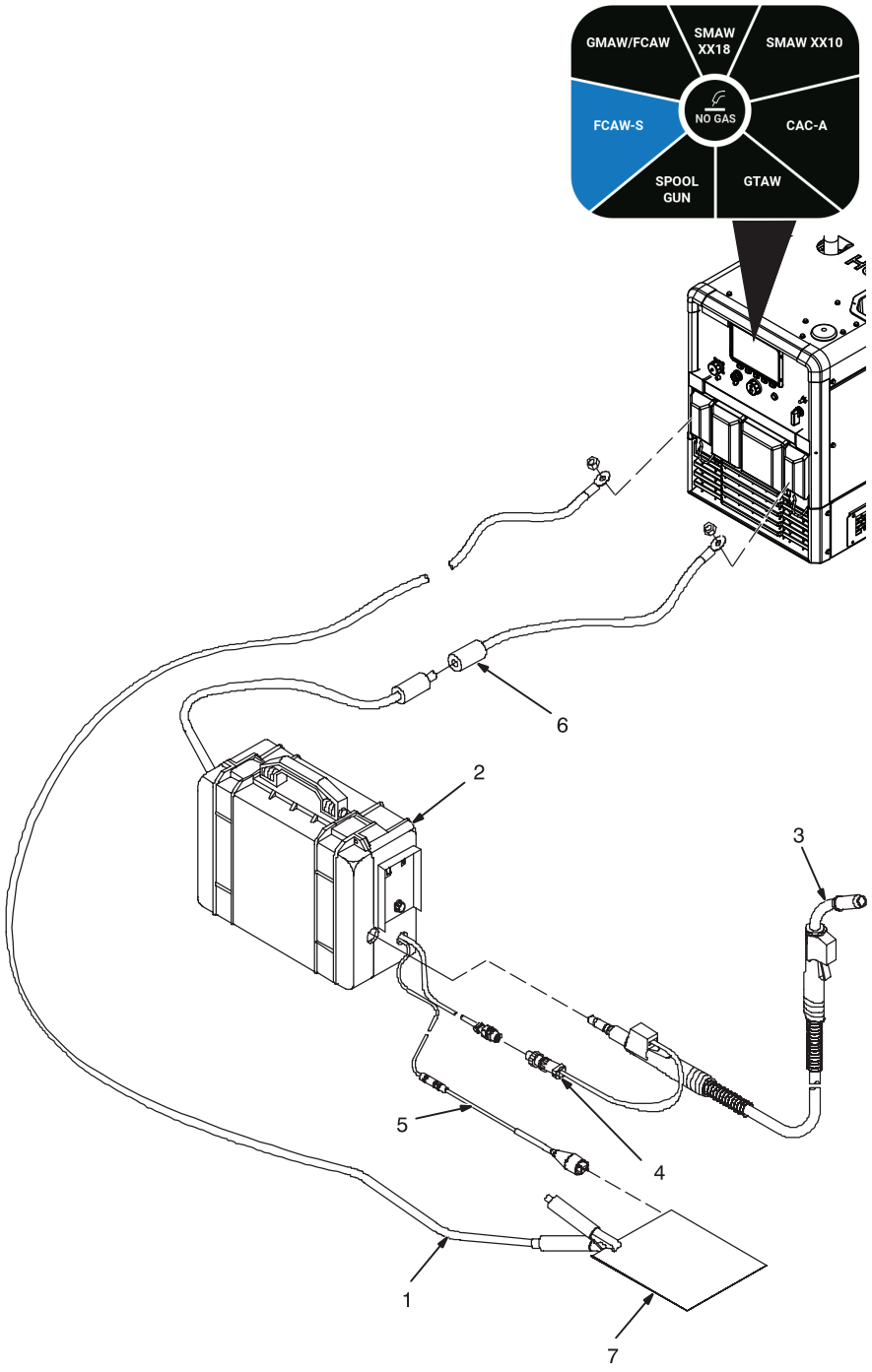
Connect gas hose from feeder to regulator on cylinder.

Typical Autoset settings

- Select GMAW/FCAW weld process.
- Enable WLC in system settings and verify correct cable length/size is selected.
- Select wire type, diameter, and material thickness on auto set screen.
- Adjust voltage within auto-set range as needed.
- Set suggested wire feed speed that is displayed on UI onto wire feeder.

B. Self-Shielded Flux Core Wire Applications





Stop engine.

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

1 Work Clamp

2 Wire Feeder

3 MIG Gun

4 Gun Trigger Plug

5 Voltage Sensing Clamp

6 Quick Connector

7 Workpiece

Connect work cable to welding generator Positive terminal. Connect cable from wire feeder to cable from welding generator Negative terminal.

Polarity Reversing Models: Work cable connects to work terminal. Wire feeder connects to electrode terminal. Polarity Reversing feature will change polarity automatically when process is selected.

Consult wire manufacturer for correct polarity.

Be sure to use the correct size weld cables (see Section 5-11).

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

See wire feeder manual for wire threading procedure.

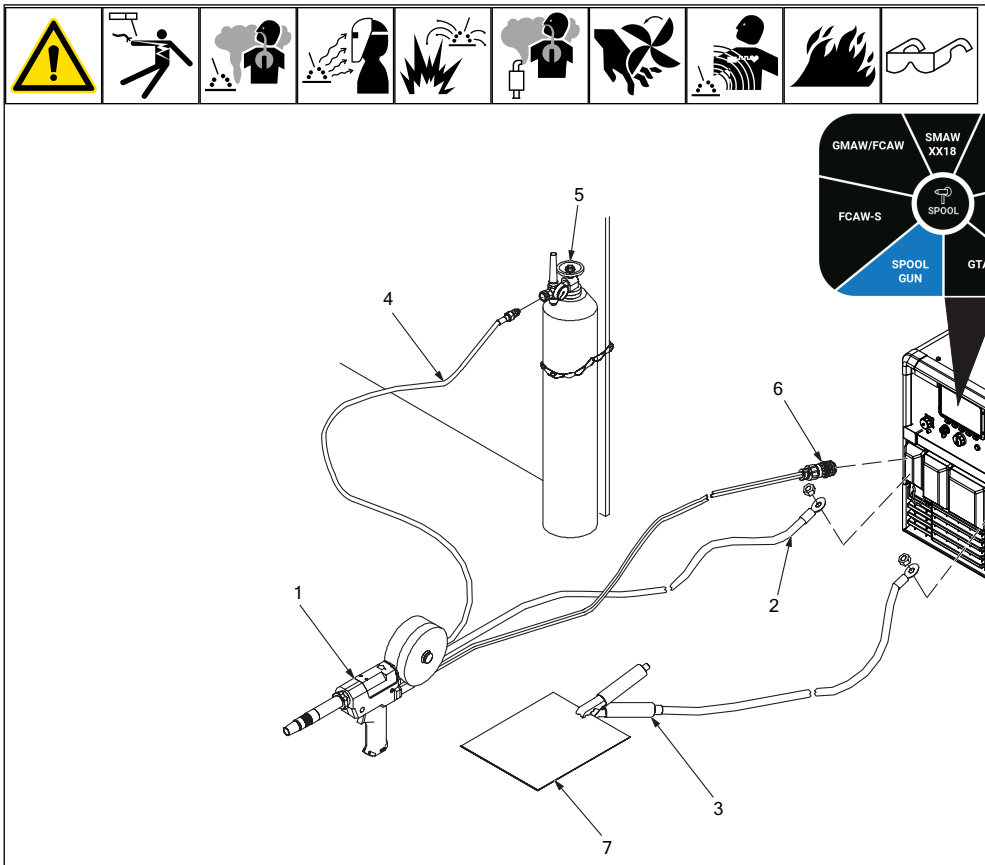
Insert gun trigger plug (item 4) into matching receptacle and tighten threaded collar.

Typical Autoset settings

- Select FCAW-S weld process.
- Enable WLC in system settings and verify correct cable length/size is selected.
- Select wire type, diameter, and material thickness on auto set screen.
- Adjust voltage within auto-set range as needed.
- Set suggested wire feed speed that is displayed on UI onto wire feeder.
- Do a test weld. To increase arc length, increase voltage. To decrease arc length reduce voltage or increase wire feed speed.

Miller recommends Hobart filler metals.

6-15. Typical Spool Gun Welding Connections And Control Settings



3/4 in.

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

1 Spool Gun

2 Weld Power Cable From Spool Gun

3 Work Clamp

4 Gas Hose

5 Gas Cylinder With Regulator

6 Spool Gun Plug

7 Workpiece

Be sure to use the correct size weld cables (see Section 5-11).

Connect Weld power cable from spool gun to the positive terminal.

Connect work cable to welder/generator negative terminal.

Polarity Reversing Models: Work cable connects to work terminal. Spool gun connects to electrode terminal.

Insert spool gun plug into 10 pin receptacle and tighten threaded collar.

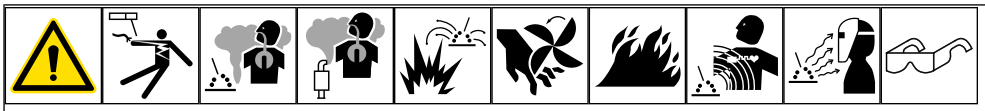
Connect gas hose from spool gun to regulator on gas cylinder.

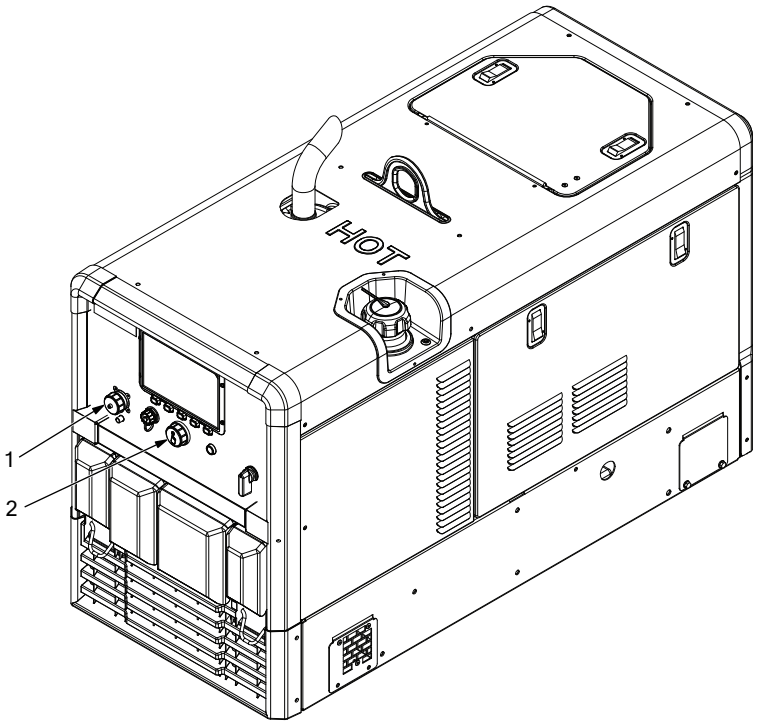
Miller recommends Hobart filler metals.

Calibrating Spool Gun

Calibration ensures wire feed speed (WFS) is accurate. To calibrate, select Calibration WFS on the Weld Settings screen (see Section 6-9), cut wire flush at nozzle, then trigger spool gun. Spool gun will feed 24 in. of wire through gun. Adjust offsets on User interface until run out is 24 in.. Repeat for both Calibration WFS.

6-16. Remote Voltage/Amperage Control





1 Remote Receptacle RC41

Connect optional remote voltage/amperage (V/A) control to Remote Control (RC) receptacle (see Section 5-9).

2 Adjust Control/Select Button

Remote weld setting must be set to AUTO. If set to OFF, remote connection will be ignored.

With remote control connected, weld output in Stick or TIG is determined by a combination of front panel and remote control voltage/amperage settings. In MIG, weld output is controlled through remote control only.

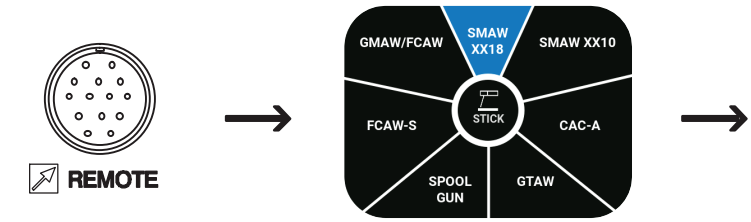
Connect remote V/A control to 14 pin remote receptacle.

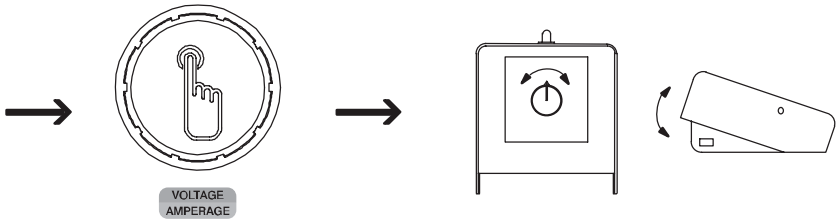
Set process (Stick shown).

Set V/A control to 160A.

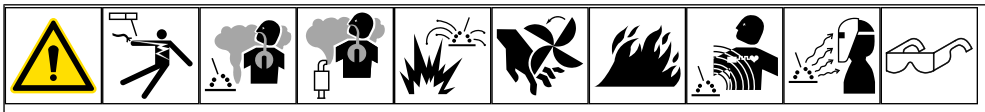
Adjust remote V/A control (stick welding only).

Min 30A DC; Max 160A DC





6-17. Engine Auto-Speed™



Engine Auto-Speed

When in Auto-Speed, unit will idle at 2400 RPM. Speed is determined based on load requirement.

Any auxiliary power load increases engine speed to 3600 RPM on models not equipped with Excel power.

RPM for a weld load is based on preset and then adjusted based on actual load.

Battery charge will charge at idle, and increase to 3600 RPM for jump starting.

Any combination of loads will increase engine speed to 3600 RPM.

6-18. Engine Cold Weather Starting And Operation

1 Prior to starting the engine verify that all fluids (fuel, engine coolant, and engine oil) are to the correct level and grade/specification for the ambient temperature indicated. If the ambient temperature is below 14°F (-10°C) engine coolant block heater may be required prior to the engine start. See chart below for minimum heater times.

☞ *All external loads on the engine should be off when starting the engine.*

2 Start engine. If engine fails to start after 10 seconds, turn unit off and repeat start sequence.

3 Allow engine to warm up prior to loading engine.

NOTICE – *Be sure to warm up engine, not only in the winter, but also in warmer seasons. An insufficiently warmed-up engine can shorten its service life.*

Ambient Temperature (At Or Below)								
F	-40	-22	-13	-4	14	32	50	68 (+)
C	-40	-30	-25	-20	-10	0	10	20
Engine								
Glow Plugs	Auto/13 sec	Auto/13 sec	Auto/13 sec	Auto/13 sec	Auto/10 sec	Auto/10 sec	Auto/5 sec	—
Oil	0W -20	5W -30	5W -30	10W -30	10W -30	10W -30	10W -30	10W -30
	Full Synthetic	5W -40	5W -40	10W -40	10W -40	10W -40	10W -40	10W -40
Block Heater	60 min	40 min	30 min	20 min	—	—	—	—
Engine Warm-up	7 min	5 min	5 min	3 min	2 min	1 min	1 min	1 min

Normal stabilized engine coolant temperatures should be in the range of 160 to 220°F (71 to 104°C). In extreme cold conditions it may become necessary to block a portion of intake cooling air. See Engine Troubleshooting Section for trouble shooting over or under coolant temperature.

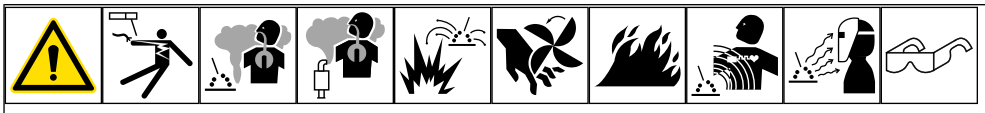
1 For temperatures below 0°F (-18°C), synthetic oil improves engine starting.

2 For additional engine oil specification see Engine Maintenance Label or Engine Operators Manual.

3 Times listed are for the standard Miller Part No. 242954, Engine Block Heater, 120V.

— Not required.

6-19. Updating Software



Preparing For Software Update

Step 1. Verify current software version installed.
Step 2. Press Settings button and use Adjust Control/Select button to select System Info.

The current software revision is displayed.

Step 3. Verify that USB thumb drive is good by inserting it into USB receptacle on bottom of remote panel. Press ”Download Service File" from menu.

Status bar should read “USB Write Successful”, indicating a good USB flash drive.

Downloading Software

☞ *Use a PC to download software. Do not use a Mac.*

Step 4. Locate latest firmware to be loaded from MillerWelds.com
Step 5. Click to download file. When the download is complete, run it.
Step 6. Accept software licensing agreement.
Step 7. Copy desired firmware to an empty USB thumb drive.

