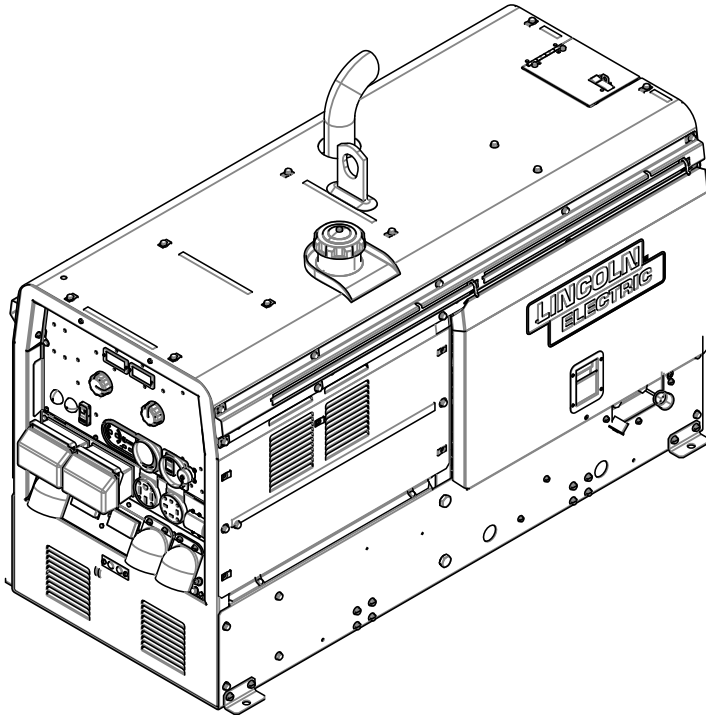




Operator's Manual

Cross Country™ 300



For use with machines having Code Numbers:
12362, 12554, 12555



Register your machine:

www.lincolnelectric.com/register

Authorized Service and Distributor Locator:

www.lincolnelectric.com/locator

Need Help? Call 1.888.935.3877

to talk to a Service Representative

Hours of Operation:

8:00 AM to 6:00 PM (ET) Mon. thru Fri.

After hours?

Use "Ask the Experts" at lincolnelectric.com
A Lincoln Service Representative will contact you
no later than the following business day.

For Service outside the USA:

Email: globalservice@lincolnelectric.com

Save for future reference

Date Purchased

Code: (ex: 10859)

Serial: (ex: U1060512345)

THANK YOU FOR SELECTING A QUALITY PRODUCT BY LINCOLN ELECTRIC.

PLEASE EXAMINE CARTON AND EQUIPMENT FOR DAMAGE IMMEDIATELY

When this equipment is shipped, title passes to the purchaser upon receipt by the carrier. Consequently, claims for material damaged in shipment must be made by the purchaser against the transportation company at the time the shipment is received.

SAFETY DEPENDS ON YOU

Lincoln arc welding and cutting equipment is designed and built with safety in mind. However, your overall safety can be increased by proper installation ... and thoughtful operation on your part. **DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS MANUAL AND THE SAFETY PRECAUTIONS CONTAINED THROUGHOUT.** And, most importantly, think before you act and be careful.

WARNING

This statement appears where the information must be followed exactly to avoid serious personal injury or loss of life.

CAUTION

This statement appears where the information must be followed to avoid minor personal injury or damage to this equipment.



KEEP YOUR HEAD OUT OF THE FUMES.

DON'T get too close to the arc. Use corrective lenses if necessary to stay a reasonable distance away from the arc.

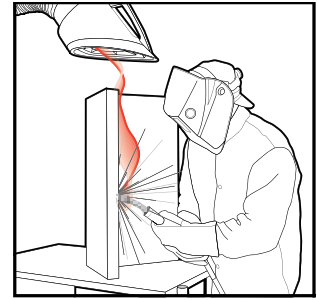
READ and obey the Safety Data Sheet (SDS) and the warning label that appears on all containers of welding materials.

USE ENOUGH VENTILATION or exhaust at the arc, or both, to keep the fumes and gases from your breathing zone and the general area.

IN A LARGE ROOM OR OUTDOORS, natural ventilation may be adequate if you keep your head out of the fumes (See below).

USE NATURAL DRAFTS or fans to keep the fumes away from your face.

If you develop unusual symptoms, see your supervisor. Perhaps the welding atmosphere and ventilation system should be checked.



WEAR CORRECT EYE, EAR & BODY PROTECTION

PROTECT your eyes and face with welding helmet properly fitted and with proper grade of filter plate (See ANSI Z49.1).

PROTECT your body from welding spatter and arc flash with protective clothing including woolen clothing, flame-proof apron and gloves, leather leggings, and high boots.

PROTECT others from splatter, flash, and glare with protective screens or barriers.

IN SOME AREAS, protection from noise may be appropriate.

BE SURE protective equipment is in good condition.

Also, wear safety glasses in work area **AT ALL TIMES.**



SPECIAL SITUATIONS

DO NOT WELD OR CUT containers or materials which previously had been in contact with hazardous substances unless they are properly cleaned. This is extremely dangerous.

DO NOT WELD OR CUT painted or plated parts unless special precautions with ventilation have been taken. They can release highly toxic fumes or gases.

Additional precautionary measures

PROTECT compressed gas cylinders from excessive heat, mechanical shocks, and arcs; fasten cylinders so they cannot fall.

BE SURE cylinders are never grounded or part of an electrical circuit.

REMOVE all potential fire hazards from welding area.

ALWAYS HAVE FIRE FIGHTING EQUIPMENT READY FOR IMMEDIATE USE AND KNOW HOW TO USE IT.



SECTION A: WARNINGS



CALIFORNIA PROPOSITION 65 WARNINGS



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 exposed 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

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



WARNING: Cancer and Reproductive Harm
www.P65warnings.ca.gov

ARC WELDING CAN BE HAZARDOUS. PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS SHOULD CONSULT WITH THEIR DOCTOR BEFORE OPERATING.

Read and understand the following safety highlights. For additional safety information, it is strongly recommended that you purchase a copy of "Safety in Welding & Cutting - ANSI Standard Z49.1" from the American Welding Society, P.O. Box 351040, Miami, Florida 33135 or CSA Standard W117.2. A Free copy of "Arc Welding Safety" booklet E205 is available from the Lincoln Electric Company, 22801 St. Clair Avenue, Cleveland, Ohio 44117-1199.

BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR PROCEDURES ARE PERFORMED ONLY BY QUALIFIED INDIVIDUALS.



FOR ENGINE POWERED EQUIPMENT.

- 1.a. Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.



- 1.b. Do not add the fuel near an open flame welding arc or when the engine is running. Stop the engine and allow it to cool before refueling to prevent spilled fuel from vaporizing on contact with hot engine parts and igniting. Do not spill fuel when filling tank. If fuel is spilled, wipe it



up and do not start engine until fumes have been eliminated.

- 1.c. Keep all equipment safety guards, covers and devices in position and in good repair. Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.
- 1.d. In some cases it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.
- 1.e. Do not put your hands near the engine fan. Do not attempt to override the governor or idler by pushing on the throttle control rods while the engine is running.
- 1.f. To prevent accidentally starting gasoline engines while turning the engine or welding generator during maintenance work, disconnect the spark plug wires, distributor cap or magneto wire as appropriate.
- 1.g. To avoid scalding, do not remove the radiator pressure cap when the engine is hot.
- 1.h. Using a generator indoors CAN KILL YOU IN MINUTES.
- 1.i. Generator exhaust contains carbon monoxide. This is a poison you cannot see or smell.
- 1.j. NEVER use inside a home or garage, EVEN IF doors and windows are open.
- 1.k. Only use OUTSIDE and far away from windows, doors and vents.
- 1.l. Avoid other generator hazards. READ MANUAL BEFORE USE.



ELECTRIC AND MAGNETIC FIELDS MAY BE DANGEROUS



- 2.a. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding current creates EMF fields around welding cables and welding machines
- 2.b. EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before welding.
- 2.c. Exposure to EMF fields in welding may have other health effects which are now not known.
- 2.d. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:
- 2.d.1. Route the electrode and work cables together - Secure them with tape when possible.
- 2.d.2. Never coil the electrode lead around your body.
- 2.d.3. Do not place your body between the electrode and work cables. If the electrode cable is on your right side, the work cable should also be on your right side.
- 2.d.4. Connect the work cable to the workpiece as close as possible to the area being welded.
- 2.d.5. Do not work next to welding power source.



ELECTRIC SHOCK CAN KILL.



- 3.a. The electrode and work (or ground) circuits are electrically “hot” when the welder is on. Do not touch these “hot” parts with your bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.
- 3.b. Insulate yourself from work and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground.

