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Processes



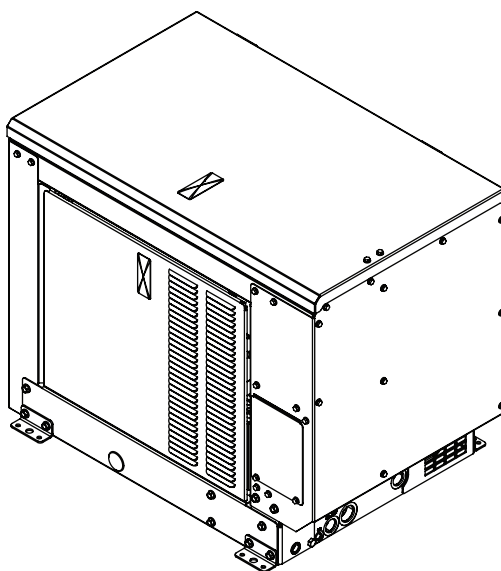
Multiprocess Welding

Description



Hydraulic Driven Air Compressor, Generator, Battery Charger, and Welder

HDI™ 265 And 325 Air Pak™



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

www.MillerWelds.com

OWNER'S MANUAL

From Miller to You

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

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

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

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



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



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



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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!

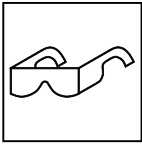
- Do not connect to any electrical distribution system normally supplied by utility power unless a proper transfer switch and grounding procedure are employed.
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (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.

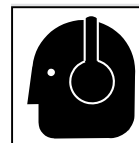


WELDING can cause fire or explosion.

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.

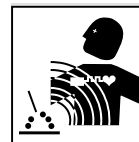
- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Do not weld where flying sparks can strike flammable material.
- Protect yourself and others from flying sparks and hot metal.
- Be alert that welding sparks and hot materials 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.

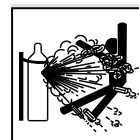
Noise from some processes or equipment can damage hearing.

- 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.

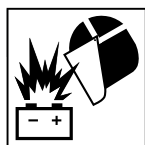
Compressed gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

- 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.



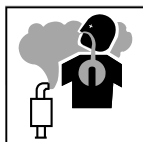
HOT PARTS can burn.

- 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. Hydraulic Hazards



HYDRAULIC 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 hydraulic pump or any equipment in the hydraulic system. Design hydraulic system so failure of any hydraulic component will not put people or property at risk.
- Before working on hydraulic system, turn off and lockout/tagout unit, release pressure, and be sure hydraulic pressure cannot be accidentally applied.
- Do not work on hydraulic system with unit running unless you are a qualified person and following the manufacturer's instructions.
- Do not modify or alter hydraulic pump or manufacturer-supplied equipment. Do not disconnect, disable, or override any safety equipment in the hydraulic system.
- Use only components/accessories approved by the manufacturer.
- Keep away from potential pinch points or crush points created by equipment connected to the hydraulic system.
- Do not work under or around any equipment that is supported only by hydraulic pressure. Properly support equipment by mechanical means.



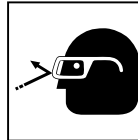
MOVING PARTS can injure.

- 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 hydraulic system, turn off and lockout/tagout unit, release pressure, and be sure hydraulic 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.



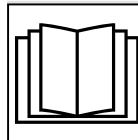
HYDRAULIC FLUID can injure or kill.

- Before working on hydraulic system, turn off and lockout/tagout unit, release pressure, and be sure hydraulic pressure cannot be accidentally applied.
- Relieve pressure before disconnecting or connecting hydraulic lines.
- Check hydraulic system components and all connections and hoses for damage, leaks, and wear before operating unit.
- Wear protective equipment such as safety glasses, leather gloves, heavy shirt and trousers, high shoes, and a cap when working on hydraulic system.
- Use a piece of paper or cardboard to search for leaks—never use bare hands. Do not use equipment if leaks are found.
- HYDRAULIC FLUID is FLAMMABLE—do not work on hydraulics near sparks or flames; do not smoke near hydraulic fluid.
- Reinstall doors, panels, covers, or guards when servicing is finished and before starting unit.
- If ANY fluid is injected into the skin or body seek medical help immediately.



HOT PARTS AND FLUID can burn.

- Do not touch hot parts bare handed or allow hot fluid to contact skin.
- 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. 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.



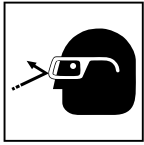
HOT METAL from air arc cutting and gouging can cause fire or explosion.

- 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.

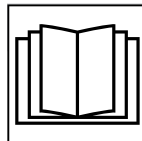
- Keep away from moving parts such as fans, belts and rotors.

- 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.

1-6. Additional Hazards For Installation, Operation, And Maintenance



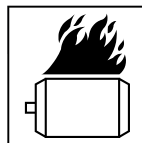
FIRE OR EXPLOSION hazard.

- 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.



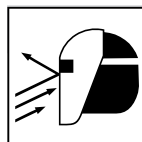
FALLING EQUIPMENT can injure.

- 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.



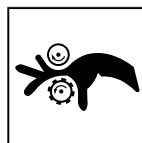
OVERHEATING can damage motors.

- 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.



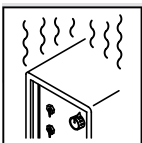
HIGH PRESSURE FLUIDS can injure or kill.

- 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.

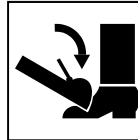
- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.



STATIC (ESD) can damage PC boards.

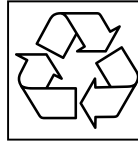
- Put on grounded wrist strap BEFORE handling boards or parts.

- Use proper static-proof bags and boxes to store, move, or ship PC boards.



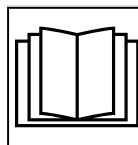
TILTING OF TRAILER can injure.

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



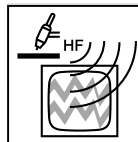
RECYCLE.

- 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.

1-7. 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.

1-8. Principal Safety Standards

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

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.

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.

EnPak Hydraulic 2024–01

1-9. 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!

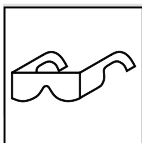
- Ne brancher aucun système de distribution électrique normalement fourni par un réseau public à moins qu'un commutateur de transfert et une procédure de mise à la terre adéquats ne soient mis en place.
- Couper l'alimentation ou arrêter le moteur avant de procéder à l'installation, à la réparation ou 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 PIÈCES DE METAL ou DES SALETES peuvent provoquer des blessures dans les yeux.

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



LES 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 dégraissants, 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 respirateur d'adduction d'air homologué.



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

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

- Porter un casque de soudage 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 homologuées.
- Ne pas souder dans un endroit 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 la plus près possible de la zone de soudage pour éviter le transport du courant sur une longue distance par des chemins inconnus éventuels en provoquant des risques d'électrocution, 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.

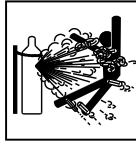
- Porter des protections approuvées pour les oreilles si le niveau sonore est trop élevé.



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 le 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 le régulateur 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.
- Éviter 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 de protection.
- 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 et outils 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.

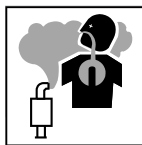
- Ne pas toucher des parties chaudes à mains nues.

- 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'hydraulique



Les ÉQUIPEMENTS HYDRAULIQUES peuvent 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, faire fonctionner et réparer 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 de la pompe hydraulique ou de tout équipement du circuit hydraulique. Concevoir le circuit hydraulique de telle sorte que la défaillance d'un composant hydraulique ne risque pas de provoquer un accident matériel ou corporel.

- Avant d'intervenir sur le circuit hydraulique, couper l'alimentation électrique, verrouiller et étiqueter l'appareil, détendre la pression et s'assurer que le circuit hydraulique ne peut être remis sous pression par inadvertance.
- Ne pas intervenir sur le circuit hydraulique lorsque l'appareil fonctionne. Seul un personnel qualifié et appliquant les consignes du fabricant est autorisé le faire.
- Ne pas modifier ou altérer la pompe hydraulique ou les équipements fournis par le fabricant. Ne pas débrancher, désactiver ou neutraliser les équipements de sécurité du circuit hydraulique.
- 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 hydraulique.
- Ne pas intervenir sous ou autour d'un équipement qui n'est soutenu que par la pression hydraulique. Soutenir l'équipement de façon appropriée par un moyen mécanique.

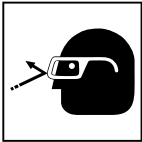


Les PIÈCES MOBILES peuvent causer des blessures.

- 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 hydraulique, couper l'alimentation électrique, verrouiller et étiqueter l'appareil, détendre la pression et s'assurer que le circuit hydraulique ne peut être remis 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.



Le LIQUIDE HYDRAULIQUE risque de provoquer des blessures ou même la mort.



● Avant d'intervenir sur le circuit hydraulique, couper l'alimentation électrique, verrouiller et étiqueter l'appareil, détendre la pression et s'assurer que le circuit hydraulique ne peut être remis sous pression par inadvertance.

● Détendre la pression avant de débrancher ou de brancher des canalisations hydrauliques.

● Avant d'utiliser l'appareil, contrôler les composants du circuit hydraulique, les branchements et les flexibles en recherchant tout signe de détérioration, de fuite et d'usure.

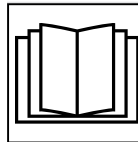
● Pour intervenir sur un circuit hydraulique, porter un équipement de protection tel que des lunettes de sécurité, des gants de cuir, une chemise et un pantalon en tissu résistant, des chaussures montantes et une coiffe.

- Pour rechercher des fuites, utiliser un morceau de papier ou de carton, jamais les mains nues. En cas de détection de fuite, ne pas utiliser l'équipement.
- Le LIQUIDE HYDRAULIQUE est INFLAMMABLE. Ne pas intervenir sur des composants hydrauliques à proximité d'étincelles ou de flammes; ne pas fumer à proximité de liquide hydraulique.
- Remettre les portes, panneaux, recouvrements ou dispositifs de protection quand l'entretien est terminé et avant de mettre en marche l'appareil.
- En cas d'injection de tout liquide sous la peau ou dans le corps, solliciter une aide médicale sur le champ.



LES PIÈCES ET LIQUIDES CHAUDS peuvent provoquer des brûlures.

- Ne pas toucher les pièces chaudes à main nue ni laisser des liquides chauds entrer en contact avec la peau.
- 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 les pièces de rechange recommandées par le constructeur.
- 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. 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.

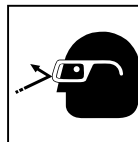


MÉTAL CHAUD provenant du découpage ou du gougeage à l'arc risque de provoquer un incendie ou une explosion.

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

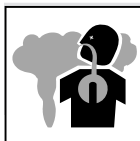


L'AIR COMPRIMÉ risque de provoquer des blessures ou même la mort.



- Avant d'intervenir sur le circuit d'air comprimé, couper l'alimentation électrique, verrouiller et étiqueter l'appareil, détendre la pression et s'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 les composants du circuit d'air comprimé, les branchements 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 un équipement 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 un détecteur à ultrasons, jamais les mains nues. En cas de détection de fuite, ne pas utiliser l'équipement.
- Remettre les portes, panneaux, recouvrements ou dispositifs de protection quand l'entretien est terminé et avant de mettre en marche 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 la mort.

- 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 ET DES 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 du compresseur.



Les PIÈCES MOBILES peuvent causer des blessures.

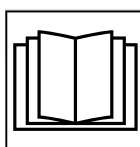
- S'abstenir de toucher des parties mobiles telles que des ventilateurs, courroies et rotors.

- 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.

2-6. Symboles de dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance



Risque D'INCENDIE OU D'EXPLOSION.

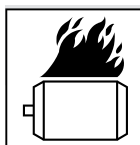
- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces inflammables.
- Ne pas installer l'appareil à proximité de produits inflammables
- Ne pas surcharger l'installation électrique – s'assurer que l'alimentation est correctement dimensionnée et protégée avant de mettre l'appareil en service.



LA CHUTE DE L'ÉQUIPEMENT peut provoquer des blessures.

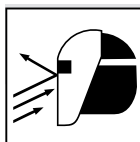
- Utiliser seulement l'anneau de levage pour soulever l'appareil et des accessoires correctement installés, non pas les bouteilles de gaz. Ne pas dépasser les capacités maximales de l'anneau de levage (voir Spécifications).
- Utilisez les procédures correctes et des équipements d'une capacité appropriée 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 No 94–110) lors du levage manuel 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 PROJÉTÉES 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.
- Éviter 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.

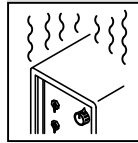
- Les composants du système d'alimentation peuvent contenir du carburant sous pression élevée.
- Avant d'intervenir sur le système d'alimentation de carburant, arrêter le moteur pour dépressuriser le système.

- En cas d'injection de tout liquide sous la peau ou dans le corps, solliciter une aide médicale sur le champ.



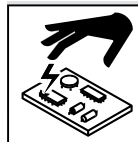
LES FILS DE SOUDAGE peuvent provoquer des blessures.

- 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.



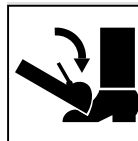
L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

- 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.



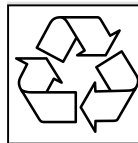
LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

- 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 imprimés.



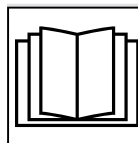
UNE REMORQUE QUI BASCULE peut provoquer des blessures.

- 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.

2-7. 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.

2-8. Principales normes de sécurité

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

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.

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.

EnPak Hydraulic_fre 2024-01

2-9. 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 découpage plasma ou de chauffage par induction. Si le médecin approuve, il est recommandé de suivre les procédures précédentes.

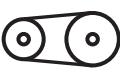
SECTION 3 – DEFINITIONS

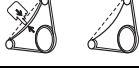
3-1. Additional Safety Symbol Definitions

	Warning! Watch Out! There are possible hazards as shown by the symbols.
	Moving parts can injure.
	Compressed air hazard. If ANY air is injected into the skin or body seek medical help immediately.
	Hot oil and compressed air can injure or kill.

3-2. Miscellaneous Symbol Definitions

A	Amperage	+	Positive		Read Operator's Manual
V	Voltage		Direct Current (DC)		Welding (General)
Hz	Hertz		Alternating Current (AC)		Shielded Metal Arc Welding (SMAW)
U₀	Rated No-Load Voltage (OCV)		Protective Earth (Ground)		Gas Metal Arc Welding (GMAW)
U₂	Load Voltage		Circuit Breaker		Flux Cored Arc Welding (FCAW)
I₂	Rated Welding Current		Off		Gas Tungsten Arc Welding (GTAW) / Tungsten Inert Gas Welding (TIG)
X	Duty Cycle		On		Air Carbon Arc Cutting (CAC-A)
%	Percent		Single Phase Alternator		Touch Start (GTAW)
IP	Internal Protection Rating		Output		Temperature
—	Negative		Remote		Idle (Slow)

	Run (Fast)
	Air Compressor
	Air Filter
	Belt Drive
	Arc Control
	USB
	Push Button
	Press Or Turn Button

	Belt
	Certified/Trained Mechanic
	Settings
	Hours
	Jump Start / Battery Charge
	Check Air Filter
	Auto Start/Stop
	Home

	Suitable For Welding In An Environment With An Increased Risk Of Electric Shock
	Single Phase
	Reduced Rated No-Load Voltage
	Rated Load Speed
	Rated No-Load Speed
	Rated Idle Speed
	Hydraulic Pump
	Hydraulic Motor

SECTION 4 – SPECIFICATIONS

4-1. Serial Number And Rating Label Location

The serial number and rating information for this product is located on the front and side panels. 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. Air Compressor Specifications

Machine Variant	Air Output At Effective Working Pressure	Pressure	Safety Relief Valve Setting	Air Compressor Oil Capacity
HDI 325	58 scfm @ 100 psi (1.64 m ³ min ⁻¹ @ 689 kPa) 100% Duty Cycle 60 CFM Max. Flow	Range: 90 - 175 psi (552-1206 kPa)	Auto Shutoff: 185 psi (1276 kPa) Pressure Relief: 220 psi (1517 kPa)	4 qt (3.79 L)
HDI 265	40 scfm @ 100 psi (1.13 m ³ min ⁻¹ @ 689 kPa) 100% Duty Cycle 40 CFM Max. Flow			

4-5. Battery Charger Specifications

Output	Rated Output	Output Range	Output Voltage
Battery Charge	Up to 150 A, 12 V Charge Up to 150 A, 24 V Charge	0–150 A	12 or 24 V
Crank Assist	300 A, 12 V for 20 seconds 300 A, 24 V for 20 seconds	0–300 A	

4-6. Hydraulic Specifications

	Motor Type	Motor Size	Input Flow Rate	Maximum Working Pressure
HDI 325	Fixed Gear	1.19 in ³ (19.5 cm ³)	16 - 18 GPM (60.6 - 68.1 LPM)	3000 psi (206.8 bar)
HDI 265	Fixed Gear	0.87 in ³ (14.3 cm ³)	11 - 13 GPM (41.6 - 49.2 LPM)	3000 psi (206.8 bar)

4-7. Generator Power Rating

Continuous: 7 kVA/kW, 58/29 A, 120/240 VAC, 60 Hz, Single Phase Peak: 7.5 kVA/kW
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4-8. Weld Specifications

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

	Welding Mode	Rated Welding Output	Weld Output Range
HDI 325	CC/DC and CV/DC	325 A, 30 V, 100% Duty Cycle	30 - 325 A
HDI 265		265 A, 30 V, 100% Duty Cycle	30 - 265 A

4-9. 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)

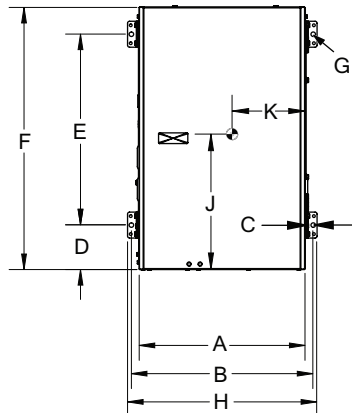
*Output is derated at temperatures above 104°F (40°C).

4-10. Fluid Specifications

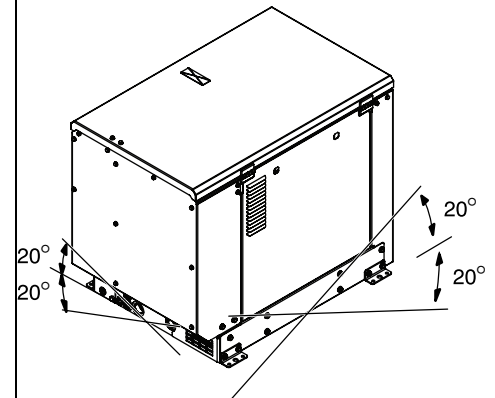
Hydraulic			
Ambient Temperature	-20°F to 28°F (-29°C to -2°C)	28°F to 90°F (-2°C to 32°C)	90°F to 104°F (32°C to 40°C)
Oil	ISO 15	ISO 32	ISO 46
Oil Viscosity Index	VI ≥ 250	VI ≥ 95	VI ≥ 95
Compressor			
Oil (Full Synthetic)	Miller 276620		

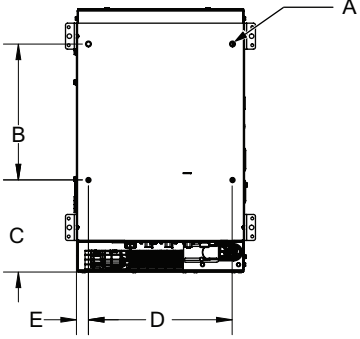
4-11. Base Unit Dimensions, Weights, And Operating Angles

Dimensions	
Height	26.605 in. (676 mm) Cover Open: 47 in. (1194 mm)
Width	23.732 in. (603 mm)
Depth	32.895 in. (836 mm)
A	21.000 in. (533 mm)
B	22.770 in. (578 mm)
C	0.885 in. (22.5 mm)
D	5.570 in. (141 mm)
E	23.900 in. (607 mm)
F	32.895 in. (836 mm)
G	0.563 in. (14.3 mm) (4 Holes)
H	23.732 in. (603 mm)
Center Of Mass	
J	17.000 (432 mm)
K	9.250 (235 mm)
Weight	
465 lb (211 kg)	
Lifting Eye Weight Rating:  Use lifting eye to lift unit only, not any accessories. 465 lb (211 kg)	



-  Do not exceed tilt angles or unit could tip.
-  Do not move or operate unit where it could tip.
-  Do not operate suspended from lifting eye.



Internal Mounting Hole Dimensions		
A	1/2-13 thread (4 holes) for optional internal mounting	
B	17.000 in. (432 mm)	
C	11.493 in. (292 mm)	
D	18.000 in. (457 mm)	
E	1.500 in. (38 mm)	

4-12. Remote Panel Dimensions And Weights

	Remote Control Panel	Weld Remote Panel	Battery Charge Remote Panel	Optional Auxiliary Power Remote Panel
Height	9.61 in. (244 mm)	5.506 in. (140 mm)	7.880 in. (200 mm)	6.490 in. (165 mm)
Width	10.32 in. (262 mm)	9.016 in. (229 mm)	4.931 in. (125 mm)	10.240 in. (260 mm)
Depth	2.68 in. (68 mm)	3.874 in. (98 mm)	5.238 in. (133 mm)	4.241 in. (108 mm)
Weight	2.8 lb (1.3 kg)	2.4 lb (1.1 kg)	1.6 lb (0.7 kg)	4.2 lb (1.9 kg)

4-13. Duty Cycle And Overheating

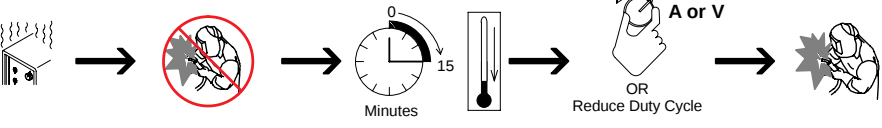



100% Duty Cycle at Maximum Rated Output




Continuous Welding

Overheating



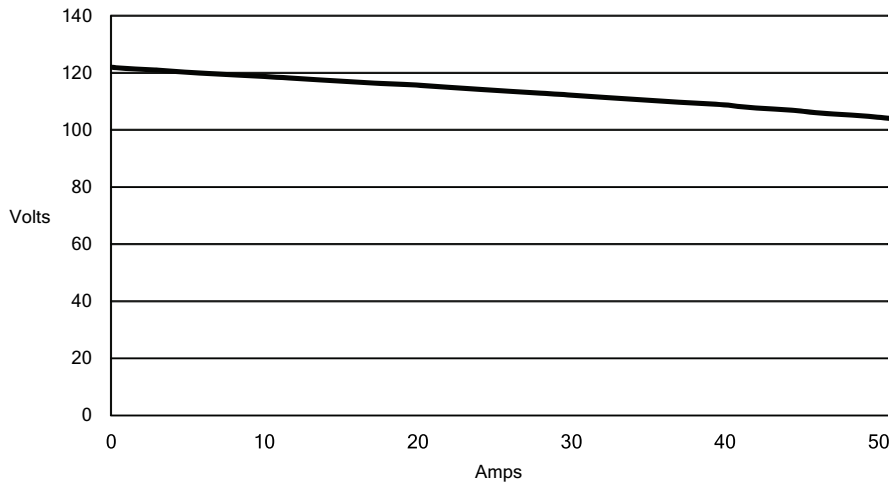
Duty cycle is the percentage of 10 minutes that unit can weld at rated load without overheating.

 This unit is designed for welding at maximum rated output.

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

4-14. Generator Power Curves

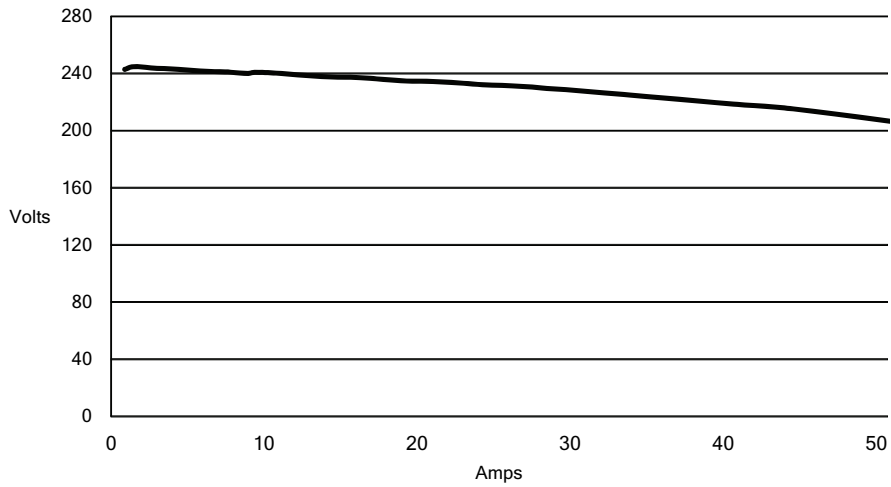
120 Volt



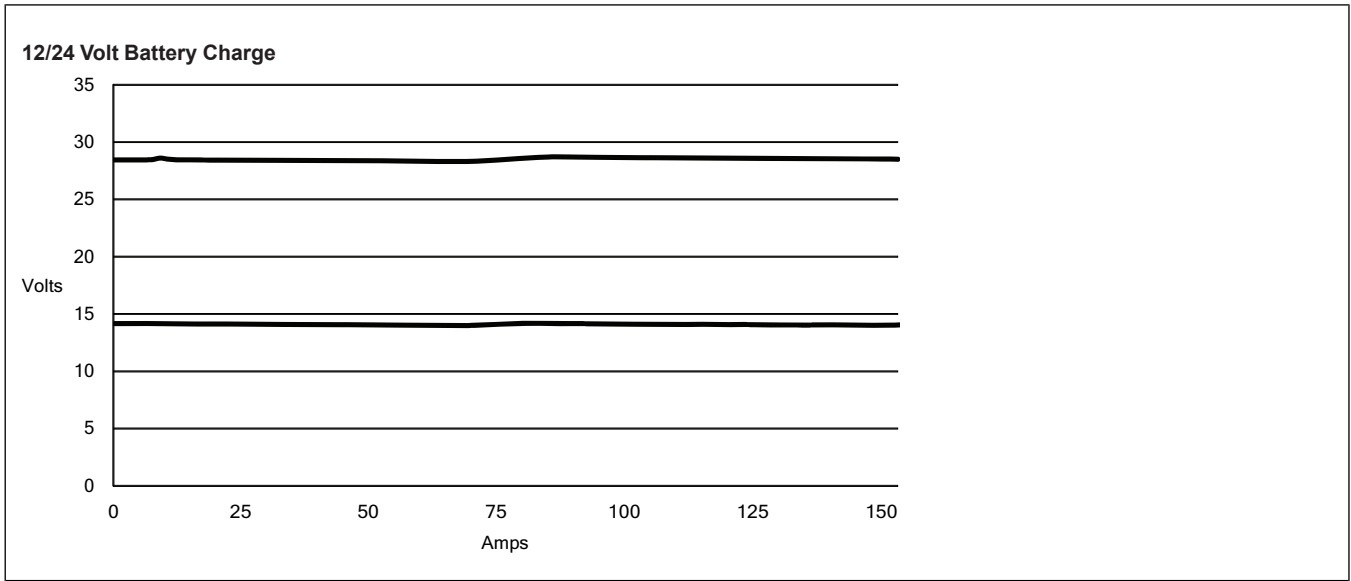
The AC generator power curve shows the generator power available in amperes at the receptacles.