☞ *Files must be at the top level of the USB and not zipped or inside a folder.*

Installing Software

Step 8. Turn Off welder/generator.
Step 9. Insert thumb drive into USB receptacle on front of machine.
Step 10. Turn Engine Control switch to Run or Run/Idle position.

☞ *Do not start engine.*

Display will change to System Info screen.

Step 11. Use Adjust Control/Select button to select Firmware Update.

Display will ask to confirm if you would like to update software.

Step 12. Confirm to update software.

☞ *After update has started, do not power down unit or remove thumb drive until update is complete.*

During download, the progress bar displays current file being updated on bottom with name of file being downloaded.

Each file being updated will progress from 0 to 100 on progress bar. Software updates may take several minutes.

Failures are indicated on status bar on top of display. Correction of failed updates depends on what type of failure occurred.

When update has completed, a prompt will read: SOFTWARE UPDATE COMPLETE

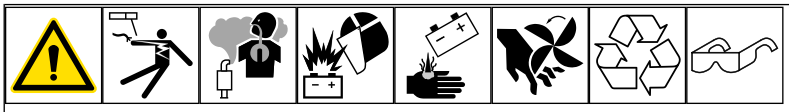
Step 13. Press Back button to go back to System Info screen.

Current software revision is displayed.

Step 14. Verify new software revision has installed.

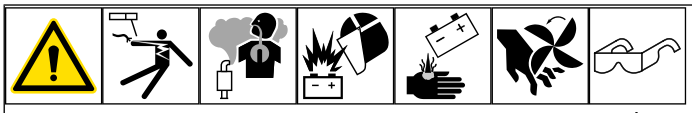
SECTION 7 – BATTERY CHARGING

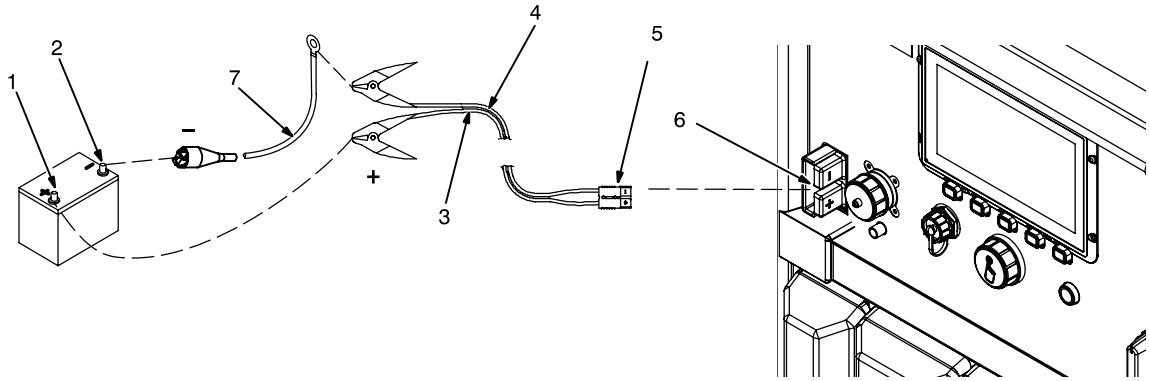
7-1. Battery Charging Guidelines



- **Stop welder/generator engine.**
- **Before charging battery, read the Safety Precautions at the beginning of this manual.**
- **Have only qualified persons do battery charging work.**
- **Do not charge a defective battery, a battery with loose terminals, or one having evidence of damage such as a cracked case or cover.**
- **Keep battery charging cables away from vehicle hood, door, and moving parts.**
- **Do not use damaged battery charging cables.**
- **Be sure charger output voltage matches battery voltage.**
- **Do not jump-start/crank assist a vehicle without a battery.**
- **Disconnect cables from weld terminals before charging a battery. Weld terminals are electrically live during battery charging.**
- **Never disconnect jump-start/crank assist connections or cables when charging or jumping/crank assisting. Clamps are always energized when unit is in battery charge mode.**
- **Never place 12V battery on 24V only setting.**

7-2. Connecting Uninstalled Battery To Optional Battery Charge Receptacle





- **Stop welder/generator engine.**
- **Before charging battery, check polarity of battery posts. Attach a 24 in. (60 cm) AWG 6 insulated battery cable to Negative (−) battery post. Connect charger Positive (+) cable to Positive (+) post of battery. Standing as far from battery as practical and looking away from battery, connect charger Negative (−) cable to the cable connected to the Negative (−) battery post.**

☞ *Battery will not charge if it is completely dead. This happens at 1 volt.*

1 Battery Positive (+) Terminal
2 Battery Negative (−) Terminal

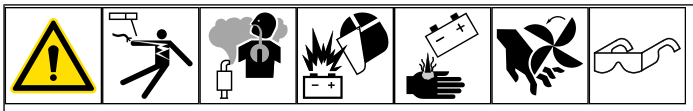
Obtain Battery Charge/Jumper Cable Kit 300422 or equivalent.

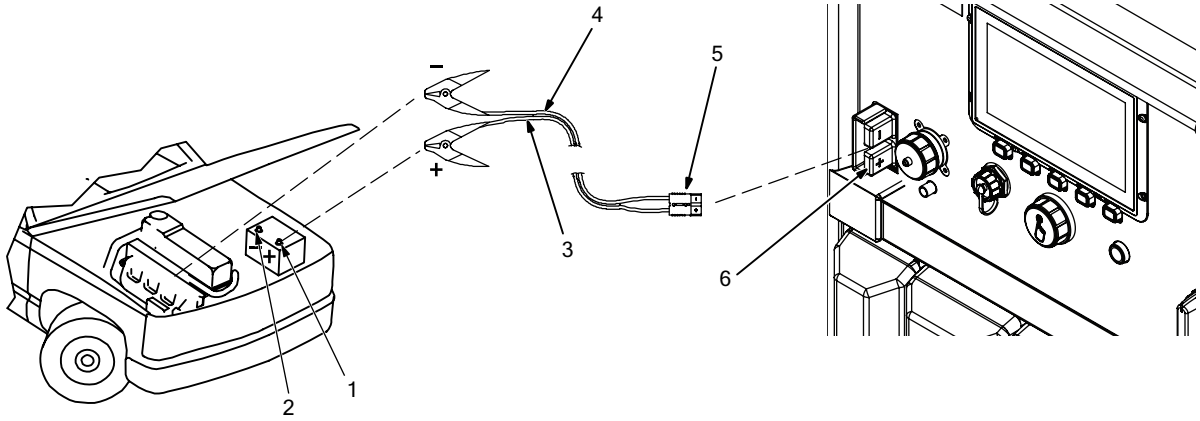
3 Red (Positive) Charging Cable
4 Black (Negative) Charging Cable
5 Battery Charge Plug
6 Battery Charge Receptacle
7 Insulated Battery Cable (Customer-Supplied)

Connect a 24 in. (60 cm) or longer insulated battery cable (AWG 6) to Negative (−) battery post. Connect red (Positive) battery charging cable to battery Positive (+) post. Connect black (Negative) battery charging cable to insulated battery cable.

Connect Battery Charge plug to Battery Charge receptacle.

7-3. Connecting Installed Battery To Optional Battery Charge Receptacle





⚠ **Stop welder/generator engine.**

⚠ **Before charging battery, check polarity of battery posts. If battery Negative (−) post is grounded to chassis (most vehicles), connect charger Positive (+) cable to Positive (+) ungrounded post of battery. Connect charger Negative (−) cable to vehicle engine block or heavy gauge metal part of frame (and away from battery). If Positive (+) post is grounded to chassis, connect charger Negative (−) cable to Negative (−) ungrounded post of battery. Connect charger Positive (+) cable to vehicle chassis or engine block (and away from battery).**

☞ *Battery will not charge if it is completely dead. This happens at 1 volt.*

1 Battery Positive (+) Terminal
2 Battery Negative (−) Terminal

Obtain Battery Charge/Jumper Cable Kit 300422 or equivalent.

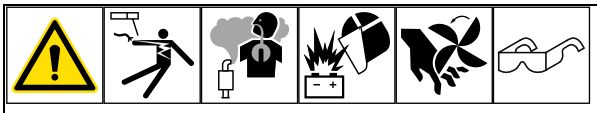
3 Red (Positive) Charging Cable
4 Black (Negative) Charging Cable
5 Battery Charge Plug
6 Battery Charge Receptacle

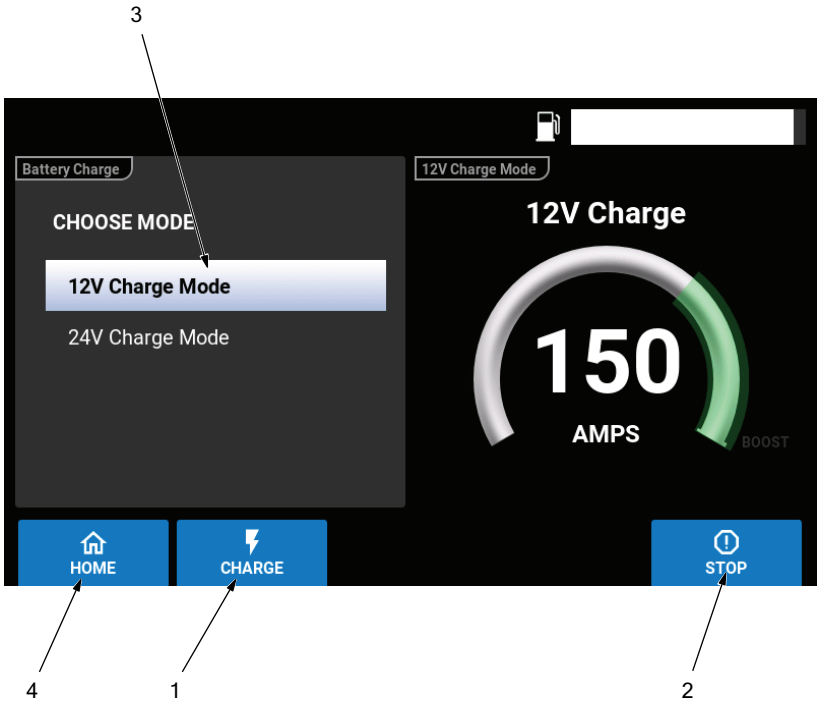
Negative Post Grounded

If battery Negative (−) post is grounded to chassis, connect red (Positive) battery charging cable to battery Positive (+) post. Connect black (Negative) battery charging cable to engine block or heavy gauge metal part of frame (and away from battery).

Connect Battery Charge plug to Battery Charge receptacle.

7-4. Setting Battery Charge Controls





To start charging a battery:

- Select either 12 V or 24 V with the control/select button depending on the type of battery being charged.
- Connect the battery terminals as described in Section 7-2 and 7-3.
- Push the Charge button.
- When finished charging push the Stop button.
- Disconnect the battery cables.

1 Charge Button

Press the Charge button to start battery charge.

2 Stop Button

Press the Stop button to stop battery charge.

3 12 V or 24 V Selection

Status bar text provides information on charge mode, charging output and charging status. Explanations of the status bar messages are provided in the table below.

4 Home Button

Press the Home button to go back to the Home screen.

For batteries that do not take a charge current:
Some batteries may not take a charge current, no matter what the voltage of the battery is. Under these conditions, the unit control system will allow a battery to charge or jump start for 40 seconds. Then, if the battery still does not take a charge, the output will turn off. Reset the system to try again. The voltage on the battery must stay above 1volt when the charging clamps are attached, or the control system will not start charging.

A. Check Battery

Batt Charge Voltage Error Batt Read Open Error Batt Check Open Error Batt Charge Polarity Error	Codes indicate the battery will not accept a charge, battery voltage does not match charging voltage, or the system is improperly connected. Check battery and connections. Cycle Charge/Stop selections to restart charging.

B. Over Voltage

Batt Charge Over Voltage Error	Code indicates the battery is accepting too much voltage or no current. Reset clamp connection to clear.

C. Jump Timeout

Batt Jump Start Timeout Error	Code indicates the system was drawing too much current for too long of a time during an attempt to jump start. Cycle Charge/Stop selections to restart charging.

D. Battery Bad

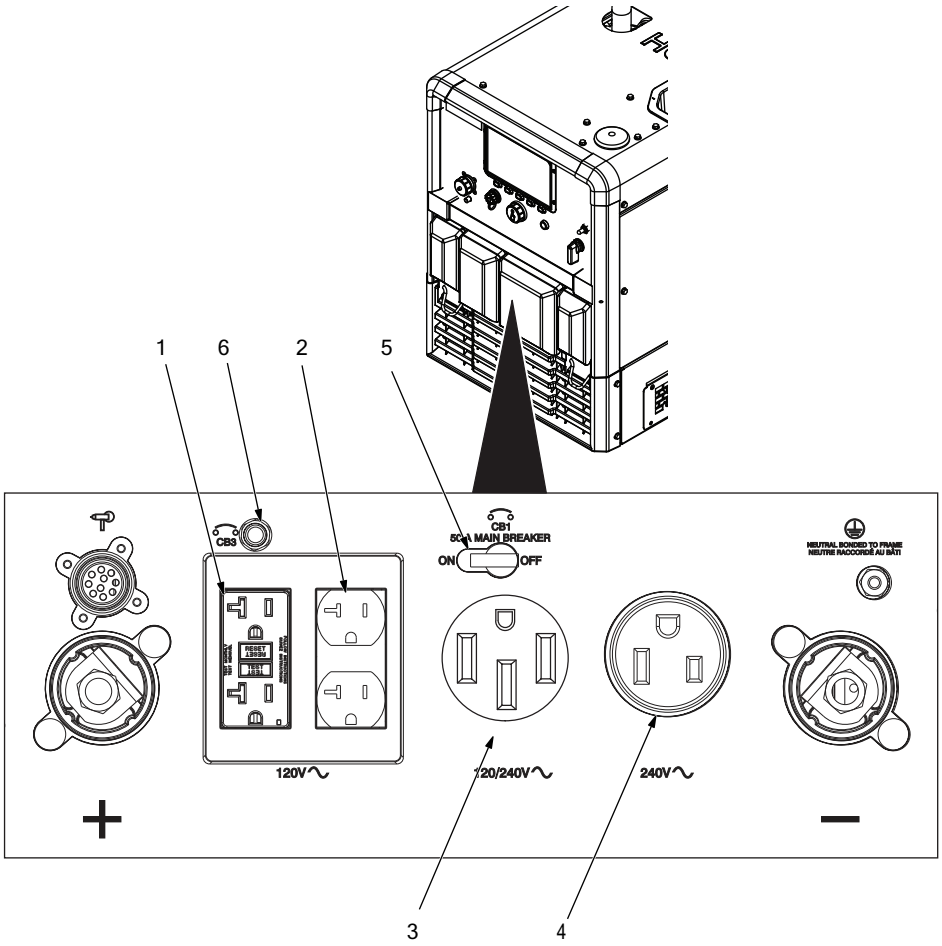
Batt Charge Check Error Batt Charging Bad Battery Error Batt Final Check Error Batt Final Check Battery Error	The charger has determined that the battery is faulty and is unable to take a charge. Replace the battery.

E. Charge Complete

Battery Charge Complete	The battery charge process has completed successfully.

SECTION 8 – OPERATING AUXILIARY EQUIPMENT

8-1. Generator Power Receptacles



⚠ **Use GFCI protection when operating auxiliary equipment. If unit does not have GFCI receptacles, use GFCI-protected extension cord. Do not use GFCI receptacle to power life support equipment.**

⚠ **Unplug power cord before attempting to service accessories or tools.**

☞ *Generator power decreases as weld current increases.*

1 120 V 20 A AC Duplex Receptacle (GFCI Receptacle, protects both duplex receptacles)

2 120 V 20 A AC Duplex Receptacle (Non-GFCI Receptacle)

3 120/240 V 50 A AC Receptacle

4 240 V 50 A AC Receptacle

Duplex receptacles supply 120 V 60 Hz single- phase power at weld/power speed. Maximum output from duplex receptacles is 2.4 kVA/kW.

120/240 V receptacle supplies 60 Hz single-phase power at 3600 rpm. Maximum output is 10.5 kVA/kW.

240 V receptacle supplies 60 Hz single-phase power at 3600 RPM. Maximum output is 10.5 kVA/kW.

☞ *Test GFCI receptacles at high engine speed only.*

⚠ **Test GFCI monthly. See Section 8-2 for GFCI information and for resetting and testing procedures.**

5 Supplementary Protector CB1

CB1 protects all receptacles from overload. If CB1 opens, the receptacles do not work. Place switch in On position to reset.

6 Supplementary Protector CB3

CB3 protects duplex receptacles from overload. If a supplementary protector opens, the receptacles do not work. Press button to reset supplementary protector.