In addition to the normal safety precautions, if welding must be performed under electrically hazardous conditions (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, if there is a high risk of unavoidable or accidental contact with the workpiece or ground) use the following equipment:

- Semiautomatic DC Constant Voltage (Wire) Welder.
 - DC Manual (Stick) Welder.
 - AC Welder with Reduced Voltage Control.
- 3.c. In semiautomatic or automatic wire welding, the electrode, electrode reel, welding head, nozzle or semiautomatic welding gun are also electrically “hot”.
 - 3.d. Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.
 - 3.e. Ground the work or metal to be welded to a good electrical (earth) ground.
 - 3.f. Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.
 - 3.g. Never dip the electrode in water for cooling.
 - 3.h. Never simultaneously touch electrically “hot” parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.
 - 3.i. When working above floor level, use a safety belt to protect yourself from a fall should you get a shock.
 - 3.j. Also see Items 6.c. and 8.



ARC RAYS CAN BURN.



- 4.a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Headshield and filter lens should conform to ANSI Z87.1 standards.
- 4.b. Use suitable clothing made from durable flame-resistant material to protect your skin and that of your helpers from the arc rays.
- 4.c. Protect other nearby personnel with suitable, non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.



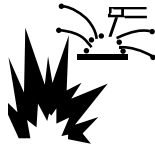
FUMES AND GASES CAN BE DANGEROUS.



- 5.a. Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. **When welding hardfacing (see instructions on container or SDS) or on lead or cadmium plated steel and other metals or coatings which produce highly toxic fumes, keep exposure as low as possible and within applicable OSHA PEL and ACGIH TLV limits using local exhaust or mechanical ventilation unless exposure assessments indicate otherwise. In confined spaces or in some circumstances, outdoors, a respirator may also be required. Additional precautions are also required when welding on galvanized steel.**
- 5.b. The operation of welding fume control equipment is affected by various factors including proper use and positioning of the equipment, maintenance of the equipment and the specific welding procedure and application involved. Worker exposure level should be checked upon installation and periodically thereafter to be certain it is within applicable OSHA PEL and ACGIH TLV limits.
- 5.c. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.
- 5.d. Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.
- 5.e. Read and understand the manufacturer’s instructions for this equipment and the consumables to be used, including the Safety Data Sheet (SDS) and follow your employer’s safety practices. SDS forms are available from your welding distributor or from the manufacturer.
- 5.f. Also see item 1.j.



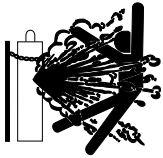
WELDING AND CUTTING SPARKS CAN CAUSE FIRE OR EXPLOSION.



- 6.a. Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Avoid welding near hydraulic lines. Have a fire extinguisher readily available.
- 6.b. Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to "Safety in Welding and Cutting" (ANSI Standard Z49.1) and the operating information for the equipment being used.
- 6.c. When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.
- 6.d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been "cleaned". For information, purchase "Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances", AWS F4.1 from the American Welding Society (see address above).
- 6.e. Vent hollow castings or containers before heating, cutting or welding. They may explode.
- 6.f. Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.
- 6.g. Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.
- 6.h. Also see item 1.b.
- 6.i. Read and follow NFPA 51B "Standard for Fire Prevention During Welding, Cutting and Other Hot Work", available from NFPA, 1 Batterymarch Park, PO box 9101, Quincy, MA 022690-9101.
- 6.j. Do not use a welding power source for pipe thawing.



CYLINDER MAY EXPLODE IF DAMAGED.

- 7.a. Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition. 
- 7.b. Always keep cylinders in an upright position securely chained to an undercarriage or fixed support.
- 7.c. Cylinders should be located:
 - Away from areas where they may be struck or subjected to physical damage.
 - A safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.
- 7.d. Never allow the electrode, electrode holder or any other electrically "hot" parts to touch a cylinder.
- 7.e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.
- 7.f. Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.
- 7.g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-1, "Precautions for Safe Handling of Compressed Gases in Cylinders," available from the Compressed Gas Association, 14501 George Carter Way Chantilly, VA 20151.



FOR ELECTRICALLY POWERED EQUIPMENT.



- 8.a. Turn off input power using the disconnect switch at the fuse box before working on the equipment.
- 8.b. Install equipment in accordance with the U.S. National Electrical Code, all local codes and the manufacturer's recommendations.
- 8.c. Ground the equipment in accordance with the U.S. National Electrical Code and the manufacturer's recommendations.

Refer to
<http://www.lincolnelectric.com/safety>
for additional safety information.

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Parts List	parts.lincolnelectric.com
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Content/details may be changed or updated without notice. For most current Instruction Manuals, go to parts.lincolnelectric.com.

GENERAL DESCRIPTION

The CROSS COUNTRY 300 is a diesel engine powered DC multi-process welding power source and 120 / 240 volt AC power generator. The engine drives a generator that supplies three phase power for the DC welding circuit, single phase and Three Phase power for the AC auxiliary outlets. The DC welding control system uses state of the art Chopper Technology (CT™) for superior welding performance.

The CROSS COUNTRY 300 has an optional, selectable VRD (Voltage Reduction Device). The VRD operates in the CV mode reducing the OCV to <13 volts, increasing operator safety when welding is performed in environments with increased hazard of electric shock such as wet areas and hot, humid sweaty conditions.

TECHNICAL SPECIFICATIONS

CROSS COUNTRY 300 (K4166-1)

CROSS COUNTRY 300 (K4166-2) w/ wireless remote

CROSS COUNTRY 300 (K4166-3) SS w/ wireless remote

INPUT - DIESEL ENGINE	
Make /Model	Description
Kubota* V1505	4 Cylinder naturally aspirated Water Cooled Diesel Engine
Speed (RPM)	Displacement
High 1890 RPM Full Load 1800 RPM Low Idle 1350 RPM	91.41cu. in. (1.5ltr) Bore x Stroke 3.07" x 3.09" (78mm x 78mm)
Starting System	Capacities
12VDC Battery and starter (Group 34; Battery 535 cold crank amps)	Fuel: 11.6gal.(44L) Oil: 6.4qts.(6.0L) Radiator Coolant: 4.8qts.(4.5L)

ENGINE	
LUBRICATION	EPA EMISSION
Full Pressure with Full Flow Filter	Tier 4 Final
FUEL SYSTEM	GOVERNOR
Mechanical Fuel Pump, Auto air bleed system Electric shutoff solenoid Indirect fuel injector	Mechanical Electronic
AIR CLEANER	ENGINE IDLER
Single Element	Automatic Idler
MUFFLER	ENGINE PROTECTION
Low noise Muffler: Made from long life, aluminized steel.	Shutdown on low oil pressure & high engine coolant temperature
ENGINE WARRANTY*:	2 year complete (parts and labor) 3rd. year major components (parts and labor)

RATED OUTPUT @ 104°F(40°C) - WELDER		
Welding Process	Welding Output Current/Voltage/Duty Cycle	Output Range
DC Stick Current	300A / 32V / 100%	40 to 300 AMPS
DC Constant Voltage	300A / 32V / 100% 350A / 28V / 100%	14 to 32 VOLTS
Touch Start™ TIG	250A / 20V / 100%	20 to 250 AMPS

MACHINE SPECIFICATIONS
RECEPTACLES (2) 120VAC Duplex (5-20R) GFCI Protected (1) 120/240VAC Dual Voltage Full KVA (14-50R) (1) 240VAC 3-Phase (15-50R)
AUXILIARY POWER CIRCUIT BREAKER Two 20AMP for Two Duplex Receptacle (1) 50Amp for Dual Voltage and 3-Phase (3-pole)
OTHER CIRCUIT BREAKERS 10AMP for Engine Battery Charging Circuit

LIFT BAIL WEIGHT RATING 2300 LBS. (1043KG.) MAXIMUM

OUTPUT @ 104°F(40°C) - WELDER
Welding Range 30 - 300 Amps PIPE/CV
Open Circuit Voltage⁽²⁾ 60 Max OCV @ 1800 RPM
Auxiliary Power ⁽¹⁾ 11,500 Watts Peak, / 10,000 Watts Continuous, 60 Hz 120/240 Volts Single Phase 12,500 Watts Peak, /11,000 Watts Continuous, 60 Hz, 240 Volts 3-Phase

PHYSICAL DIMENSIONS	
Height	31.94** in. (811 mm)
Width	24.00*** in. (609 mm)
Depth	56.00 in. (1422 mm)
Weight	1034 lbs. (470kg.) (Approx.)

⁽¹⁾ Output rating in watts is equivalent to volt-amperes at unity power factor. Output voltage is within ± 10% at all loads up to rated capacity. When welding, available auxiliary power will be reduced.

* Engine warranty may vary outside of the USA. (See Engine warranty for details).

** To Top of enclosure, add 5.50"(139.7mm) to top of exhaust pipe. Add 4.97"(126mm) to top of Lift Bail.

*** Outside width of Base. Add 3.00" (76.2mm) to outside of mounting feet.

⁽²⁾ Reduced to less than 30V in the stick mode when VRD (Voltage Reduction Device) is on.

(Optional) VRD (VOLTAGE REDUCTION DEVICE)
See Installation and Operation sections for an explanation.

WARNING

Do not attempt to use this equipment until you have thoroughly read the engine manufacturer’s manual supplied with your welder. It includes important safety precautions, detailed engine starting, operating and maintenance instructions, and parts lists.