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

240 Volt



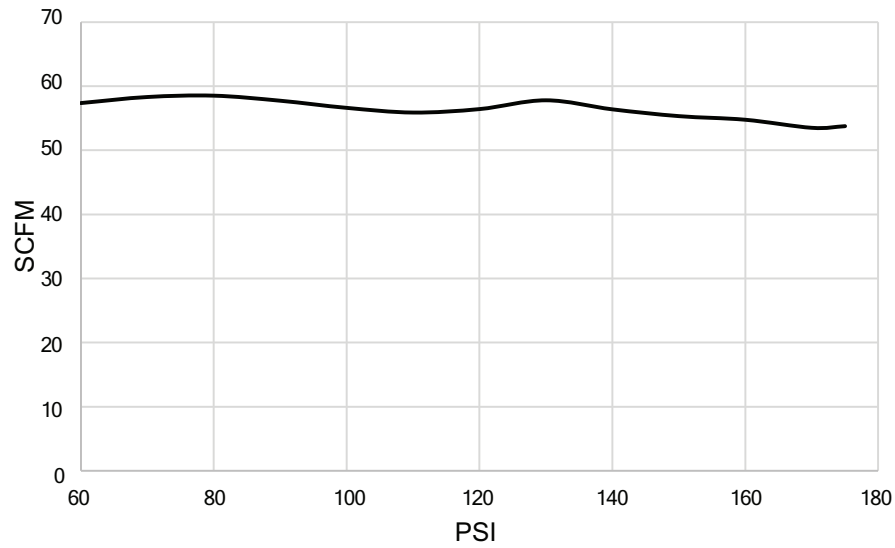
4-15. Volt-Ampere Curves—Battery Charge



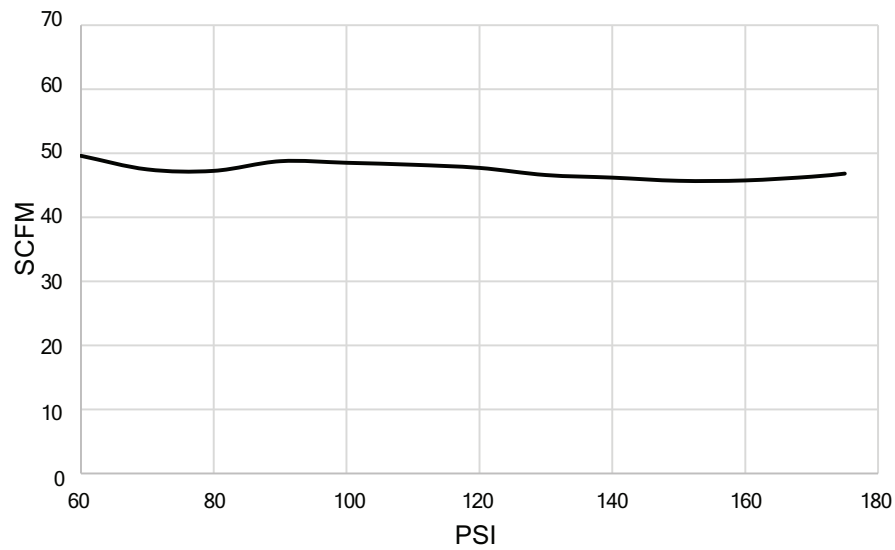
4-16. Air Compressor Curve

HDI 325

Standard Conditions: Temperature = Operating Temperature



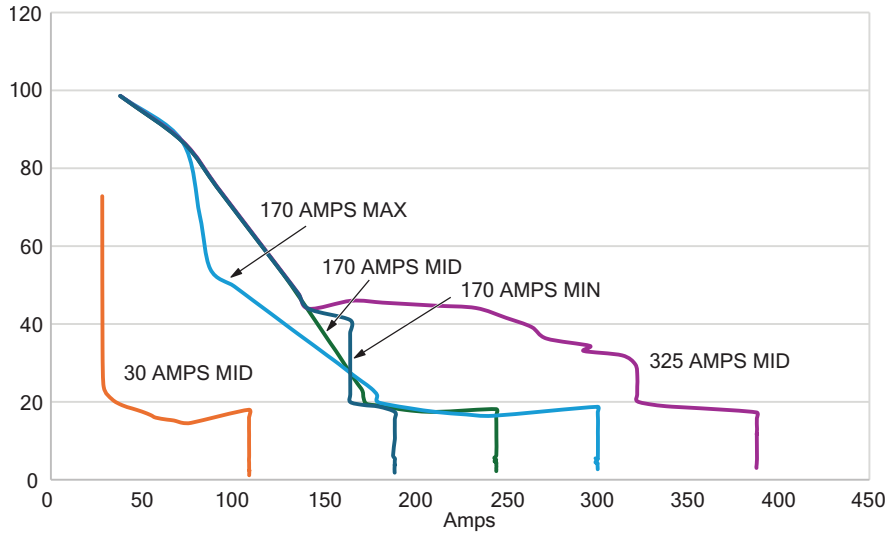
HDI 265



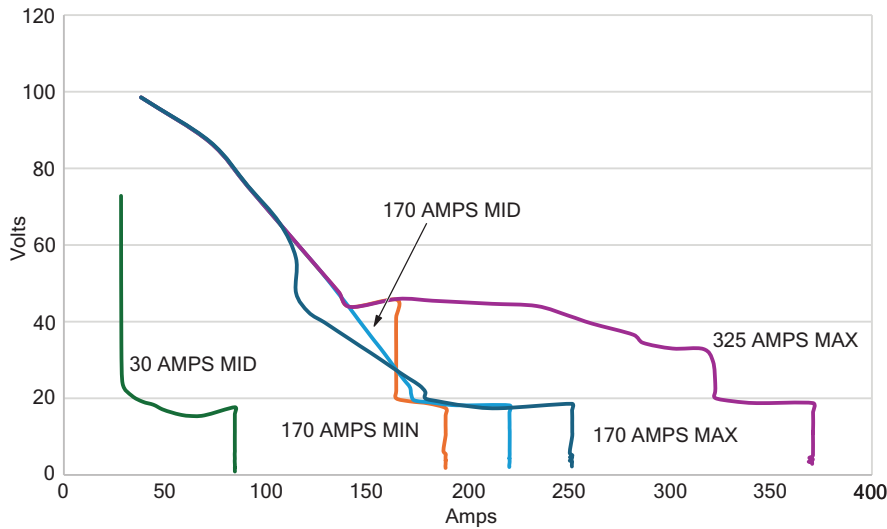
4-17. HDI 325 Volt-Ampere Curves—Weld

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

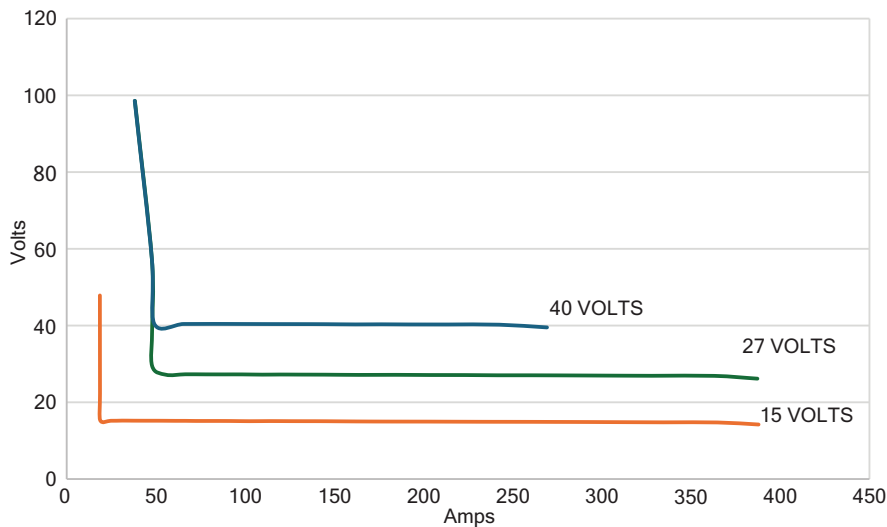
CC/DC SMAW XX10 Electrode



CC/DC SMAW XX18 Electrode

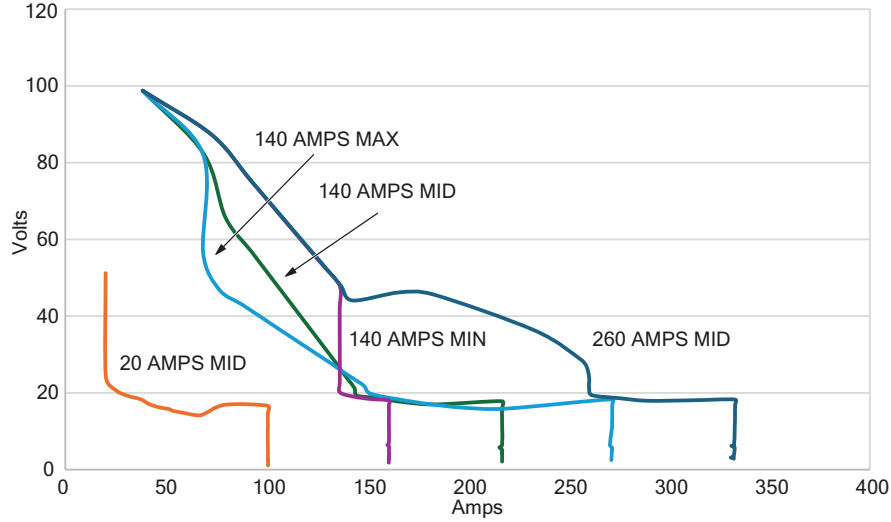


MIG



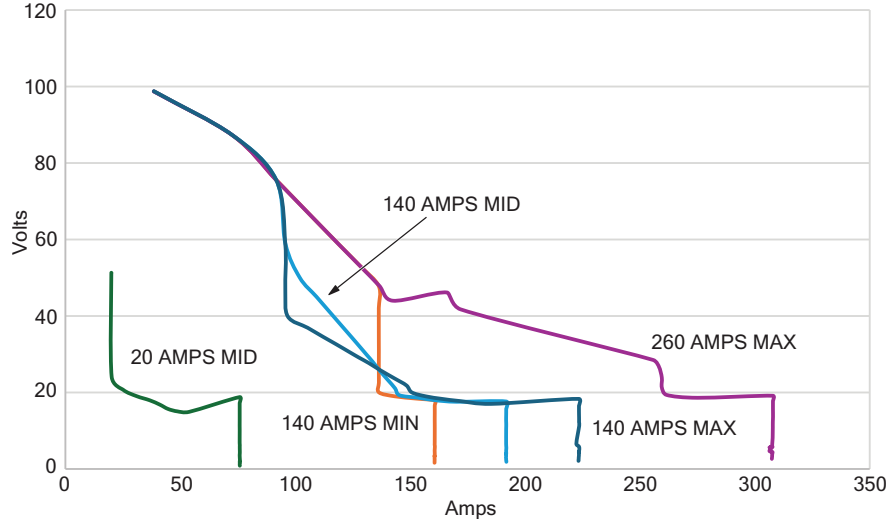
4-18. HDI 265 Volt-Ampere Curves — Weld

CC/DC SMAW XX10 Electrode

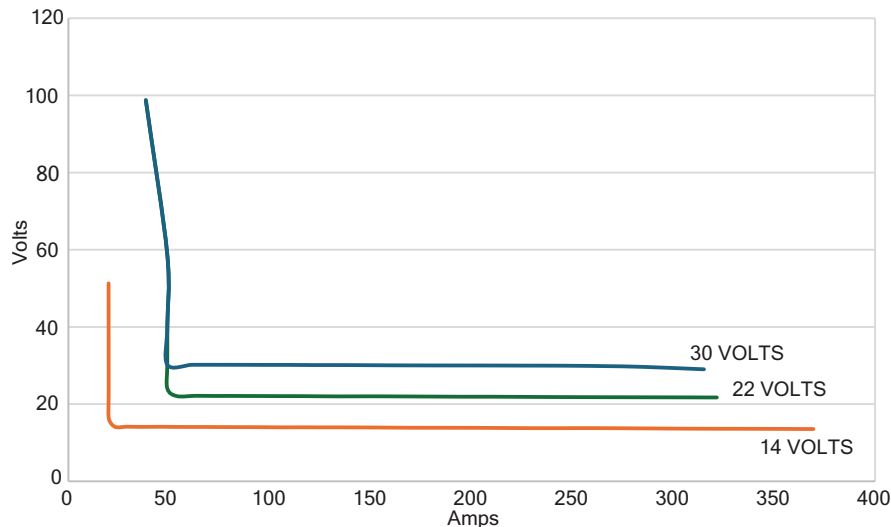


The volt-ampere curves show the minimum and maximum voltage and amperage output capabilities of the unit. Curves of other settings fall between the curves shown.

CC/DC SMAW XX18 Electrode

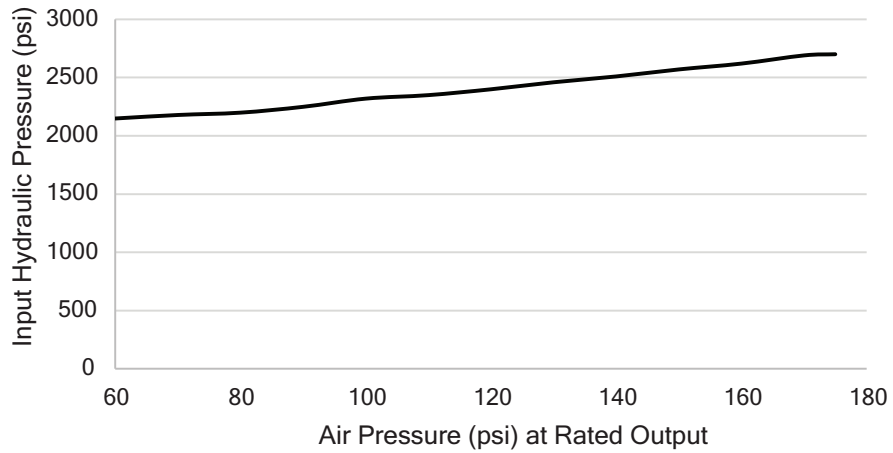


MIG

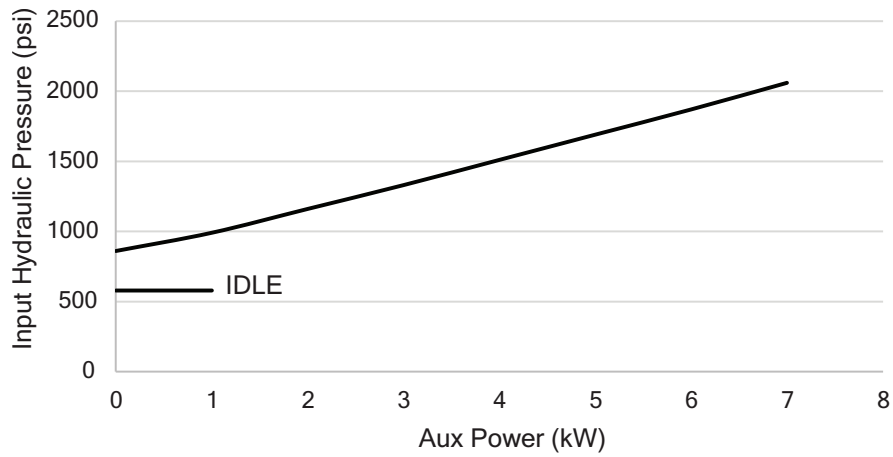


4-19. HDI 325 Hydraulic Motor Curve

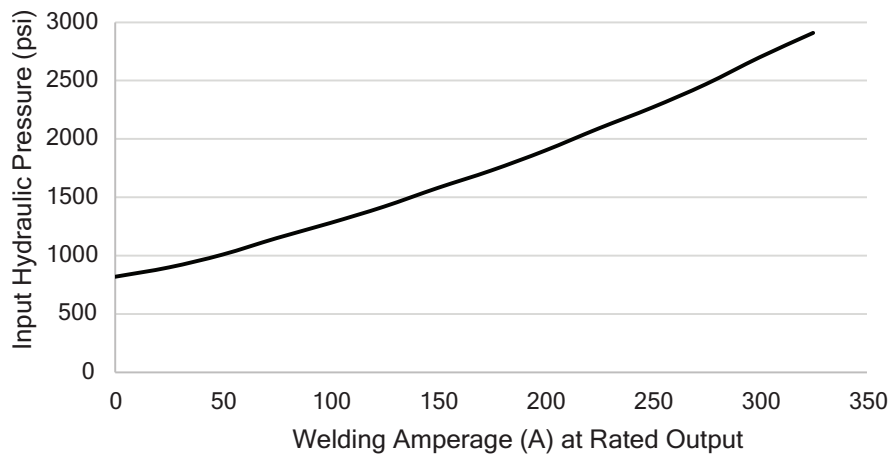
Air Compressor



Auxiliary Power

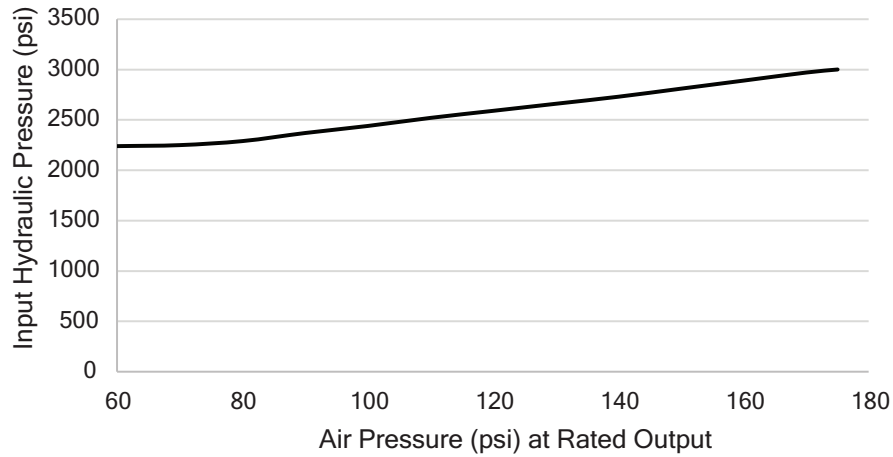


Weld

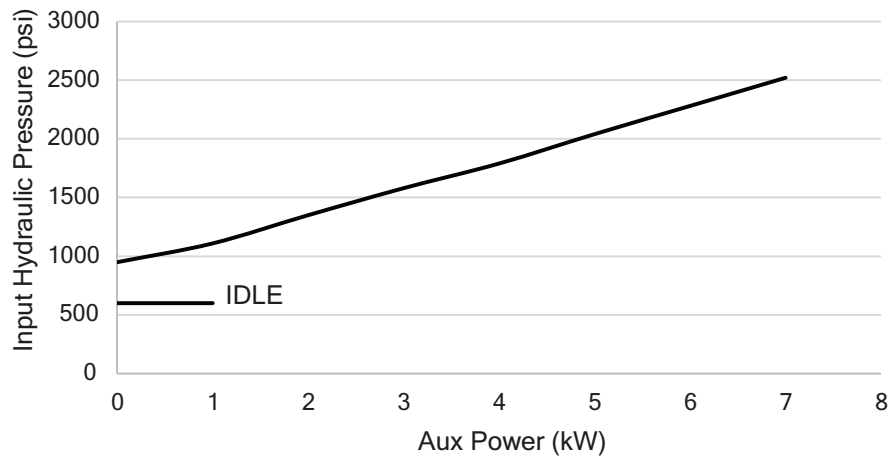


4-20. HDI 265 Hydraulic Motor Curve

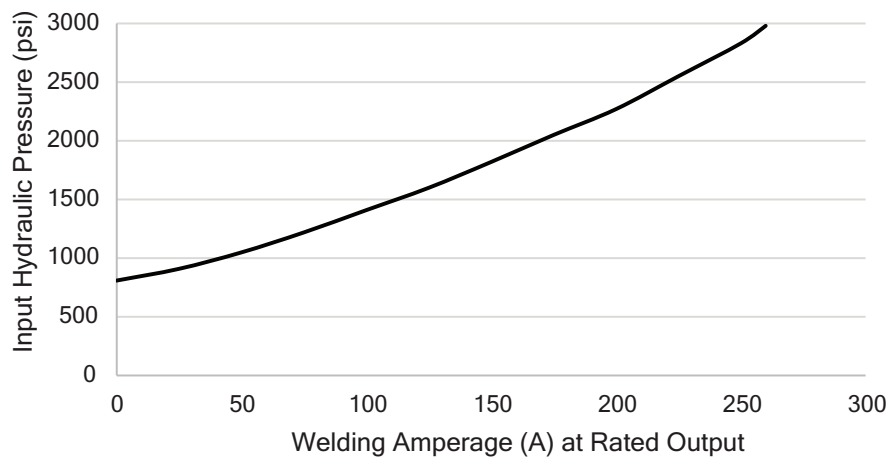
Air Compressor



Auxiliary Power

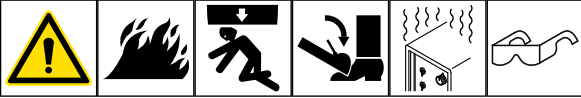


Weld

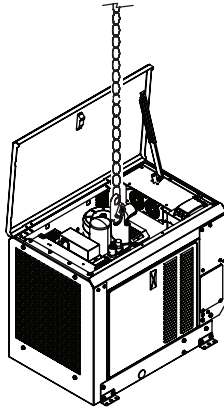
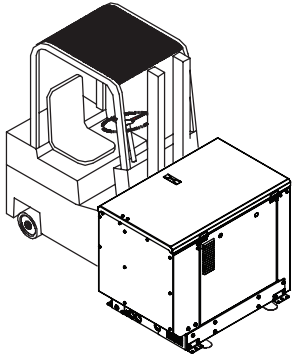


SECTION 5 – INSTALLATION

5-1. Welder/Generator Movement And Air Flow Clearance



Movement



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

Movement

Do not move or operate unit where it could tip.

Do not lift unit from end.

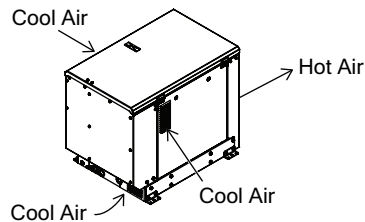
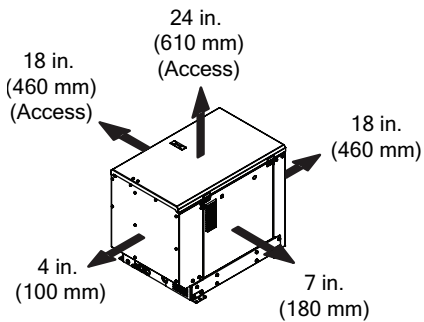
See Specifications for lifting eye rating.