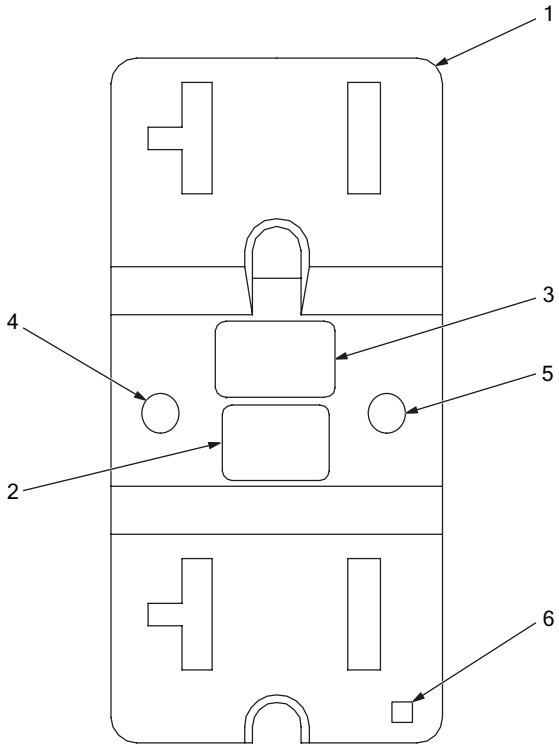
☞ *If supplementary protector continues to open, contact Factory Authorized Service Agent.*

Maximum continuous output of all receptacles is limited to 10.5 kVA/kW. Maximum peak is 12 kVA/kW.

EXAMPLE: If 20 A is drawn from a 120 V duplex receptacle, only 34 A is available at the 120/240V receptacle:

(120 V x 20 A) + (240 V x 34 A) = 10.5 kVA/kW

8-2. GFCI Receptacle Information, Resetting, And Testing



⚠ **Use GFCI protection when operating auxiliary equipment. If unit does not have GFCI receptacles, use GFCI-protected extension cord. Do not use GFCI receptacle to power life support equipment.**

⚠ **Unplug power cord before attempting to service accessories or tools.**

1 120 V 20 A AC GFCI Receptacle
2 GFCI Receptacle Test Button
3 GFCI Receptacle Reset Button
4 Red GFCI Indicator Light (LED)
5 Green GFCI Indicator Light (LED)
6 Alternate Location For Red And Green Indicator LEDs

☞ *Red and Green indicator lights may be combined in a single LED.*

☞ *Orientation of receptacle may be different in other applications.*

GFCI Receptacles

GFCI receptacles protect the user from electric shock if a ground fault occurs in equipment connected to the receptacle. A ground fault occurs when electrical current takes the shortest path to ground (which could be through a person) rather than follow its intended safe path.

If a ground fault is detected, the GFCI Reset button pops out, and the circuit opens to disconnect power to the faulty equipment. A GFCI receptacle does not protect against circuit overloads, short circuits, or shocks not related to ground faults. Reset and test GFCI receptacle according to the following procedures.

A solid green LED indicates power to the GFCI. A solid red LED indicates that the GFCI has been tripped.

Resetting/Testing GFCI Receptacle

⚠ **Test GFCI monthly.**

⚠ **If Red LED blinks, stop using GFCI receptacle and have a Factory Authorized Service Agent replace it.**

⚠ **Extension cords with bad insulation or of extended length can allow enough leakage current to trip the GFCI circuit. Reset and test as follows.**

Resetting GFCI Receptacles

If a GFCI fault occurs, stop engine and disconnect equipment from GFCI receptacle. Check for damaged or wet tools, cords, plugs, etc. connected to the receptacle. Start engine, place engine control switch in RUN position, and press GFCI Reset button. Reconnect equipment to GFCI receptacle. If GFCI Reset button pops out again, check the equipment and repair or replace if faulty.

Testing GFCI Receptacles

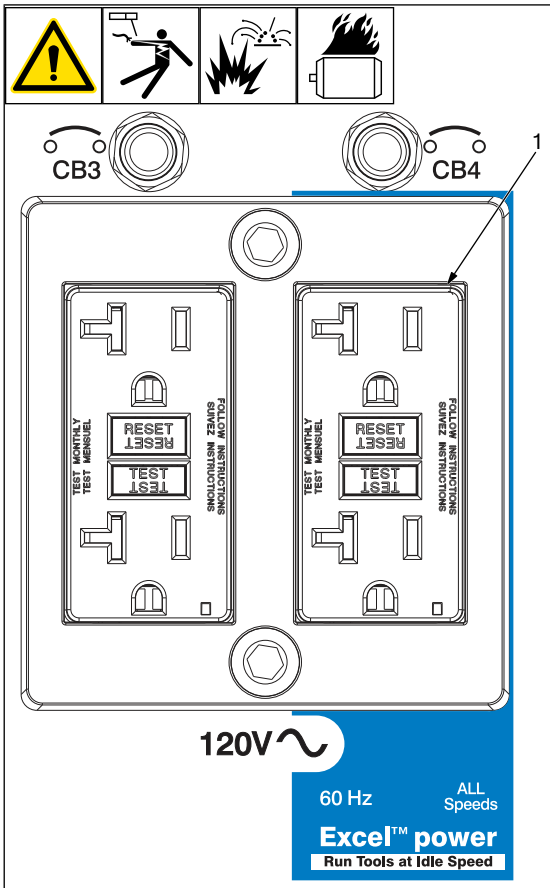
☞ *Test GFCI receptacles at high engine speed only.*

Start engine and place engine control switch in Run position. Press the GFCI Test button. The GFCI Reset button should pop out.

Press the GFCI Reset button.

Have a Factory Authorized Service Agent replace GFCI if any of the following occur:
GFCI does not trip when tested
Red LED blinks
GFCI does not reset.

8-3. Optional Excel Power



Excel power option provides generator power at idle speed and while welding. This allows most job site tools to operate properly at engine idle speed.

Use GFCI protection when operating auxiliary equipment. If unit does not have GFCI receptacles, use GFCI-protected extension cord. Do not use GFCI receptacles to power life support equipment.

1 120 V 20 A AC Excel Power Receptacle

This receptacle supplies 2.4 kVA/kW of pure 120 V, 60 Hz sine wave power at ALL engine speeds.

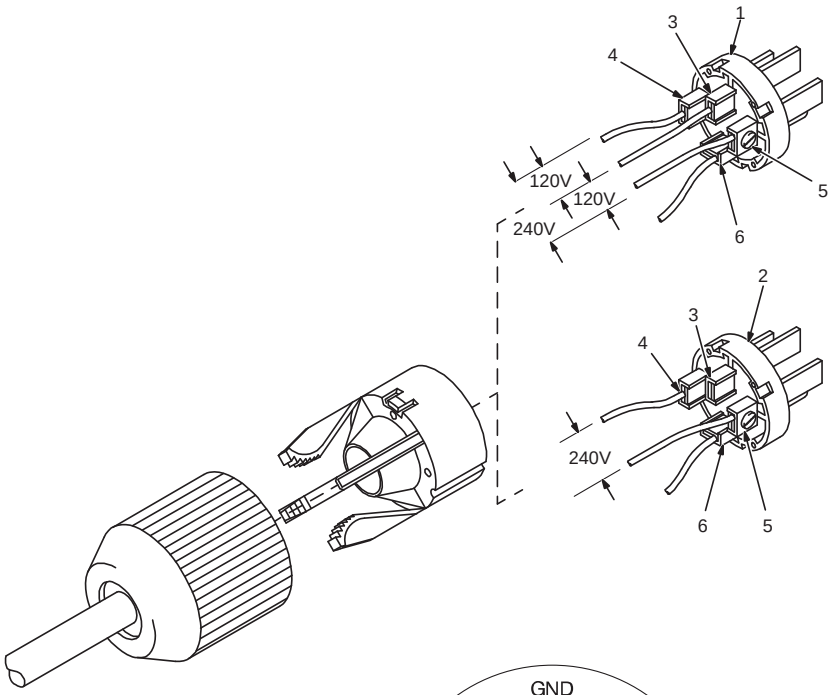
Circuit protection is provided by CB4 only; CB1 does not provide protection to Excel power.

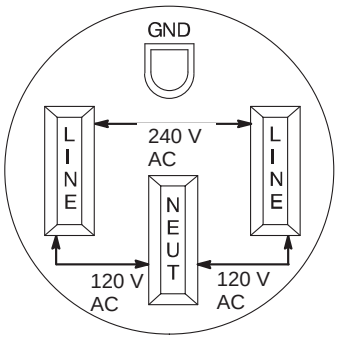
Combined output of all receptacles limited to 10.5 kVA/kW.

8-4. Simultaneous Weld And Power

Weld Current in Amperes At 30 Volts DC	Total Power Available in Watts	120 V Receptacle Amperes	240 V Receptacle Amperes
300	1500	13	6
250	3000	20	13
200	4500	20	19
150	6000	20	25
100	7500	20	31
0	10500	20	40

8-5. Wiring Instructions For 240 Volt, Single-Phase Plug (NEMA 14-50P)





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

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

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

2 Plug Wired for 240 V, 2-Wire Load

3 Neutral (Silver) Terminal

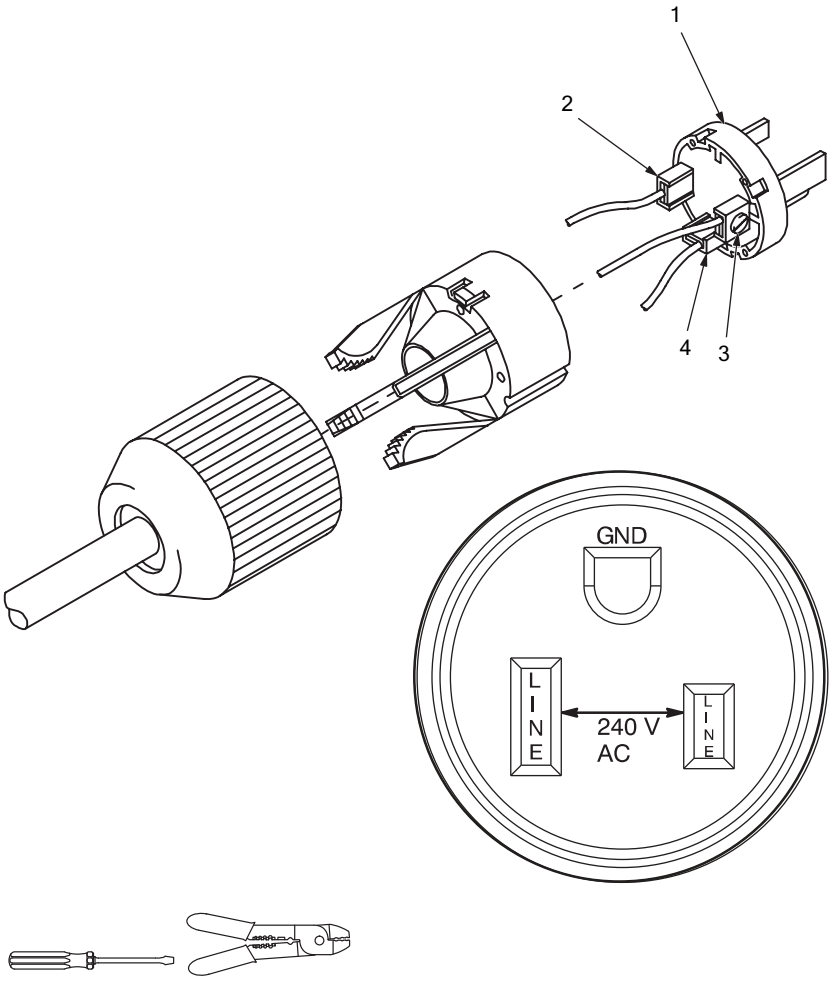
4 Load 1 (Brass)Terminal

5 Load 2 (Brass) Terminal

6 Ground (Green) Terminal

Current Available in Amperes	
240 V Receptacle*	**120 V Duplex Receptacle**
0	20
5	20
10	20
15	20
20	20
25	20
30	20
35	18
40	8
V x A = Watts *One 240 V load or two 120 V loads	

8-6. Wiring Instructions For 240 Volt, Single-Phase Plug (NEMA 6-50P)



The plug can be wired for a 240 V, 2-wire load.

1 Plug Wired for 240 V, 2-Wire Load

2 Load 1 (Brass)Terminal

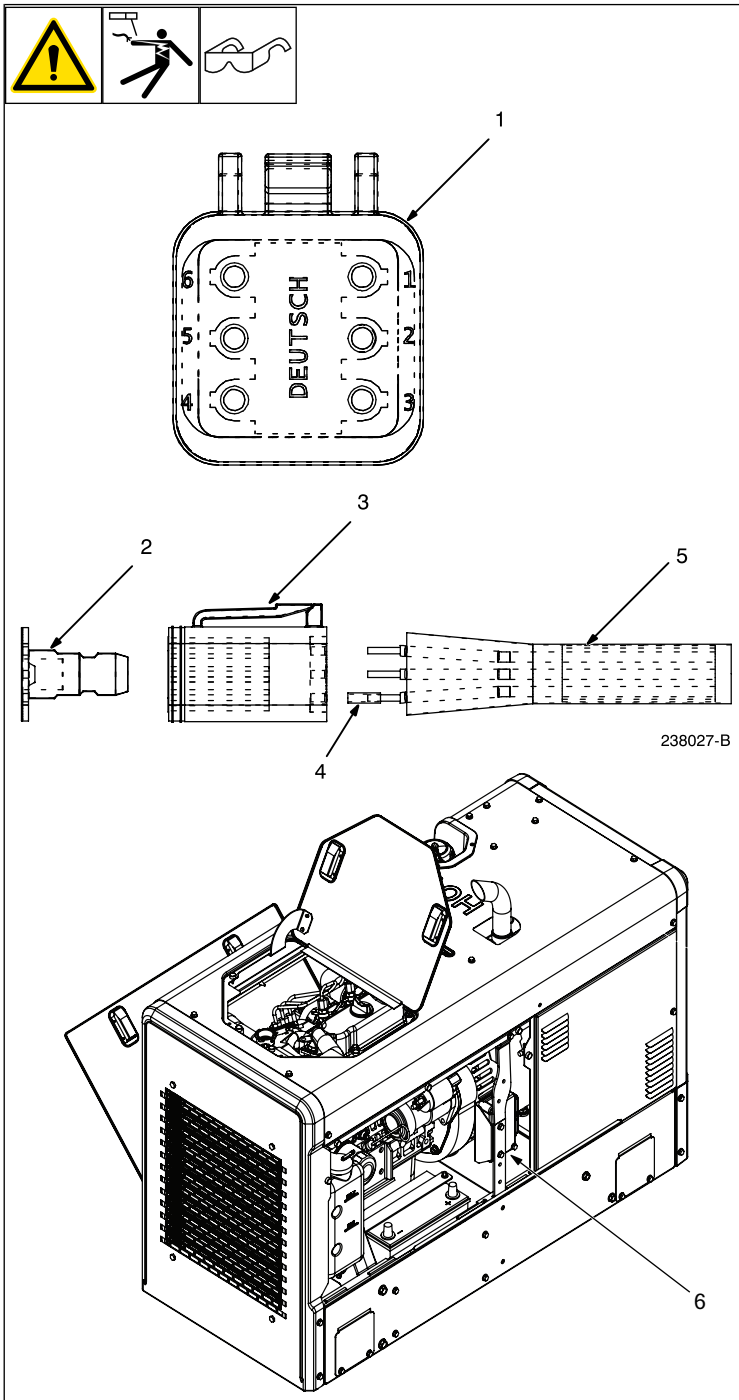
3 Load 2 (Brass) Terminal

4 Ground (Green) Terminal

Current Available in Amperes	
240 V Receptacle	**120 V Duplex Receptacle**
0	20
5	20
10	20
15	20
20	20
25	20
30	20
35	18
40	8
V x A = Watts	

SECTION 9 – CAN-BUS CONNECTION

9-1. CAN-Bus Connection



1 CAN-Bus Connector

A CAN-bus connection is provided to allow read-only data communication. The data is available through the CAN-bus connector located inside left-hand access door, on the main harness. Data is transmitted when the unit is On. The CAN port is transmit only.

Pin	Description
1	Ground
2	CAN High
3	CAN Low
4	Cable Shield
5	+12 VDC
6	(Open)

2 Wedge Lock (Supplied) (Deutsch W65-P012)

3 CAN Plug (Supplied) (Deutsch DT06-6S-P012)

4 Terminal (Not Supplied) (Deutsch 1062-16-0122)

5 Cabling (Customer Supplied)

6 CAN BUS Receptacle

Remove connector plug from receptacle.

Disassemble plug and remove seals as needed.

Insert insulated wires (16 or 18 AWG) using Deutsch 1062-16-0122 terminals.

Reassemble connector and reconnect to CAN BUS receptacle.