ELECTRIC SHOCK can kill.



- Do not touch electrically live parts or electrode with skin or wet clothing.
- Insulate yourself from work and ground
- Always wear dry insulating gloves.

ENGINE EXHAUST can kill.



- Use in open, well ventilated areas or vent exhaust outside.

MOVING PARTS can injure.



- Do not operate with doors open or guards off.
- Stop engine before servicing.
- Keep away from moving parts.

See additional warning information at front of this operator’s manual.

Only qualified personnel should install, use, or service this equipment.

LOCATION AND VENTILATION

The welder should be located to provide an unrestricted flow of clean, cool air to the cooling air inlets and to avoid restricting the cooling air outlets. Also, locate the welder so that the engine exhaust fumes are properly vented to an outside area.

STACKING

CROSS COUNTRY 300 machines cannot be stacked.

ANGLE OF OPERATION

Engines are designed to run in the level condition which is where the optimum performance is achieved. The maximum angle of continuous operation is 20 degrees in all directions, 30 degrees Intermittent (less than 10 minutes continuous) in all directions. If the engine is to be operated at an angle, provisions must be made for checking and maintaining the oil level at the normal (FULL) oil capacity in the crankcase.

When operating the welder at an angle, the effective fuel capacity will be slightly less than the amount specified.

LIFTING

The CROSS COUNTRY 300 weighs approximately 1119 lbs. (508kg.) with a full tank of fuel (1034 lbs. (470kg.) less fuel). A lift bail is mounted to the machine and should always be used when lifting the machine.

WARNING



- Lift only with equipment of adequate lifting capacity.
- Be sure machine is stable when lifting.
- Do not lift this machine using lift bail if it is equipped with a heavy accessory such as trailer or gas cylinder.
- Do not lift machine if lift bail is damaged.
- Do not operate machine while suspended from lift bail.

HIGH ALTITUDE OPERATION

At higher altitudes, output derating may be necessary. For maximum rating, derate the machine 2.5% to 3.5% for every 1000 ft. (305m). Due to new EPA and other local emissions regulations, modifications to the engine for high altitude are restricted within the United States. For use above 6000 ft.(1828 m) an authorized engine field service shop should be contacted to determine if any adjustments can be made for operation in higher elevations.

HIGH TEMPERATURE OPERATION

At temperatures above 104°F (40°C), Welder output derating is necessary. For maximum output ratings, derate the welder output 2 volts for every 18°F (10°C) above 104°F (40°C).

COLD WEATHER STARTING

With a fully charged battery and the proper oil, the engine should start satisfactorily down to 5°F (-15°C). If the engine must be frequently started at or below 23°F (-5°C), the factory installed block heater can be utilized. It may also be desirable to install the Cold Weather Kit (K4213-1) to improve cold temperature starts. For cold weather operation, 0W40 synthetic oil is recommended. The use of No. 1D diesel fuel is recommended in place of No. 2D at temperatures below 23°F (-5°C). Allow the engine to warm up before applying a load or switching to high idle.

 **WARNING**

Note: Extreme cold weather starting may require longer glow plug operation.

Under no conditions should ether or other starting fluids be used with this engine!

TOWING

Use a recommended trailer for use with this equipment for road, in-plant and yard towing by a vehicle(1). If the user adapts a non-Lincoln trailer, he must assume responsibility that the method of attachment and usage does not result in a safety hazard or damage the welding equipment. Some of the factors to be considered are as follows:

1. Design capacity of trailer vs. weight of Lincoln equipment and likely additional attachments.
2. Proper support of, and attachment to, the base of the welding equipment so there will be no undue stress to the framework.
3. Proper placement of the equipment on the trailer to insure stability side to side and front to back when being moved and when standing by itself while being operated or serviced.
4. Typical conditions of use, i.e., travel speed; roughness of surface on which the trailer will be operated; environmental conditions; like maintenance.
5. Conformance with federal, state and local laws.(1)

(1) Consult applicable federal, state and local laws regarding specific requirements for use on public highways.

VEHICLE MOUNTING

 **WARNING**

Improperly mounted concentrated loads may cause unstable vehicle handling and tires or other components to fail.

- Only transport this Equipment on serviceable vehicles which are rated and designed for such loads.
- Distribute, balance and secure loads so vehicle is stable under conditions of use.
- Do not exceed maximum rated loads for components such as suspension, axles and tires.
- Mount equipment base to metal bed or frame of vehicle.
- Follow vehicle manufacturer's instructions.

PRE-OPERATION ENGINE SERVICE

READ the engine operating and maintenance instructions supplied with this machine.

WARNING

- Stop engine and allow to cool before fueling
- Do not smoke when fueling.
- Fill fuel tank at a moderate rate and do not overfill.
- Wipe up spilled fuel and allow fumes to clear before starting engine.
- Keep sparks and flame away from tank.

OIL

The CROSS COUNTRY 300 is shipped with the engine crankcase filled with high quality SAE 10W-30 Oil that meets classification CG-4 or CH-4 for diesel engines. Check the oil level before starting the engine. If it is not up to the full mark on the dip stick, add oil as required. Check the oil level every four hours of running time during the first 50 running hours. Refer to the engine Operator’s Manual for specific oil recommendations and break-in information. The oil change interval is dependent on the quality of the oil and the operating environment. Refer to the Engine Operator’s Manual for more details on the proper service and maintenance intervals.

FUEL

DIESEL FUEL ONLY-Low sulphur fuel or ultra low sulphur fuel in U.S.A. and Canada.

WARNING

Fill the fuel tank with clean, fresh fuel. The capacity of the tank is 11.6 gals. (44 ltrs). When the yellow light of the fuel gauge is illuminated there is 1.2 gallons of fuel remaining. When the red fuel pump light starts to blink there is .25 gallon of reserve fuel remaining.

WARNING

NOTE: The fuel shut off valve should be in the closed position when the welder is not used for extended periods of time.

ENGINE COOLING SYSTEM

WARNING

Air to cool the engine is drawn in the front and side. It is exhausted through radiator and case back. It is important that the intake and exhaust air is not restricted. Allow a minimum clearance of 1ft. (0.6m) from the case back and 16in.(406mm) from either side of the base to a vertical surface.

BATTERY CONNECTION

CAUTION

Use caution as the electrolyte is a strong acid that can burn skin and damage eyes.

The CROSS COUNTRY 300 is shipped with the negative battery cable disconnected. Make certain that the RUN-STOP switch is in the STOP position. Remove the two screws from the battery tray using a screwdriver or a 3/8" socket. Attach the negative battery cable to the negative battery terminal and tighten using a 1/2" socket or wrench.

NOTE: This machine is furnished with a wet charged battery; if unused for several months, the battery may require a booster charge. Be careful to charge the battery with the correct polarity. (See Battery in “Maintenance Section”)

SPARK ARRESTER

Some federal, state or local laws may require that gasoline or diesel engines be equipped with exhaust spark arresters when they are operated in certain locations where unarrested sparks may present a fire hazard. The standard muffler included with this welder does not qualify as a spark arrester. When required by local regulations, a suitable spark arrester, such as the K1898-1 must be installed and properly maintained.

WARNING

An incorrect spark arrester may lead to damage to the engine or adversely affect performance.

ELECTRICAL CONNECTIONS

Machine Grounding



Because this portable engine driven welder creates its own power, it is not necessary to connect its frame to an earth ground, unless the machine is connected to premises wiring (home, shop, etc.)


To prevent dangerous electric shock, other equipment to which this engine driven welder supplies power must:

⚠ WARNING

- Be grounded to the frame of the welder using a grounded type plug.
- Be double insulated.
- Do not ground the machine to a pipe that carries explosive or combustible material.

When this welder is mounted on a truck or trailer, its frame must be electrically bonded to the metal frame of the vehicle. Use a #8 or larger copper wire connected between the machine grounding stud and the frame of the vehicle. When this engine driven welder is connected to premises wiring such as that in a home or shop, its frame must be connected to the system earth ground. See further connection instructions in the section entitled "Standby Power Connections" as well as the article on grounding in the latest National Electrical Code and the local code.

In general, if the machine is to be grounded, it should be connected with a #8 or larger copper wire to a solid earth ground such as a metal water pipe going into the ground for at least ten feet and having no insulated joints, or to the metal framework of a building which has been effectively grounded.

The National Electrical Code lists a number of alternate means of grounding electrical equipment. A machine grounding stud marked with the symbol  is provided on the front of the welder.

Welding OUTPUT Cables

With the engine off connect the electrode and work cables to the output studs. The welding process dictates the polarity of the electrode cable. These connections should be checked periodically and tightened with a 3/4" wrench.

Table A.2 lists recommended cable sizes and lengths for rated current and duty cycle. Length refers to the distance from the welder to the work and back to the welder. Cable diameters are increased for long cable lengths to reduce voltage drops.