Air Flow Clearance

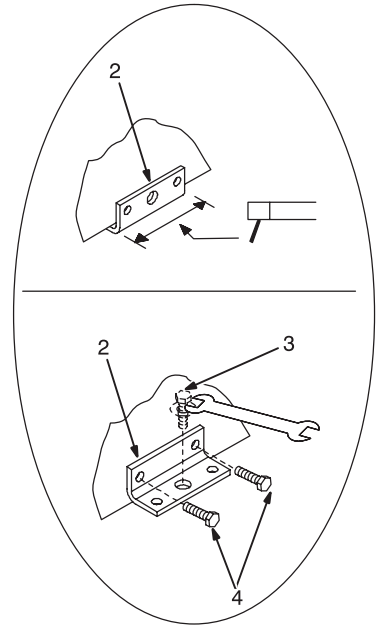
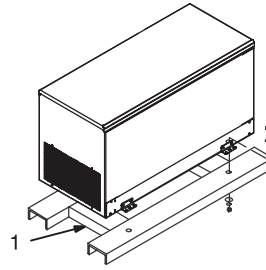
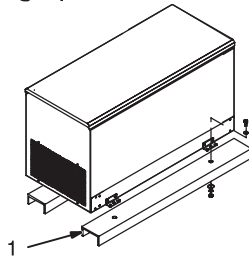
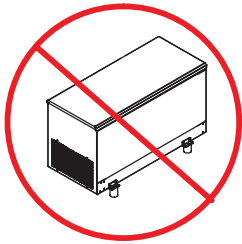
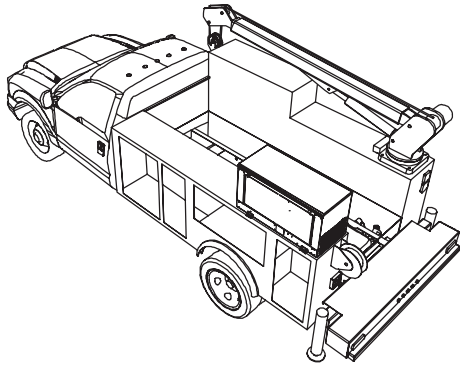
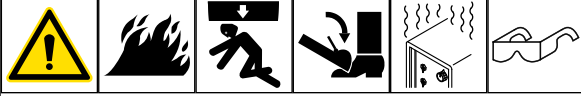
NOTICE – Do not install unit where air flow is restricted.

NOTICE – Make sure the hot air is not allowed to recirculate into the cool air inlets.

Air Flow Clearance



5-2. Welder/Generator Location And Mounting



Location/Mounting

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

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

1 Cross-Supports (Minimum 3 in. Wide)

2 Mounting Brackets (Supplied)

NOTICE – If mounting brackets are removed, the bolts must be reinstalled into the unit.

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

3 3/8 in. Bolt And Washer (Minimum - Not Supplied)

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

To Bolt Unit In Place Using Internal Pattern:

Remove hardware securing four mounting brackets to base. Discard brackets and reinstall original hardware.

Mount unit to truck with 1/2–13 hardware (not supplied).

NOTICE – Four internal mounting holes are threaded.

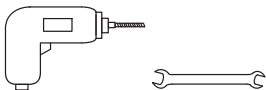
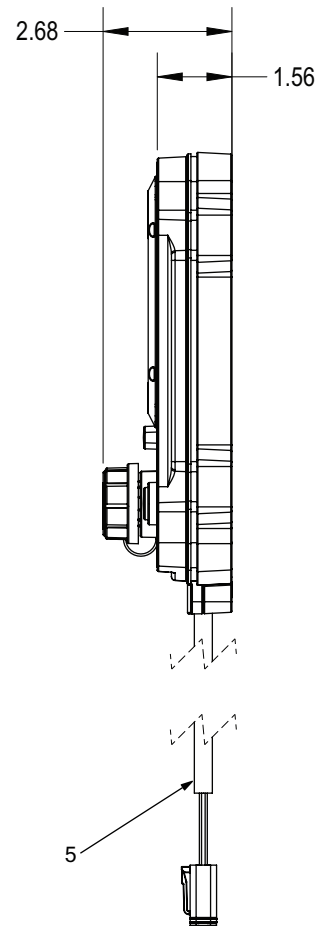
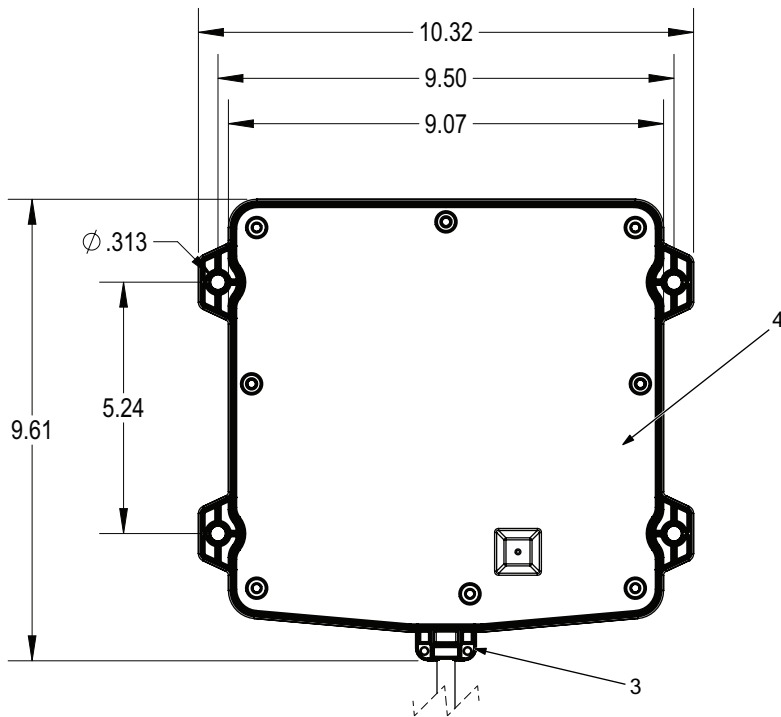
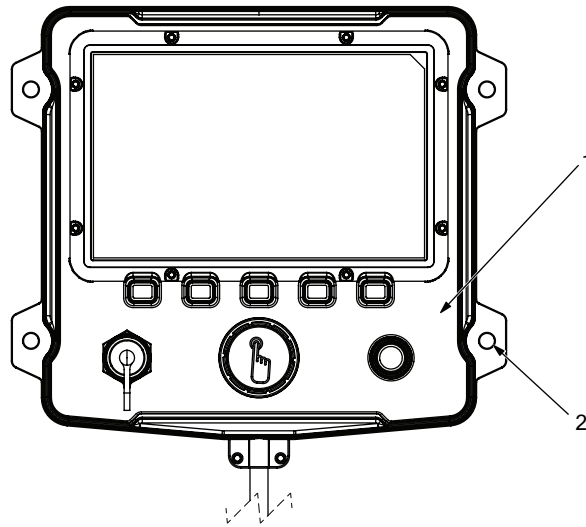
To Weld Unit In Place:

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

Weld unit to vehicle only at four mounting brackets.

⚠ Do not weld on base.

5-3. Installing Remote Control Panel



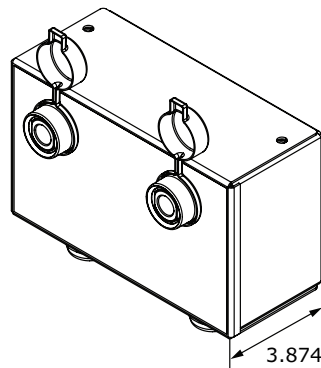
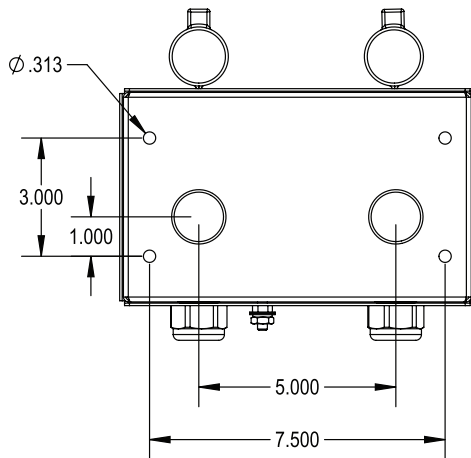
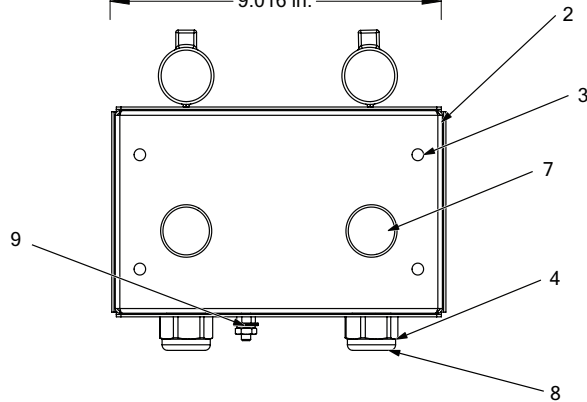
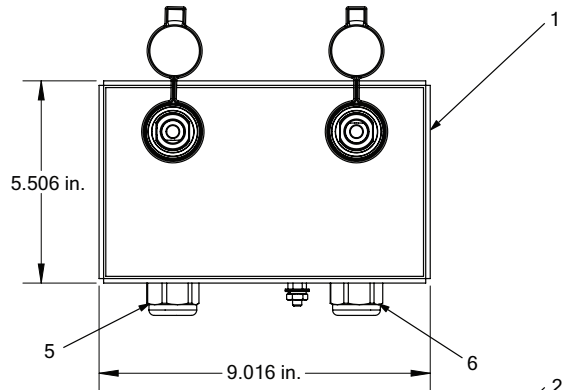
- 1 Remote Control Panel - Front
- 2 Mounting Hole (4)
- 3 Strain Relief
- 4 Remote Control Panel - Rear
- 5 Remote Cable

NOTICE – Control Panel must be mounted vertically.

Select mounting location and mark remote mounting hole placement. Ensure cables will reach from base unit to remote. Mount rear

panel by installing bolts through four mounting holes. Hardware is customer supplied.

5-4. Installing Weld Remote Panel



- 1 Weld Remote Panel - Front
- 2 Weld Remote Panel - Rear
- 3 Mounting Holes
- 4 Strain Relief
- 5 Weld Negative Cable (AWG 1/0 min)
- 6 Weld Positive Cable (AWG 1/0 min)

See Section 11-5 for weld cable size recommendation based on application.

- 7 Plug For Alternate Strain Relief Location
- 8 Outer Strain Relief Nut
- 9 Ground Stud

Select mounting location and mark remote mounting hole placement. Ensure cables will reach from base unit to remote. Mount rear panel by installing bolts through four mounting holes. Hardware and cables are customer supplied. See Section 11-5.

Strain relief and cables may be routed through rear of panel or through the bottom. To change configuration, follow these steps:

Remove front cover.

Remove plugs from back holes. Remove strain reliefs from bottom of remote box.

Install strain reliefs on back holes of remote box.

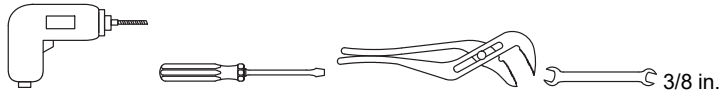
Install plugs in holes on bottom of remote front panel.

Route leads through strain relief and connect to weld terminals.

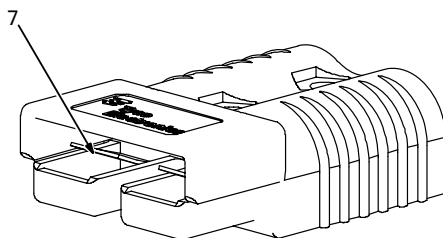
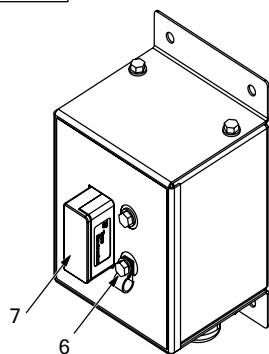
Verify cable insulation extends through strain relief. Then tighten outer strain relief nut until cable does not move in strain relief.

Reassemble front panel to rear panel.

NOTICE – Record cable size and length for Truck Upfitter Settings (see Section 7-5).



5-5. Installing Battery Charge Remote Panel



- 1 Battery Charge Remote Panel - Front
- 2 Battery Charge Remote Panel - Rear
- 3 Mounting Holes
- 4 Strain Relief
- 5 Plug
- 6 Ground Stud
- 7 Retention Clip

Select mounting location and mark remote mounting hole placement. Ensure cables will reach from base unit to remote. Recommended battery charge cable size is 2 AWG. Mount remote panel by installing bolts through four mounting holes. Hardware and cables are customer supplied.

Supplied terminals are only compatible with 2 AWG cables.

Strain relief and cables may be routed through rear of panel or through the bottom. To change the configuration, follow these steps:

Remove front cover.

Remove battery positive lead from battery charge terminal. To remove lead, push down on metal retention clip in plastic housing with a screwdriver and pull lead out from backside.

Remove leads from strain reliefs by removing outer strain relief nut.

Remove plugs from back holes. Remove strain reliefs from bottom of remote box.

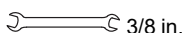
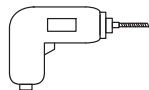
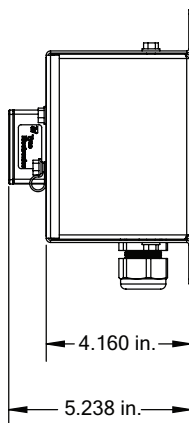
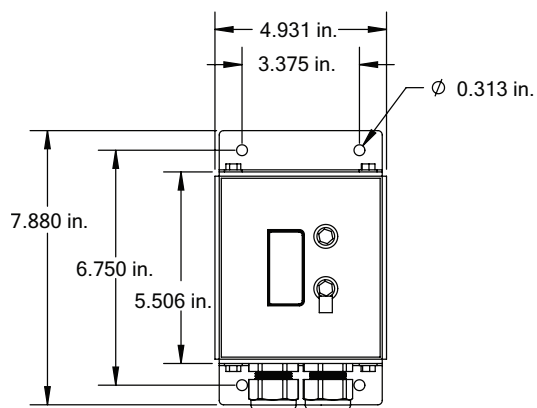
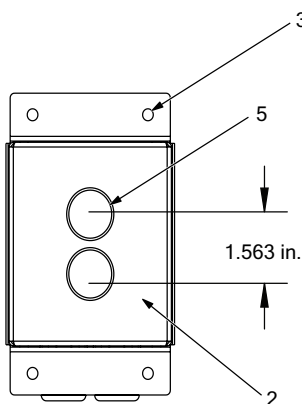
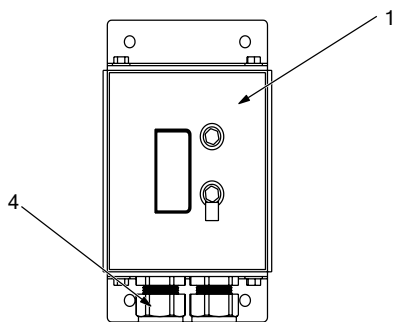
Install strain reliefs on back holes of remote box.

Install plugs in holes on bottom of remote front panel.

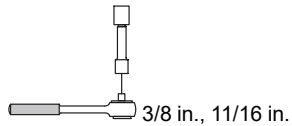
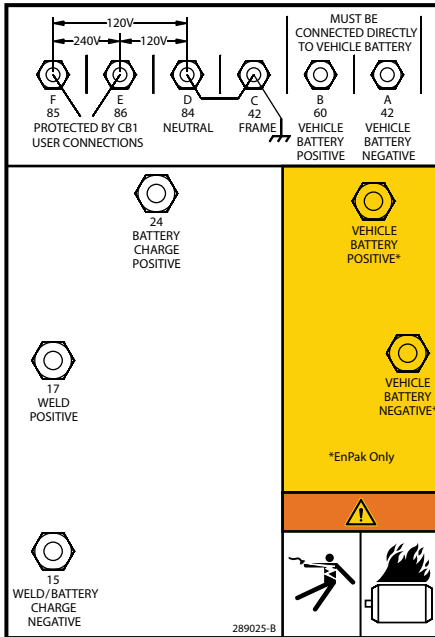
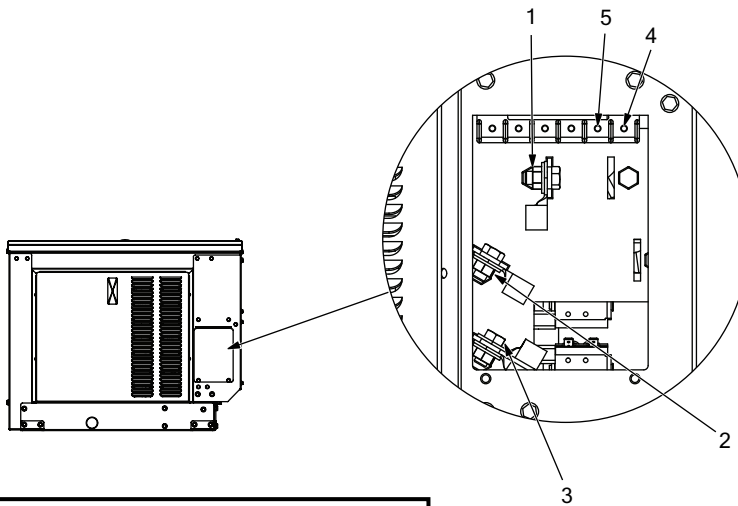
Route leads through strain relief and reconnect to battery charge terminal. When reinstalling battery positive lead, push lead in until it clips on metal retention clip in plastic housing.

Verify cable insulation extends through strain relief. Then tighten outer strain relief nut until cable does not move in strain relief.

Reassemble front panel to rear panel.



5-6. Electrical Connections For Remote Panels And Truck



Only qualified individuals should make connections or crimp cables.

Cables are customer supplied.

- 1 Battery Charge Positive (2 AWG)
- 2 Weld Positive (1/0 AWG Min.)
- 3 Battery Charge Negative (2 AWG)
Weld Negative (1/0 AWG Min.)
- 4 Vehicle Battery Negative (6 AWG Min.)
- 5 Vehicle Battery Positive (6 AWG Min.)

Remove operator connection door.

Route all weld/battery charge leads through slide clamp into base of unit from either end.

Secure leads to low voltage DC terminal strip studs.

Reinstall operator connection door.

For 12V Circuit protection, install 75 amp fuse or breaker in 6 AWG vehicle positive lead as close to battery as possible.

5-7. Remote Devices Connections

1 Remote Panel Connection Receptacle RC86

Mount remote panel inside of truck body cabinets where easily accessible. Connect cable to RC86.

2 Receptacle RC87 (Refer to Table 5–1. for connector inputs/outputs.

Contact Factory for list of harness adapters available.

3 CAN Bus Connection

The CAN bus connection is for use with a customer-supplied telematics device.

Insert wires into included plug to match pins as listed.

Pin 1	GND
Pin 2	CAN bus HIGH
Pin 3	CAN bus LOW
Pin 4	GND
Pin 5	+12 volts DC output only (1 amp output maximum)
Pin 6	Not used

The remote panel can transmit system data on CAN bus network, including other component related errors and general system function information. The full data packet can be found at MillerWelds.com.

See Section 12 for more CAN bus info.

4 10-Pin Spool Gun Connection

5 14-Pin Remote Connection (HDI 325 Air Pak only)

Table 5–1. RC87 Communication Connector Inputs/Outputs

Pin	Description	Voltage	Machine Response (Input) Truck Response (Output)	Voltage	Machine Response (Input) Truck Response (Output)
1	Machine Start Input	0 V	No start.	12 V	Machine starts.
2	Engine Speed Output	0 V	Engine Low Idle Speed Required.	12 V	Engine High Idle Speed Required.
3	Compressor On/Off Input	0 V	Compressor off.	12 V	Compressor circuit activates.
4	Machine Stop Input	0 V	Machine runs.	12 V	Machine shuts off.
5	12 V Unit Enable Input	0 V	Will not allow machine to power on.	12 V	Allows machine to operate ¹ .
6	No Connection	N/A	N/A	N/A	N/A

¹ See Section 5-8.

5-8. 12V Unit Enable



All units require 12 volts DC signal to RC87 pin 5 through the PTO control circuit.

Unit requires a +12 volts DC signal to Pin5 of Comm I/O interconnect cable. Crane

adapter harness will access lockout signal from crane harness. To enable unit, the +12 volts DC that enables PTO must be switched on through use of a safety lockout.

See adapter kit installation instructions for information concerning crane adapter.

Test lockout system to verify correct function.

5-9. Remote Receptacle Information

		Remote 14	Socket*	Socket Information
		24 Volts AC Output (Contactor)	A	24 volts AC. Protected by supplementary protector CB2.
	Remote Output Control		B	Contact closure to A completes 24 volt AC contactor control circuit.
			C	+10 volts DC output to remote control.
			D	Remote control circuit common.
	A/V Amperage Voltage		E	0 to +10 volts DC input command signal from remote control.
			F	Current feedback: 1 volt per 100 amperes.
GND			H	Voltage feedback: 1 volt per 10 arc volts.
			G	Circuit common for 24 and 115 volts AC circuits.
			K	Chassis common.

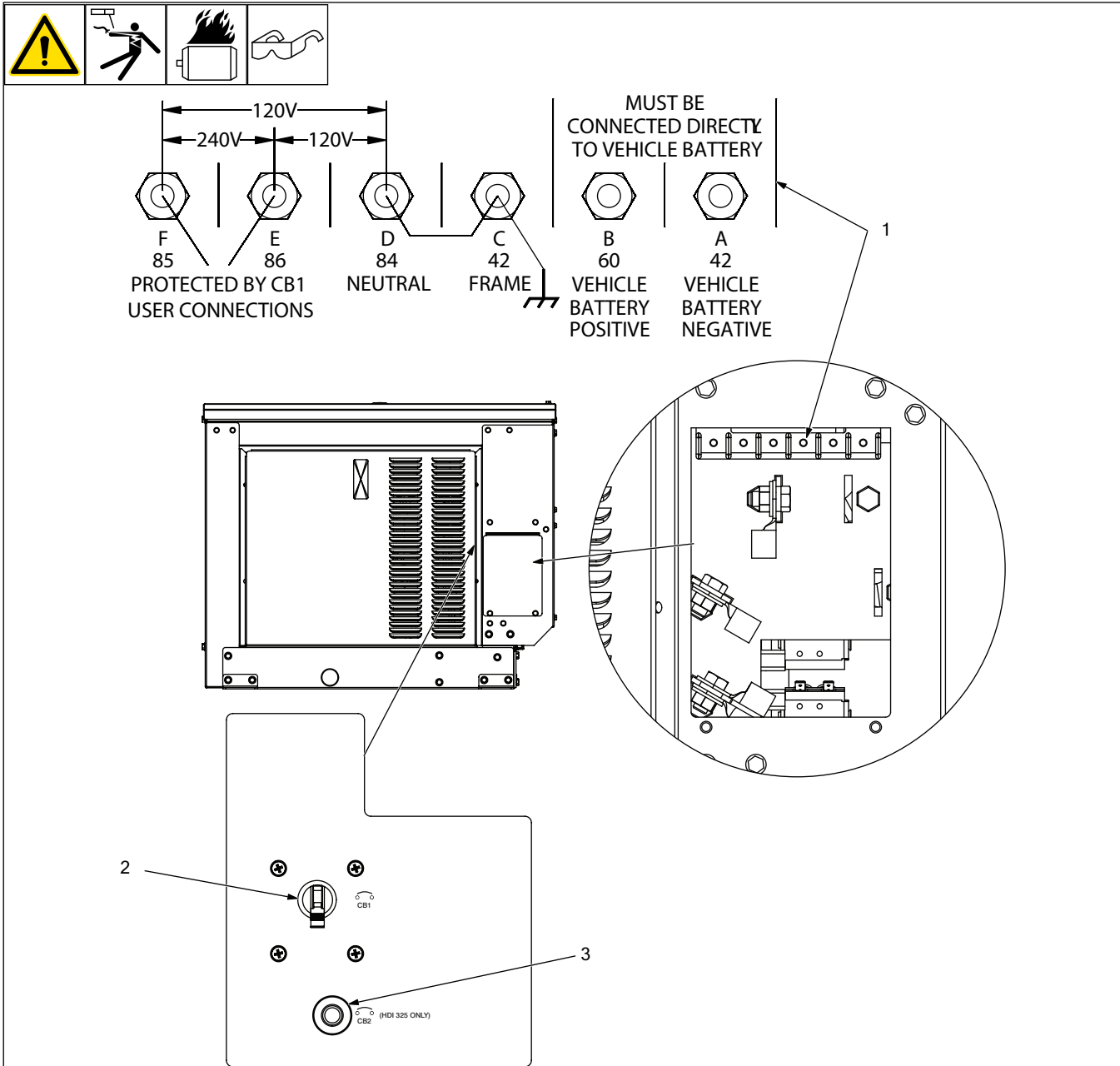
*The remaining sockets are not used.

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. Auxiliary Power System Connections And Overload Protection



Stop hydraulic flow and let cool.

Keep wiring away from hot, sharp, or moving parts.

Recommended wiring size for auxiliary power connections is 8 AWG.

1 Terminal Block 1T

240 VAC power is available between 1T-F and 1T-E, with terminal 1T-D as neutral.

120 VAC standard generator power is available between 1T-F and 1T-D or 1T-E and 1T-D.

Combined output of all generator loads cannot exceed 7 kVA/kW.

2 Supplementary Protector CB1

Supplementary protector CB1 protects generator winding from overload when a 120/240 VAC load is connected.

If supplementary protector continues to open, check external auxiliary connections. If external auxiliary connections are good, contact Factory Authorized Service Agent.

When unit is running at 2400 RPM, voltage output of generator is too low to activate some electric machines that require full 120 VAC or 240 VAC for operation. Generator must be at high speed for output of generator to be at normal 120 VAC or 240 VAC level, and machine that is plugged into generator should work normally.