9-2. Trailblazer J1939 Messages

Message	Notes	Acro-nym	ID (Hex)	PGN (Deci-mal)	Start Posi-tion	Length	SPN (Deci-mal)	Tx Rate (ms)
Engine Speed	0 to 8031.875rpm 0.125rpm/bit 0 offset	EEC1	0CF004D1	61444	4	2 bytes	190	200
Battery Potential (Voltage)	0 to 3212.75V, 0.05V/bit, 0 offset	VEP	18FEF7D1	65271	7	2 bytes	158	1000
Error State	See Table 9–2.	Propri-etary	18FF78D1	65400	3	1 byte	516107	100
Engine Hours	Actual engine hours 0 to 65535 hours 1 hour/bit 0 offset	Propri-etary	1CFF79D1	65401	1	2 bytes	516110	1000
Engine Oil Maintenance Hours	Actual hours until engine oil change is required -32767 to 32767 hours 1 hour/bit 0 offset	Propri-etary	1CFF79D1	65401	3	2 bytes	516111	1000
Fuel Sender	Percent of fuel remaining 0 to 100	Propri-etary	1CFF79D1	65401	7	1 bytes	516112	1000
Brush Maintenance Hours	Actual hours until generator brush change is required -32767 to 32767 hours 1 hour/bit 0 offset	Propri-etary	1CFF7CD1	65404	1	2 bytes	516116	1000
Battery Terminal Mainte-nance Hours	Actual hours until battery terminal cleaning is required -32767 to 32767 hours 1 hour/bit 0 offset	Propri-etary	1CFF7CD1	65404	3	2 bytes	516117	1000
Air Cleaner Maintenance Hours	Actual hours until engine air cleaner change is required -32767 to 32767 hours 1 hour/bit 0 offset	Propri-etary	1CFF7DD1	65405	1	2 bytes	516118	1000
Fuel Filter Maintenance Hours	Actual hours until engine fuel filter change is required -32767 to 32767 hours 1 hour/bit 0 offset	Propri-etary	1CFF7DD1	65405	7	2 bytes	516121	1000

Table 9–1. J1939 Name For Address Claim

Field	Value	Notes
Industry Group	5	Industrial-Process Control-Stationary (Gen-Sets)
Vehicle System Instance	0	
Vehicle System	0	
Function	129	Generator Set Controller
Function Instance	1	
ECU Instance	1	
MFG Code	402	Simma Software
Identity Number	1	
Source Address	209	

Table 9–2. Error State

Error	Value	Detection
NO ERROR	0	
WELD BOOST CONNECTOR FAULT	1	Connector RC2 not plugged in.
WELD BOOST VBUS HIGH FAULT	2	Weld module bus voltage exceeded threshold during operation.
WELD BOOST VBUS LOW FAULT	3	Weld module bus voltage below threshold while engine running.
WELD BOOST FAULT	4	Low weld module bus voltage after soft start.
WELD BOOST CURRENT SENSOR FAULT	5	Weld module current sensor not wired properly or high boost current detected.
WELD MODULE PRIMARY CT FAULT	7	Transformer primary current exceeded threshold.
WELD MODULE CS FAULT	8	Output CT not reading correctly.
WELD MODULE PLUS 15V FAULT	9	Weld module +15V fault.
WELD MODULE PLUS 5V FAULT	10	Weld module +5V fault.
WELD MODULE PLUS 12V FAULT	11	Weld module +12V fault.
WELD MODULE MINUS 15V FAULT	12	Weld module -15V fault.
WELD MODULE CONNECTOR FAULT	13	Weld module connector unplugged.
WELD MODULE LIN FAULT	14	Weld module boost LIN communication fault.
WELD MODULE LIN COMMUNICATION FAULT	15	Weld module boost LIN communication fault.
WELD MODULE COMMUNICATION FAULT	16	Communication has been lost with weld inverter.
WELD MODULE THERMISTOR OPEN	17	Weld module thermistor fault - open.
WELD MODULE THERMISTOR SHORTED	18	Weld module thermistor fault - shorted.
WELD MODULE THERMISTOR OVERTEMP	19	Weld module thermistor fault - overtemp.
WELD MODULE OVERTEMP FAULT	26	Internal temperature of welder has exceeded the maximum limit.
WELD MODULE THERMISTOR FAULT	27	Thermistor defective - see fault codes 17-19.
WELD MODULE INVERTER DC BUS HIGH	28	Inverter DC Bus voltage exceeding high limit.
WELD MODULE INVERTER DC BUS LOW	29	Inverter DC Bus voltage under low limit.

Table 9–3. DM1 Definitions

DTC	J1939-73		SPN Name SAE J1939 Table C1	Detection	DTC Set Parameter	Time to action or number of error detection	ECU Action	Recovery From Error
	SPN	FMI						
Oil pressure error	100	1	Engine Oil Pressure	Oil pressure switch	Despite rpm, oil pressure switch is ON	1.0 sec or more	Engine Stop	Key switch turn OFF
Engine overheat	110	0	Engine Coolant Temperature	Overheat of engine water temperature	Engine water temperature ≥ 115C (239F)	1.0 sec or more	Engine Stop	Key switch turn OFF
Water temperature sensor: High	110	3	Engine Coolant Temperature	Open circuit of sensor / harness, + B short circuit	Voltage of coolant temperature sensor is 4.9 V or above	1.0 sec or more	Engine Stop	Key switch turn OFF
Water temperature sensor: Low	110	4	Engine Coolant Temperature	Ground short circuit of sensor / harness	Voltage of coolant temperature sensor is 0.1 V or less	1.0 sec or more	Engine Stop	Key switch turn OFF
Battery voltage: High	158	3	Battery Potential (Voltage) Switched	Open circuit, short circuit, or damage of harness. Failure of battery	ECU recognition of battery voltage is above 18 V.	1.0 sec or more	Engine Stop	Key switch turn OFF
Engine overrun	190	0	Engine Speed	Engine speed exceeds threshold speed	Engine speed >4140 rpm	1.0 sec or more	Engine Stop	Key switch turn OFF
Sensor supply voltage 1: Low	3509	4	Sensor supply voltage 1	Sensor supply voltage 1	Voltage to sensor is below 4.00 V	1.0 sec or more	Engine Stop	Key switch turn OFF
Actuator Abnormal	5.00-E+05	2	proprietary	Open circuit, short circuit, or damage of harness.	Actuator current >3.0A or < 80mA	1.0 sec or more	Engine Stop	Key switch turn OFF
Engine Speed Sensor Abnormal	5.00-E+05	2	proprietary	Open circuit, short circuit, or damage of harness.	Engine speed = 0 min-1 (rpm) after Starter signal into ECU	30.0 sec or more	Engine Stop	Key switch turn OFF

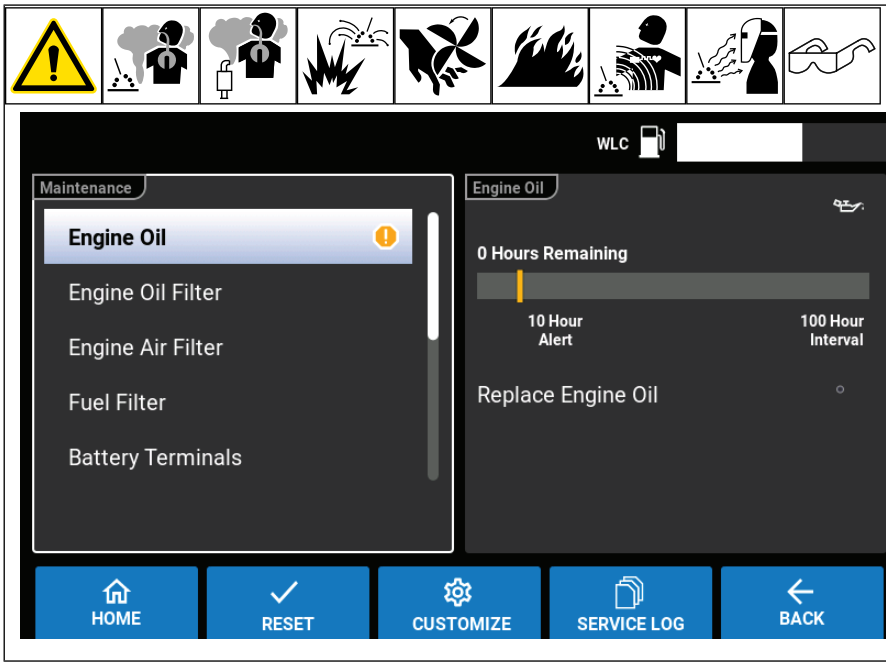
DTC	J1939-73		SPN Name SAE J1939 Table C1	Detection	DTC Set Parameter	Time to action or number of error detection	ECU Action	Recovery From Error
	SPN	FMI						
Starter error	5.00-E+05	2	proprietary	Starter running time exceed threshold time	Starter running time is above 12sec	12.0 sec or more	Engine Stop	Key switch turn OFF
Charging failure	5.00-E+05	2	proprietary	Open circuit, short circuit, or damage of harness	Alternator L terminal is 0 V while engine is running	1.0 sec or more	Engine Stop	Key switch turn OFF
CAN Communication Abnormal	5.00-E+05	2	proprietary	CAN Bus	CAN Bus OFF	0.2 sec or more		Key switch turn OFF
Emergency Stop	-	-	-	Emergency Stop switch	Emergency Stop CAN Signal into ECU	0.1 sec or more	Engine Stop	Key switch turn OFF

Table 9–4. CAN Specification

Communication Protocol	SAE J1939
Format Type	Extended Format (ID:29bit)
Baud Rate	250kbps
Sample Point	80%
Number of Sample	1
SJW	2Tq
Terminal Resistor	120 ohms

SECTION 10 – GENERATOR/ENGINE MAINTENANCE

10-1. Maintenance Screen



The Maintenance screen displays hours remaining for service items and allows the user to reset service hours and change the interval (only shorter than recommended.)

Press the Home Button to go to the Home screen.

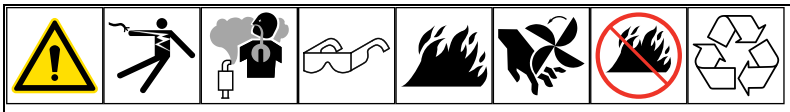
Press the Back button to go to the Menu screen.

10-2. Routine Generator/Engine Maintenance

☞ *Use information displayed on the LCD display to assist in scheduling maintenance (see Section 10-1).*

☞ *Engine speed is regulated by an electronic governor. Engine speed adjustments may only be performed by a Factory Authorized Service Agent.*

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



⚠ **Stop engine before maintaining.**

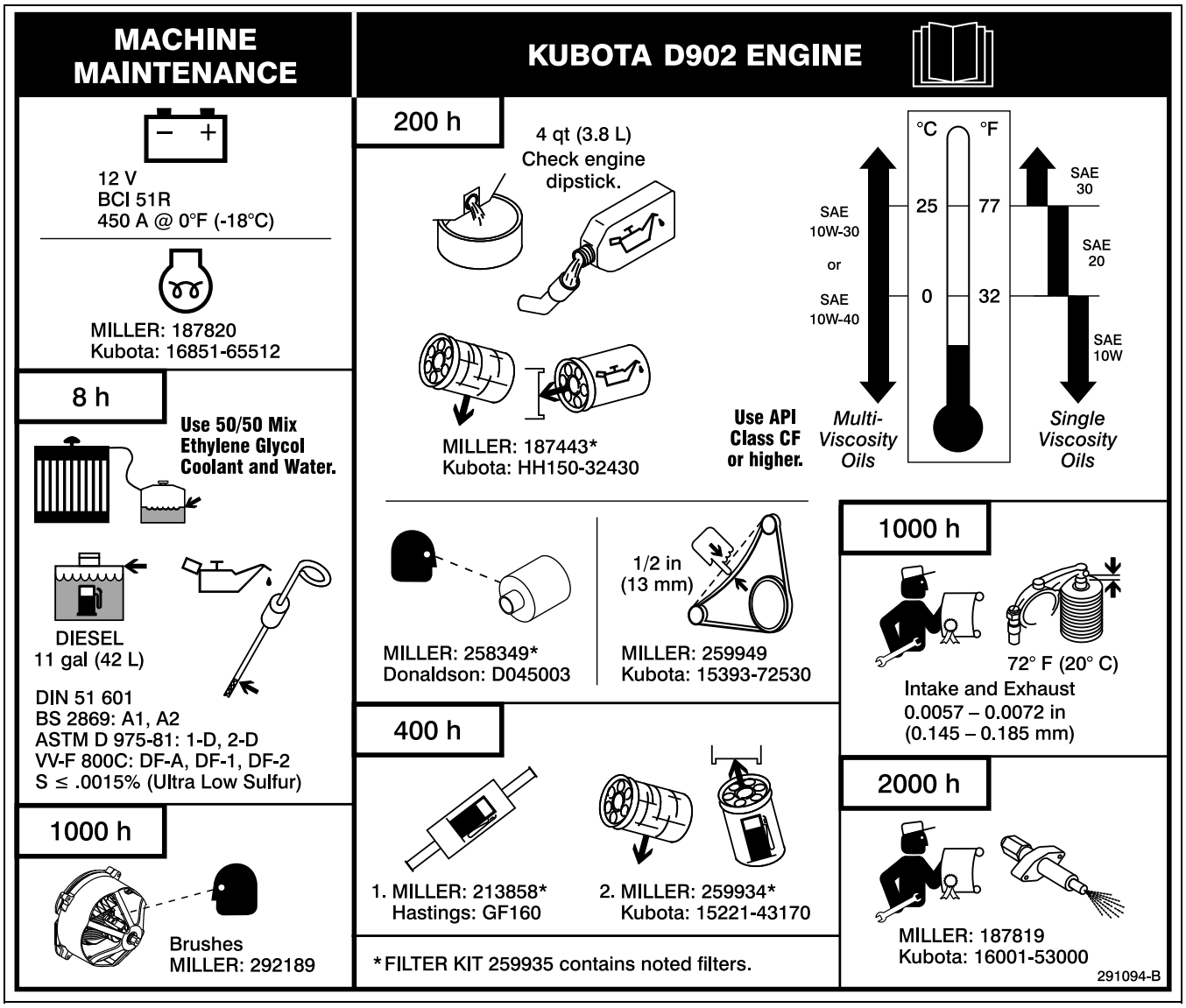
☞ *See Engine Manual and Maintenance Label for important start-up, service, and storage information. Service Engine more often if used in severe conditions.*

☞ *Recycle engine fluids.*

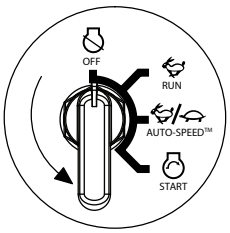
Maintenance Schedule		Every 8 Hours	Every 200 Hours	Every 400 Hours	Every 1000 Hours	Every 2000 Hours	Reference
Fuel and Oil	Check fuel and oil levels. Clean any fuel and/or oil spills.	●					Section 5-5, 10-5
Coolant	Check coolant level.	●					Engine Manual
Maintenance Screen	Check Maintenance screen for next oil change interval.	●					Section 10-1
Fuel Connections	Check		●				Section 10-5
Oil and Oil Filter	Change		●				Section 10-5
Air Cleaner	Change		●				Section 10-4
Battery Terminals	Clean		●				
Labels	Replace any unreadable labels.		●				
Weld Terminals	Clean		●				
Belt	Check tension		●				Engine Manual
Fuel Filters	Change			●			Section 10-5
Weld Cables	Check cables for any signs of damage and replace if necessary.			●			
Fan Belt	Check				●		Engine Manual
Radiator	Flush coolant.				●		Engine Manual, Section 10-5
Radiator Hoses	Check				●		
Air Cleaner Hoses	Check				●		
Valve Clearance*	Check				●		Engine Manual
Brushes*	Check brushes and replace if necessary.				●		
Slip Rings*	Check slip rings for any signs of wear or damage.				●		
Fuel Hoses	Check fuel hoses and replace if necessary.					●	Section 10-5
Fuel Injectors*	Check injectors and replace if necessary.					●	Engine Manual
Coolant and Hoses	Change coolant. Check hoses and replace if necessary.					●	Engine Manual, Section 10-5

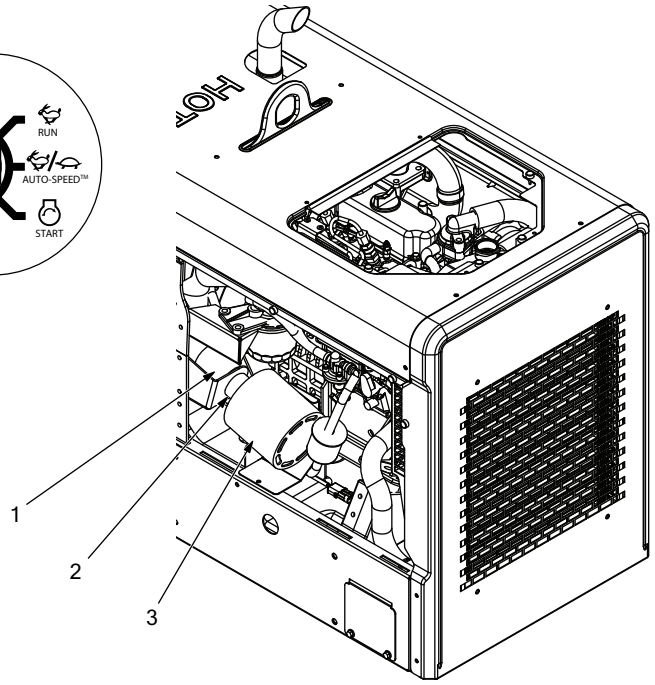
*To be done by factory authorized service agent.