TABLE A.2

TOTAL COMBINED LENGTH OF ELECTRODE AND WORK CABLES	
Cable Length	Cable Size for 400 Amps 60% Duty Cycle
0-100 Ft. (0-30 meters)	2 / 0 AWG
100-150 Ft. (30-46 meters)	2 / 0 AWG
150-200 Ft. (46-61 meters)	3 / 0 AWG

Cable Installation

Install the welding cables to your CROSS COUNTRY 300 as follows.

1. The engine must be OFF to install welding cables.
2. Remove the flanged nuts from the output terminals
3. Connect the electrode holder and work cables to the weld output terminals. The terminals are identified on the case front.
4. Tighten the flanged nuts securely.
5. Be certain that the metal piece you are welding (the "work") is properly connected to the work clamp and cable.
6. Check and tighten the connections periodically.

AUXILIARY POWER RECEPTACLES

Start the engine and set the "IDLER" control switch to the "High Idle" mode. Voltage is now correct at the receptacles for auxiliary power. This must be done before a tripped GFCI can be reset properly. See the MAINTENANCE section for more detailed information on testing and resetting the GFCI.

The auxiliary power of the CROSS COUNTRY 300 consists of two 20 Amp-120 VAC (5-20R) duplex receptacles with GFCI protection, one 50 Amp 120/240 VAC (14-50R) receptacle and one 50 Amp 240VAC Three-Phase (15-50R) receptacle.

The auxiliary power capacity is 11,500 watts Peak, 10,000 Watts Continuous of 60 Hz, single phase power. The auxiliary power capacity rating in watts is equivalent to volt-amperes at unity power factor. The max permissible current of the 240 VAC output is 42amps.

The 240 VAC output can be split to provide two separate 120 VAC outputs with a max permissible current of 42 Amps per output to two separate 120 VAC branch circuits (these circuits cannot be paralleled). Output voltage is within $\pm 10\%$ at all loads up to rated capacity.

The Three-Phases auxiliary power capacity is 12,500 watts peak, 11,000 watts continuous. The maximum current is 27 amps.

120 V Duplex Receptacles and GFCI

A GFCI protects the two 120V auxiliary power receptacles.

A GFCI (Ground Fault Circuit Interrupter) is a device to protect against electric shock should a piece of defective equipment connected to it develop a ground fault. If this situation should occur, the GFCI will trip, removing voltage from the output of the receptacle. If a GFCI is tripped see the MAINTENANCE section for detailed information on testing and resetting it. A GFCI should be properly tested at least once every month.

The 120 V auxiliary power receptacles should only be used with three wire grounded type plugs or approved double insulated tools with two wire plugs. The current rating of any plug used with the system must be at least equal to the current capacity of the associated receptacle.

NOTE: The 240 V receptacle has two 120 V circuits, but are of opposite polarities and cannot be paralleled.

All auxiliary power is protected by circuit breakers. The 120V has 20 Amp circuit breakers for each duplex receptacle. The 120/240V Single Phase and the 240V Three-Phases have a 50 Amp 3-pole Circuit Breaker that disconnects both hot leads and all Three Phases simultaneously.

CONNECTION OF THE LN-25 PIPE TO THE CROSS COUNTRY 300

WARNING

Shut off welder before making any electrical connections.

The LN-25 Pipe may be used with the CROSS COUNTRY 300. See the appropriate connection diagram in Section F.

NOTE: The LN-25 (K431) Remote Control Module and (K432) Remote Cable are not recommended for use with the CROSS COUNTRY 300.

1. Shut the welder off.

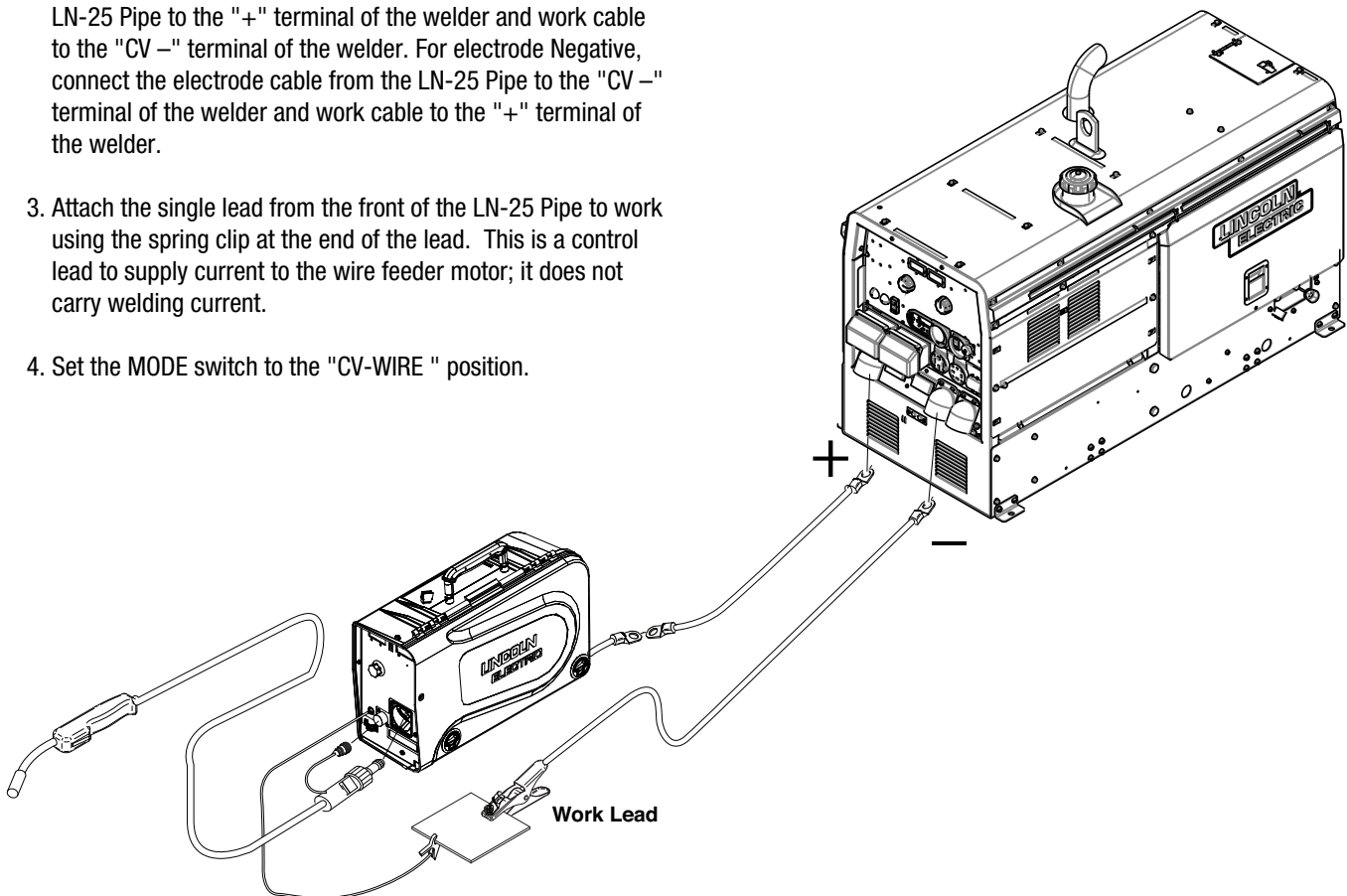
2. For electrode Positive, connect the electrode cable from the LN-25 Pipe to the "+" terminal of the welder and work cable to the "CV -" terminal of the welder. For electrode Negative, connect the electrode cable from the LN-25 Pipe to the "CV -" terminal of the welder and work cable to the "+" terminal of the welder.

3. Attach the single lead from the front of the LN-25 Pipe to work using the spring clip at the end of the lead. This is a control lead to supply current to the wire feeder motor; it does not carry welding current.

4. Set the MODE switch to the "CV-WIRE " position.

5. Set the "IDLE" switch to the "AUTO" position. When not welding, the CROSS COUNTRY 300 engine will be at the low idle speed.

6. When the gun trigger is closed, the current sensing circuit will cause the CROSS COUNTRY 300 engine to go to the high idle speed, the wire will begin to feed and the welding process started. When welding is stopped, the engine will revert to low idle speed after approximately 12 seconds unless welding is resumed.



SAFETY PRECAUTIONS

WARNING

Do not attempt to use this equipment until you have thoroughly read the engine manufacturer's manual supplied with your welder. It includes important safety precautions, detailed engine starting, operating and maintenance instructions, and parts lists.

ELECTRIC SHOCK can kill.



- Do not touch electrically live parts or electrode with skin or wet clothing.
 - Insulate yourself from work and ground
 - Always wear dry insulating gloves.
 - Always operate the welder with the hinged door closed and the side panels in place.
- Read carefully the Safety Precautions page before operating this machine. Always follow these and any other safety procedures included in this manual and in the Engine Instruction Manual.

FOR AUXILIARY POWER

Start the engine and set the IDLER control switch to the desired operating mode. Full power is available regardless of the welding control settings providing no welding current is being drawn.