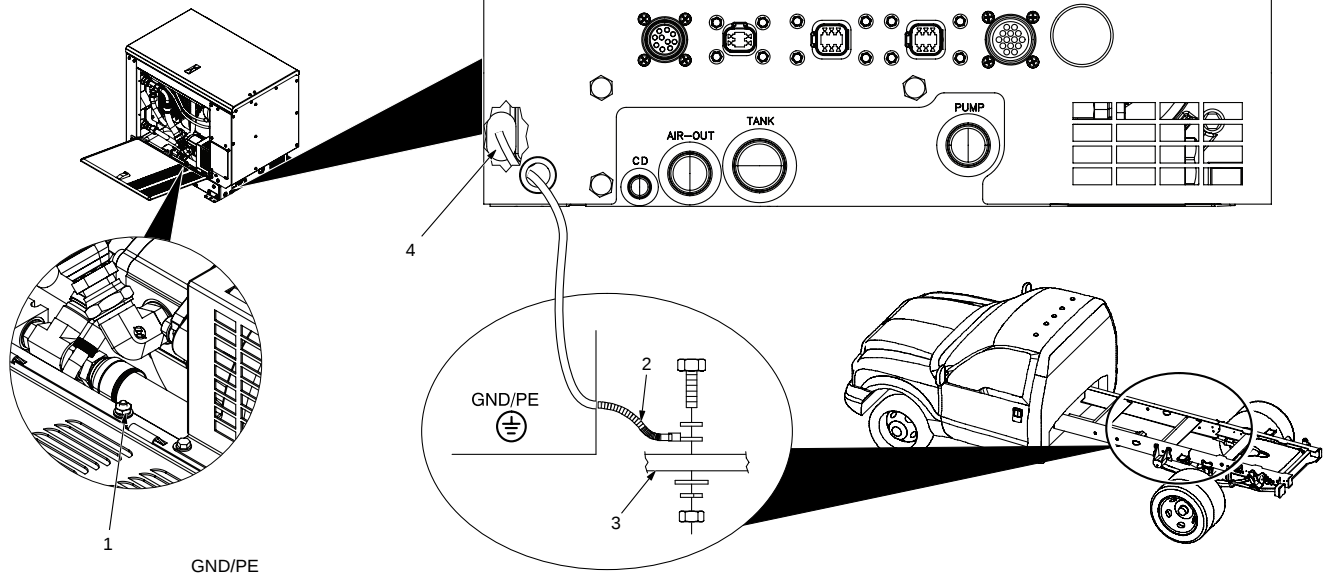
3 Supplementary Protector CB2 (HDI 325 Only)

Supplementary protector CB2 protects 14 pin remote receptacle from overload. If supplementary protector opens, receptacle will not work. Press button to reset supplementary protector.

Use only Miller-recommended GFCI receptacles (see Parts List). The generator does not provide usable power at machine idle speed (2400 RPM). Other GFCI receptacles cannot be used. The low frequency/low voltage may prevent other GFCI receptacles from operating properly.

Test GFCI receptacles at least once a month by running engine at high speed and pressing Test button to verify GFCI receptacles are working properly.

5-12. Grounding Generator to Truck Frame



GND/PE
Existing Green or
Green/Striped Lead

⚠ 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.

⚠ 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.

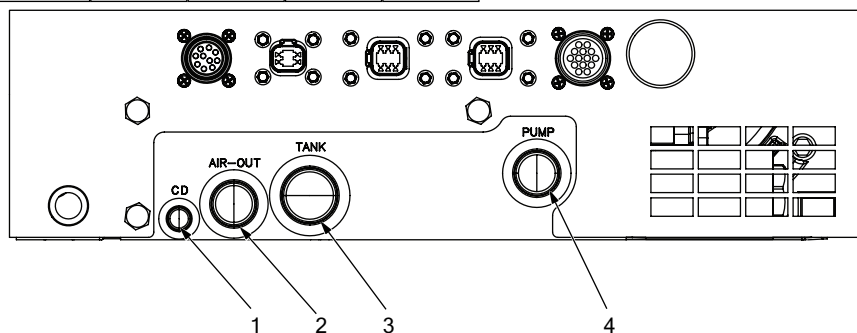
- 1 Equipment Grounding Terminal (On Frame Near Hydraulic Motor)
- 2 Grounding Cable (8 AWG Minimum, Customer Supplied)
- 3 Metal Vehicle Frame
- 4 Cable Routing Hole

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

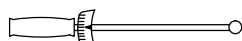
Validate that wire is secured in unit and will not contact belts and pulleys after final assembly.

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

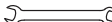
5-13. Hydraulic And Air Compressor Connections



Torques:



SAE-ORB 6	23 ft lb (31 N•m)
SAE-ORB 12	85 ft lb (115 N•m)
SAE-ORB 16	112 ft lb (152 N•m)

 11/16 in., 1-1/4 in., and 1-1/2 in.

 Hydraulic fluid is flammable. Do not work on hydraulics near sparks or flames; do not smoke near hydraulic fluid. Route all hoses away from hot, sharp or moving parts. Check all connections and hoses for damage, leaks, and wear.

 Stop truck and hydraulic flow. Be sure hydraulic oil is cool prior to servicing hydraulics.

 Stop engine, wait 10 minutes, and verify the air pressure gauge reads 0 psi before servicing compressor.

- 1 Motor Case Drain
SAE-ORB 6

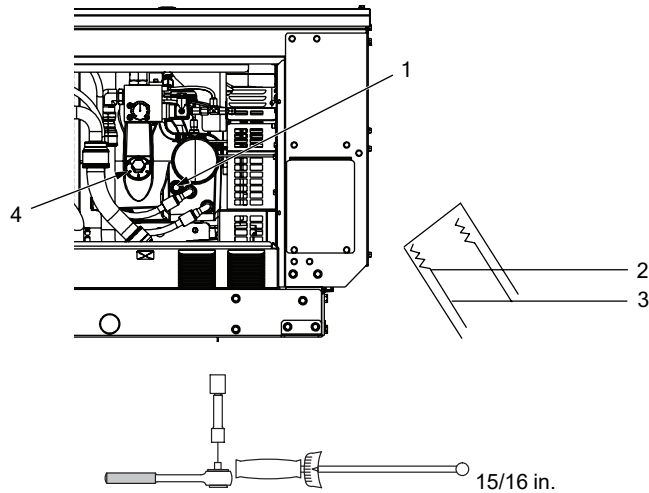
 Motor case drain must be connected directly to reservoir.

- 2 Compressed Air Out
SAE-ORB 12
- 3 Hydraulic Return Tank Connection
SAE-ORB 16
- 4 Hydraulic Pump Connection
SAE-ORB 12

Connect hoses and torque connections.

 Ensure hoses are routed and secured to eliminate vibration.

5-14. Compressor Prestart Checks



⚠ Stop hydraulic flow, wait 10 minutes, and verify the air pressure gauge reads 0 psi before opening oil cap. Do not open oil fill cap while running.

☞ The compressor is equipped with high oil temperature shutdown. High oil temperature can be caused by low oil level or hot air recirculation.

NOTICE – Do not mix oil types. Do not overfill.

Check all fluids daily. Compressor must be cold and on a level surface. Unit is shipped with oil.

Open side service door.

- 1 Oil Level Sight Glass
- 2 High/Max
- 3 Low/Min

The unit is shipped with oil in the compressor. Oil level sight glass shows oil level.

☞ Bottom of oil sight glass is minimum oil level. Top of sight glass is full.

Minimum oil level is half way up the oil fill pipe. Maximum oil level is in threaded area of oil fill pipe.

Check level frequently. If oil needs to be added, be sure unit is off and compressor case pressure is released according to Section 8-3 before removing fill cap.

- 4 Air Compressor Oil Fill Cap

Torque oil fill cap to 7.4 ft lb (10 N•m). Using excess force can damage o-ring.

Inspect compressor air cleaner element and replace if dirty. See Section 13-4.

Close side service door.

5-15. Air Compressor Operation With Air Tools

HDI 265: 1/2 in. Min ID Hose
HDI 325: 3/4 in. Min ID Hose

20 Gallon (Recommended)
10 Gallon (Minimum)
Air Tank

Ball-Valve Drain

Quick Connect

Air Pressure Regulator

Connect 20-gallon (recommended; 10-gallon minimum) air tank to air compressor outlet. Added air volume will supplement air output for proper Auto Start/Stop function until compressor builds pressure.

For air usage greater than compressor output, air tank supplements air output for intermittent use. The more the continuous CFM of the tool exceeds the rating of compressor, the larger the tank that is needed for proper tool performance.

Air Tool	Average CFM	Continuous CFM
3/4 in. Impact Wrench (IR 2141)	10	40
3/4 in. Impact Wrench (Speedaire)	7	26
1/2 in. Impact Wrench (IR 231C)	4	22
Needle Scaler (IR 182LNA1)	3	13
4-1/2 in. Grinder (Dayton)	7	26
1/4 in. Die Grinder (IR G1H340RG4)	6	25
1/2 in. Drill (IR 7AQSTB)	4	17
Air Shears (IR 7802SA)	4	21
Sand Blaster	--	6
Soda Blaster	--	18
Button Punch/Deck Tool	--	4
Decking Crimp Tool	4	15

SECTION 6 – HYDRAULIC SYSTEM

6-1. Hydraulic System Integration

A. General Information—Minimum Requirements

System recommendations are intended for operating unit continuously, such as used on a mechanic's truck. When installed with a crane, unit must be on a dedicated open center hydraulic circuit with a fixed displacement PTO pump. Closed center hydraulic circuits and/or variable displacement PTO pumps are not recommended.

For use with a mechanic's truck, system should at a minimum include the following items:

- Fixed displacement PTO pump capable of meeting minimum flow and pressure requirements dedicated to HDI unit.
- Secondary tandem PTO pump recommended for auxiliary equipment (crane, outriggers, etc.) if simultaneous operation of HDI unit and auxiliary equipment is anticipated.
- Reservoir of 20 gal (76 L) or more capacity
- Pressure relief valve (Included in unit)
- Properly sized hoses and fittings, restrained and protected (see Table 6–1.)
- Return line filter to maintain an ISO 4406:1999 Cleanliness Code of 18/16/13. Exceeding max contamination level will void warranty.

B. Reservoir

Minimum reservoir size is 20 gal (76 L). To accommodate changes in volume due to cylinder displacement, a filtered breather must be used and vented to atmosphere. This filter should be 10 micron.

Design of reservoir must allow for adequate oil circulation to disperse entrapped air and maintain sufficient cooling through use of baffles. Changes in oil volume due to cylinder displacement also need to be accounted for by allowing adequate air space inside reservoir. Unit must operate properly at up to a 20° angle.

Allowance for properly sized immersion heater may be necessary in some climates. Hydraulic oil reservoir heater is recommended to improve time to full operation in temperatures below 0°F (-18°C).

A reservoir low oil level shutdown is required to be incorporated into truck or chassis hydraulic system.

C. Hoses And Fittings

All hoses should be sized appropriately according to flow capacity and pressure loss. See Table 6–1. as a guide.

Use of quick disconnects in any line is not recommended. Using quick disconnects will cause higher system losses, result in elevated fluid temperature, and reduced system performance.

Obtain hoses of the proper length and type with appropriate fittings for the installation according to Table 6–1.

Temperature rating: -40 to 212°F (-40 to 100°C).

Table 6–1. Hydraulic Hoses Specifications

Hydraulic Hoses	Hose ID (in. / mm)	Minimum Working Pressure (psi/MPa)	Minimum Burst Pressure (psi/MPa)	Connection	Torque (ft lb / N·m)
Case Drain Line	0.375 / 9.53	200 / 1.37	800 / 5.51	SAE-6 (F) ORB fitting	23 / 31
Pressure Line ¹	0.75 / 19.05	3500 / 24.13	14,000 / 96.52	SAE-12 (F) ORB fitting	85 / 115
Return Line ²	1.00 / 25.4	200 / 1.37	800 / 5.51	SAE-16 (F) ORB fitting	112 / 151

1 Based on 15 fps velocity.

2 Based on 8 fps velocity. Line should connect directly back to reservoir through a return filter. Filter cleanliness code: 18/16/13 or better.

D. Filtration

System filtration requirements are to maintain a cleanliness code of 18/16/13 per ISO 4406:1999.

Filtration should be met with use of a return line filter.

Filter must be compatible with all petroleum and synthetic hydraulic fluids. Filter should operate in a temperature range of -22°F to 250°F (-30°C to 121°C). Consideration should be given to filter bypass rating. Excessive bypass at low temperatures should be avoided.

E. Hydraulic Fluid

Premium grade petroleum-based fluid that contains anti-wear agents, rust inhibitors, anti-foaming agents, and oxidation inhibitors and has an ISO VG rating as recommended.

Table 6–2. Hydraulic Fluid Specifications

Ambient Temperature	-20°F to 28°F (-29°C to -2°C)	28°F to 90°F (-2°C to 32°C)	90°F to 104°F (32°C to 40°C)
Oil	ISO 15	ISO 32	ISO 46
Oil Viscosity Index	VI ≥ 250	VI ≥ 95	VI ≥ 95

General fluid recommendations:

- Recommended operating viscosity: 20 - 100 cSt
- Maximum continuous viscosity: 420 cSt
- Minimum continuous viscosity: 12 cSt

6-2. Extreme Temperature Operation

A. Operating Procedure

When operating in extreme temperatures, the unit will follow the procedure outlined below.

Table 6–3. Extreme Temperature Operating Procedure

Hydraulic Oil Temperature	Operating Condition
Less than 0°F (less than -18°C)	Unit will not start. Hydraulic fluid will bypass internally until it reaches 0°F. “Hydraulic Cold Start Wait” will be displayed.
0°F to 176°F (-18°C to 80°C)	Unit will operate normally.
Greater than 176°F (80°C)	Unit will automatically shut down. Cooling fans will continue to run if 12V power is maintained to the machine. “Hydraulic Over Temp - Wait For Temp To Drop” will be displayed.

B. Hydraulic System Cooling

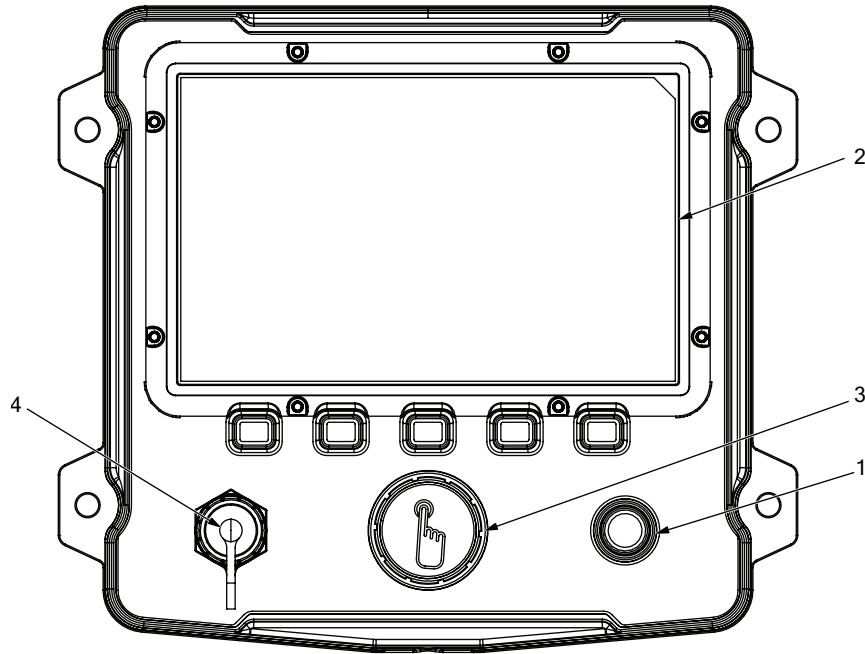
HDI is equipped with hydraulic fluid and compressor oil coolers designed to reject 100% of heat generated by the unit at maximum rated outputs and ambient temperature.

NOTICE – Operating unit above hydraulic flow input, ambient temperature, or output ratings will reduce duty cycle.

Hydraulic cooler can be used to cool other equipment in system, such as crane circuit on mechanic's truck, independent of unit operation. See Section 7-4 for more information.

SECTION 7 – CONTROLS

7-1. Remote Control Panel



1 On/Off Button

2 Home Screen

3 Adjust Control/Select Button

4 USB Port (See Sections 7-7 and 7-8)

A splash screen will display and advance to Home screen.

Press On/Off button to enable hydraulic system. Use soft buttons to open Weld, Battery, and Settings screens.

Turning Off Unit

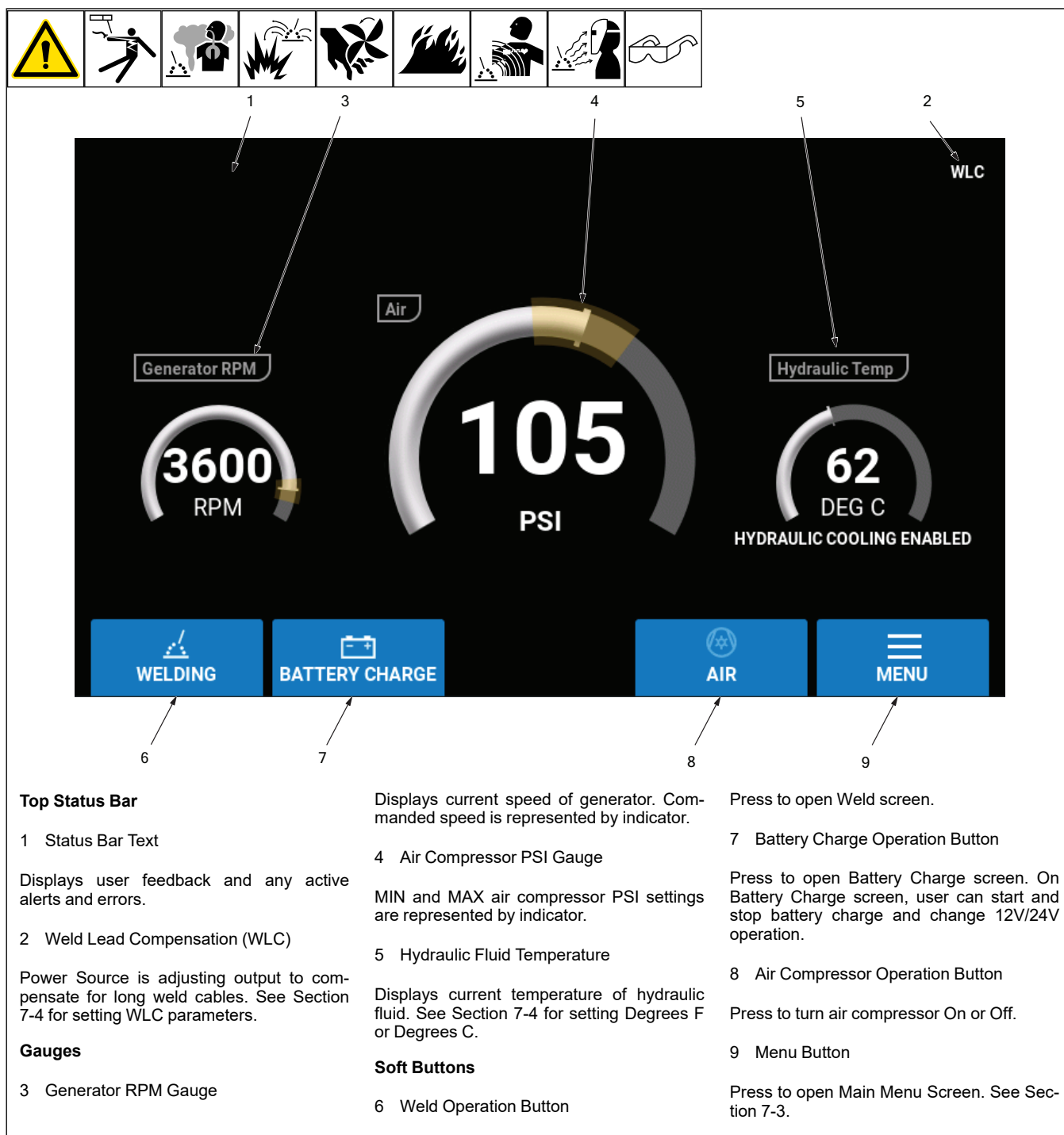
Press On/Off button to turn unit off.

NOTICE – Always turn unit off from remote control panel before stopping flow of hydraulic fluid or cutting power to machine.

Turning On Unit

12V Enable signal must be provided to turn unit On. Refer to Section 5-8 for more information.

7-2. Home Screen



7-3. Menu Screen












WLC

1

2

3

4

5

Menu

System Settings

Maintenance

System Info

Productivity

Troubleshooting


HOME


BACK

1 System Settings
Select to change unit operation parameters. See Section 7-4.

2 Maintenance Menu
Select to check, change, or reset maintenance interval schedule. See Section 13-2.

3 System Info
Select to check and update software, check and download summary file, and restore unit to factory defaults (see Section 7-7).

4 Productivity
Select to check unit usage hours.

5 Troubleshooting
Displays live unit data for troubleshooting purposes.

6 Truck Upfitter Settings
See Section 7-5.

7-4. System Settings Screen










System Settings

Hydraulic Cooling

Air Pressure Minimum

Air Pressure Maximum

Air Compressor Response

Temperature Display Units

Hydraulic Cooling

Enabled

Disabled

WLC

To change System Settings:

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

Soft Buttons:

- Press Home button to return to Home screen.
- Press Back button to return to Menu screen.
- Press More Info button to see detailed information on System Settings.


HOME


MORE INFO


BACK

System Settings Item	Selectable Item Option	Default Setting	Description
Hydraulic Cooling	Enabled / Disabled	Enabled	Allows hydraulic fluid to flow through machine cooler without machine running.  Fan will start without warning.
Air Pressure Minimum	90 to 165	100	Sets minimum pressure.
Air Pressure Maximum	100 to 175	120	Sets maximum pressure.
Air Compressor Response	Low / Medium / High	High	Sets how quickly the compressor responds.
Temperature Display Units	Degrees F / Degrees C	Degrees F	Sets temperature units on display.
High Speed Lock	Auto / High Speed	Auto	Machine will only run at high speed when "High Speed" selected.  Defaults to "Auto" when powered up.
Weld Lead Calibration	Enabled / Disabled	Disabled	Enables Weld Lead Calibration.
Cable Size*	2, 1, and 1/0 to 4/0	2/0	Sets cable size (in AWG) for Weld Lead Calibration.
Cable Length*	10 to 500	250	Sets cable length (in feet) 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 increase in arc voltage to help offset voltage drop based off of inputs of weld cable length and diameter. WLC is required for Auto-Set feature to function..

7-5. Truck Upfitter Settings Screen

Upfitter settings allow truck upfitter to input total length and size of positive and negative weld leads installed between HDI unit and weld remote connections panel.

☞ Cable Lengths and sizes must be entered into Upfitter Settings to enable Auto-Set function.

To change Truck Upfitter Settings:

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

Soft Buttons:

- Press Home button to return to Home screen.
- Press Back button to return to Menu screen.
- Press More Info button to see detailed information on Truck Upfitter Settings.

Truck Upfitter Settings Item	Selectable Item Option	Default Setting	Description
Weld Cable Length	10 to 100	0	Sets total length (in feet) of positive and negative cables between the unit and weld remote panel.
Weld Cable Size	2, 1, and 1/0 to 4/0	0	Sets cable size (in AWG), of weld cable between unit and weld output box, for Weld Lead Calibration.
Upfitter Factory Reset	Back / Reset	Back	Resets Weld Cable Length and Weld Cable Size to factory default. Notification will pop up when unit is powered up if these settings are not set.

☞ Weld Lead Calibration provides increase in arc voltage to help offset voltage drop based off of inputs of weld cable length and diameter. WLC is required for Auto-Set feature to function.

7-6. Weld Lead Calibration

☞ Refer to Section 7-4 for enabling Weld Lead Calibration (WLC)

☞ Use of Auto-Set requires truck upfitter setting information and WLC to be enabled.

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

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

7-7. 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.

Current software revision is displayed.

Step 3. Verify 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 download is complete, run it.

Step 6. Accept software licensing agreement.

Step 7. Copy desired firmware to empty USB thumb drive.

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

Installing Software

Step 8. Turn Off hydraulic flow.

Step 9. Insert thumb drive into USB receptacle on front of machine.

Step 10. Power on the control panel but do not start the machine.

☞ Do not start hydraulic flow.

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, 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.

7-8. Service Log

When “Download Service Log” is selected, a service log is saved to the USB stick as ServiceLog.txt.

The service log provides diagnostic and weld information.