10-3. Maintenance Label



10-4. Replacing Air Cleaner





Stop engine.

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

1 Air Intake Tube

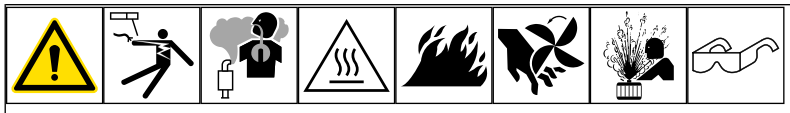
2 Hose Clamp

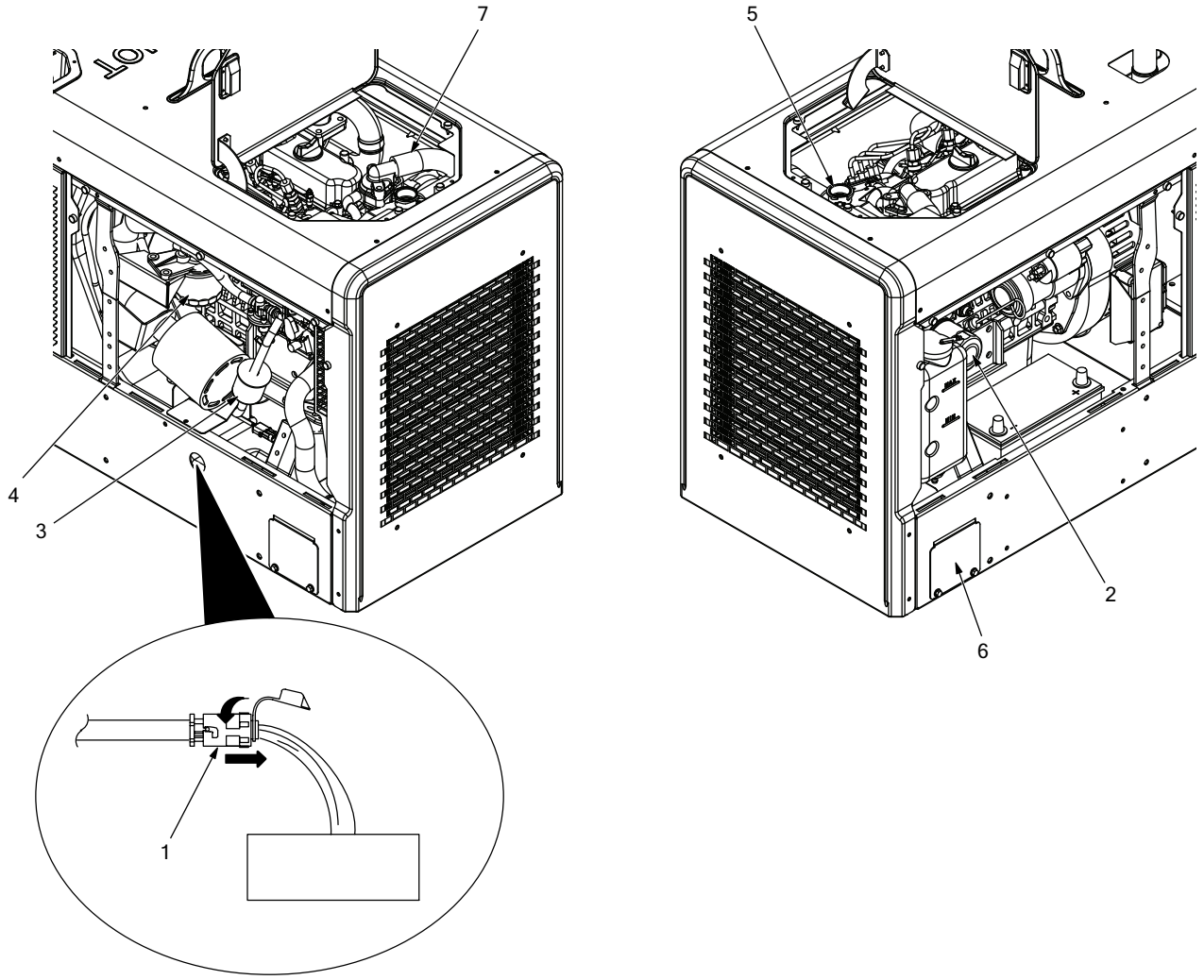
3 Air Cleaner

Loosen hose clamp, slide air cleaner towards rear of unit and remove. Slide new air cleaner onto intake tube and tighten clamp.

Replace air cleaner every 200 hours or less if used in severe conditions.

10-5. Engine Maintenance Activities





⚠ **Stop engine and let cool.**

Oil And Fuel

1 Oil Drain Valve
2 Oil Filter

Change engine oil and filter according to engine manual.

NOTICE – *Close valve and valve cap before adding oil and running engine.*

Fill crankcase with new oil to full mark on dipstick (see Section 5-5).

3 Inline Fuel Filter
4 Fuel Filter

Replace fuel filters according to engine manual.

Replace fuel lines if cracked or worn.

Wipe up any spilled fuel.

Start engine, and check for fuel leaks.

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

Coolant

5 Radiator Cap
6 Radiator Drain Cock (Located on bottom of radiator)

Drain engine coolant according to procedure in engine manual.

Add engine coolant as follows:

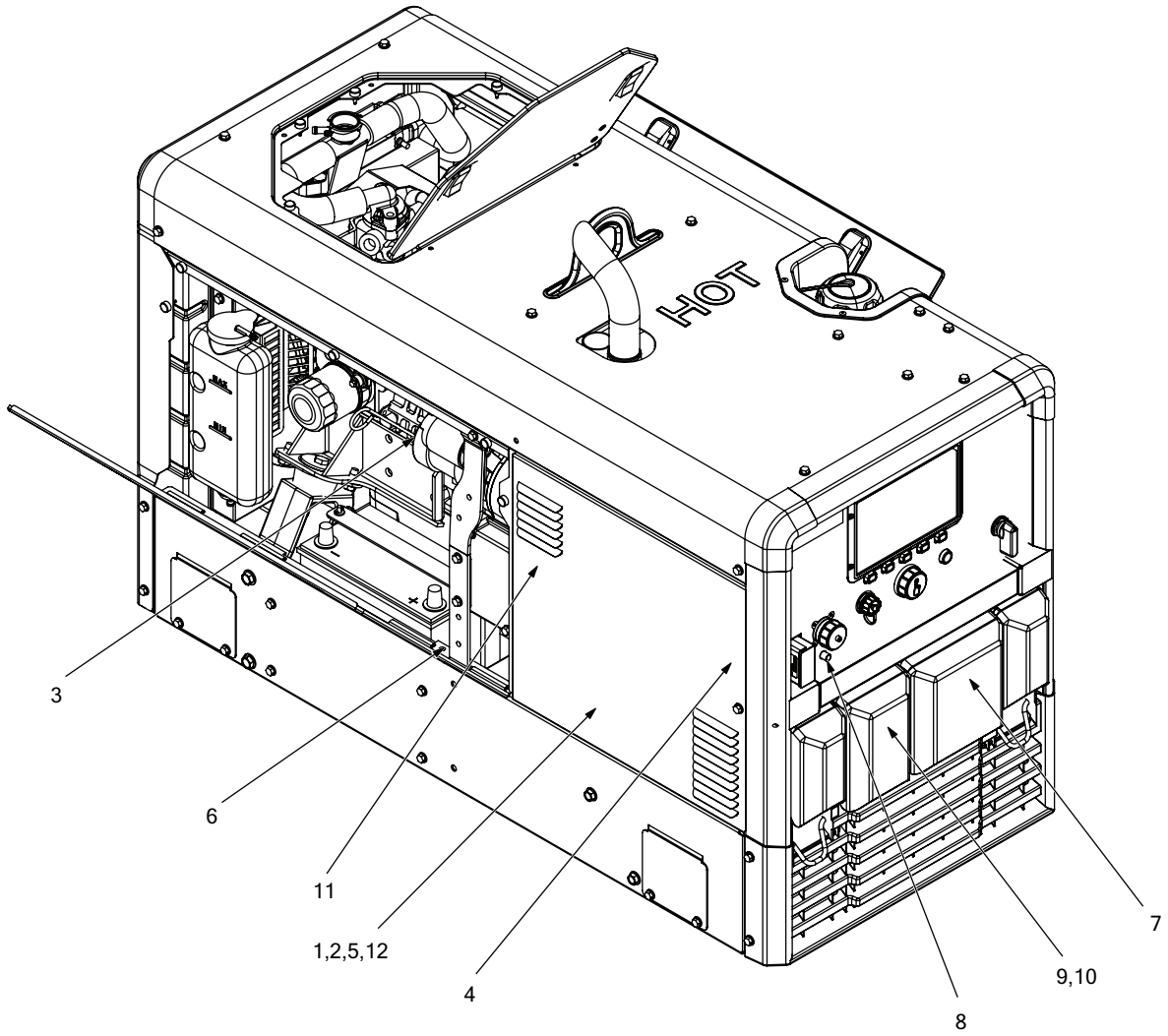
7 Coolant Bypass Hose

Fill the radiator and then squeeze the bypass hose to ensure all air is removed from the system.

Reinstall radiator cap. Check coolant level in overflow bottle.

See engine manual for engine coolant specifications

10-6. Overload Protection



⚠ **Stop engine. Disconnect negative (-) battery cable.**

☞ *If a fuse opens, it usually indicates a more serious problem exists. Contact a Factory Authorized Service Agent.*

1 Fuse F1

Protects ignition switch from overload. If open, engine will not start.

2 Fuse F2

Protects starter solenoid from overload. If open, engine will not crank.

3 Fuse F3

Protects machine from reverse polarity battery hookup. If open, engine will not start.

4 Fuse F4

Protects battery charge board from overload. If open, battery will not charge.

5 Fuse F5

Protects engine ECU from overload. If open, engine will not start.

6 Fuse F6

Protects CAN wiring from overload. If open, CAN connection will not work.

7 Circuit Breaker CB1 (Under Cover)

Protects 240V receptacle.

8 Circuit Breaker CB2

Protects 14 pin receptacle.

9 Circuit Breaker CB3 (Under Cover)

Protects non Excel 120V receptacle.

10 Circuit Breaker CB4

Protects Excel 120V receptacle.

11 Circuit Breaker CB5

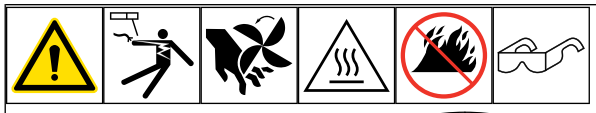
Protects Excel power circuit.

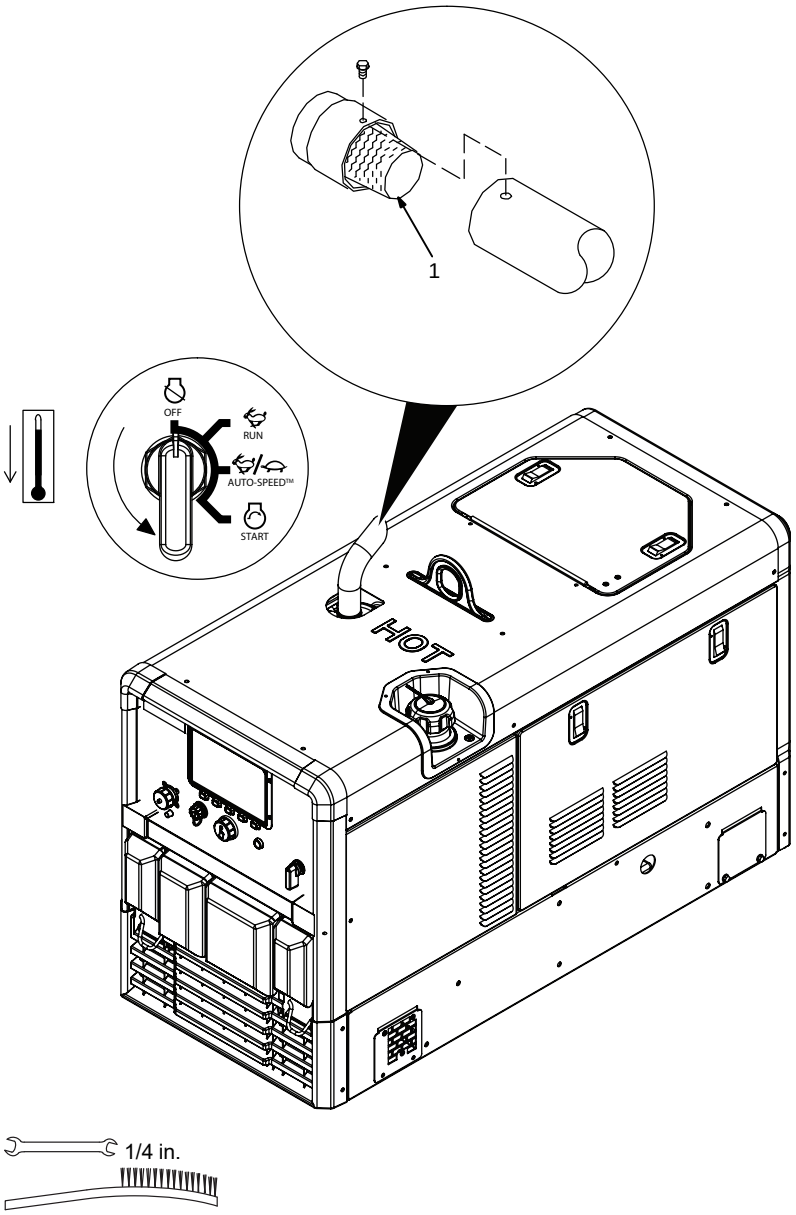
12 Circuit Breaker CB6

Protects glow plug.

Replace any open fuses and/or reset any circuit breakers. Reinstall cover before operating.

10-7. Servicing Optional Spark Arrestor





Stop engine and let cool.