ENGINE OPERATION

Before Starting the Engine:

- Be sure the machine is on a level surface.
- Open side engine door and remove the engine oil dipstick and wipe it with a clean cloth. Reinsert the dipstick and check the level on the dipstick.
- Add oil (if necessary) to bring the level up to the full mark. Do not overfill. Close engine door.
- Check radiator for proper coolant level. (Fill if necessary).
- See Engine Owner's Manual for specific oil and coolant recommendations.

ADD FUEL

WARNING

- Stop engine while fueling.
- Do not smoke when fueling.
- Keep sparks and flame away from tank.
- Do not leave unattended while fueling.
- Wipe up spilled fuel and allow fumes to clear before starting engine.
- Do not overfill tank, fuel expansion may cause overflow.



DIESEL FUEL can cause fire.

DIESEL FUEL ONLY-Low sulphur fuel or ultra low sulphur fuel in U.S.A. and Canada.

- Remove the fuel tank cap.
- Fill the tank. **DO NOT FILL THE TANK TO THE POINT OF OVERFLOW.**
- Replace the fuel cap and tighten securely.
- See Engine Owner's Manual for specific fuel recommendations.

BREAK-IN PERIOD

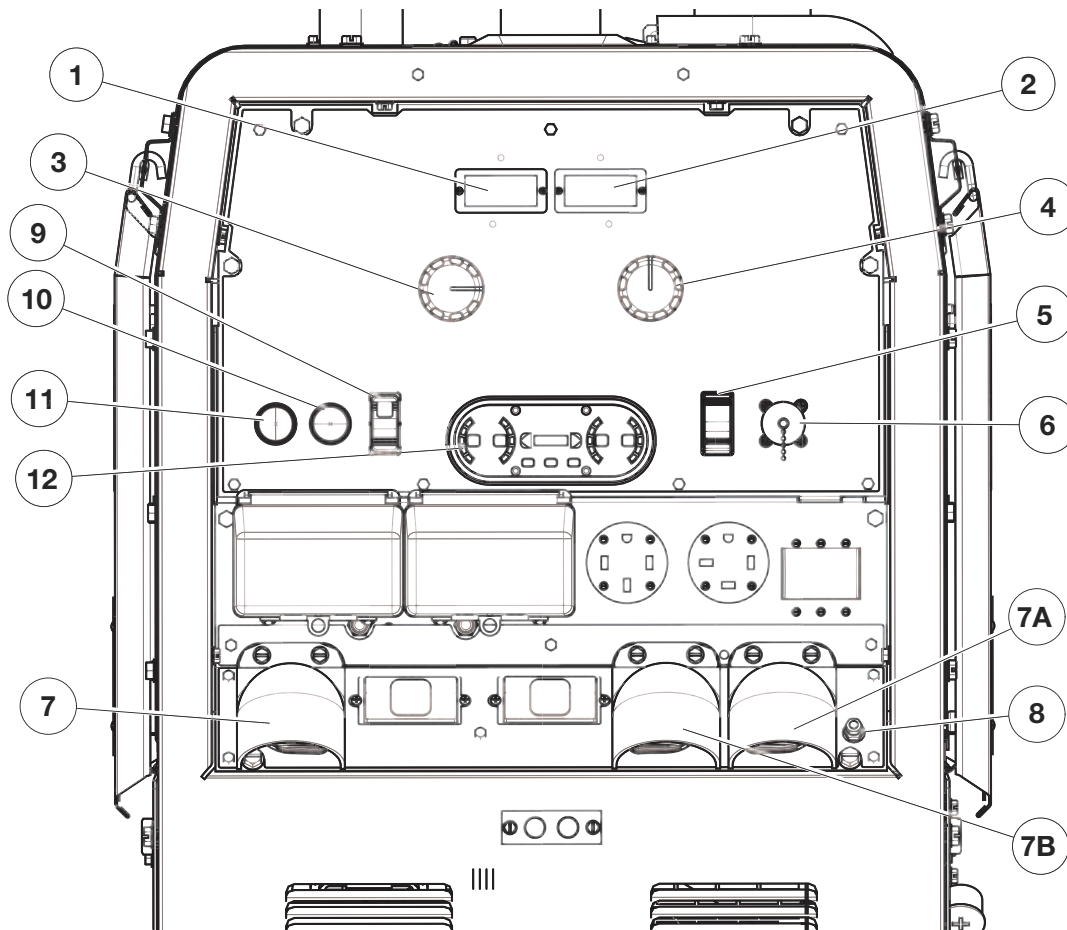
The engine will use a small amount of oil during its "break-in" period. The break-in period is about 50 running hours. Check the oil every four hours during break-in.

CAUTION

During break-in, subject the Welder to moderate loads. Avoid long periods running at idle. Before stopping the engine, remove all loads and allow the engine to cool several minutes.

WELDING CONTROLS

FIGURE B.1



1. AMP METER- Shows the current prior to welding using the OUTPUT control dial. During welding, the meter displays the actual output current (AMPS). A memory feature holds the display of both the AMP and VOLT meters on for seven seconds after welding is stopped. This allows the operator to read the actual current and voltage just prior to when welding was ceased.

2. VOLT METER- Shows the voltage prior to welding using the OUTPUT control dial. During welding, the meter displays the actual output voltage (VOLTS). A memory feature holds the display of both the AMP and VOLT meters on for seven seconds after welding is stopped. This allows the operator to read the actual current and voltage just prior to when welding was ceased. While the display is being held the left-most decimal point in each display will be flashing. The accuracy of the meters is +/- 3%.

3. OUTPUT- Adjusts output setting of machine

4. CONTROL- Fine tunes the arc for optimal weld performance

5. WELD MODE SELECTOR SWITCH-

(Provides Three selectable welding modes)
 STICK
 TIG
 CV-WIRE


6. 6-PIN CONNECTOR- For attaching optional remote control equipment. Includes auto-sensing remote control circuit.

7. WELD OUTPUT TERMINALS WITH FLANGE NUT-

Provides a connection point for the electrode and work cables.

7A. Connect work lead to 7A for STICK welding.

7B. Connect work lead to 7B for CV and TIG welding.




8. GROUND STUD-  Provides a connection point for connecting the machine case to earth ground.

ENGINE CONTROLS:

9. STOP / (LOW IDLE/RUN) / (HIGH IDLE/RUN) SWITCH-

Toggling the switch to the RUN position energizes the engine prior to starting.

Has three positions as follows:

- 1) In the “High” position , the engine runs at the high idle speed controlled by the governor.
- 2) In the “Auto”  /  position, the idler operates as follows:
 - a. When switched from “High” to “Auto” or after starting the engine, the engine will operate at full speed for approximately 12 seconds and then go to low idle speed.
 - b. When the electrode touches the work or power is drawn for lights or tools (approximately 100 Watts minimum) the engine accelerates and operates at full speed.
 - c. When welding ceases and the AC power load is turned off, a fixed time delay of approximately 12 seconds starts.
 - d. If the welding or AC power load is not restarted before the end of the time delay, the idler reduces the engine speed to low idle speed.
 - e. The engine will automatically return to high idle speed when the welding load or A.C. power load is reapplied.
- 3) The “Stop” position stops the engine.

10. START SWITCH- Energizes the starter motor to crank the engine.

11. GLOW PLUG PUSH BUTTON-

- When pushed activates the glow plugs. Glow plug should not be activated for more than 20 seconds continuously.

12. DASH BOARD GAUGE-

The dash board gauge displays 5 gauges:

12a. OIL PRESSURE

The gauge displays the engine oil pressure when the engine is running.

12b. ENGINE TEMPERATURE 

The gauge displays the engine coolant temperature.

12c. HOUR METER

The hour meter displays the total time that the engine has been running. This meter is a useful indicator for scheduling preventive maintenance.

12d. FUEL LEVEL 

Displays the level of diesel fuel in the fuel tank.

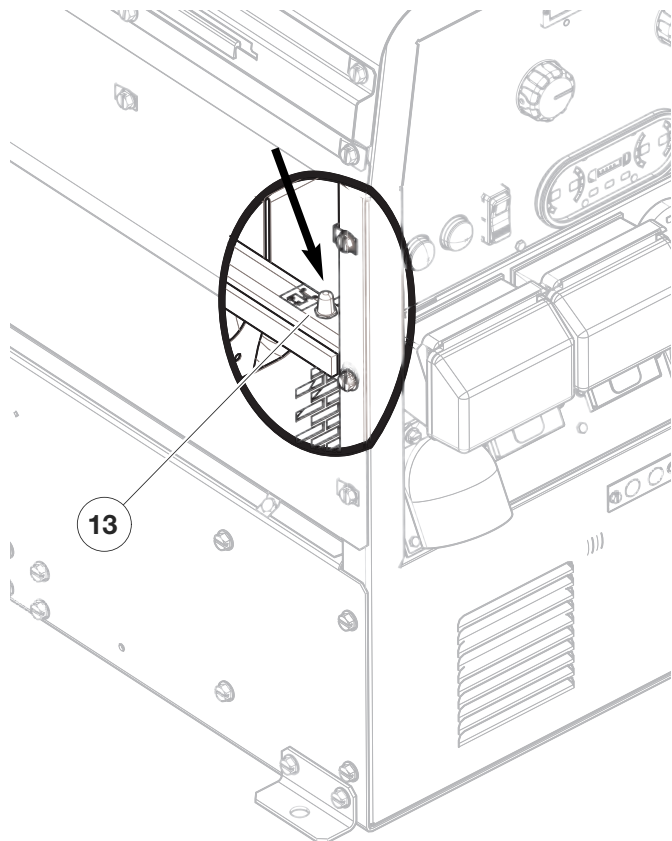
The operator must watch the fuel level closely to prevent running out of fuel and possibly having to bleed the system.