SERVICE LOG

SYSTEM INFORMATION

Model : HDI 265 AirPak
 System Software Revision: Rev b
 Machine On Time : 15h 52m 3s
 Air Compressor On Time : 1h 42m 54s
 Last Log Reset : 0h 0m 0s

FIRMWARE INFORMATION

	APPLICATION	APPLoader	LAUNCHER
UI Processor	91224b	50724a	50224a
Control Board	91224b	82324a	82324a
Weld Board	91224b	60123a	60123a

CHANGLIST INFORMATION

	APPLICATION	APPLoader	LAUNCHER
UI Processor	4B4C1A35	5C78EC7	3F6EC46B
Control Board	FB15035	4541908D	4541908D
Weld Board	FB15035	48713A6B	4B427EE4

DHC INFORMATION

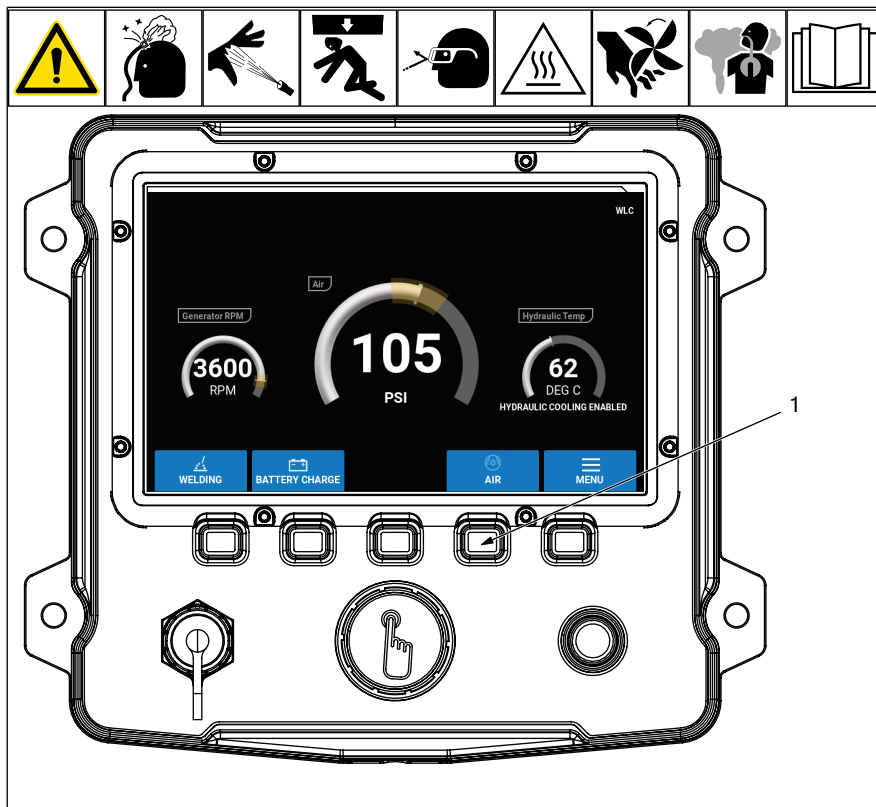
Most Recent DDMs:	DHC	REMEDY	SELECTED PROCESS	TIME STAMP
Spool Gun Not Connected	ALRT WE00	Connect Spool Gun	DC SPOOLGUN MIG ALUMINUM	0h 0m 0s
Inverter Board Communication Error	ERR SA01	Cycle Power	NONE	0h 0m 0s

DHC LOG

Logged DDMs:	DHC	REMEDY	LIFETIME	SINCE LAST LOG RESET
Hydraulic Thermistor Short Error	ERR YH01	Have Unit Serviced	5	5
Inverter Primary CT Error	ERR HG00	Have Power Module Serviced	1	1
Inverter Current Sensor Error	ERR DE00	Have Power Module Serviced	4	4

SECTION 8 – COMPRESSOR SYSTEM

8-1. Air Compressor Operation Button



Weld output and generator power may be reduced when air compressor is on.

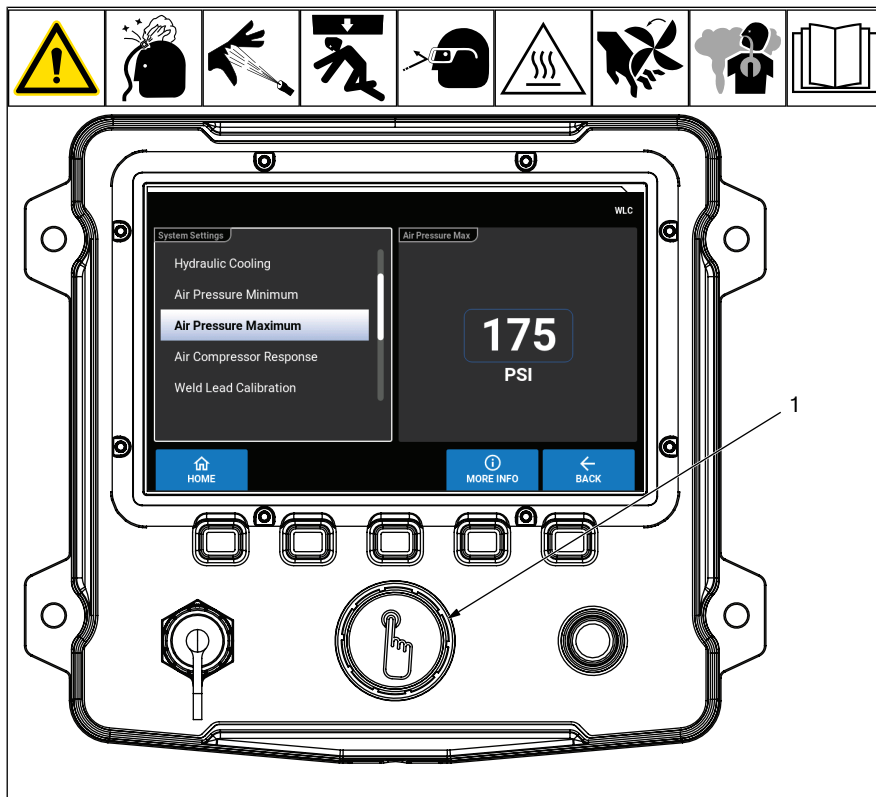
1 Air Compressor Operation Button

While in Home screen and Weld screen, press Air Compressor Operation button to toggle the compressor output. Compressor is On when Air Icon is white, and Off when Air Icon is gray.

Cold Weather Operation

Air compressor is equipped with a heater for cold environments. If ambient temperature is below 0°C (32°F) the heater will start when unit is started. If air compressor is enabled before compressor oil is at 5°C (41°F), "Cold Start Wait" will be displayed and compressor clutch will not be enabled until oil is at 5°C (41°F) or higher.

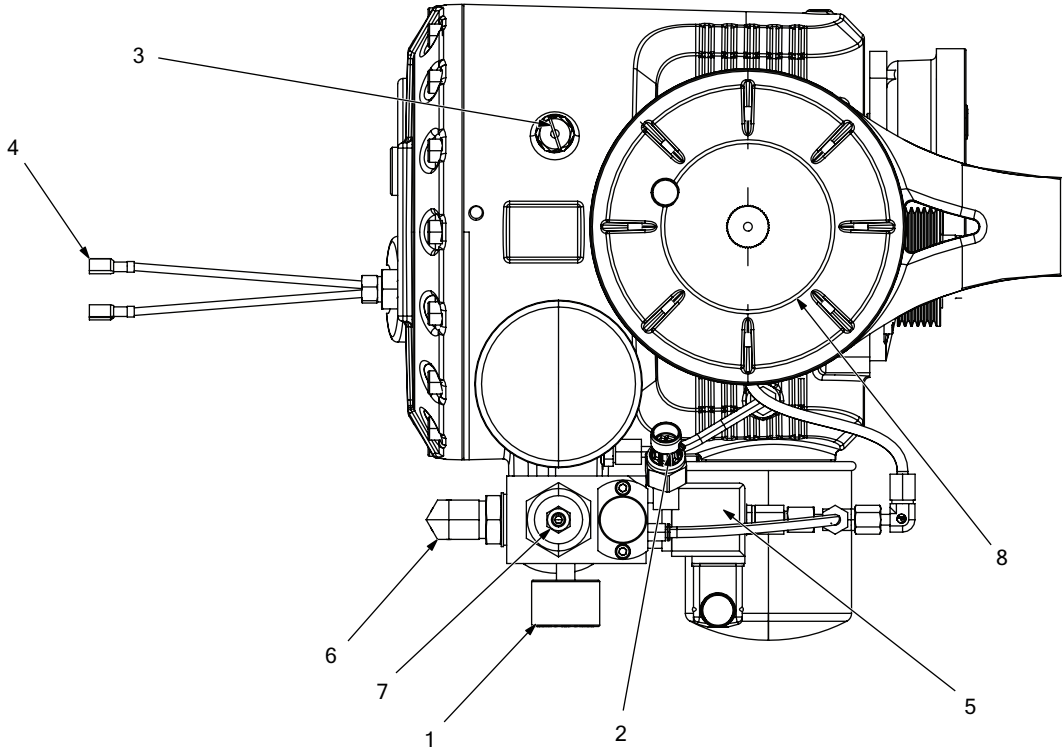
8-2. Adjusting System Pressure



1 Adjust Control/Select Button

When air compressor is On, outlet air pressure is monitored. If pressure is below MIN pressure setting, compressor clutch engages. When MAX pressure setting is reached, compressor case pressure reduces. If there is no air demand for 45 seconds, clutch disengages until outlet pressure is below MIN setting. Access System Settings menu to set MIN and MAX pressure settings (see Section 7-4). See Section 8-3 for air compressor controls.

8-3. Air Compressor Controls



⚠ After air compressor shuts off, blow down cycle begins and takes several minutes. When gauge reads zero, open cap slowly to release remaining pressure.

- 1 Air Compressor Case Pressure Gauge
- 2 Pressure Sensor

Pressure sensor measures compressor outlet pressure. A check valve in compressor allows outlet pressure to remain while case pressure is reduced.

See Section 8-2 to set compressor pressure.

☞ *MAX pressure is factory set at 120 psi. MIN pressure is factory set at 100 psi.*

Over pressure activates at 185 psi (1275 kPa), disables compressor, and displays "Air Comp Over Pressure." Power to compressor is disabled until air compressor is turned off or case pressure is reduced below 165 psi.

NOTICE – Frequent over pressure cycling can cause clutch and belt damage.

- 3 Pressure Relief Valve

Compressor is also equipped with a mechanical safety valve (pressure relief valve) that will open if pressure reaches 220 psi.

- 4 Temperature Sensor

Compressor shuts down due to over-temperature and "Air Comp Over Temp" displays. Error condition automatically resets when temperature reduces. Power to compressor is disabled until air compressor switch is turned off.

Compressor Blow Down

- 5 Blow Down Valve

☞ *To prevent foaming or sudden release of pressure, allow 10 minutes after shutdown before opening compressor fill cap or performing other compressor maintenance.*

To control release of air mixed in the compressor oil (while running), compressor goes through a blow down cycle when compressor is turned off or hydraulic motor is stopped. The blow down valve slowly discharges pressure in compressor.

Compressor Idle Down And Standby Mode

- 6 Compressor Outlet

When MAX pressure is reached, blow down valve is de-energized and compressor begins reducing case pressure. If no air is used, compressor case pressure continues to drop. After 45 seconds the clutch will disengage. If there is a rapid pressure drop on outlet of compressor, or if pressure is below MIN pressure, clutch and compressor engage until MAX pressure is reached.

- 7 Minimum Pressure Check Valve

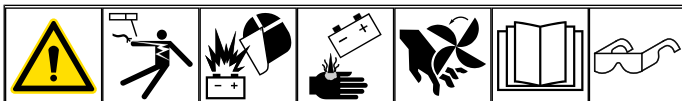
Maintains 60 psi (414 kPa) minimum at compressor outlet to keep oil circulating in the system, and also includes check valve to prevent air from user-provided air tank from flowing back into compressor during blow-down.

- 8 Intake Control Valve

Controls amount of air entering compressor. As intake control valve closes, less air is delivered by compressor at outlet.

SECTION 9 – BATTERY CHARGING

9-1. Battery Charging Guidelines

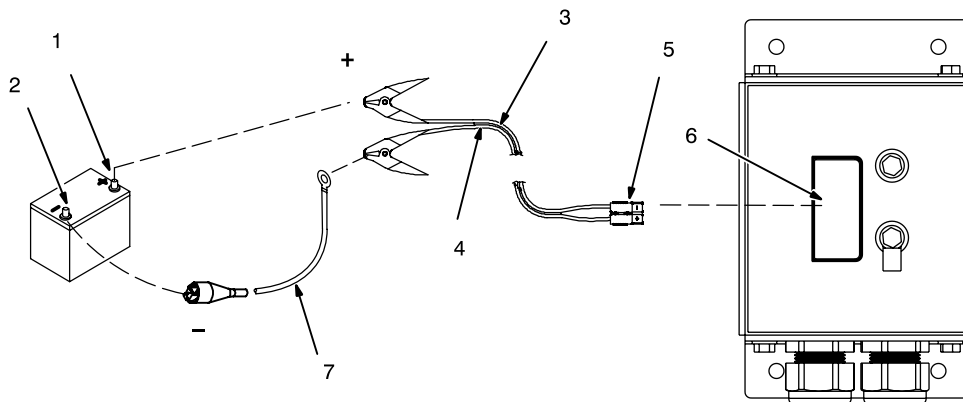


- ⚠ Before charging battery, read the Safety Precautions at the beginning of this manual.
- ⚠ Have only qualified persons do battery charging work.
- ⚠ Do not charge a defective battery, a battery with loose terminals, or one having evidence of damage such as a cracked case or cover.
- ⚠ Keep battery 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.
- ⚠ Never disconnect jump-start/crank assist connections or cables when charging or jumping/crank assisting. Clamps may be energized when unit is in battery charge mode.
- ⚠ Never place 12V battery on 24V only setting.

9-2. Connecting Uninstalled Battery To Battery Charge Receptacle



Battery located outside of vehicle



- ⚠ 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.

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

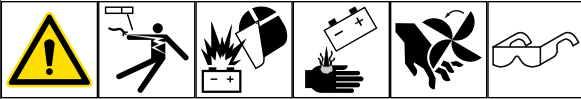
7 Insulated Battery Cable (Customer-Supplied)

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.

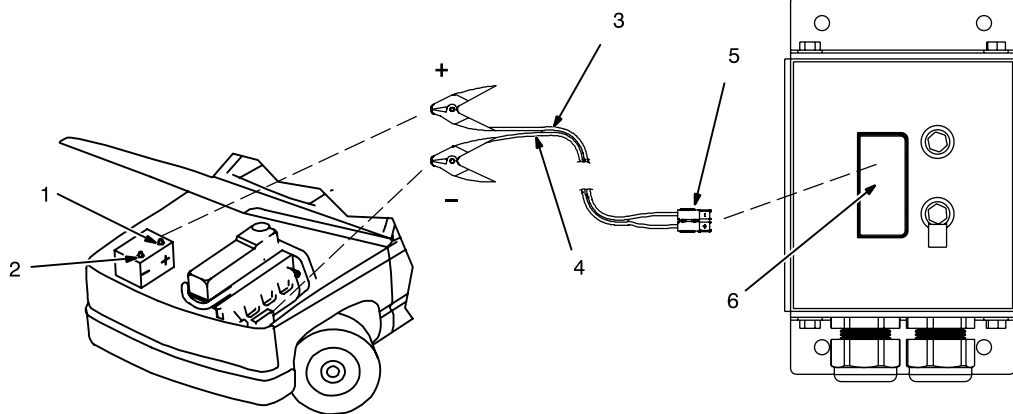
Connect Battery Charge plug to Battery Charge receptacle.

NOTICE – Always connect cables to battery first, then to Battery Charge receptacle.

9-3. Connecting Installed Battery To Battery Charge Receptacle



Battery located in vehicle (Negative post grounded to chassis)



⚠ 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).

NOTICE – For equipment with sensitive electronics, such as a vehicle with an on-board computer, disconnect battery from vehicle or equipment before charging battery.

NOTICE – Never leave machine unattended when charging a battery.

- 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

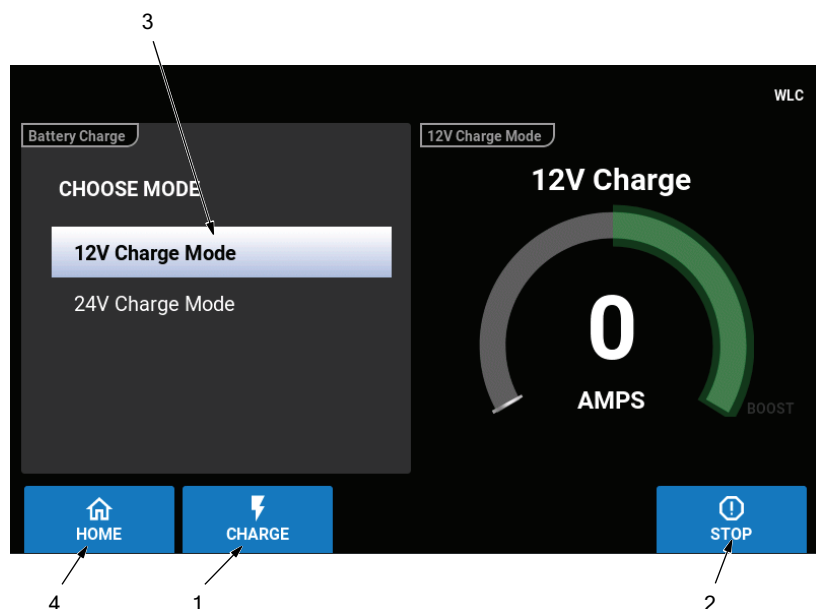
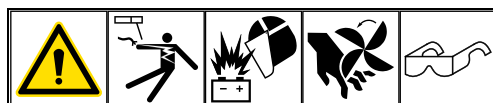
6 Battery Charge Receptacle

7 Insulated Battery Cable (Customer Supplied)

Connect 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.

9-4. Setting Battery Charge Controls



To start charging a battery:

- Select either 12 V or 24 V with control/ select button depending on type of battery being charged.
- Connect battery terminals as described in Section 9-2 and 9-3.
- Push Charge button.
- When finished charging push Stop button.
- Disconnect battery cables.

1 Charge Button

Press Charge button to start battery charge.

2 Stop Button

Press 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 status bar messages are provided in table below.

4 Home Button

Press Home button to go back to Home screen.

For batteries that do not take a charge current:

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

A. Check Battery

Batt Charge Voltage Error Batt Read Open Error Batt Check Open Error	Codes indicate battery will not accept a charge, battery voltage does not match charging voltage. Check battery and connections. Cycle Charge/Stop selections to restart charging.
--	--

B. Batt Charge Polarity Error

Batt Charge Polarity Error	Code indicates system is improperly connected. Check connections. Cycle machine power to clear.
----------------------------	---

C. Over Voltage

Batt Charge Over Voltage Error	Code indicates battery is accepting too much voltage or no current. For 24 V battery, verify 24 V selection on UI before connecting clamps. Cycle machine power to clear.
--------------------------------	---

D. Jump Timeout

Batt Charge Timer Expired Error	Code indicates 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.
---------------------------------	--

E. Battery Bad

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

F. Charge Complete

Battery Charge Complete	Battery charge process has completed successfully.
-------------------------	--

SECTION 10 – OPERATING AUXILIARY EQUIPMENT

10-1. Generator Power Receptacles And Supplementary Protectors



⚠ 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.

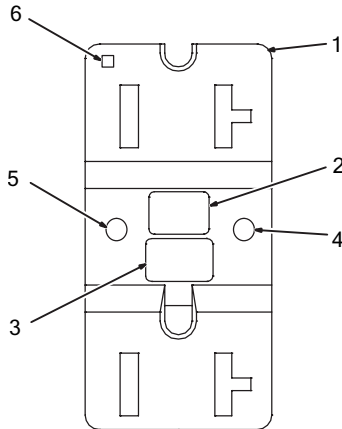
⚠ Unplug power cord before attempting to service accessories or tools.

☞ Generator power decreases as weld current or air compressor output increases.

Receptacles and circuit protection are customer supplied. Miller Auxiliary Power Remote Panel Kit 301562 can be connected to machine.

Combined output of all receptacles limited to 7 kVA/kW rating of the generator.

10-2. 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.

Testing GFCI Receptacles

Start hydraulic motor and press the GFCI Test button. The GFCI Reset button should pop out.

Resetting GFCI Receptacles

If a GFCI fault occurs, stop hydraulic motor and disconnect equipment from GFCI receptacle. Check for damaged or wet tools, cords, plugs, etc. connected to the receptacle.

Start hydraulic motor and access System Settings menu. Select High Speed Lock. Scroll to and select High Speed. Verify generator speed has increased to 3600 RPM in Home screen. Press GFCI Reset button. Access System Settings menu, select High Speed Lock, and select Auto. Verify generator speed returns to 2400 RPM.

Reconnect equipment to GFCI receptacle. If GFCI Reset button pops out again, check the equipment and repair or replace if faulty.

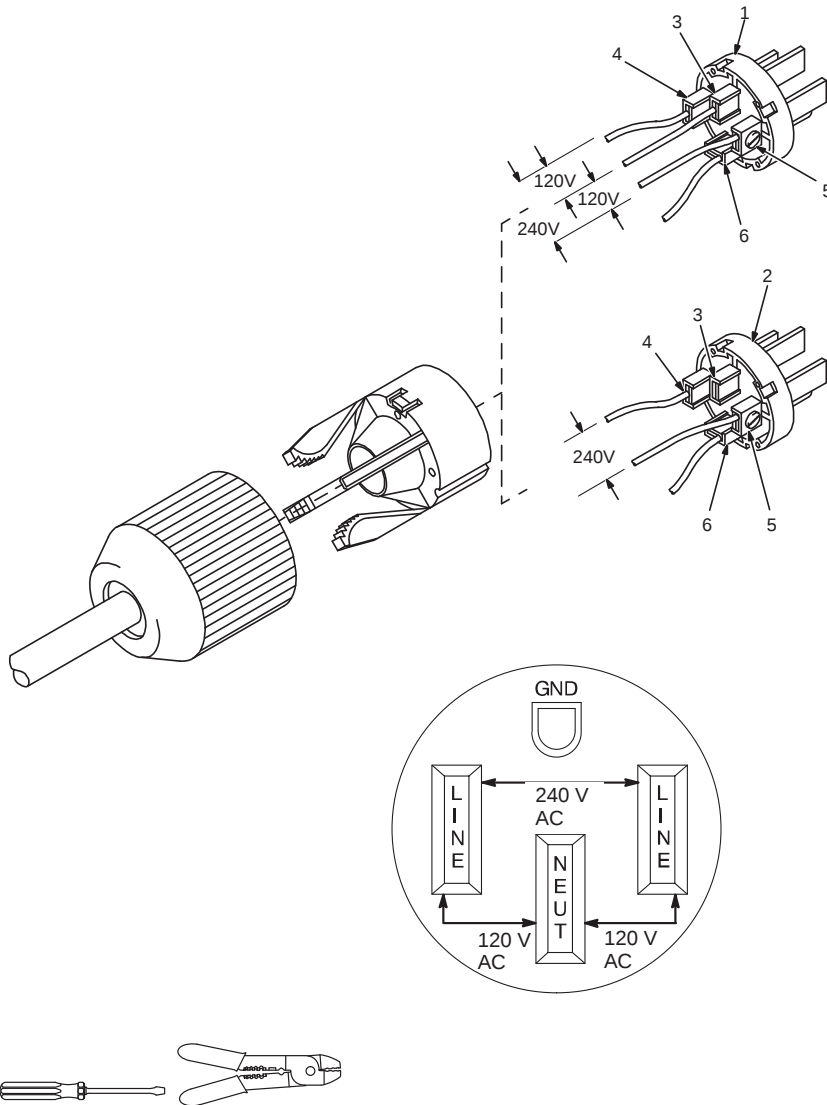
Have a Factory Authorized Service Agent replace GFCI if any of the following occur:

GFCI does not trip when tested

Red LED blinks

GFCI does not reset.

10-3. Wiring Optional 120/240 Volt Plug



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*	Each 120 V Duplex Receptacle
0	20
5	20
10	19
15	14
20	9
25	4
29	0
V x A = Watts	
*One 240 V load or two 120 V loads	

SECTION 11 – WELDING OPERATION

11-1. Weld Controls

1 Process

Shows icon of welding process and name of welding process (SMAW XX18)

2 Volts Display

Voltage feedback while welding. Voltage preset before welding in CV process.

3 Amps Display

Amperage feedback while welding. Amperage preset before welding in CC process.

4 Arc Control Bar

Shows Arc Control value for each process between SOFT and STIFF

Press Adjust Control/Select button to access Arc Control, then rotate knob to adjust between SOFT and STIFF.

5 Home Button

Press to return to Home screen.

6 Process Button

Press to open Weld Process screen, where weld process can be changed.

7 Auto-Set Button

Press to enable Auto-Set

Upfitter Settings and WLC settings must be entered to enable this feature (see Sections 7-4 and 7-5).

8 Air Compressor Operation Button

Press to turn air compressor On or Off.

9 Weld Settings Button

Press to open Weld Settings screen.

11-2. Process Screen

The diagram shows a central circle with a 'STICK' icon. Surrounding it are seven segments: SMAW XX18 (top, highlighted in blue), SMAW XX10 (top-right), CAC-A (right), GTAW (bottom-right), SPOOL GUN (bottom), FCAW-S (left), and GMAW/FCAW (top-left).

1

2

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

1 Home Button

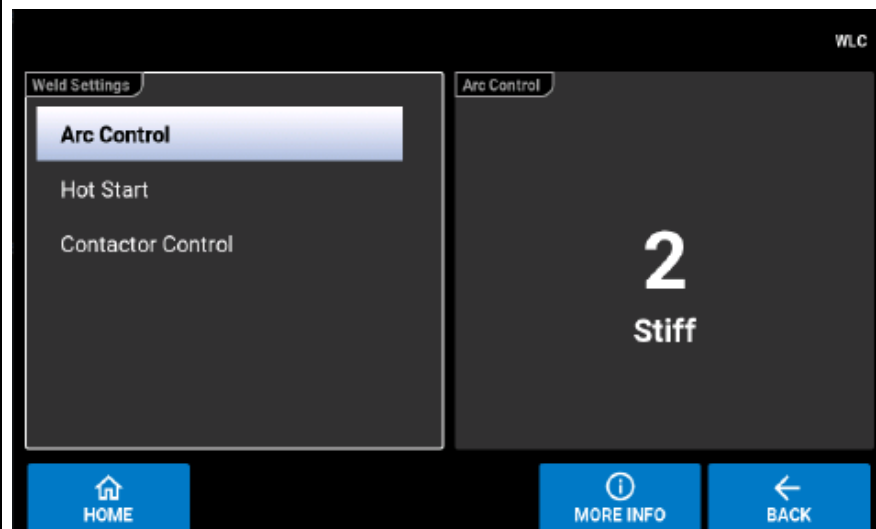
Press to return to Home screen.

2 Back Button

Press to return to Weld screen.