1 Spark Arrestor Screen

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

SECTION 11 – TROUBLESHOOTING

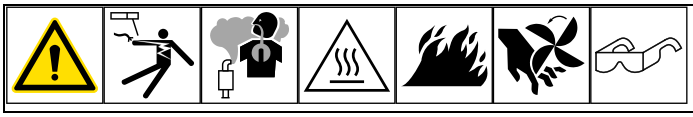
11-1. Front Panel Display Code Information

LCD Message	Help Code	Problem	Possible Cause	Potential Solution
Engine Oil Pressure Error - Have Unit Serviced	ERR PF00	Despite RPM, oil pressure switch is ON.	Indicates malfunction of oil pressure switch	Contact a Factory Authorized Service Agent.
Engine Overheat Error - Let Engine Cool	ERR PT00	Engine water temperature greater than or equal to 239° F (115°C).	High engine demand.	Wait for unit to cool.
Engine Temp Sensor Error - Have Unit Serviced	ERR PT01	Voltage of coolant temperature sensor is out of range.	Indicates malfunction of engine temp sensor.	Contact a Factory Authorized Service Agent.
Engine Battery Error - Check Battery	ERR PB00	ECU recognition of battery voltage is above 18 volts.	Bad battery.	Check battery.
Engine Overrun Error - Have Unit Serviced	ERR PE00	Engine speed is greater than 4140 RPM.	Indicates malfunction of engine ECU.	Contact a Factory Authorized Service Agent.
Engine Sensor Supply Error - Have Unit Serviced	ERR PN00	Engine Sensor voltage low.	Indicates malfunction of engine sensor.	Contact a Factory Authorized Service Agent.
Engine Actuator Error - Have Unit Serviced	ERR PK00	Engine actuator current detected out of range.	Indicates malfunction of engine actuator.	Contact a Factory Authorized Service Agent.
Engine Speed Sense Error - Have Unit Serviced	ERR PR00	Engine speed is 0 RPM after Start signal into ECU.	Indicates malfunction of speed sense signal.	Contact a Factory Authorized Service Agent.
Engine Starter Error - Have Unit Serviced	ERR PE01	Starter running time is above 12 seconds.	Indicates malfunction of engine starter.	Contact a Factory Authorized Service Agent.
Engine Alternator Error - Have Unit Serviced	ERR PE03	Alternator L terminal has voltage while 0 RPM (After Key On).	Indicates malfunction of alternator.	Contact a Factory Authorized Service Agent.
Engine Charging Error - Have Unit Serviced	ERR PB01	Alternator L terminal is 0 volts while engine is running.	Indicates malfunction of alternator.	Contact a Factory Authorized Service Agent.
Engine CAN Bus Error - Have Unit Serviced	ERR PC00	CAN bus OFF.	Indicates malfunction of CAN communication with engine ECU.	Contact a Factory Authorized Service Agent.
Engine Thermal Foldback - LET ENGINE COOL	ALRT PT03	Thermal foldback starts at 221°F (105°C) and increases by 10% per degree until output is shut off at 239°F (115° C)	High engine demand.	Wait for unit to cool.
Engine Low Fuel Shutdown - Refill Fuel	ERR PF01	Fuel level is low.	Fuel level is low.	Refill fuel.
Engine Check Error - Have Unit Serviced	ERR PE02	Check Engine Error.	Indicates malfunction of engine.	Contact a Factory Authorized Service Agent.
Boost Connector Error - Have Power Module Serviced	ERR EE00	Inverter Control board does not have connector RC2 plugged in.	Indicates malfunction in primary power circuit of unit.	Contact a Factory Authorized Service Agent.
Boost DC Bus Out of Range - Have Unit Serviced	ERR EE01	DC bus voltage too high or low for 10 seconds.	Indicates malfunction in primary power circuit of unit.	Contact a Factory Authorized Service Agent.
Boost DC Bus High Error - Have Power Module Serviced	ERR EV00	Inverter Control board bus voltage exceeded 480V during operation.	Indicates malfunction in primary power circuit of unit.	Contact a Factory Authorized Service Agent.
Boost DC Bus Low Error - Have Power Module Serviced	ERR EU00	Inverter Control board bus voltage went below 160V while engine was running.	Indicates malfunction in primary power circuit of unit.	Contact a Factory Authorized Service Agent.
Boost Initial Check Error - Have Power Module Serviced	ERR EB00	Bus voltage detected below 360V after soft start.	Indicates malfunction in primary power circuit of unit.	Contact a Factory Authorized Service Agent.
Boost Current Sensor Error - Have Power Module Serviced	ERR EN00	Inverter Control board current sensor is not wired correctly or high boost current detected.	Indicates malfunction in primary power circuit of unit.	Contact a Factory Authorized Service Agent.
Boost Over Current Error - Have Power Module Serviced	ERR EG00	Inverter Control board detected boost current over 100A.	Indicates malfunction in primary power circuit of unit.	Contact a Factory Authorized Service Agent.
Inverter Primary CT Error - Have Power Module Serviced	ERR HG00	Transformer primary current exceeded trip level.	Indicates malfunction in primary power circuit of unit.	Contact a Factory Authorized Service Agent.

LCD Message	Help Code	Problem	Possible Cause	Potential Solution
Inverter Current Sensor Error - Have Power Module Serviced	ERR DE00	Output Current Sensor not reading correctly.	Indicates malfunction of output current sensor.	Contact a Factory Authorized Service Agent.
Inverter Plus 15V Error - Have Power Module Serviced	ERR HN00	Inverter Control board +15V supply out of range.	Indicates malfunction of power supplies on inverter control board.	Contact a Factory Authorized Service Agent.
Inverter Plus 5V Error - Have Power Module Serviced	ERR HN01	Inverter Control board +5V supply out of range.	Indicates malfunction of power supplies on inverter control board.	Contact a Factory Authorized Service Agent.
Inverter Plus 12V Error - Check Battery Voltage	ERR HN02	Battery voltage outside of range.	Low battery voltage.	Charge battery.
Inverter Minus 15V Error - Have Power Module Serviced	ERR HN03	Inverter Control board -15V supply out of range.	Indicates malfunction of power supplies on inverter control board.	Contact a Factory Authorized Service Agent.
Inverter Connector Error - Have Power Module Serviced	ERR DE01	Inverter Control board does not have inverter connector plugged in.	Indicates malfunction in primary power circuit of unit.	Contact a Factory Authorized Service Agent.
Boost LIN Communication Error - Have Power Module Serviced	ERR NC00	Inverter Control board boost LIN communication fault.	Indicates malfunction of communication systems.	Contact a Factory Authorized Service Agent.
Inverter LIN Communication Error - Have Power Module Serviced	ERR NC01	Inverter Control board inverter LIN communication fault.	Indicates malfunction of communication systems.	Contact a Factory Authorized Service Agent.
Inverter Thermistor Open Error - Have Power Module Serviced	ERR DH00	Inverter Control board thermistor open.	Indicates a malfunction in thermal protection circuitry.	Contact a Factory Authorized Service Agent.
Inverter Thermistor Short Error - Have Power Module Serviced	ERR DH01	Inverter Control board thermistor shorted.	Indicates a malfunction in thermal protection circuitry.	Contact a Factory Authorized Service Agent.
Inverter Over Temp Error - Wait For Temp To Drop	ERR DH02	Inverter Control board thermistor overtemp.	Indicates unit has overheated.	Unit has shut down to allow fan to cool it. Operation will continue when unit has cooled.
14 Pin Remote Removed During Weld - Check 14 Pin Connection	ALRT RE00	Lost 14 pin remote command during weld.	Remote disconnected.	Reconnect remote.
Spool Gun Not Connected - Connect Spool Gun	ALRT WE00	Spool gun not connected.	Spool gun not connected.	Check spool gun connection.
Spool Gun Motor Error - Have Power Module Serviced	ERR WK00	Spool gun motor fault.	High current detected in spool gun motor circuit.	Check spool gun connector and cable. Switch process or power cycle unit to clear error. If issue persists, contact a Factory Authorized Service Agent.
Polarity Reversing Error - Have Unit Serviced	ERR LL00	Polarity Reversing contactor stuck in incorrect polarity.	Stuck contactor.	Contact a Factory Authorized Service Agent.
Inverter Control Comm Error - Have Power Module Serviced	ERR NC02	Inverter Control board communication fault between inverter and weld micro.	Indicates malfunction of communication systems.	Contact a Factory Authorized Service Agent.
Batt Charge Error - Check Charge Voltage	ERR BP00	Battery charge set to wrong voltage.	Incorrect battery charge voltage selected.	Select charge voltage that matches battery.
Batt Read Open Error - Check Battery Connection	ERR BU00	Battery is disconnected or reverse connected.	Disconnected battery.	Check battery connection.
Batt Check Open Error - Check Battery Connection	ERR BU01	Battery is disconnected.	Disconnected battery.	Check battery connection.
Batt Charge Check Error - Bad Battery Replace Battery	ERR BE00	Not enough voltage or no current flow during battery check.	Bad battery.	Check battery.
Batt Jump Start Timeout Error - Jump Start Timer Expired	ERR BE01	Battery charging at more than 155A for over 20 seconds. Battery charge current at 0 or less current for over 40 seconds.	Boost charge timer expired. Battery not drawing current, timer expired.	Check load on battery. Check connection to battery.
Batt Final Check Error - Bad Battery Replace Battery	ERR BE02	Voltage has fallen below fault level after charging.	Bad battery.	Replace battery.

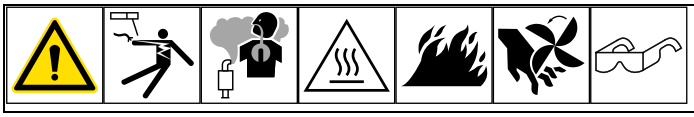
LCD Message	Help Code	Problem	Possible Cause	Potential Solution
Batt Final Check Battery Error - Bad Battery Replace Battery	ERR BE03	Too many retries on battery charge final test.	Bad battery.	Replace battery.
Batt Charge Timer Expired Error - Wait For Process To Start Again	ERR BX00	Battery charging past 13.5 hours.	Battery charge time expired.	Start battery charge process again if more time needed.
Batt Charge Check Connection - Check Battery Connection	ALRT BN00	Battery connection lost or polarity incorrect.	Battery connection lost or connected in reverse.	Check battery connection.
Batt Charge Over Voltage Error - Check Battery, Disconnect Clamp To Clear	ERR BV00	24V Battery when in 12V charge. High voltage detected while charging.	Incorrect battery charge voltage selected. Battery not taking charge.	Disconnect clamps from battery. Select charge voltage that matches battery. Reconnect and try again.
Control Board Communication Error - Cycle Power	ERR SA01	CAN communication timeout on control board.	Indicates issue with CAN communication between boards.	Contact a Factory Authorized Service Agent.
Software Invalid or Mismatch - Update Software	ERR SA00	Different software versions among PC boards.	Different software versions among PC boards.	Contact a Factory Authorized Service Agent.
Smart Accessory Bind Error - Smart Accessory Not Currently Supported, Disconnect	ERR ZM00	Smart Feeder/Heater not supported currently for this product.	Smart Feeder/Heater not supported currently for this product.	Disconnect Smart Accessory from power source.

11-2. Welding Troubleshooting



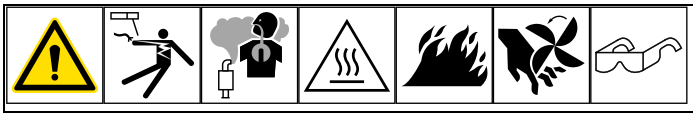
Trouble	Remedy
No weld output.	Check weld control settings.
	Check weld connections.
	Verify generator output is not present.
	Disconnect equipment from generator power receptacles during start-up.
	Increase front panel and/or remote voltage/amperage control settings (see Sections 6-9 and 6-16).
	Check and secure connections to Remote receptacle RC41 (see Sections 5-9).
	Have Factory Authorized Service Agent check brushes, slip rings, and circuit board PC1.
Low weld output.	Check control settings.
	Increase front panel and/or remote voltage/amperage control settings (see Sections 6-9 and 6-16).
	Check and clean air cleaner as necessary (see Section 10-4).
	Verify generator output is low.
	Have Factory Authorized Service Agent check engine speed, brushes, slip rings, and circuit board PC1.
	See engine manual.
High weld output.	Check control settings.
	Have Factory Authorized Service Agent check engine speed and circuit boards PC1 and PC2.
Weld output cannot be adjusted.	Have Factory Authorized Service Agent check circuit board PC1.
Erratic weld output.	Verify generator output is erratic.
	Check control settings.
	Clean and tighten connections both inside and outside unit.
	Check and secure lead connections to remote control.
	Be sure connection to work piece is clean and tight.
	Remove excessive coils from weld cables.
	Use dry, properly stored electrodes.
	Have Factory Authorized Service Agent check engine speed, brushes, slip rings, and circuit boards PC1 and PC2.
	Check shielding gas, ensure proper shielding gas coverage while welding.
No remote voltage/amperage control.	Check and tighten connections to Remote receptacle RC41 (see Section 5-9). Check and secure lead connections to remote control.
No front panel voltage/amperage control.	Disconnect remote control from Remote receptacle RC41 if not needed for weld process (see Section 5-9).
No 24 volt AC power output at Remote receptacle RC41.	Reset supplementary protector CB2 on front, below Remote receptacle (see Section 10-6).
Difficulty in establishing Gas Tungsten Arc Welding arc.	Use proper size tungsten for welding amperage.
	Adjust Auto-Stop sensitivity on weld settings screen.
	Check cables and torch for cracked or deteriorated insulation or bad connections. Repair or replace necessary parts.
Wandering arc − poor control of arc direction.	Reduce gas flow rate.
	Select proper size tungsten. Properly prepare tungsten.
Tungsten electrode oxidizing and not remaining bright after conclusion of weld.	Shield weld zone from drafts.
	Increase postflow time.
	Check and tighten all gas fittings.
	Properly prepare tungsten.

11-3. Generator Power Troubleshooting



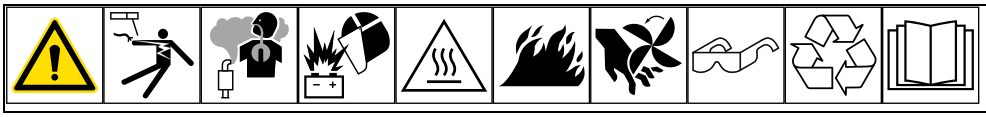
Trouble	Remedy
No power output.	Reset supplementary protectors (see Section 8-1).
	Have Factory Authorized Service Agent check brushes, slip rings, and circuit board PC2.
Low power output.	Check and clean air cleaner as necessary.
	Have Factory Authorized Service Agent check engine speed.
	Have Factory Authorized Service Agent check PC2.
High power output.	Have Factory Authorized Service Agent check engine speed.
Erratic power output.	Have Factory Authorized Service Agent check engine speed, brushes, slip rings, and circuit board PC2.
	Check receptacle wiring and connections.

11-4. Engine Troubleshooting



Trouble	Remedy
Engine does not crank.	Supplementary protector F1 or F2 may be open. Wait and retry.
	Check battery voltage.
	Check battery connections; clean and tighten if necessary.
	Check Engine Control switch and engine wiring harness connections.
	Have Factory Authorized Service Agent check CR6 control relay and starter.
Engine cranks but does not start.	Check fuel level and front panel fault indicators (see Section 6-1).
	Glow plug circuit breaker CB4 may be open (see Section 10-6). Wait and retry.
	Service inline fuel strainer and fuel filter (see Section 10-2).
	Check battery and replace if necessary.
	Check engine charging system according to engine manual.
	Have Factory Authorized Service Agent check Engine Control Unit (ECU) fault codes and speed actuator.
	Have Factory Authorized Service Agent check glow plug relay CR1.
Engine starts but stops when Engine Control switch S2 returns to Auto-Speed position.	Check oil level (see Section 5-5) and front panel fault indicators (see Section 6-1). Engine will start if oil pressure is too low and will shut off if no pressure is present.
	Check coolant level and fan belt (see Section 5-5 and engine manual), and check front panel fault indicators (see Section 6-1). Engine will not start if engine temperature is too high.
	Have Factory Authorized Service Agent check low oil pressure shutdown switch S3 and engine water temperature sensor.
Engine stopped during normal operation.	Check fuel level and front panel fault indicators (see Section 6-1).
	Check oil level (see Section 5-5) and front panel fault indicators (see Section 6-1).
	Check coolant level and fan belt (see Section 5-5 and engine manual), and check front panel fault indicators (see Section 6-1). Engine stops if engine temperature is too high.
	Have Factory Authorized Service Agent check low oil pressure shutdown switch S3 and engine water temperature sensor.
Battery discharges between uses.	Periodically recharge battery (approximately every 3 months).
	Replace battery.
	Check alternator voltage according to engine manual.
Engine does not return to idle speed when load is removed with Engine Control switch in Auto-Speed position.	Remove all weld and generator power loads.
	Have engine Factory Authorized Service Agent check engine and wiring.
Engine does not remain at weld/power speed when power or weld load is applied with Engine Control switch in Auto-Speed position.	Have engine Factory Authorized Service Agent check engine and wiring.
Engine exhaust smoke black when unit is under load.	Replace air cleaner. Replace fuel filter.

11-5. Battery Charge/Jump Troubleshooting



Trouble	Remedy
No battery charge/jump output.	Be sure battery is connected.
	Check battery voltage, charging may be finished.
	Have Factory Authorized Service Agent check battery charge circuitry. ☞ *This machine will not charge or jump start a completely dead battery. Some voltage must be detected from the battery that is being charged/jump started or this function will not work.*
Charging current turns on and off while charging battery.	Clean and tighten battery connections, if necessary. Clean battery terminals and posts with baking soda solution and rinse with clear water.
	Fully charged batteries, or batteries that do not take any charge, may experience intermittent charging. This is normal.