12e. BATTERY VOLTAGE INDICATOR

Displays the battery voltage and indicates that the charging system is functioning properly.

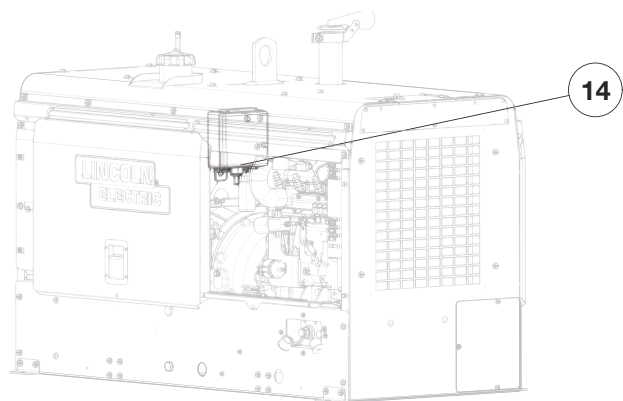
13. CIRCUIT BREAKER- For protection of Battery Charging Circuit.

FIGURE B.2 Circuit Breaker.



14. WIRELESS REMOTE RECEIVER BOX-

- ON/OFF toggle switch activates / deactivates wireless remote
- Houses wireless remote fuses



STARTING THE ENGINE

1. Remove all plugs connected to the AC power receptacles.
2. Set IDLER switch to AUTO.
3. Press Glow Plug Button and hold 15 to 20 seconds.
4. Set the RUN/STOP switch to RUN.
5. Press START button until the engine starts or for up to 10 seconds. Continue to hold the glow plug button for up to an additional 10 seconds.
6. Release the engine START button immediately when the engine starts.
7. The engine will run at high idle speed for approximately 12 seconds and then drop to low idle speed. Allow the engine to warm up at low idle for several minutes before applying a load and/or switching to high idle.
Allow a longer warm up time in cold weather.

NOTE: If the unit fails to start turn run/stop switch to off and repeat step 3 through step 7 after waiting 30 seconds.

 **CAUTION**

- Do not allow the starter motor to run continuously for more than 20 seconds.
- Do not push the START button while the engine is running because this can damage the ring gear and/or the starter motor.
- If the Engine Protection or Battery Charging Lights do “not” turn off shortly after starting the engine shut off the engine immediately and determine the cause.

NOTE: When starting for the first time, or after an extended period of time of not operating, it will take longer than normal to start because the fuel pump has to fill the fuel system. For best results, bleed the fuel system as indicated in Maintenance Section of this manual.

WELDER OPERATION

DUTY CYCLE

Duty Cycle is the percentage of time the load is being applied in a 10 minute period. For example a 60% duty cycle, represents 6 minutes of load and 4 minutes of no load in a 10 minute period.

ELECTRODE INFORMATION

The CROSS COUNTRY 300 can be used with a broad range of DC stick electrodes.

For any electrode the procedures should be kept within the rating of the machine. For information on electrodes and their proper application see (www.lincolnelectric.com) or the appropriate Lincoln publication.

STOPPING THE ENGINE

Remove all welding and auxiliary power loads and allow the engine to run at low idle speed for a few minutes to cool the engine.

STOP the engine by placing the RUN-STOP switch in the STOP position.

NOTE: A fuel shut off valve is located on the fuel pre-filter.

TYPICAL CROSS COUNTRY 300 FUEL CONSUMPTION		
Load	Kubota V1505 gal./hr (liters/hr)	Running Time for 11 gallons - (Hours)
LOW IDLE - NO LOAD 1350 R.P.M. (KUBOTA)	.42 (1.59)	27.6
HIGH IDLE - NO LOAD 1890 R.P.M. (KUBOTA)	.66 (2.50)	17.6
STICK WELD OUTPUT 150 AMPS @ 20 VOLTS	.91 (3.44)	12.8
STICK WELD OUTPUT 250 AMPS @ 24 VOLTS	1.07 (4.05)	10.8
STICK WELD OUTPUT 300 AMPS @ 32 VOLTS	1.42 (5.38)	8.2
10,000 WATTS	1.29 (4.88)	9.0
7,500 WATTS	1.12 (4.24)	10.4
5,000 WATTS	.92 (3.48)	12.6
2,500 WATTS	.79 (2.99)	14.7

NOTE: This data is for reference only. Fuel consumption is approximate and can be influenced by many factors, including engine maintenance, environmental conditions and fuel quality.

WIRELESS REMOTE CONTROL

K4166-2 and K4166-3 Cross Country 300 welders are equipped with a factory installed wireless remote control.

Cold Starting Procedure (See Figure B.3)

1. Toggle the ON/OFF toggle to the ON position to activate the remote. The STOP/IDLE switch on the control panel needs to be switched to the HIGH IDLE position to START the Cross Country 300 with the wireless remote.
The toggle switch on the receiver box is shipped from the factory in the OFF position. If it is desired to operate the Cross Country 300 using the controls on the front panel and not the wireless controls, leave the receiver toggle switch in the OFF position.
2. Push the START/CI button once on the Transmitter. The greeting screen will illuminate.
3. Push the START/CI button a second time. START will appear in the upper left hand corner of the screen. The glow plugs are pre heating . Wait 15 seconds for glow plugs to pre heat.
4. Push the START/CI button a third time to start the Cross Country 300. RUN will appear in the upper right hand side of the screen. The Cross Country 300 will start in the AUTO IDLE position and CI will display on the screen. To go to HIGH IDLE, push the CO button on the Transmitter. The STOP/IDLE switch on the control panel will remain in the HIGH idle position when using the wireless remote.
5. Push the increase button to test the increase function. Push the decrease button to test the decrease function.

Warm Starting Procedure (See Figure B.3)

1. Same as steps 1 and 2 from cold start procedure.
2. Push the START button on the transmitter a second time to energize the Receiver and Transmitter. The word START will appear in the upper right hand corner of the screen. Push G.P./SEL button to terminate the glow plugs.
3. Same as step 4 and 5 from cold start procedure.

Shut Down Procedure (See Figure B.3)

1. Push the STOP button on the Transmitter to shut the engine down.
2. Push the STOP/IDLE switch on the control panel to the OFF position.

Idle Control Operation (See Figure B.3)

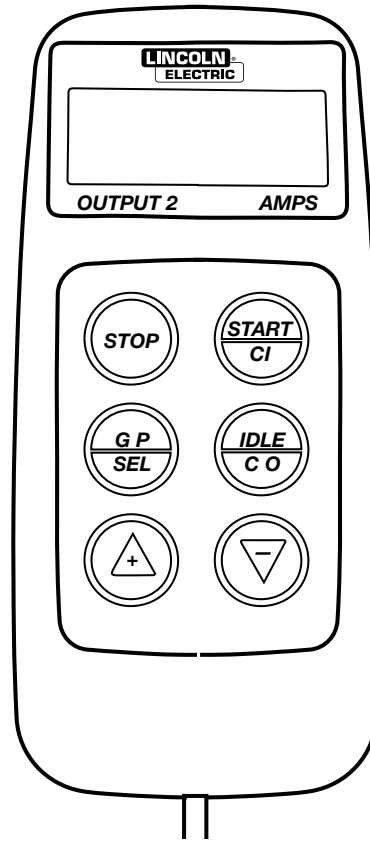
The unit will start and function in AUTO idle. To change the unit to HIGH idle, press the CO button on the transmitter one time. To return the unit to AUTO idle, press the CI button on the transmitter one time.

Output Adjustment (See Figure B.3)

The output of the welder can be adjusted using the up and down arrow buttons on the transmitter.

Only STICK mode output adjustment is controlled by the wireless remote.

FIGURE B.3



WARNING

This equipment is capable of remote starting and may start without warning if activated.



Always disconnect battery and turn the Receiver Box Toggle Switch to the "Off" position before servicing this equipment.



CORDSET REMOTE CONTROL

The CROSS COUNTRY 300 is equipped with a 6-pin connector. When in the CV-WIRE mode and when a remote control is connected to the 6-pin Connector, the auto-sensing circuit automatically switches the OUTPUT control from at the welder to remote control.

When in the STICK and TIG mode and when a remote control is connected to the 6-Pin connector, the output control is used to set the maximum and minimum current range of the remote when using a K4268-1 or K4330-1.