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)	Constant voltage process used for MIG solid wire and dual shield flux core with the use of a externally supplied shielding gas. This process requires the use of a separate wire feeder to support this function.	DCEP(+)
FCAW-S (NO GAS)	Constant voltage process used with self-shielding flux core without use of shielding gas. This process requires the use of a separate wire feeder to support this function.	DCEN(-)
SPOOL GUN (SPOOL)	Constant voltage process used for aluminum/FCAW-s wire types. Requires spool gun with 10 pin connection.	DCEP(+)

11-3. Weld Settings



To access weld settings, press Weld Settings button.

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

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

Soft Buttons:

- Press Home button to return to Home screen.
- Press Back button to return to Menu screen.
- Press More Info button to see detailed information on Weld Settings.

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.
	Hot Start	Provides additional amperage to assist in starting electrode. Adjust in 0.1 second increments to increase or decrease time it takes to transition from hot start current to preset current.
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.
	Electrode Size	2 Selectable Parameters (HDI 365 Air Pak only): 1/8"-5/32" (Continuous Operation) – Allows amperage setting 20 to 150 amps with continuous weld and compressed air operation. 3/16"-1/4" (Intermittent Operation) – Allows amperage setting 20 to 325 amps. Weld output is turned on and air compressor turned off when pressure reaches max setting. Weld output is then turned off and air compressor is turned on when air pressure reaches minimum setpoint. This prevents overload of hydraulic motor with simultaneous high weld output setting and air compressor power requirements. HDI 265 Air Pak: – Allows amperage setting 20 to 265 amps for intermittent operation. Weld output is turned on and air compressor turned off when pressure reaches max setting. Weld output is then turned off and air compressor is turned on when air pressure reaches minimum setpoint. This prevents overload of hydraulic motor with simultaneous high weld output setting and air compressor power requirements.
	Air Pressure Min	Minimum air pressure maintained during CAC-A process.
	Air Pressure Max	Maximum air pressure maintained during CAC-A process.
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.
SPOOL GUN (SPOOL)	Inductance	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)	Inductance	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)		
All	Contact Control	Auto Detect (HDI 365 Air Pak only) – 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.

11-4. Auto-Set Screen

The screenshot shows the Auto-Set screen with the following elements:

- Top Bar:** A row of safety icons including a warning triangle, a person with a tool, a person with a mask, a person with a flame, a person with a spark, a person with a flame, a person with a flame, and a person with a flame.
- Process:** STICK SMAW XX10 DCEP(+)
- Voltage:** 0.0 VOLTS
- Amperage:** 45 AMPS (with a star icon on the gauge)
- Electrode Type:** XX10/11
- Electrode Diameter:** 3/32"
- Material Thickness:** 14 GA
- Buttons:** AIR, BACK
- Labels:** WLC, FF

Numbered callouts point to the following features:

- Electrode Type Button
- Electrode Diameter Button
- Material Thickness Button
- Auto-Set Indicator
- Auto-Set Star
- Air Compressor Operation Button
- Back Button

1 Electrode Type Button
Press to select through electrodes.

2 Electrode Diameter Button
Press to select electrode diameter.

3 Material Thickness Button
Press to select material thickness range.

4 Auto-Set Indicator
Represents recommended setting range for selected welding parameters.

5 Auto-Set Star
Star appears and text turns blue when recommended setting is selected.

6 Air Compressor Operation Button
Press to turn air compressor On or Off.

7 Back Button
Press to disable Auto-Set.

Upfitter Settings and WLC settings must be entered to enable this feature (see Sections 7-4 and 7-5).

Options change depending on weld process selected.

11-5. 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.

Select weld cables that meet all applicable local and national regulations.

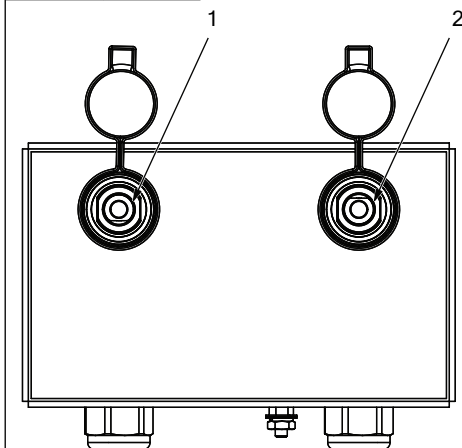
	Weld Cable Size** and Total Cable (Copper) Length in Weld Circuit Not Exceeding***							
	100 ft (30 m) or Less		150 ft (45 m)	200 ft (60 m)	250 ft (70 m)	300 ft (90 m)	350 ft (105 m)	400 ft (120 m)
Welding Amperes	10 - 60% Duty Cycle AWG (mm²)	60 - 100% Duty Cycle AWG (mm²)	10 - 100% Duty Cycle AWG (mm²)					
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)

* 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. () = mm² 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>.

11-6. Weld Output Terminals



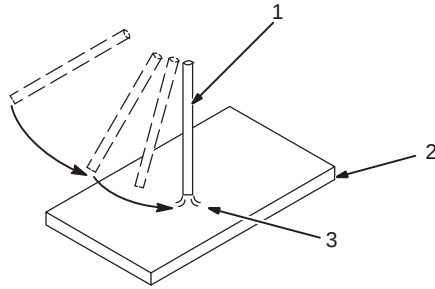
- ⚠ Turn off power before connecting to weld output terminals.
- ⚠ Do not use worn, damaged, undersized, or repaired cables.

- 1 Positive (+) Weld Output Terminal
- 2 Negative (-) Weld Output Terminal

The weld output terminals require Tweco style connectors.

To connect base unit to weld output terminals, see Section 5-6.

11-7. Stick Start Procedure—Scratch Start Technique



With Stick selected, start arc as follows:

- 1 Electrode
- 2 Workpiece
- 3 Arc

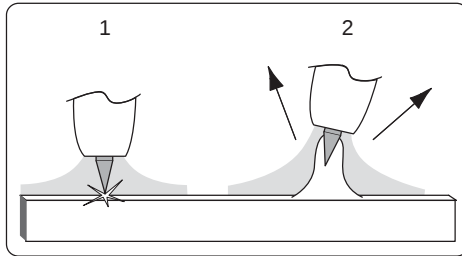
Drag electrode across workpiece like striking a match; lift electrode slightly after touching work. If arc goes out electrode was lifted too high. If electrode sticks to workpiece, use a quick twist to free it.

Miller recommends Hobart filler metals.

11-8. Lift-Arc™ TIG With Auto-Stop™ And Auto-Crater™



Arc Start With Lift-Arc



Arc Start With Lift-Arc TIG

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

Select GTAW at Process screen.

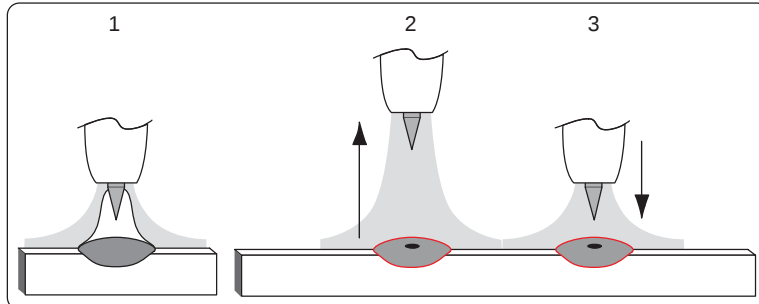
Turn gas on.

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.

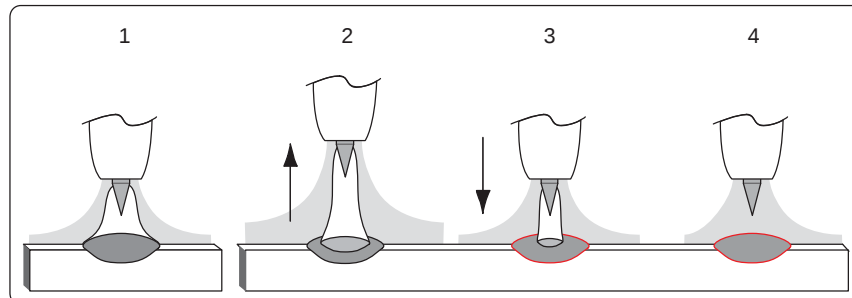
Arc End With Auto-Stop



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



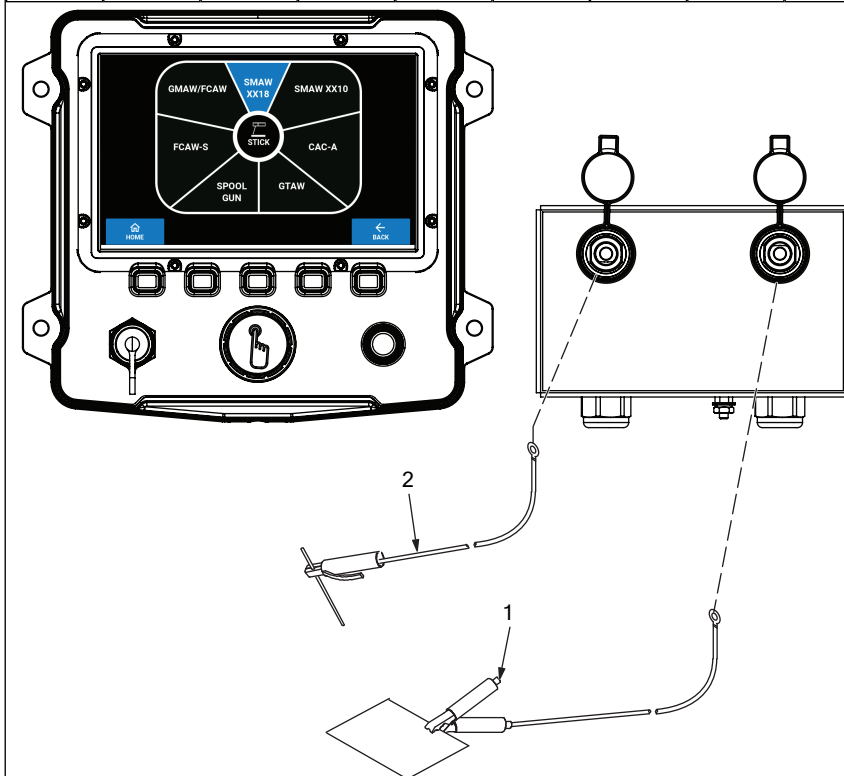
Arc End With Auto-Crater

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.

11-9. Typical Stick Welding Connections And Control Settings



⚠ Disengage hydraulic motor.

☞ 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 11-5).

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

Connect Work cable to Negative terminal and Electrode holder cable to Positive terminal on remote panel.

- 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.

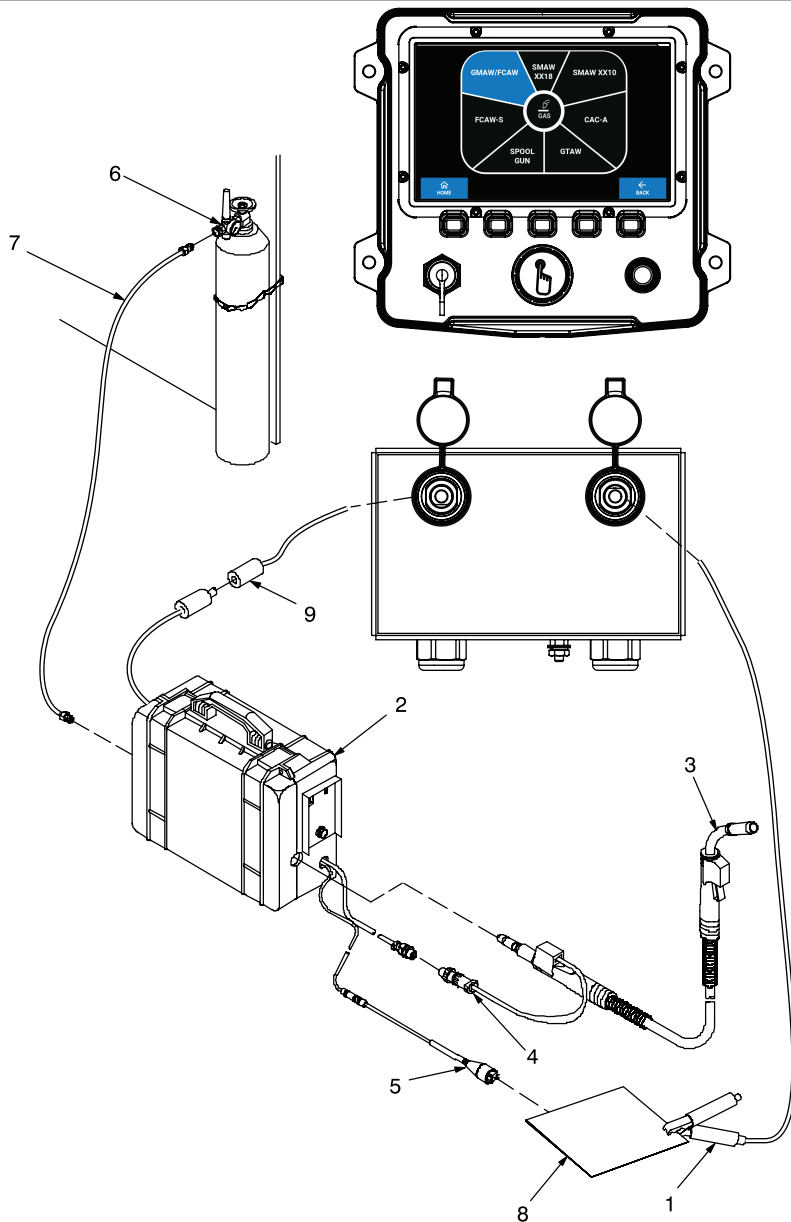
Recommended Process Stick Electrodes:

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

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

☞ Miller recommends Hobart filler metals.

11-10. MIG Welding Connections And Settings



250 916-A / 802 766 / 250 290-C

Disengage hydraulic motor.

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:
100 CO₂/75/25 Argon-Based Gas for Short Circuit Transfer
- 7 Gas Hose
- 8 Work
- 9 Quick Connector

Connect work cable to remote panel negative terminal. Connect cable from wire feeder to remote panel positive terminal.

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

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.

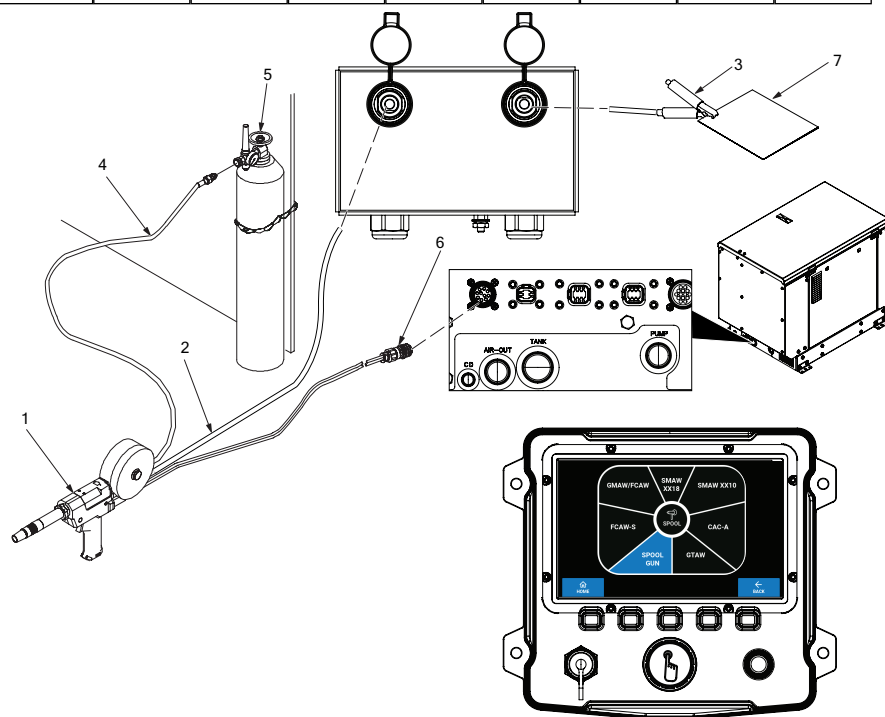
Insert gun trigger plug (item 4) into matching receptacle and tighten threaded collar.

Connect gas hose from feeder to regulator on cylinder.

Typical Auto-Set 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.

11-11. Connecting Spool Gun



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 11-3).

Connect Weld power cable from spool gun to positive terminal.

Connect work cable to remote panel negative terminal.

Insert spool gun plug into receptacle and tighten threaded collar.

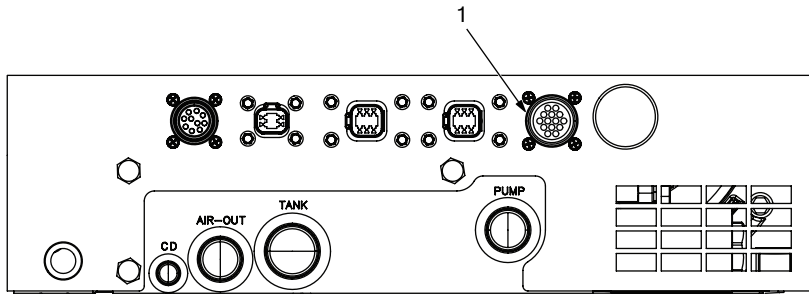
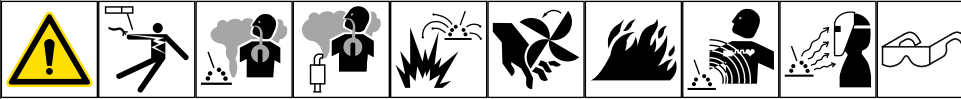
Connect gas hose from spool gun to regulator on gas bottle.

Miller recommends Hobart filler metals.

Calibrating Spool Gun

Calibration ensures wire feed speed (WFS) is accurate. To calibrate, select Calibration WFS on Weld Settings screen (see Section 11-3), 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.

11-12. Remote Voltage/Amperage Control (HDI 325 AirPak only)



1 Remote Receptacle RC41

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

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.

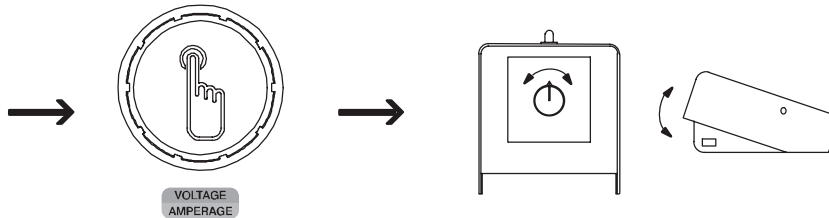
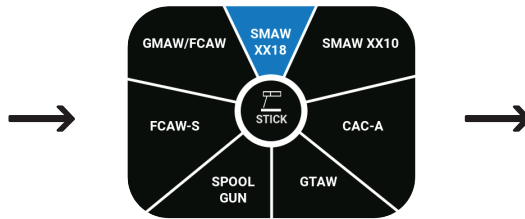
Connect remote V/A control to 14 pin remote receptacle.

Set process (Stick shown).

Set V/A control to 160A.

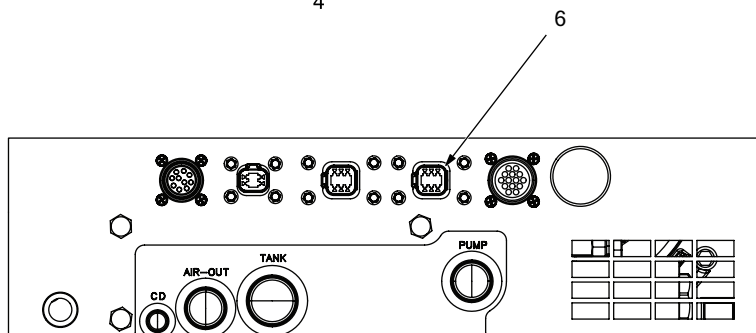
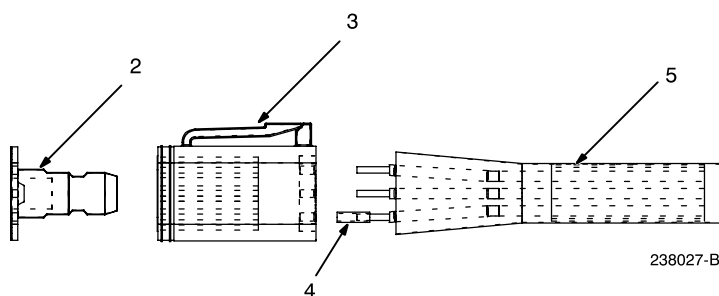
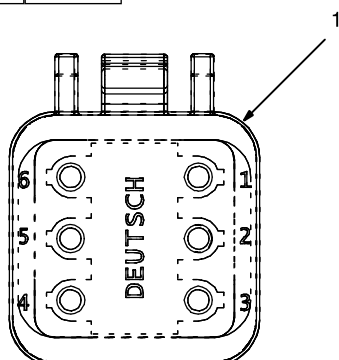
Adjust remote V/A control (stick welding only).

Min 30 A DC; Max 160 A DC



SECTION 12 – CAN BUS CONNECTION

12-1. CAN Bus Connection



1 CAN Bus Connector

CAN bus connection is provided to allow read-only data communication. Data is available through CAN bus connector located at connection panel on the front of unit. Data is transmitted when unit is On. 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 busreceptacle.

12-2. HDI 325 and HDI 265 J1939 Messages

Message	Notes	Ac- ro- nym	ID (Hex)	PGN (Dec- imal)	Start Posi- tion	Len- gth	SPN (Deci- mal)	Tx Rate (ms)	Tran- smit	Re- ceiv- e	Pri- ority
Machine Speed	0 to 8031.875rpm 0.125rpm/ bit 0 offset	EE- C1	1CF004E4	6144- 4	4	2 bytes	190	200	X		3
Error State	See Table 12-2.	pro- prietary	1CFF78E4	6540- 0	3	1 byte	5161- 07	100	X		6
Machine Hours	Actual machine hours 0 to 65535 hours 1 hour/bit 0 offset	pro- prietary	1CFF79E4	6540- 1	1	2 bytes	5161- 10	1000	X		7
Compressor Hours	Actual compressor clutch on hours 0 to 65535 hours 1 hour/bit 0 offset	pro- prietary	1CFF7AE4	6540- 2	1	2 bytes	5161- 12	1000	X		7
Compressor Mainte- nance Hours	Actual hours until compressor oil change is required -32767 to 32767 hours 1 hour/bit 0 offset	pro- prietary	1CFF7AE4	6540- 2	3	2 bytes	5161- 13	1000	X		7
Brush Maintenance Hours	Actual hours until brush re- placement is required -32767 to 32767 hours 1 hour/bit 0 offset	pro- prietary	1CFF7CE4	6540- 4	1	2 bytes	5161- 14	1000	X		7
Aux Power Lifetime Usage	Actual aux power usage hours 0 to 65535 hours 1 hour/bit 0 offset	pro- prietary	1CFC10E4	6452- 8	1	2 bytes	5161- 25	3000	x		7
Weld Lifetime Usage	Actual weld usage hours 0 to 65535 hours 1 hour/bit 0 offset	pro- prietary	1CFC40E4	6457- 6	1	2 bytes	5161- 26	3000	x		7
Machine Idle Time Lifetime Usage	Actual idle time usage hours 0 to 65535 hours 1 hour/bit 0 offset	pro- prietary	1CFC70E4	6462- 4	1	2 bytes	5161- 27	3000	x		7

Table 12-1. 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	228	

Table 12-2. 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 hydraulic motor 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 BOOST OVERCURRENT FAULT	6	Weld module boost current exceeded threshold during operation.
WELD MODULE PRIMARY CT FAULT	7	Transformer primary current exceeded threshold.
WELD MODULE CS FAULT	8	Output CT not reading correctly

Error	Value	Detection
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 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 SPOOLGUN NOT CONNECTED	20	Spool gun weld process selected without Spool gun connected to unit.
WELD SPOOLGUN MOTOR FAULT	21	Spool gun motor fault.
WELD FAN 1 STUCK FAULT	22	Weld fan 1 not spinning.
WELD FAN 2 STUCK FAULT	23	Weld fan 2 not spinning.
WELD FAN 1 RPM FAULT	24	Weld fan 1 not sending speed feedback.
WELD FAN 2 RPM FAULT	25	Weld fan 2 not sending speed feedback.
CHECK REMOTE FAULT	27	14 pin remote lost connection while welding.
AIR COMPRESSOR OVER PRESSURE	29	Tank pressure over 185 psi. Reduce tank pressure to 165 psi to clear.
AIR COMPRESSOR OVER TEMPERATURE	30	Air compressor oil temp over 125°C.
AIR COMPRESSOR THERMISTOR OPEN	31	Air compressor thermistor reading below valid temperature.
AIR COMPRESSOR THERMISTOR LOW	32	Air compressor thermistor reading above valid temperature.
AIR COMPRESSOR TRANSDUCER HIGH	33	Air compressor pressure transducer reading above valid pressure.
AIR COMPRESSOR TRANSDUCER LOW	34	Air compressor pressure transducer reading below valid pressure.
HYDRAULIC FAULT OVER PRESSURE	37	Hydraulic pressure over 3250 psi.
HYDRAULIC OVER TEMPERATURE	38	Hydraulic oil temp over 80°C.
HYDRAULIC THERMISTOR OPEN	39	Hydraulic thermistor reading below valid temperature.
HYDRAULIC THERMISTOR LOW	40	Hydraulic thermistor reading above valid temperature.
HYDRAULIC TRANSDUCER HIGH	41	Hydraulic pressure transducer reading above valid pressure.
HYDRAULIC TRANSDUCER LOW	42	Hydraulic pressure transducer reading below valid pressure.
MACHINE SPEED FEEDBACK FAULT	43	Generator speed feedback signal lost.
MACHINE OVER RUN FAULT	44	Generator speed over 4200 RPM.