SECTION 12 – PARTS LIST

12-1. Recommended Spare Parts

Recommended Spare Parts

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
		292189	Brushholder Assy, Generator	1
		280236	Receptacle, Gfci 15/20a	2
	F1	281761	Fuse, Mini Blade Atm 30. Amp 32 Volt	1
	F2	281760	Fuse, Mini Blade Atm 20. Amp 32 Volt	1
	F3	288238	Fuse, Auto 80a 32vdc Auto Link	1
	F5	281758	Fuse, Mini Blade Atm 5. Amp 32 Volt	1
	F6	291226	Fuse, Inline	1
		259549	Belt, Fan	1
		187820	Glow Plug	1
		197145	Switch, Pressure Oil	1
		290797	Terminal, Pwr Output Black	1
		291500	Terminal, Pwr Output Black	1
		243344	Sensor, Temperature	1
		093996	Supplementary Pro, Man Reset 1p 20a 250vac Frict	1
		301742	Kit, Screen Protector Bobcat/Trailblazer	1

☞ *See maintenance label for common maintenance parts.*

☞ *A complete Parts List is available on-line at www.MillerWelds.com .*

NOTICE – *This equipment meets US EPA Evaporative Standards. Be sure fuel system replacement parts meet EPA Evaporative Standards.*

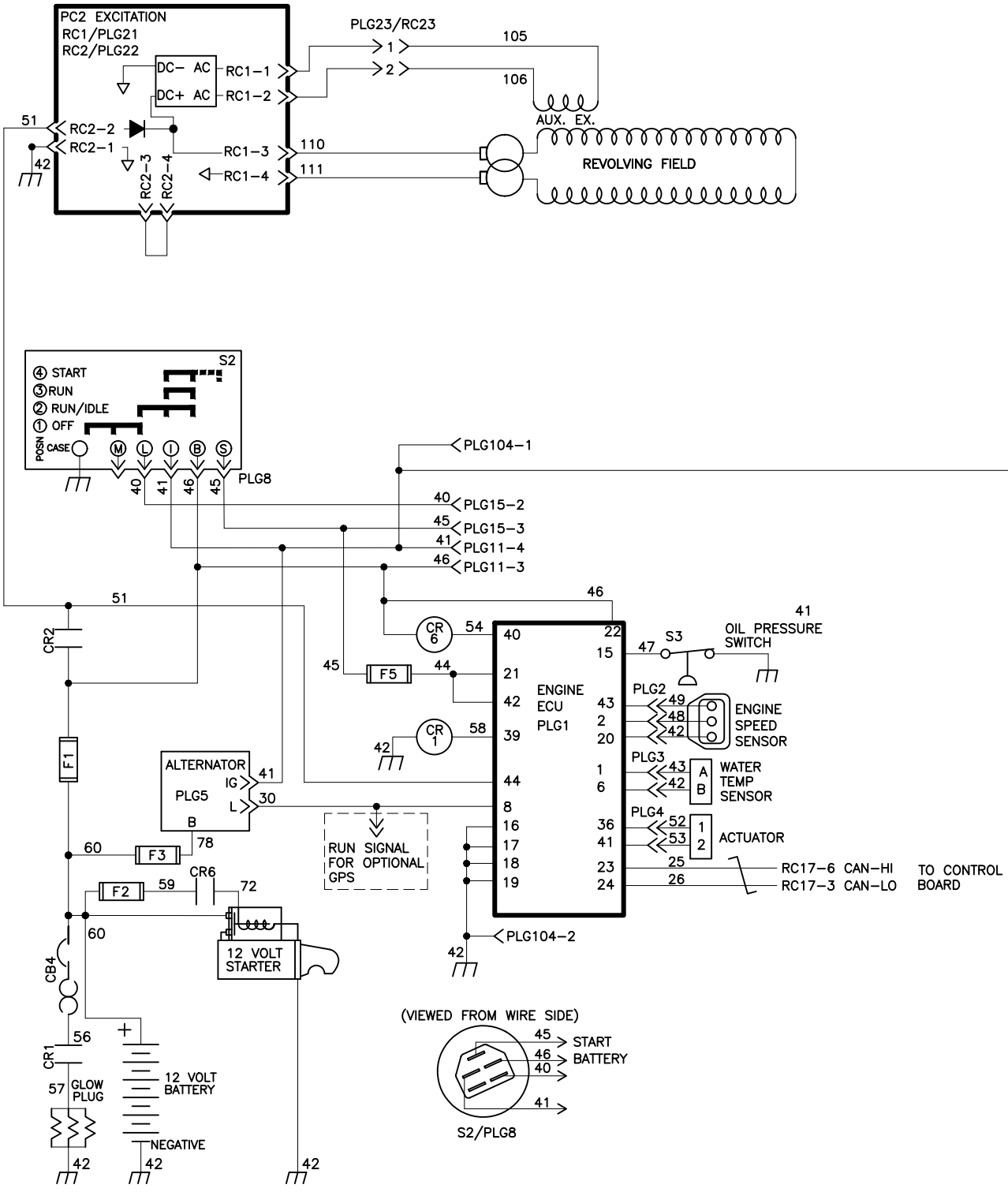
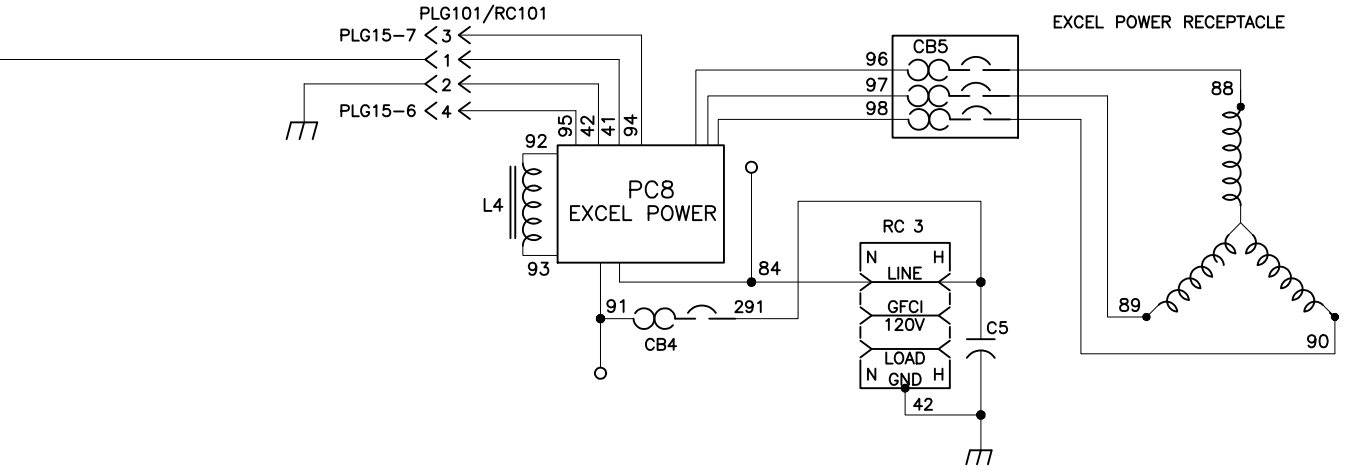
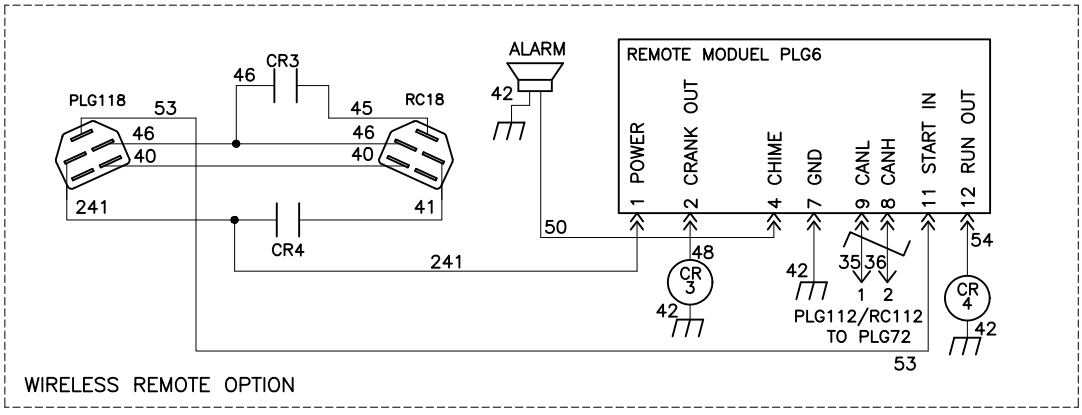


Figure 13-1. Circuit Diagram Page 1 of 2

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





292067-B-1

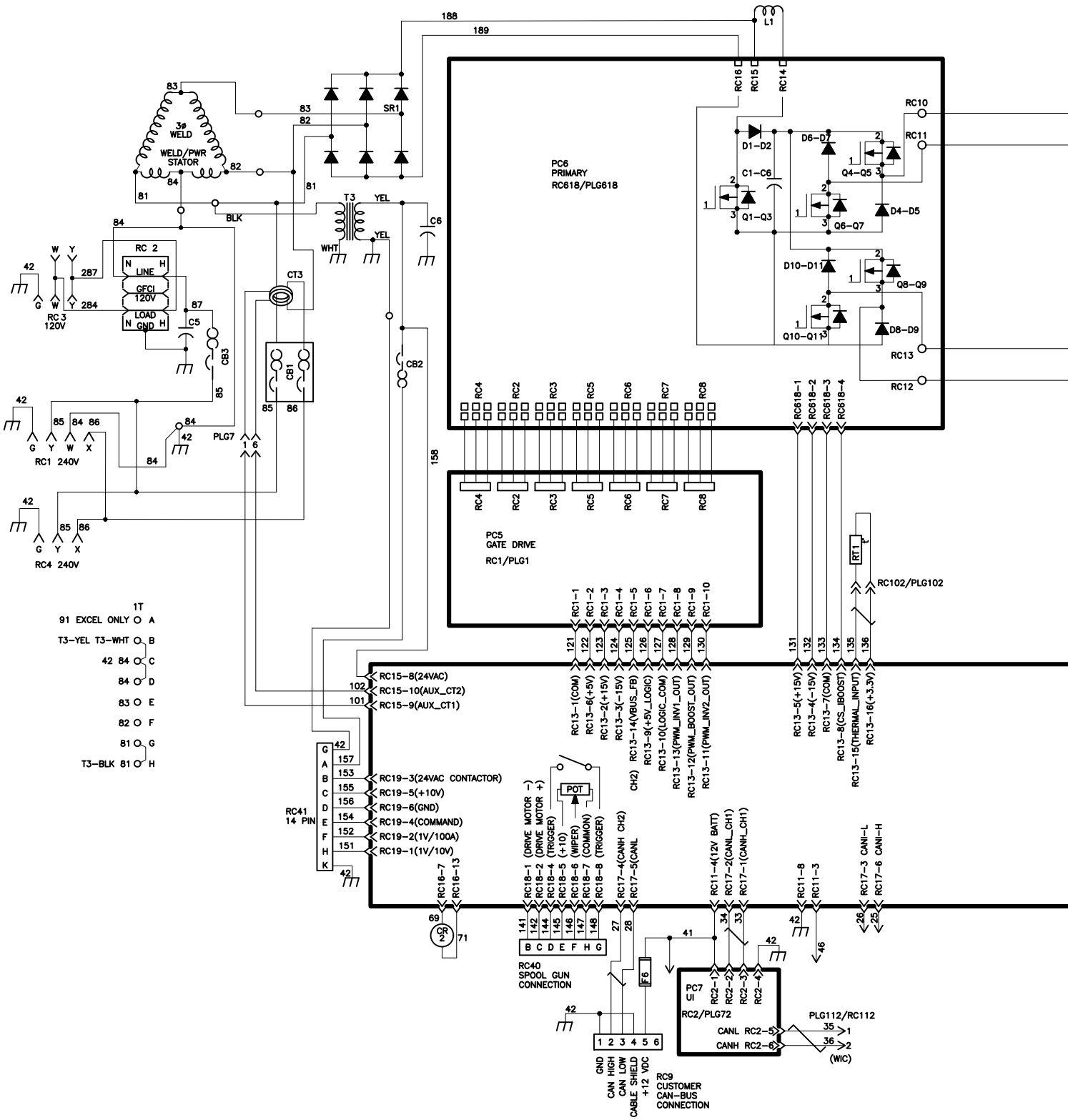
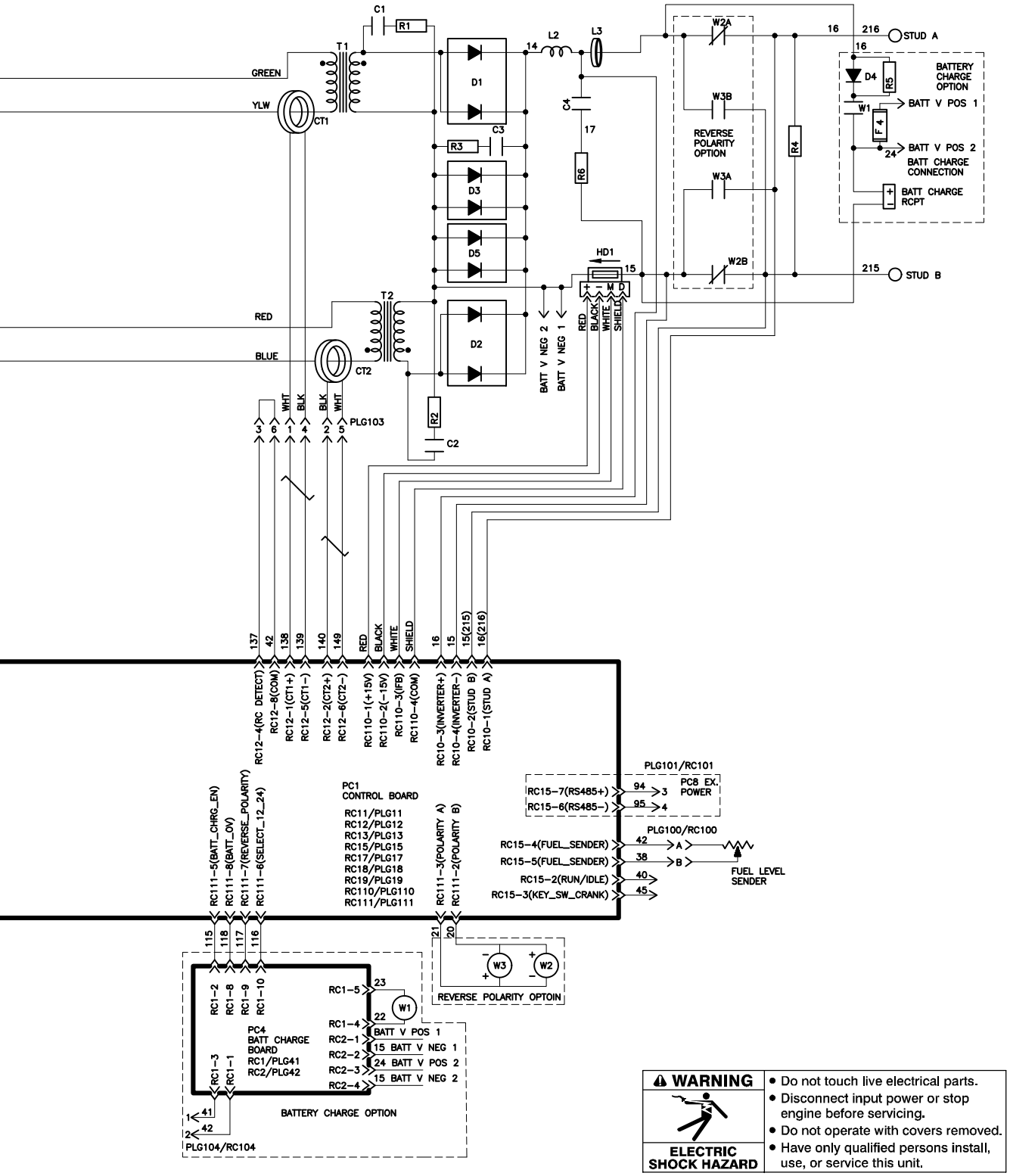


Figure 13-2. Circuit Diagram Page 2 of 2



⚠ WARNING

ELECTRIC SHOCK HAZARD

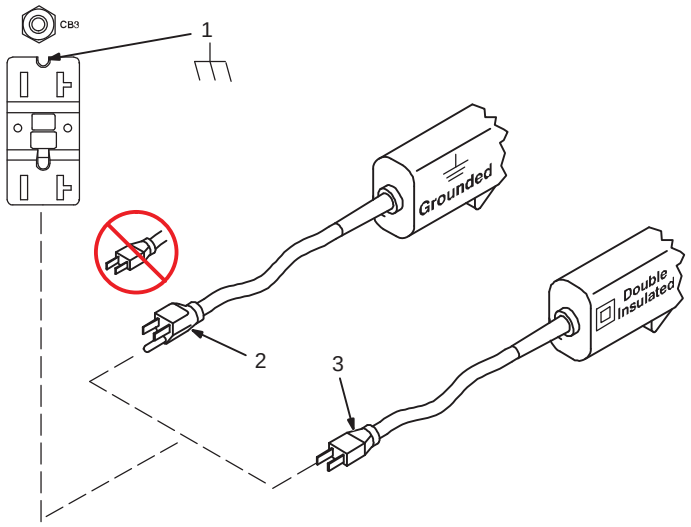
- Do not touch live electrical parts.
- Disconnect input power or stop engine before servicing.
- Do not operate with covers removed.
- Have only qualified persons install, use, or service this unit.