EXAMPLE: When the OUTPUT CONTROL on the welder is set to 200 amps the current range on the remote control will be Min.-200 amps, rather than the full Min.-Max. amps. Any current range that is less than the full range provides finer current resolution for more fine tuning of the output. The low-end set point knob allows the min. value to be increased to improve the adjustment resolution of the remote. By adjusting the low end set point to 80 amps for example, the range of the remote will now be 80-200 amps.

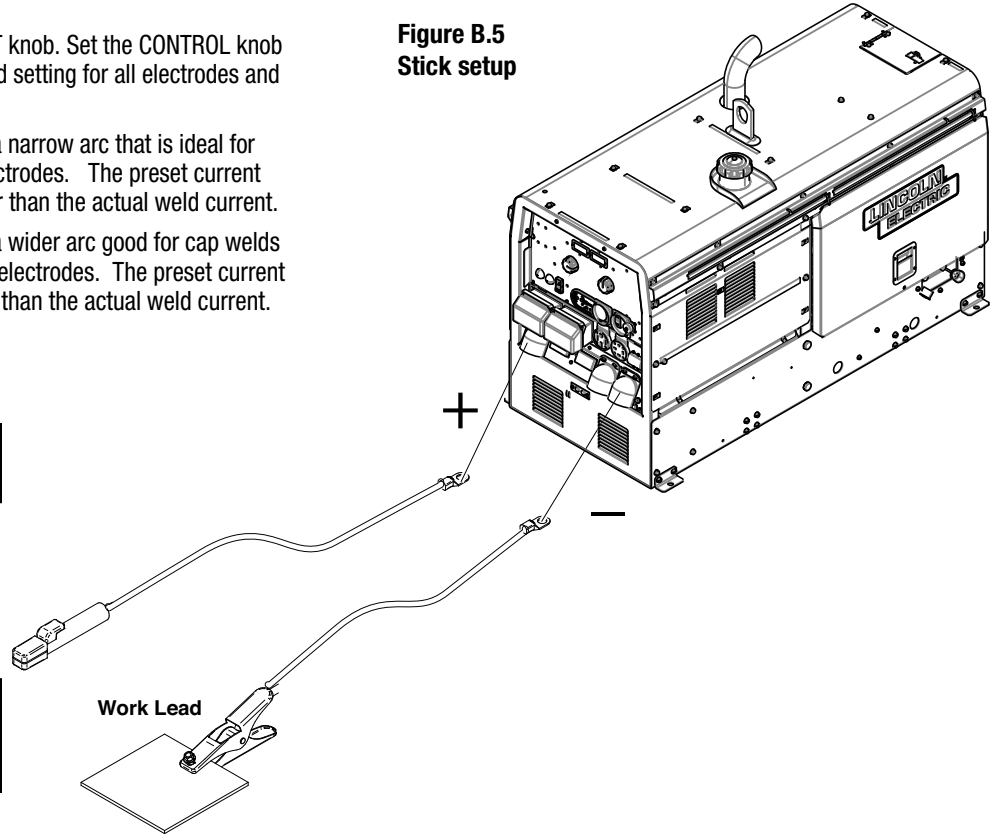
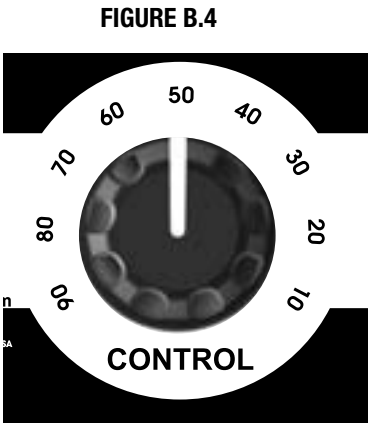
STICK WELDING

Set the preset current with the OUTPUT knob. Set the CONTROL knob to “50” for a normal arc. This is a good setting for all electrodes and applications. See Figure B.4

Adjust the CONTROL knob to “20” for a narrow arc that is ideal for welding root passes with cellulosic electrodes. The preset current may need to be adjusted slightly higher than the actual weld current.

Adjust the CONTROL knob to “80” for a wider arc good for cap welds on the bottom of a pipe with cellulosic electrodes. The preset current may need to be adjusted slightly lower than the actual weld current.

Figure B.5
Stick setup



WIRE WELDING-CV

Connect a wire feeder to the CROSS COUNTRY 300 according to the instructions in INSTALLATION INSTRUCTIONS Section.

The CROSS COUNTRY 300 in the CV-WIRE mode, permits it to be used with a broad range of flux cored wire (Innershield and Outershield) electrodes and solid wires for MIG welding (gas metal arc welding). The CONTROL knob does not change or have any effect on the arc when the unit is used in the CV mode.

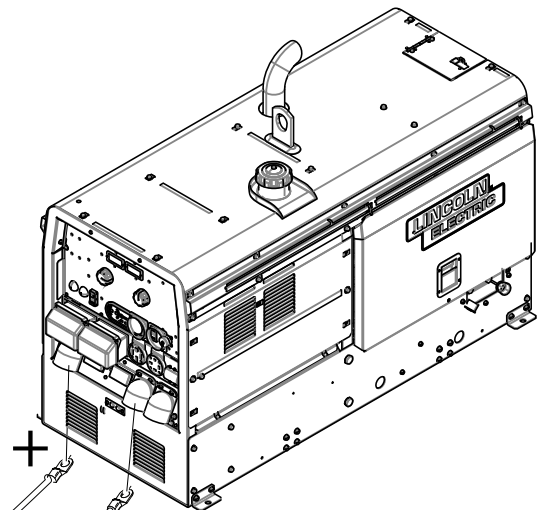


Figure B.6
Wire Welding-CV Setup

TIG WELDING

Before TIG welding begins, use the OUTPUT knob to set the current to the desired preset current.

If a remote control like a foot pedal is used, the preset current represents the maximum current with the foot pedal depressed. For example, if the preset current is set to 150 amps, the foot pedal will provide a range of 0-150 amps.

The CONTROL knob does nothing for TIG welding.

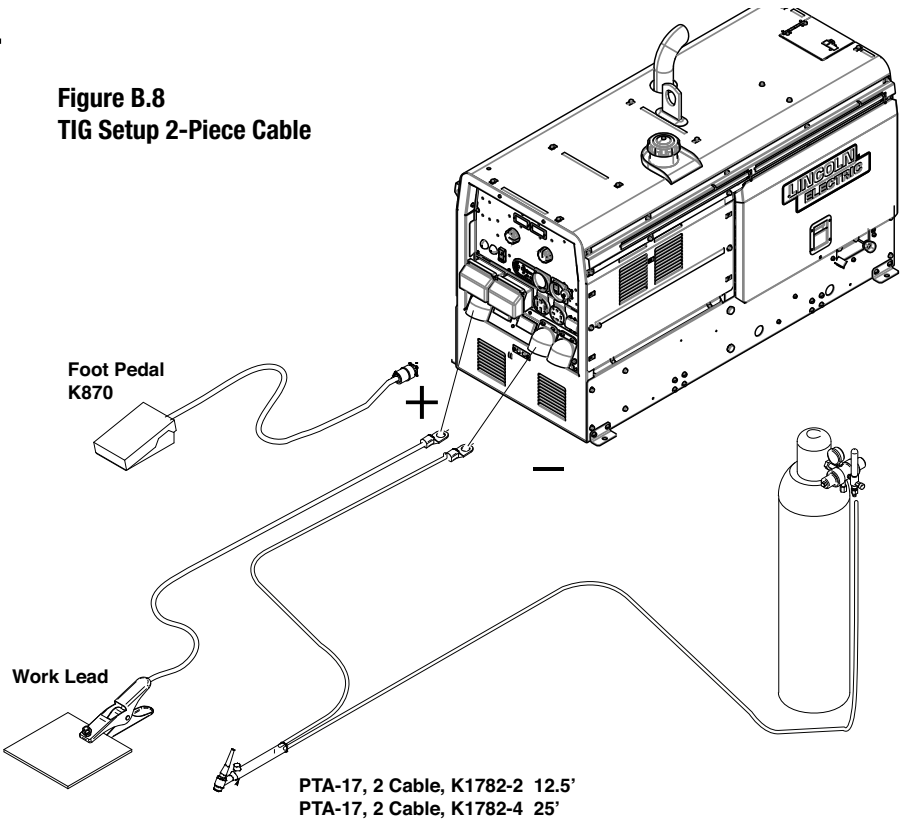
To make a weld, touch the tungsten to the work piece. Only a small amount of voltage and current will be present, so there is very little tungsten contamination. Gently lift the tungsten away from the work with a rocking motion. An arc will be established.

To STOP a weld, simply pull the TIG torch away from the work. When the arc voltage reaches approximately 30 Volts the arc will go out and the machine will reset the current to the Touch Start level.

To reinitiate the arc, retouch the tungsten to the work and lift. Alternatively, the weld can be stopped by releasing the Amptrol or arc start switch.