Table 12–3. 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 13 – MAINTENANCE AND TROUBLESHOOTING

13-1. Maintenance Label

GENERATOR		1000 h Brushes MILLER: 493509	2000 h / 2 yr MILLER: 296473 Bando USA Inc.: 8PK915
AIR COMPRESSOR		500 h / 1 yr MILLER: 232207*	1000 h / 1 yr Air/Oil Separator MILLER: 232209*
8 h	500 h MILLER: 262573*	2000 h / 2 yr HDI 265 MILLER: 298212 Bando USA Inc.: 6PK1000 HDI 325 MILLER: 287273 Bando USA Inc.: 6PK0975	
HYDRAULIC SYSTEM		8 h	1000 h / 1 yr See Owner's Manual for hydraulic fluid recommendations.
DRIVE COUPLER		500 h	2000 h / 1 yr Coupler Spider MILLER: 296687 296633-B

13-2. Maintenance Screen











1 Maintenance screen displays compressor oil hours for unit and allows user to reset oil change hours and change interval (only shorter than recommended).

1 Hours Before Next Oil Change Required

Soft Buttons:

- Press Home button to go to Home screen.
- Press Back button to go to Menu screen.
- Press Reset button to reset maintenance item to starting hours selected.
- Press Customize button to adjust alert or starting interval hours.
- Press Service Log button to view service log of unit.

Maintenance

- Compressor Oil**
- Air/Oil Separator
- Brushes
- Belts
- Drive Coupler

WLC

Compressor Oil

0 Hours Remaining

0 Hour Alert
500 Hour Interval

Replace Compressor Oil & Filter
Check Compressor Air Filter


HOME


RESET


CUSTOMIZE


SERVICE LOG


BACK

13-3. Routine Maintenance



Stop hydraulic flow before maintaining.

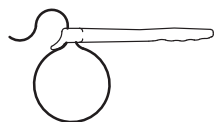
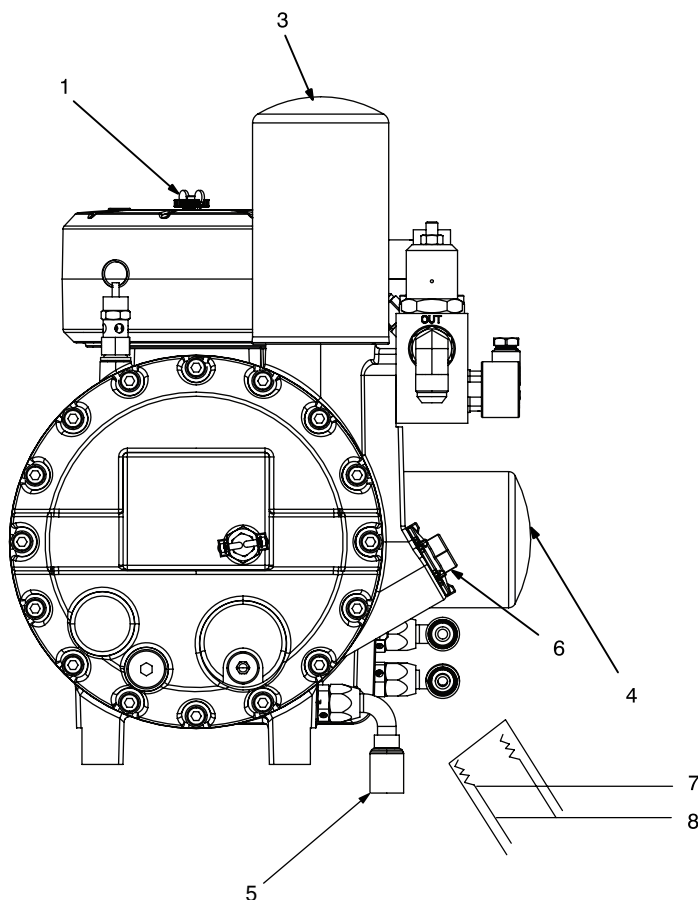
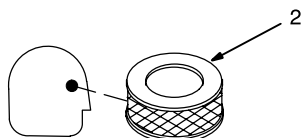
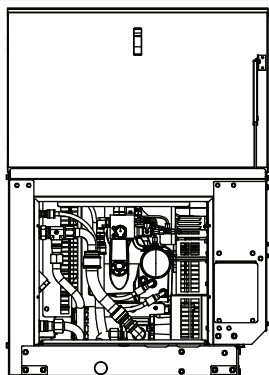
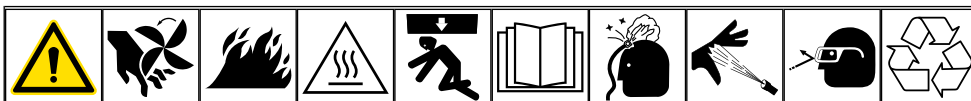
Recycle fluids.

Replace compressor oil and filter after the first 50 hours of operation.

Maintenance Schedule		Every 8 Hours	Every 100 Hours	Every 500 Hours	Every 800 Hours	Every 1000 Hours Or Every Year	Every 2000 Hours Or Every 2 Years	Reference
Prestart	Check compressor and hydraulic oil levels. Inspect each system for leaks. Clean any oil spills.	•						
Weld Terminals	Clean		•					
Labels	Replace any unreadable labels.		•					
Compressor Air Cleaner Element	Replace			•				Section 13-4
Compressor Oil	Change			•				Section 13-4
Compressor Oil Filter	Replace			•				Section 13-4
Drive Coupler	Inspect spider and replace if necessary.			•				
Weld Cables	Inspect and replace if necessary.				•			
Brushes*	Check brushes and replace if necessary.					•		
Slip Rings*	Check slip rings for any signs of wear or damage.					•		
Inside Unit	Clean					•		
Hydraulic Fluid	Change hydraulic fluid in entire system					•		
Hydraulic Filter	Replace					•		
Compressor Air/Oil Separator	Replace					•		Section 13-4
Belts	Replace compressor and main drive belt.						•	
Drive Coupler	Replace spider.						•	

*To be done by factory authorized service agent.

13-4. Changing Compressor Oil, Oil Filter, Air Cleaner, And Air/Oil Separator



⚠ Stop hydraulic flow.

⚠ Do not open oil fill cap until unit has been off for 10 minutes and pressure in the case has been released. Do not open while running.

⚠ Do not run air compressor without air cleaner or with dirty element. Compressor damage caused by using a damaged element is not covered by the warranty.

1 Compressor Air Cleaner Cover

2 Air Cleaner Element

Wipe off cover. Remove cover and element. Wipe dust from cover and housing with damp cloth. Inspect element and install new element if necessary. Reinstall cover.

⚠ Do not clean element with compressed air.

3 Air/Oil Separator

To replace air/oil separator:

Turn filter counterclockwise. Remove filter.

Apply thin coat of oil to gasket on new filter. Install filter and turn clockwise 1/2 to 3/4 turn after gasket contact is made.

4 Air Compressor Oil Filter

5 Oil Drain Hose

6 Oil Fill Pipe Cap

To change compressor oil and filter:

☞ Make sure pressure gauge reads 0 PSI before changing oil and filter.

Drain compressor oil while compressor is still warm.

Remove oil drain plug located on the end of the oil drain hose to drain oil.

Remove filter by turning filter counterclockwise. Fill new oil filter with oil and apply thin coat of oil to gasket on new filter. Install new filter and turn clockwise 1/2 to 3/4 turn after gasket contact is made.

Reinstall oil drain plug and torque to 12 ft lb.

Add recommended oil until oil level is half way up oil fill pipe (see compressor maintenance label for oil specifications). Reinstall oil fill cap. Hand-tighten cap to prevent pressure release.

7 High/Max

8 Low/Min

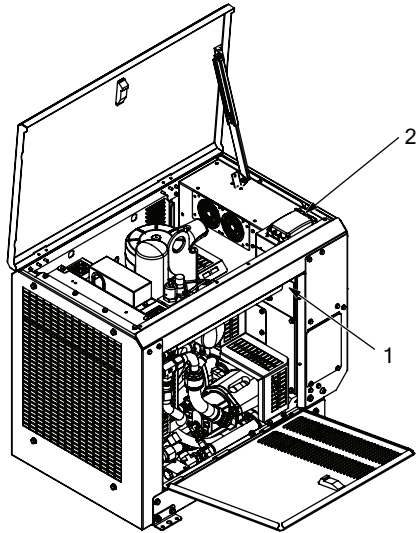
☞ Bottom of oil sight glass is minimum oil level. Top of oil sight glass is full.

Start hydraulic flow, run air compressor, and check for oil leaks.

⚠ Stop hydraulic flow.

Check oil level and top off to fill line if necessary.

13-5. Overload Protection



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

1 Supplementary Protector CB1

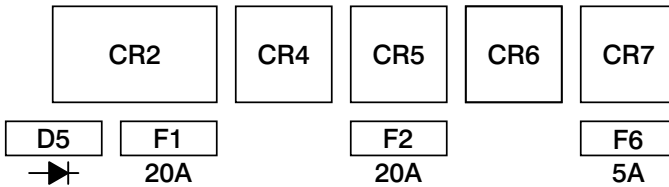
CB1 is located inside side service door below fuse/relay module.

2 Fuse/Relay Module Label

Control fuses are located in fuse/relay module located in compressor compartment. Fuses protect control components.

CR2 – Engine Speed Relay
CR4 – Comp Clutch Relay
CR5 – Valve/Gen/Clutch Control
CR6 – Weld Module Relay
CR7 – Safety Interlock Relay

D5 – Blocking Diode
F1 – Battery Supply
F2 – Battery Supply
F6 – Can Bus Power



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13-6. Fault Displays



Use the fault displays to diagnose and correct fault conditions.

When a fault is displayed, normally weld output has stopped but generator power output may be okay.

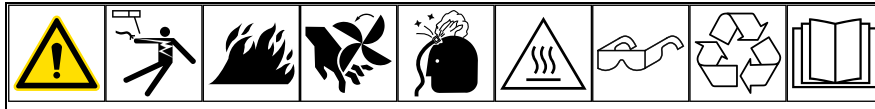
To reset fault displays, stop unit and then restart.

LCD Message	Help Code	Problem	Possible Cause	Potential Solution
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 sec.	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 motor 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.	Power cycle unit to clear.
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.
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.

LCD Message	Help Code	Problem	Possible Cause	Potential Solution
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.
Inverter Fan1 Stuck Error - Have Power Module Serviced	ERR FE00	Inverter fan 1 not rotating.	Obstruction	Contact a Factory Authorized Service Agent.
Inverter Fan2 Stuck Error - Have Power Module Serviced	ERR FE01	Inverter fan 2 not rotating.	Obstruction	Contact a Factory Authorized Service Agent.
Inverter Fan1 RPM Error - Have Power Module Serviced	ERR FE02	Inverter fan 1 not rotating at commanded speed.	Bad fan.	Contact a Factory Authorized Service Agent.
Inverter Fan2 RPM Error - Have Power Module Serviced	ERR FE03	Inverter fan 2 not rotating at commanded speed.	Bad fan.	Contact a Factory Authorized Service Agent.
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.
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.
Remote Disconnected Error - Remote Disconnected With Contactor Control. Clear To Enable Output	ERR RE00	Lost 14-pin remote command with contactor control.	Remote disconnected.	Re-connect remote and/or clear error message to re-enable output.
AC Over Pressure - Reduce Tank Pressure	ALRT AV00	Tank pressure over 185 PSI.	Compressor pumping air past set point.	Reduce pressure in tank.
AC Over Temp - Wait For Temp To Drop	ALRT AT00	Air compressor oil temp over 257°F (125°C).	High air demand.	Wait for unit to cool.
AC Thermistor Open Error - Have Unit Serviced	ERR AH00	Air compressor thermistor reading above valid temperature.	Thermistor not connected.	Contact a Factory Authorized Service Agent.
AC Thermistor Short Error - Have Unit Serviced	ERR AH01	Air compressor thermistor reading below valid temperature.	Thermistor shorted.	Contact a Factory Authorized Service Agent.
AC Transducer Open Error - Have Unit Serviced	ERR AH02	Air compressor pressure transducer reading above valid pressure.	Transducer not connected.	Contact a Factory Authorized Service Agent.
AC Transducer Short Error - Have Unit Serviced	ERR AH03	Air compressor pressure transducer reading below valid pressure.	Transducer shorted.	Contact a Factory Authorized Service Agent.
Hydraulic Over Pressure - Reduce Hydraulic Pressure	ERR YV00	Hydraulic system pressure over 3250 PSI.	Faulty hydraulic pump.	Reduce pressure in tank.
Hydraulic Over Temp - Wait For Temp To Drop	ALRT YT00	Hydraulic oil temp over 176°F (80°C).	High air demand.	Wait for unit to cool.
Hydraulic Thermistor Open Error - Have Unit Serviced	ERR YH00	Hydraulic oil thermistor reading above valid temperature.	Thermistor not connected.	Contact a Factory Authorized Service Agent.
Hydraulic Thermistor Short Error - Have Unit Serviced	ERR YH01	Hydraulic oil thermistor reading below valid temperature.	Thermistor shorted.	Contact a Factory Authorized Service Agent.
Hydraulic Transducer Open Error - Have Unit Serviced	ERR YH02	Hydraulic pressure transducer reading above valid pressure.	Transducer not connected.	Contact a Factory Authorized Service Agent.
Hydraulic Transducer Short Error - Have Unit Serviced	ERR YH03	Hydraulic pressure transducer reading below valid pressure.	Transducer shorted.	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.

LCD Message	Help Code	Problem	Possible Cause	Potential Solution
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.
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.
Weld Inverter Board Communication Error - Cycle Power	ERR SA01	CAN communication timeout to weld inverter board.	Indicates issue with CAN communication between UI and weld inverter boards.	Contact a Factory Authorized Service Agent.
Control Board Communication Error - Cycle Power	ERR SA02	CAN communication timeout to control board.	Indicates issue with CAN communication between UI and control 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.
Machine Speed Sense Error - Have Unit Serviced	ERR YR00	Machine speed feedback lost from generator output. Machine speed deviates from command.	No generator output for speed feedback or machine speed does not match command speed from control board. Verify generator output is correct, speed transformer is functioning correct and wiring is good.	Contact a Factory Authorized Service Agent.
Machine Speed Overrun Error - Have Unit Serviced	ERR YR01	Machine speed is greater than 4200 RPM or loss of RPM feedback.	Machine speed does not match command speed from control board. Verify generator output is correct, speed transformer is functioning correct and wiring is good.	Contact a Factory Authorized Service Agent.

13-7. Troubleshooting



A. Compressor Troubleshooting

Trouble	Remedy
Air compressor does not operate; no air pressure on gauge; no clutch engagement.	Go to the Home screen and enable the compressor by pressing Air Compressor Operation button. If compressor is turned off, wait for air pressure to bleed off before turning compressor on again.
	Pressure downstream of compressor outlet above MIN pressure setting keeps compressor from engaging. Compressor will engage when outlet pressure reduces below MIN pressure.
	Check for over pressure. Check pressure settings and reduce if necessary. Turn compressor off to reset.
	Check for restricted air line between compressor and tank.
	Check for over temperature. Allow unit to cool. Recirculation or open covers may cause overheating. Be sure all covers, panels, and doors are in place. Operate in area with proper airflow. Automatic shutdown stops compressor if compressor temperature is too high.
	Check compressor belt and tension. Be sure correct belt is used and is properly installed. Replace belt if damaged or worn.
	Have Factory Authorized Service Agent check air compressor control circuit and clutch.
Air compressor stops producing air, or air compressor cycles on and off.	Compressor idle down causes compressor to turn off when set pressure is reached.
	During air use, compressor pressure will continue to decrease if using more than 60 CFM. Decrease load, or allow compressor to build pressure between loads. Compressor will automatically produce air when a load is applied, unless it is a light load such as an air leak. For light loads, pressure will decrease to MIN pressure and then increase to MAX pressure.
	Check for air leaks downstream of compressor outlet. Air leaks cause more frequent compressor cycling. Repair all air leaks.
	Check function of minimum pressure check valve.
	Check for over pressure. Check pressure settings and reduce if necessary. Turn compressor off to reset.
	Check that air tank is 10 gallons or more.
	Check compressor oil level (see Section 13-4). Automatic shutdown stops compressor if compressor temperature is too high.
	Check for over temperature. Allow unit to cool. Recirculation or open covers may cause overheating. Be sure all covers, panels, and doors are in place. Operate in area with proper airflow. Automatic shutdown stops compressor if compressor temperature is too high.
	Have Factory Authorized Service Agent check and clean compressor cooler core. Automatic shutdown stops compressor if compressor temperature is too high.
Compressor operates, but air pressure is low.	Verify adequate air flow to compressor. Check for blocked air intake.
	Check for leaks in air lines and hoses.
	Adjust compressor air pressure.
	Reduce air demand/close air outlet valve.
	Run compressor to increase temperature above freezing.
	Check for frozen lines or hoses downstream from compressor outlet.
	Blowdown valve is frozen. Run compressor to build heat and blowdown valve will return to normal operation.
	Check compressor air cleaner (see Section 13-4).
	Check compressor oil level (see Section 13-4).
	Check air/oil separator, and replace if plugged (see Section 13-4).
	Check compressor belt and tension. Be sure correct belt is used and is properly installed. Replace belt if damaged or worn.
	Have Factory Authorized Service Agent check solenoid blow down valve, and for leaks in control lines. Also check compressor for rated output.
High air pressure.	Check air compressor gauge. Adjust compressor air pressure.
	Check for frozen control lines.

Trouble	Remedy
Oil in air from compressor.	Check compressor oil level (see Section 13-4). If oil level is too high, system becomes saturated with oil.
	Open line (nothing connected to compressor outlet) will result in oil in air. Do not operate with open air line.
	Change compressor air/oil separator if close to replacement hours (see Section 13-3).
	Check for plugged air/oil separator filter or distorted sealing washer below the separator filter stem.
	Wrong or mixed oil results in foaming which can cause oil in air. If mixed oil is suspected, replace oil, oil filter, and air/oil separator.
	Have Factory Authorized Service Agent check for plugged oil scavenge line.
Air compressor overheats. Display reads "Air Comp Over Temp."	Check that all covers, panels, and doors are in place during operation.
	Check compressor oil level (see Section 13-4). Low oil level causes increased compressor temperature. Automatic shutdown stops compressor if compressor temperature is too high.
	Recirculation or open covers may cause overheating. Be sure all covers, panels, and doors are in place. Operate in area with proper airflow. Automatic shutdown stops compressor if compressor temperature is too high.
	Check/clean oil cooler.
	Verify adequate air flow to compressor. Check for blocked air intake.
	Adjust compressor air pressure.
	Replace compressor oil filter (see Section 13-4).
	Wrong oil or mixed oil. Drain oil and replace with factory oil and filter.
	Have Factory Authorized Service Agent check temperature sensor.
Oil in compressor air cleaner.	Have Factory Authorized Service Agent verify compressor inlet valve is operating properly.
Water in compressor oil. Oil appears milky.	Operate air compressor continuously under pressure to allow the compressor to reach operating temperature. Water in oil is often caused by intermittent use in which compressor does not reach temperature.
	If oil still appears milky, change oil, oil filter, and air/oil separator.
Water in air from compressor.	Some water in air from compressor is normal. Install air line water separator if necessary.
Compressor case retains pressure after shutdown.	Have Factory Authorized Service Agent check compressor blow down valve.

B. Battery Charge/Jump-Start/Crank Assist Troubleshooting

Trouble	Remedy
No battery charge/jump start/crank assist output.	Be sure battery is connected.
	Check polarity.
	Be sure Battery Charge gauge displays 12V or 24V according to the voltage of the battery being charged.
	Start Battery Charge process from the Battery Charge screen.
	Check battery voltage. Charging may be finished.
	Have Factory Authorized Service Agent check battery charge circuitry.
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.
	Check condition of battery.

C. Generator Power Troubleshooting

Trouble	Remedy
No or low generator power output at AC receptacles.	Reset supplementary protector(s) (see Section 13-5).
	Access Home screen to view generator speed. Verify hydraulic motor speed does not increase above to 3600 rpm with auxiliary power load.
	Have Factory Authorized Service Agent check brushes and slip rings and PC2.
	Be sure all equipment is disconnected from receptacles when starting unit.
Low power output at AC receptacles.	Access Home screen to view generator speed. Verify generator speed increases to 3600 rpm with auxiliary power load.
	Verify there is no weld load.
High power output at AC receptacles.	Access Home screen to view generator speed. Verify hydraulic motor speed increases to 3600 rpm with auxiliary power load.
CB1 trips when generator starts or CB1 is reset	Ensure all equipment is disconnected from receptacles when starting unit.
	Disconnect compressor sump heater at RC37/PLG37 (leads 93, 84, and 42).
	Disconnect compressor block heater lead 94 at blue fast-on connection.
	Have Factory Authorized Service Agent check inverter module.

D. Hydraulic Troubleshooting

Trouble	Remedy
Low generator speed.	Reduce load on unit.
	Have Factory Authorized Service Agent check hydraulic flow and pressure input.
Generator speed oscillating.	Confirm hydraulic fluid is above minimum operating temperature.
	Confirm fluid used is within recommended operating viscosity range.
	Reduce load on unit.
	Have Factory Authorized Service Agent check hydraulic flow and pressure input.
Unit overheats. Display reads "Hydraulic Over Temp."	Check that all covers, panels, and doors are in place during operation. Recirculation or open covers may cause over heating. Operate in area with proper air flow.
	Check hydraulic fluid level. Low oil level causes increased temperatures. Automatic shutdown stops unit if hydraulic fluid temperature is too high.
	Check/clean oil cooler.
	Verify adequate air flow to unit. Check for blocked air intake.
	Verify cooling fan operation.
	Reduce duty cycle.

E. Welding Troubleshooting

Trouble	Remedy
No weld output or generator power output at AC receptacles.	Be sure all equipment is disconnected from receptacles when starting unit.
	Check and reset circuit breaker CB1.
	Have Factory Authorized Service Agent check brushes and slip rings and PC2.
No weld output; generator power output okay at AC receptacles.	Check weld connections.
	Have Factory Authorized Service Agent check PC1 and weld/battery charge inverter.
No weld output during generator power load.	Reduce generator load.
Low weld output.	Check Weld Output control setting.
	Check weld cable size and length.
	Access Home screen to view generator speed (see Section 7-2).
	Have Factory Authorized Service Agent check PC1 and weld/battery charge inverter.
High weld output.	Check Weld Output control setting.
Erratic weld output.	Check Weld Output control setting.
	Tighten and clean connections to electrode and workpiece.
	Use dry, properly stored electrodes for Stick welding.
	Remove excessive coils from weld cables.
	Clean and tighten connections both inside and outside welder/generator.
	Access Home screen to view generator speed (see Section 7-2).

SECTION 14 – PARTS LIST

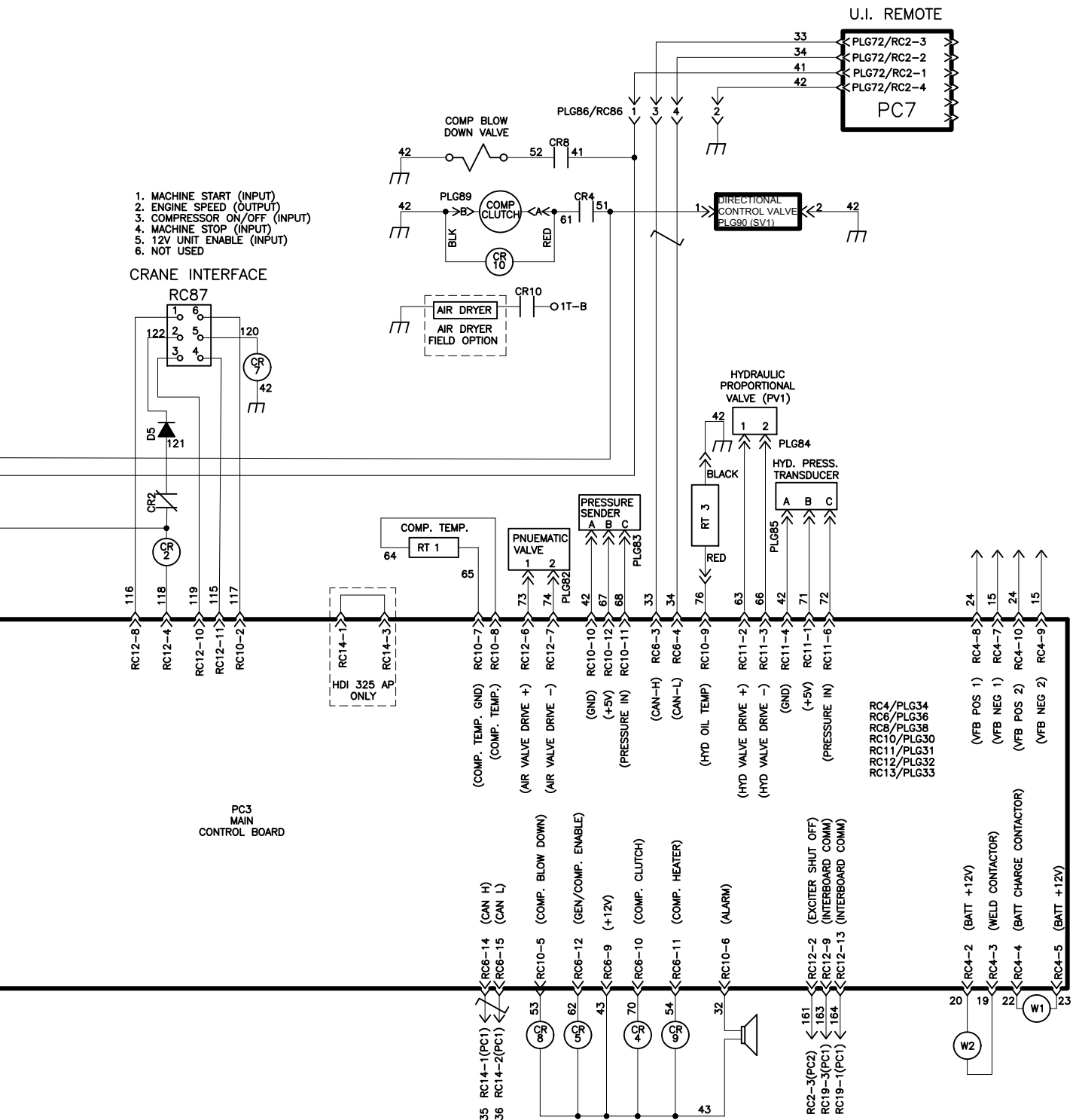
14-1. Recommended Spare Parts

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
		493509	Brushholder Assy, Generator	1
		296473	Belt, Motor Drive	1
		298212*	Belt, HDI 265 Compressor	1
		287273*	Belt, HDI 325 Compressor	1
		298687	Spider, Drive Coupler	1
		279123	Kit, Filter/Separator, Compressor (Includes)	1
		232207	—Filter, Oil Air Compressor	1
		276620	—Oil, Air Compressor Rotary Screw (Synthetic) (Quart)	3
		232209	—Separator, Oil/Air Rotary Screw Compressor	1
		262573	—Filter, Inlet Air Air Compressor	1
	F1, F2	281760	Fuse, Mini Blade Atm 20. Amp 32 Volt	2
	F6	281758	Fuse, Mini Blade Atm 5. Amp 32 Volt	1
	CR2	283807	Relay, Encl 12VDC NC/NO 20A/14VDC	1
	CR4, CR5, CR6, CR7	281755	Relay, Encl 12VDC Spst 20A Skt Mtg	4
	CR8	173069	Relay, Encl 12VDC NC/NO 20A/14VDC	1
	CR9	113247	Relay ,Encl 12VDC DPDT 20A/120VAC	1
	W1	288400	Contact, 14VDC	1
	W2	274641	Contact, 14DC CO Encl	1

*Confirm unit model number.