292067-B-2

SECTION 14 – GENERATOR POWER GUIDELINES

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

14-1. Selecting Equipment



1 Generator Power Receptacles – Neutral Bonded To Frame

2 3-Prong Plug From Case Grounded Equipment

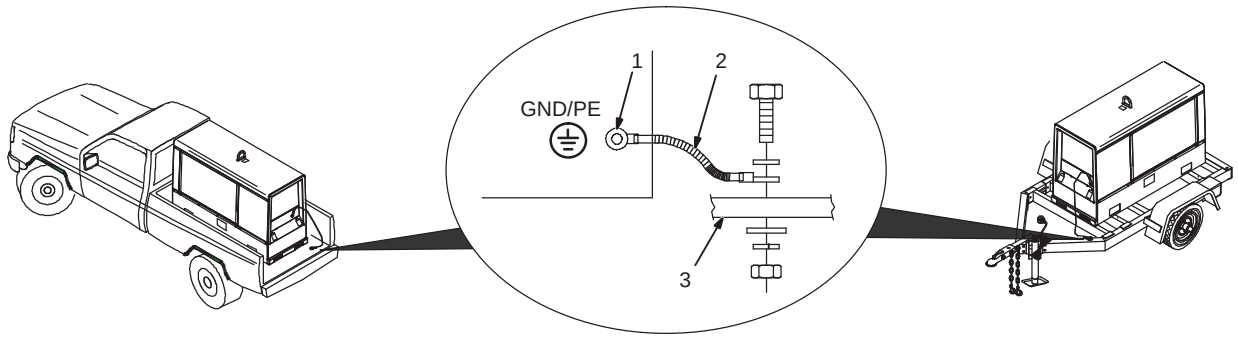
OR

3 2-Prong Plug From Double Insulated Equipment

☞ *Be sure equipment has double insulated symbol and/or wording on it.*

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

14-2. Grounding Generator to Truck or Trailer Frame



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

⚠ **Also see AWS Safety & Health Fact Sheet No. 29, Grounding of Portable And Vehicle Mounted Welding Generators.**

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

1 Equipment Grounding Terminal (On Front Panel)

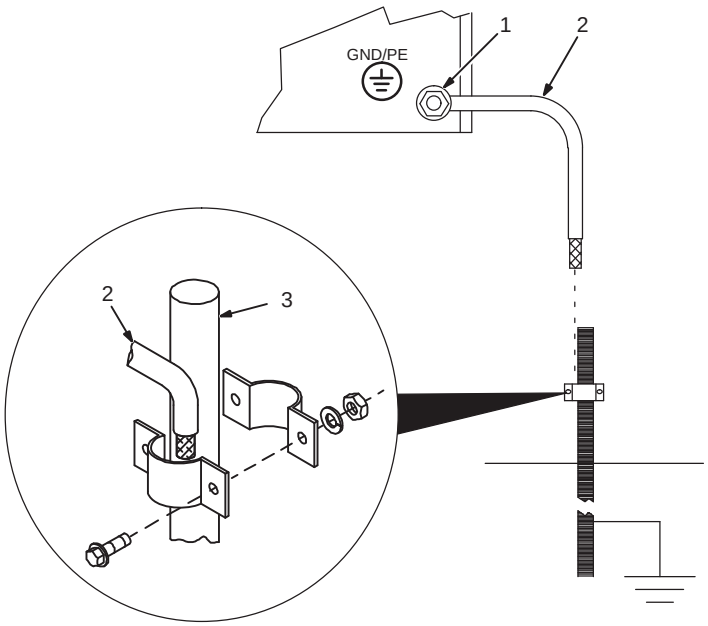
2 Grounding Cable (Not Supplied)

3 Metal Vehicle Frame

Connect cable from equipment ground terminal to metal vehicle frame. Use #8 AWG or larger insulated copper wire.

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

14-3. Grounding When Supplying Building Systems



1 Equipment Grounding Terminal

2 Grounding Cable

Use #8 AWG or larger insulated copper wire.

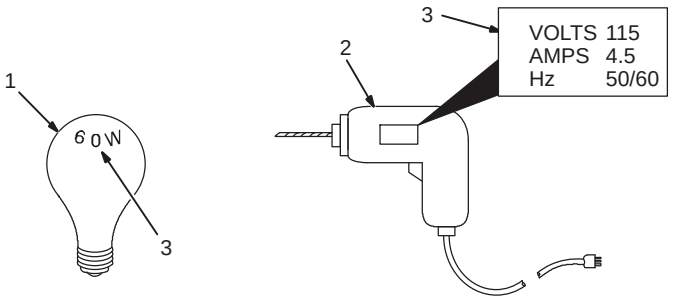
3 Ground Device

☞ *Use ground device as stated in electrical codes.*

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

⚠ **Also see AWS Safety & Health Fact Sheet No. 29, Grounding of Portable And Vehicle Mounted Welding Generators.**

14-4. 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 14-8).

3 Rating Data

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

Amperes x Volts = Watts

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

4.5 A x 115 V = 520 W

The load applied by the drill is 520 watts.

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

(3 x 200W) + 520 W = 1120 W

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

14-5. 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	10,550	2850
	3 HP	15,900	3900
	5 HP	23,300	6800
Capacitor Start-Capacitor Run	1-1/2 HP	8100	2000
	5 HP	23,300	6000
	7-1/2 HP	35,000	8000
	10 HP	46,700	10,700
Fan Duty	1/8 HP	1000	400
	1/6 HP	1400	550
	1/4 HP	1850	650
	1/3 HP	2400	800
	1/2 HP	3500	1100

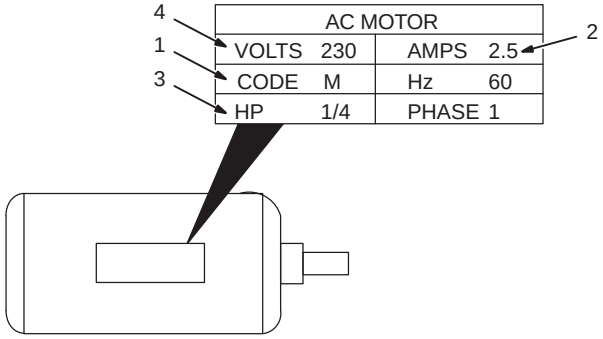
14-6. Approximate Power Requirements For Farm/Shop Equipment

Farm/Shop 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	10,500	2800
Farm Duty Motors Std. (e.g. Conveyors, Feed Augers, Air Compressors)	1/3 HP	1720	720
	1/2 HP	2575	975
	3/4 HP	4500	1400
	1 HP	6100	1600
	1-1/2 HP	8200	2200
	2 HP	10,550	2850
	3 HP	15,900	3900
	5 HP	23,300	6800
Farm Duty Motors High Torque (e.g. Barn Cleaners, Silo Unloaders, Silo Hoists, Bunk Feeders)	1-1/2 HP	8100	2000
	5 HP	23,300	6000
	7-1/2 HP	35,000	8000
	10 HP	46,700	10,700
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
	700 PSI	6100	1600
Shallow Well Pump	1/3 HP	2150	750
	1/2 HP	3100	1000

14-7. Approximate Power Requirements For Contractor Equipment

Contractor Equipment	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	10,500	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

14-8. Power Required To Start Motor



1 Motor Start Code

2 Running Amperage

3 Motor HP

4 Motor Voltage

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).

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

(kVA/HP x HP x 1000) / Volts = Starting Amperage

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

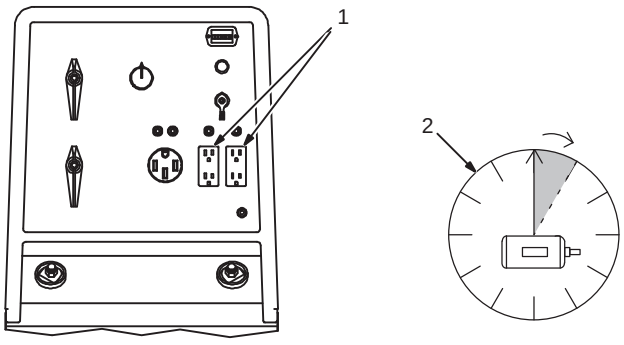
Volts = 230, HP = 1/4, kVA/HP = 11.2

(11.2 x 1/4 x 1000) / 230 = 12.2A

Starting the motor requires 12.2 amperes.

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

14-9. How Much Power Can Generator Supply?



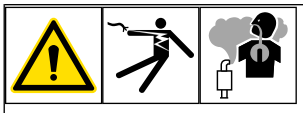
1 Limit Load To 90% Of Generator Output

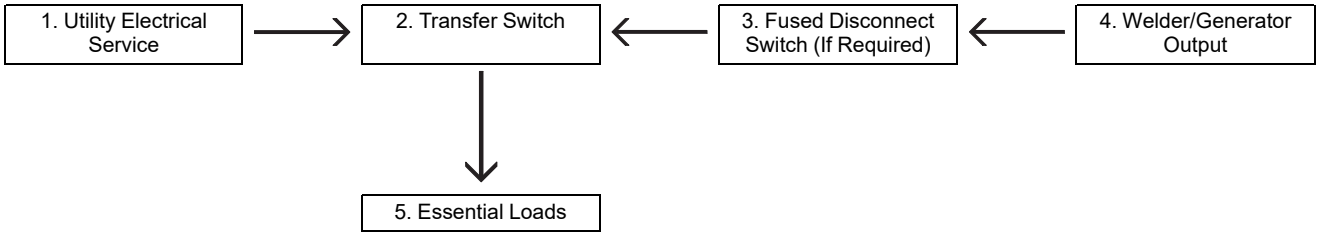
Always start non-resistive (motor) loads in order from largest to smallest, and add resistive loads last.

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.

14-10. Typical Connections To Standby Power





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

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

⚠ **Do not connect to any electrical distribution system normally supplied by utility power unless a proper transfer switch and grounding procedure are employed.**

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

1 Utility Electrical Service

2 Transfer Switch (Double-Throw)

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

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

3 Fused Disconnect Switch

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

4 Welder/Generator Output

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

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

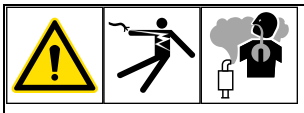
Turn off or unplug all equipment connected to generator before starting or stopping engine. When starting or stopping, the engine has low speed which causes low voltage and frequency.

5 Essential Loads

Generator output may not meet the electrical requirements of the premises. If generator does not produce enough output to meet all requirements, connect only essential loads. See Section 14-4.

14-11. Selecting Extension Cord (Use Shortest Cord Possible)

A. Cord Lengths For 120 Volt Loads



Use GFCI protection when operating auxiliary equipment. If unit does not have GFCI receptacles, use GFCI-protected extension cord. Do not use GFCI receptacles to power life support equipment.

		Maximum Allowable Cord Length In ft (m) for Conductor Size In AWG (mm²)*					
Current (Amperes)	**Load (Watts)**	**4 (25)**	**6 (16)**	**8 (10)**	**10 (6)**	**12 (4)**	**14 (2.5)**
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.

B. Cord Lengths For 240 Volt Loads

Use GFCI protection when operating auxiliary equipment. If unit does not have GFCI receptacles, use GFCI-protected extension cord. Do not use GFCI receptacles to power life support equipment.

		Maximum Allowable Cord Length In ft (m) for Conductor Size In AWG (mm²)*					
Current (Amperes)	**Load (Watts)**	**4 (25)**	**6 (16)**	**8 (10)**	**10 (6)**	**12 (4)**	**14 (2.5)**
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.

TRUE BLUE® WARRANTY

Miller

Effective January 1, 2024 (Equipment with a serial number preface of NE or newer)
This limited warranty supersedes all previous Miller warranties and is exclusive with no other guarantees or warranties expressed or implied.

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

Within the warranty periods listed below, Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Notifications submitted as online warranty claims must provide detailed descriptions of the fault and troubleshooting steps taken to diagnose failed parts. Warranty claims that lack the required information as defined in the Miller Service Operation Guide (SOG) may be denied by Miller.

Miller shall honor warranty claims on warranted equipment listed below in the event of a defect within the warranty coverage time periods listed below. Warranty time periods start on the delivery date of the equipment to the end-user purchaser.

1 5 Years Parts — 3 Years Labor

- Original Main Power Rectifiers Only to Include SCRs, Diodes, and Discrete Rectifier Modules in non-inverter products

2 4 Years Parts (No Labor)

- Auto-Darkening ClearLight 2.0 Helmet Lenses

3 3 Years — Parts and Labor Unless Specified

- Auto-Darkening Helmet Lenses (No Labor)
- Copilot Collaborative Welding Systems
- Engine Driven Welder/Generators (Including EnPak) **(NOTE: Engines are Warranted Separately by the Engine Manufacturer.)**
- Handheld Laser Power Sources
- Insight Welding Intelligence Products (Except External Sensors)
- Inverter Power Sources
- Plasma Arc Cutting Power Sources
- Process Controllers
- Semi-Automatic and Automatic Wire Feeders
- Transformer/Rectifier Power Sources

4 2 Years — Parts and Labor

- Auto-Darkening Weld Masks (No Labor)
- Fume Extractors - Filtair 215, Capture 5, and Industrial Collector Series

5 1 Year — Parts and Labor Unless Specified

- ArcReach Heater
- AugmentedArc, LiveArc, and MobileArc Welding Systems
- Automatic Motion Devices
- Bernard BTB Air-Cooled MIG Guns (No Labor)
- CoolBelt, PAPR Blower, and PAPR Face Shield (No Labor)
- Desiccant Air Dryer System
- Field Options **(NOTE: Field options are covered for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)**
- RFCS Foot Controls (Except RFCS-RJ45)
- Fume Extractors - Filtair 130, MWX and SWX Series, Standard, Telescopic, and ZoneFlow Extraction Arms and Motor Control Box
- Handheld Laser Torches (No Labor)
- HF Units
- Induction Heating Power Sources, Coolers **(NOTE: Digital Recorders are Warranted Separately by the Manufacturer.)**
- Insight Sensors
- Laser Welding Helmets (No Labor)
- Load Banks
- MDX Series MIG Guns (No Labor)
- Motor-Driven Guns
- Positioners and Controllers
- Racks (For Housing Multiple Power Sources)
- Running Gear/Trailers
- Spoolmate Spoolguns (No Labor)
- Subarc Wire Drive Assemblies
- Supplied Air Respirator (SAR) Boxes and Panels
- TIG Torches (No Labor)
- Tregaskiss Guns (No Labor)
- Water Cooling Systems
- Wireless Remote Foot/Hand Controls and Receivers
- Work Stations/Weld Tables (No Labor)
- XT Plasma Cutting Torches (No Labor)

6 6 Months — Parts

- 12 Volt Automotive-Style Batteries

7 90 Days — Parts

- Accessories (Kits)
- ArcReach Heater Quick Wrap and Air Cooled Cables
- Canvas Covers
- Induction Heating Coils and Blankets, Cables, and Non-Electronic Controls
- M-Guns
- MIG Guns, Subarc (SAW) Torches, and External Cladding Heads
- Remote Controls and RFCS-RJ45
- Replacement Parts (No labor)

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

1. **Consumable components; such as contact tips, cutting nozzles, contactors, brushes, relays, work station table tops and welding curtains, or parts that fail due to normal wear. (Exception: brushes and relays are covered on all engine-driven products.)**
2. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.
4. Defects caused by accident, unauthorized repair, or improper testing.

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

The exclusive remedies for warranty claims are, at Miller's option, either: (1) repair; or (2) replacement; or, if approved in writing by Miller, (3) the pre-approved cost of repair or replacement at an authorized Miller service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon use). Products may not be returned without Miller's written approval. Return shipment shall be at customer's risk and expense.

The above remedies are F.O.B. Appleton, WI, or Miller's authorized service facility. Transportation and freight are the customer's responsibility. TO THE EXTENT PERMITTED BY LAW, THE REMEDIES HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES REGARDLESS OF THE LEGAL THEORY. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT) REGARDLESS OF THE LEGAL THEORY. ANY WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY, OR REPRESENTATION, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, ARE EXCLUDED AND DISCLAIMED BY MILLER.

Some US states do not allow limiting the duration of an implied warranty or the exclusion of certain damages, so the above limitations may not apply to you. This warranty provides specific legal rights, and other rights may be available depending on your state. In Canada, some provinces provide additional warranties or remedies, and to the extent the law prohibits their waiver, the limitations set out above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary by province.

Warranty Questions?

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

Your distributor also gives you...

Service

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

Support

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

Owner's Record

Please complete and retain with your personal records.

Model Name | Serial/Style Number

Purchase Date (Date which equipment was delivered to original customer.)

Distributor

Address

City

State | Zip

For Service

Contact a DISTRIBUTOR or SERVICE AGENCY near you.

Always provide Model Name and Serial/Style Number.

Contact your Distributor for:

- Welding Supplies and Consumables
- Options and Accessories
- Personal Protective Equipment (PPE)
- Service and Repair Replacement Parts
- Training (Schools, Videos, Books)
- Welding Process Handbooks

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

Contact the Delivering Carrier to:

File a claim for loss or damage during shipment.

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

Miller Electric Mfg. LLC
An Illinois Tool Works Company
1635 West Spencer Street
Appleton, WI 54914 USA

International Headquarters–USA
USA Phone: 920-735-4505
USA & Canada FAX: 920-735-4134
International FAX: 920-735-4125

For International Locations Visit
www.MillerWelds.com

ORIGINAL INSTRUCTIONS – PRINTED IN USA