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⚠ 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.

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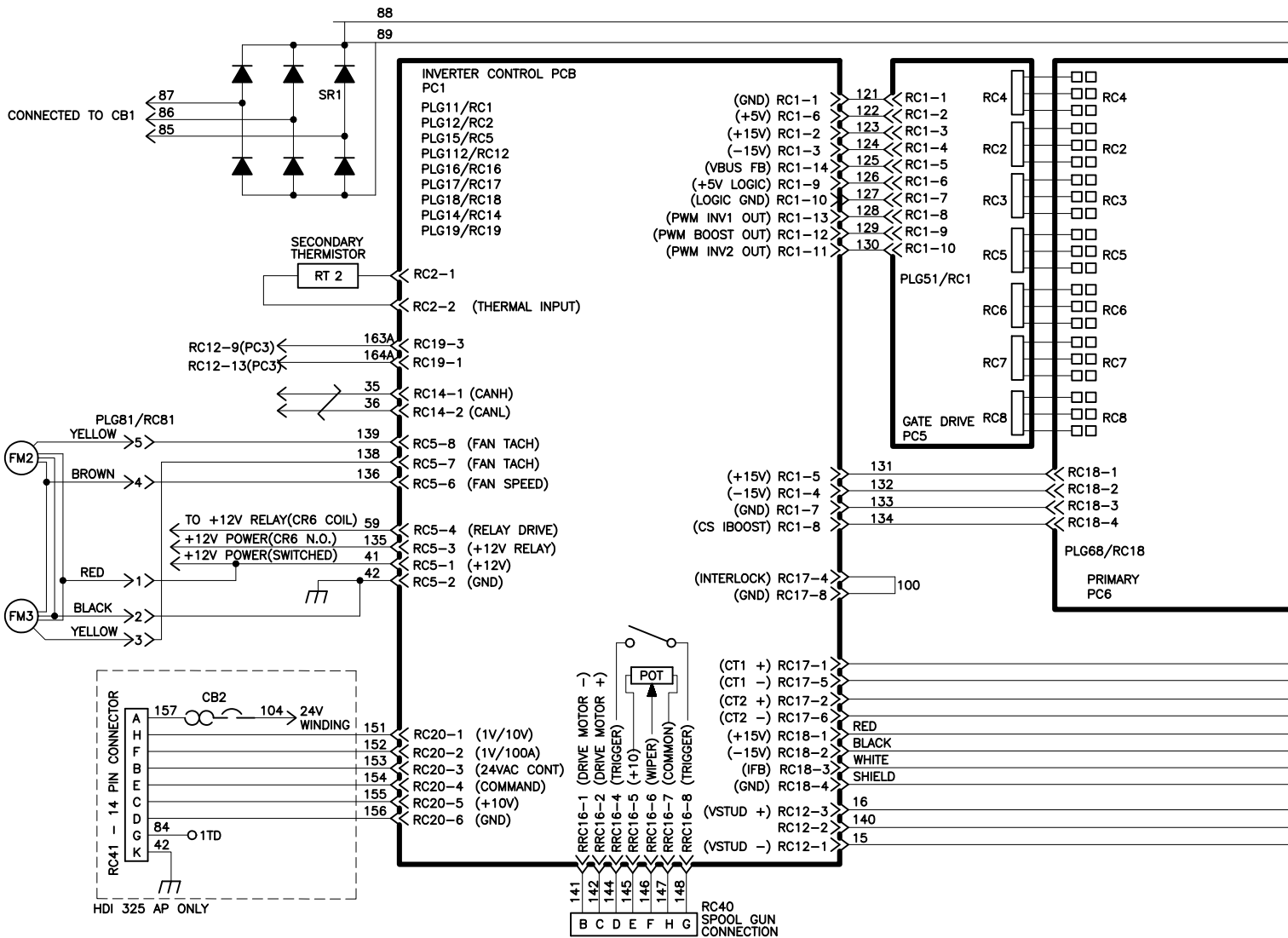
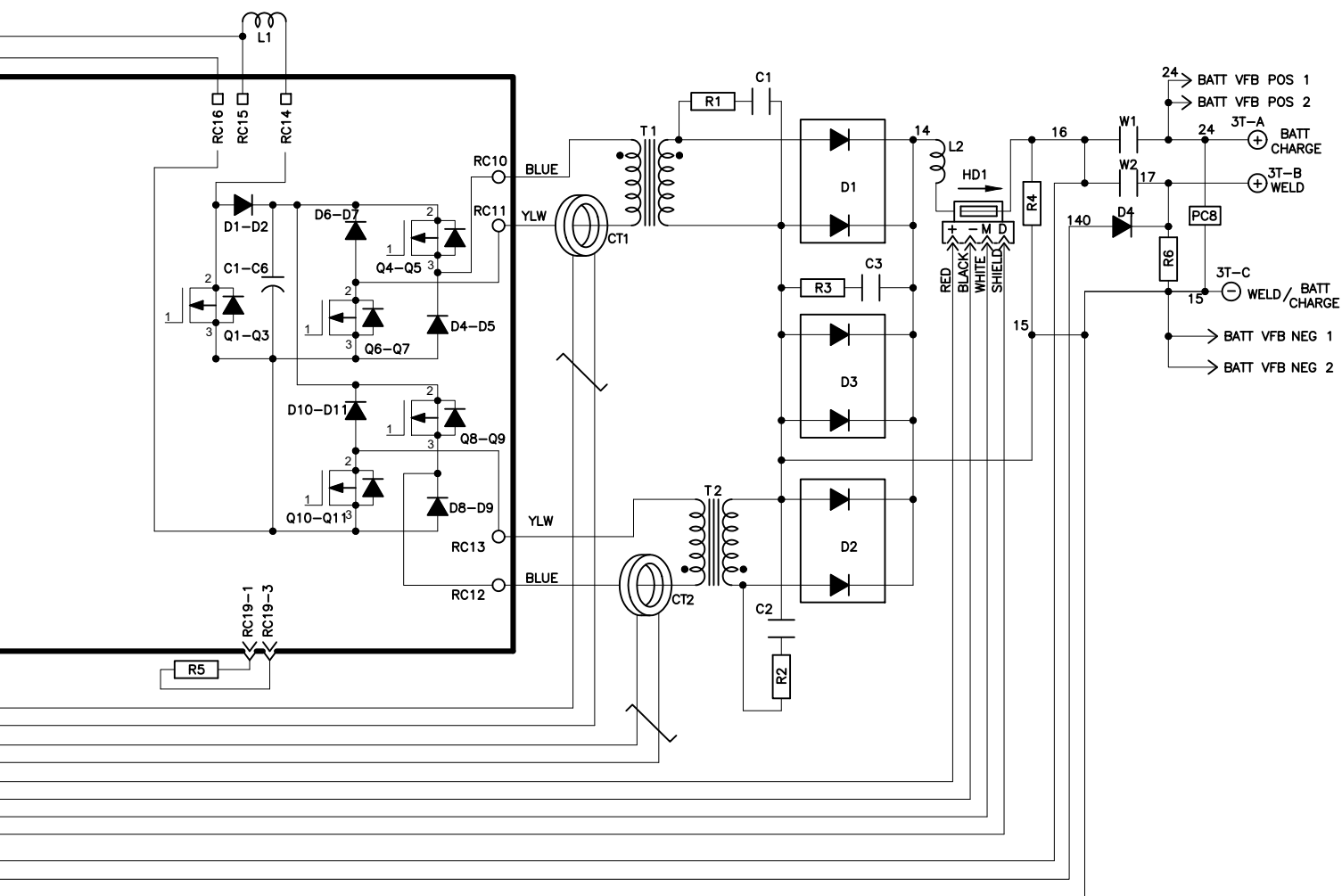


Figure 15-2. Circuit Diagram (Page 2 of 2)

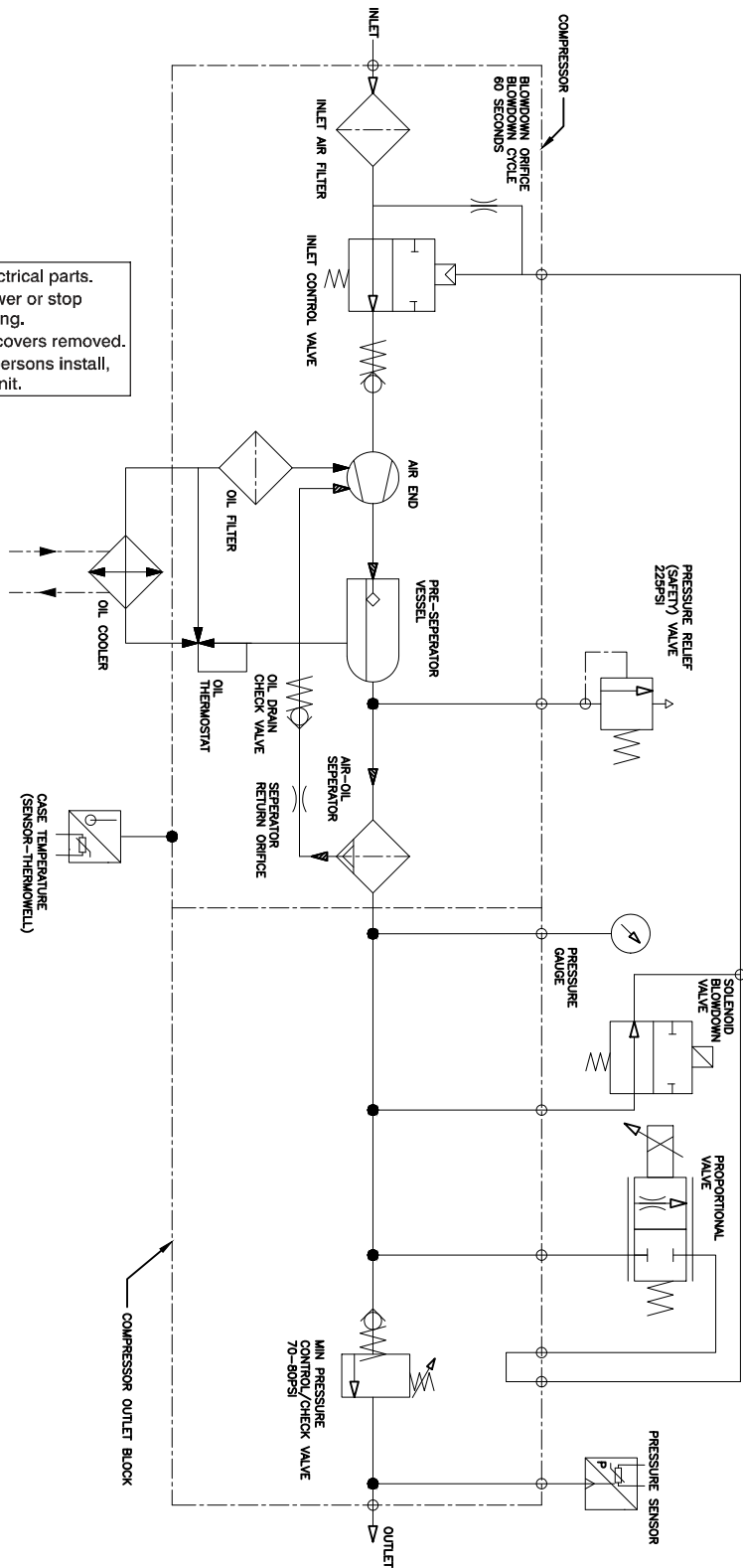


⚠ WARNING  ELECTRIC SHOCK HAZARD	• Do not touch live electrical parts. • Disconnect input power or stop engine before servicing. • Do not operate with covers removed. • Have only qualified persons install, use, or service this unit.
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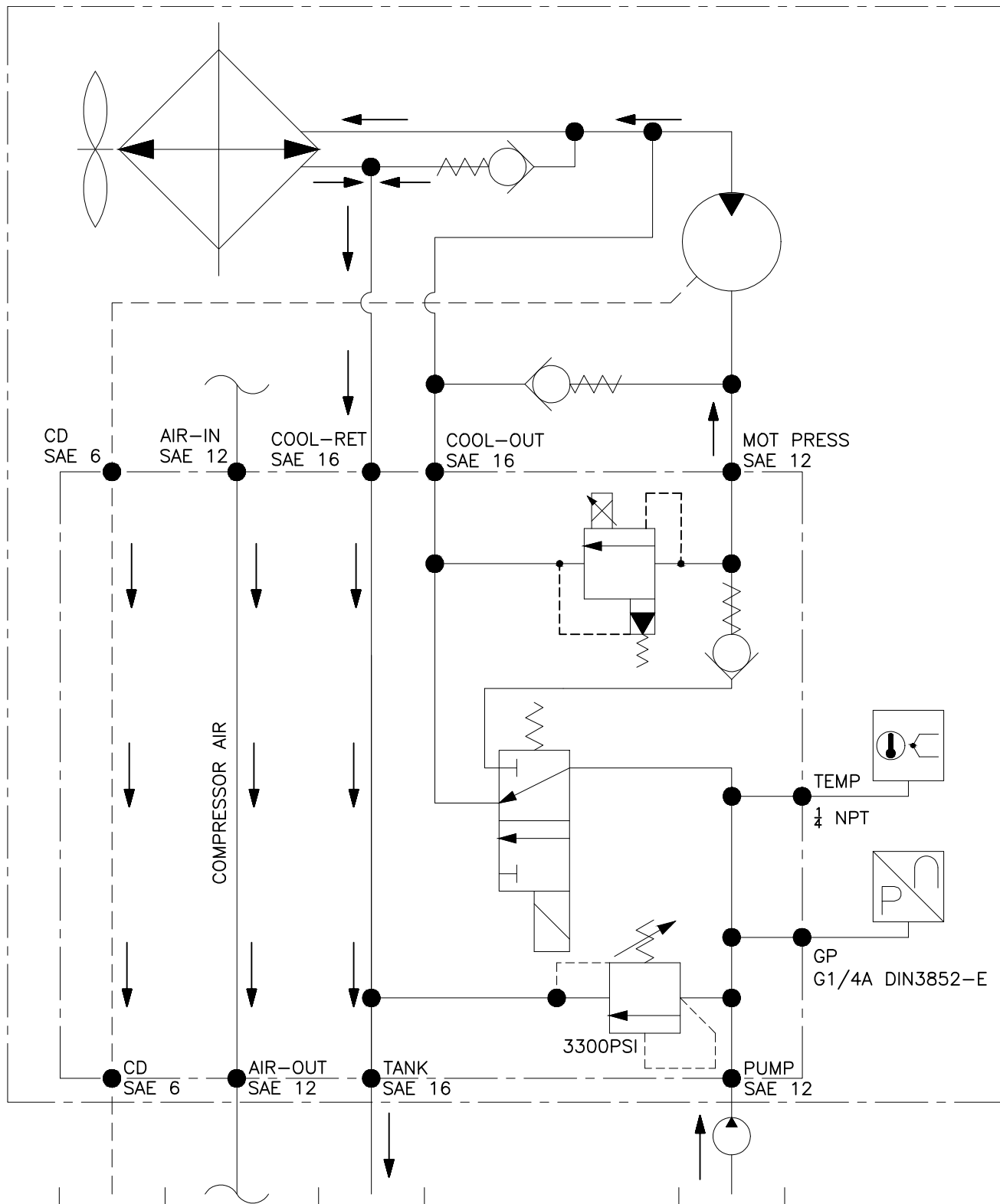
	WARNING
	Do not touch live electrical parts. Disconnect input power or stop engine before servicing. Do not operate with covers removed. Have only qualified persons install, use, or service this unit.

ELECTRIC SHOCK HAZARD



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Figure 15-3. Air Compressor Diagram



MAX OPERATING PRESSURE: 3000PSI
 OPERATING FLOW WITH 19CC MOTOR: 16–18GPM
 OPERATING FLOW WITH 14CC MOTOR: 11–13GPM

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

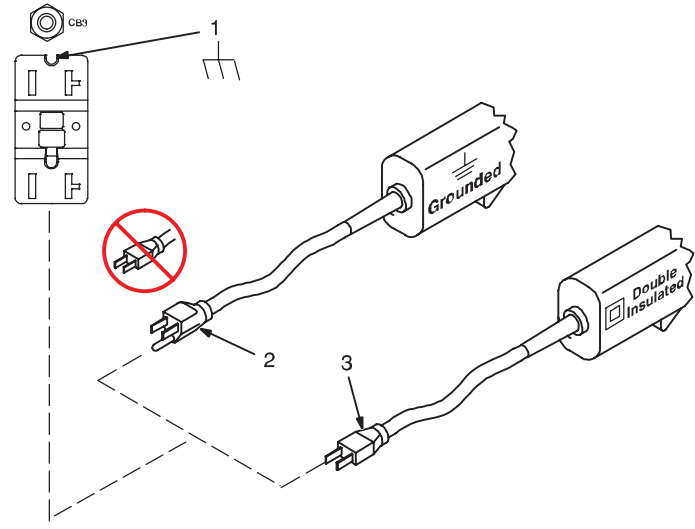
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Figure 15-4. Hydraulic Diagram

SECTION 16 – 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.

16-1. Selecting Equipment



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

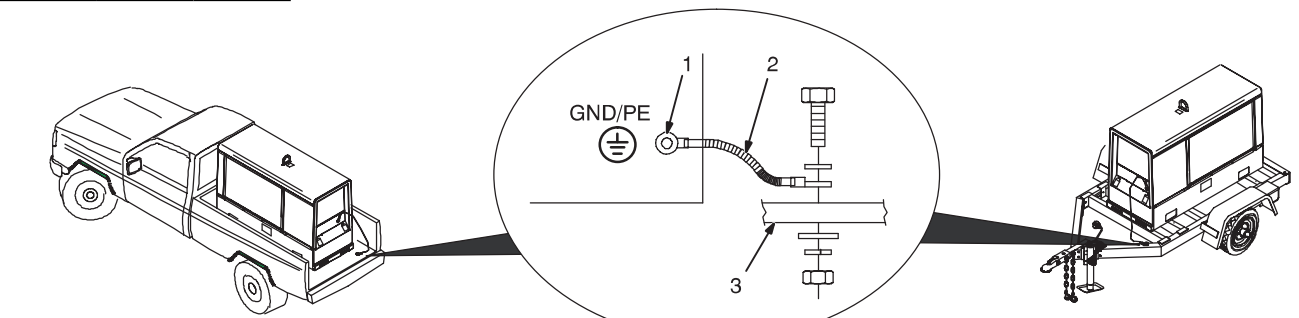
OR

- 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.

16-2. 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.

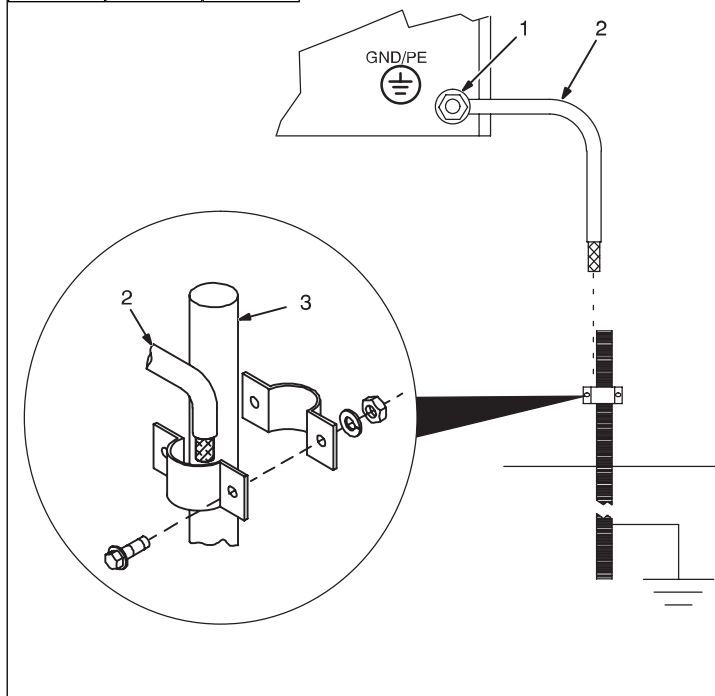
 Bed liners, shipping skids, and some running gear insulate the welding generator from the vehicle frame. Always connect a ground wire from the generator equipment grounding terminal to bare metal on the vehicle frame as shown.

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

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

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

16-3. Grounding When Supplying Building Systems



1 Equipment Grounding Terminal

2 Grounding Cable

Use #8 AWG or larger insulated copper wire.

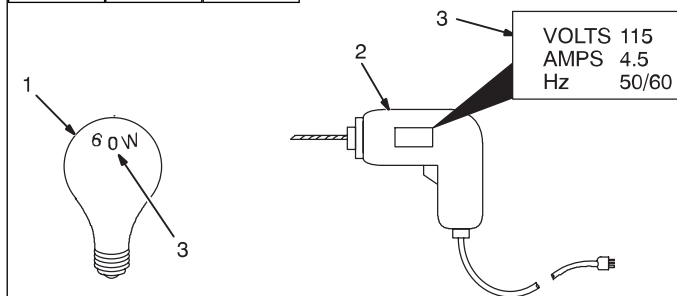
3 Ground Device

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.

16-4. 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 16-8).

3 Rating Data

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

Amperes x Volts = Watts

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

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

The load applied by the drill is 520 watts.

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

$$(3 \times 200\text{W}) + 520 \text{ W} = 1120 \text{ W}$$

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

16-5. 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

16-6. 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

16-7. 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

16-8. Power Required To Start Motor



4

1

3

AC MOTOR			
VOLTS	230	AMPS	2.5
CODE	M	Hz	60
HP	1/4	PHASE	1

- 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

$(11.2 \times 1/4 \times 1000) / 230 = 12.2A$

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

16-9. How Much Power Can Generator Supply?



1

2

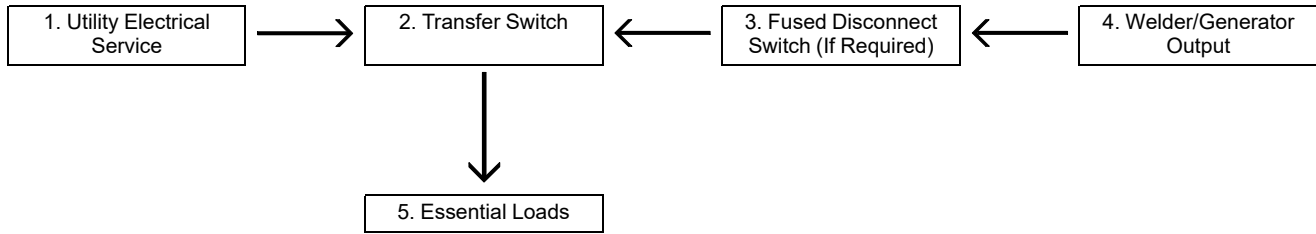
- 1 Limit Load To 90% Of Generator Output

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.

16-10. 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 16-4.

16-11. 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 (mm ²)*					
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 (mm ²)*					
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.

Notes

Notes

Notes

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
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Contact the Delivering Carrier to:	File a claim for loss or damage during shipment. For assistance in filing or settling claims, contact your distributor and/or equipment manufacturer's Transportation Department.
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Miller Electric Mfg. 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