The Cross Country 300 can be used in a wide variety of DC TIG welding applications. In general the 'Touch Start' feature allows contamination free starting without the use of a Hi-frequency unit. If desired, the K930-2 TIG Module can be used with the Cross Country 300. The settings are for reference.

**Figure B.8
TIG Setup 2-Piece Cable**



**Figure B.7
TIG Setup 1-Piece Cable**

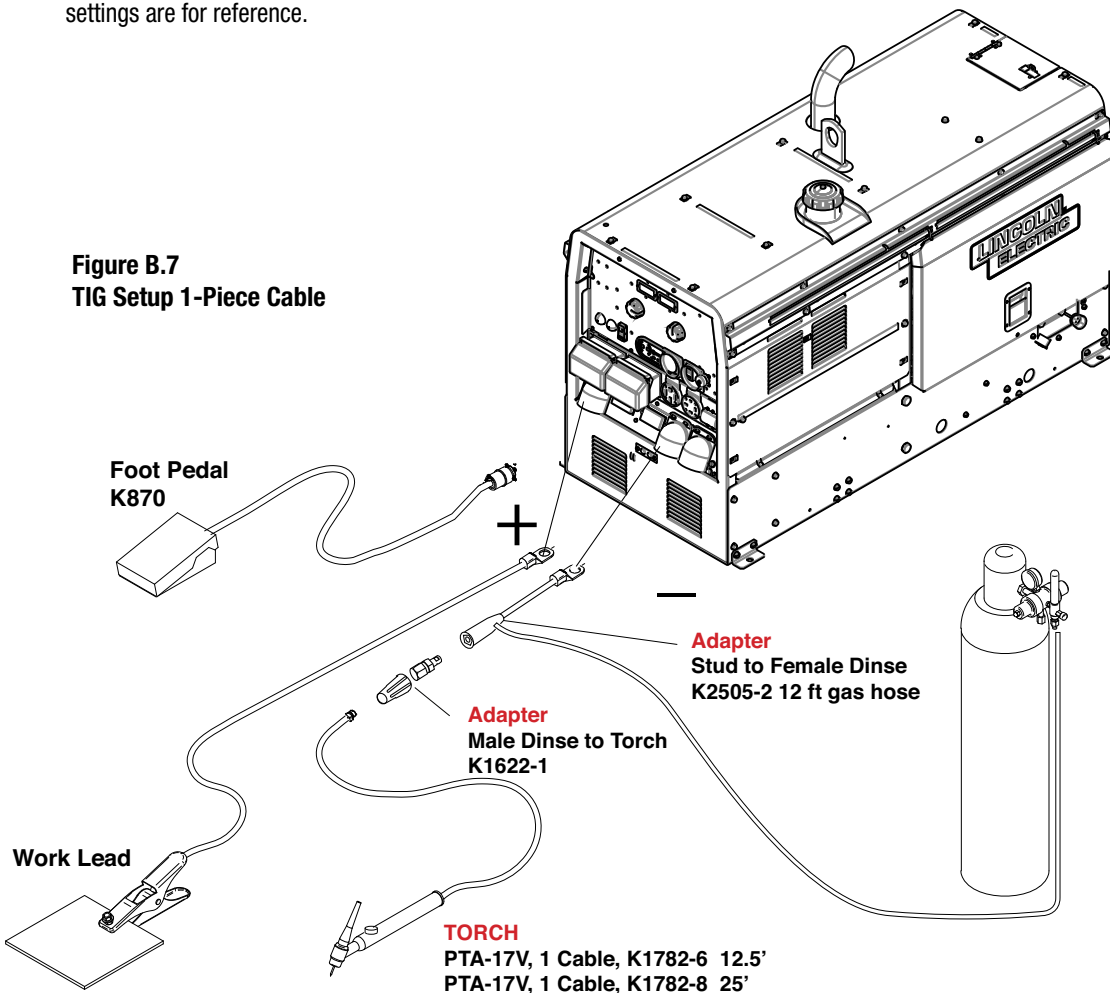


Figure B.9
TIG Setup - TIG Module + 1-Piece Cable

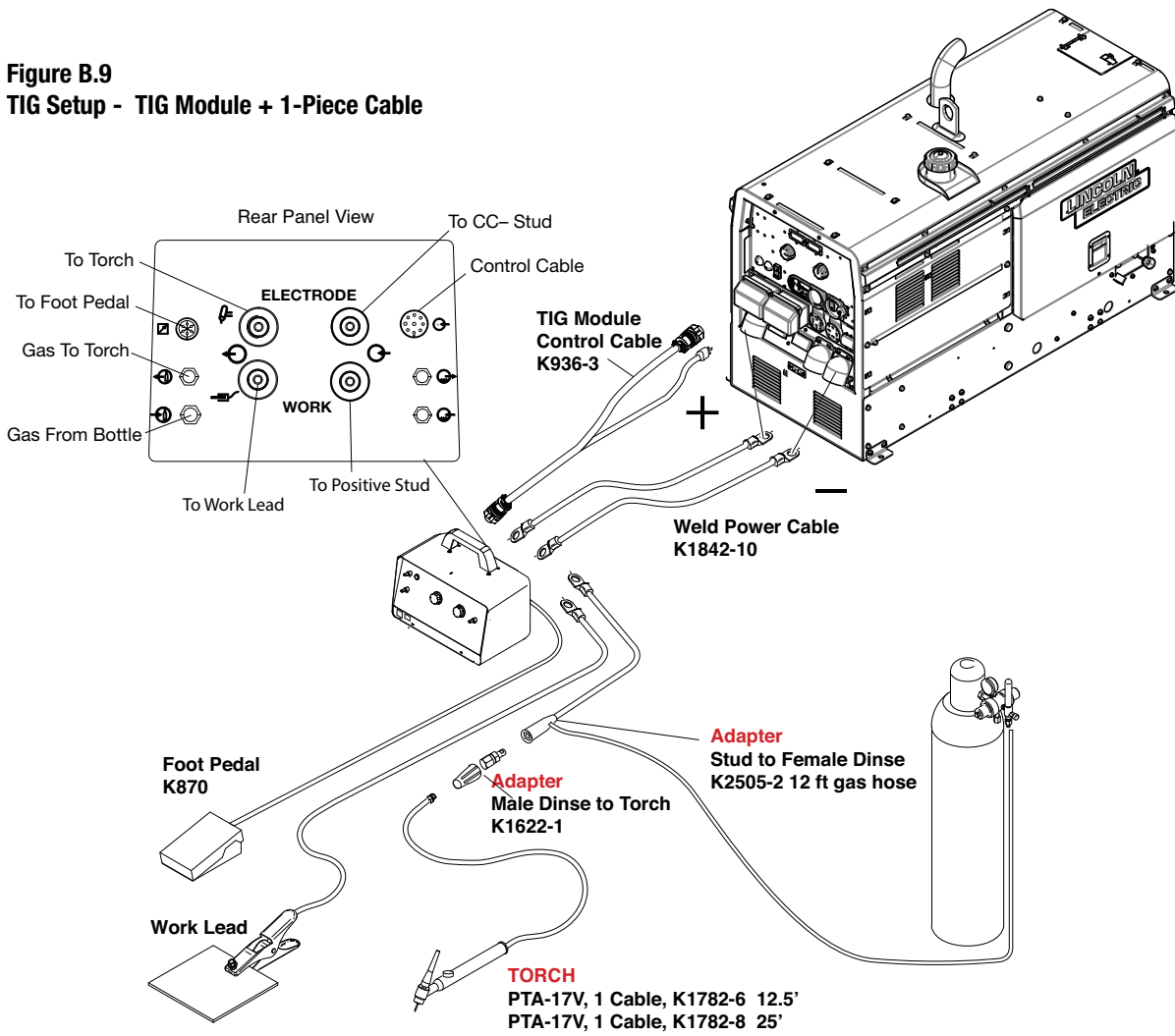


TABLE B.4

TYPICAL CURRENT RANGES (1) FOR TUNGSTEN ELECTRODES(2)						
Tungsten Electrode Diameter in. (mm)	DCEN (-)		DCEP (+)	Approximate Argon Gas Flow Flow Rate C.F.H. (l /min.)		TIG TORCH Nozzle Size (4), (5)
	1%, 2% Thoriated Tungsten	1%, 2% Thoriated Tungsten	1%, 2% Thoriated Tungsten	Aluminum	Stainless Steel	
.010 (.25)	2-15	(3)	(3)	3-8 (2-4)	3-8 (2-4)	#4, #5, #6
0.020 (.50)	5-20	(3)	(3)	5-10 (3-5)	5-10 (3-5)	
0.040 (1.0)	15-80	(3)	(3)	5-10 (3-5)	5-10 (3-5)	
1/16 (1.6)	70-150		10-20	5-10 (3-5)	9-13 (4-6)	#5, #6
3/32 (2.4)	150-250		15-30	13-17 (6-8)	11-15 (5-7)	#6, #7, #8
1/8 (3.2)	250-400		25-40	15-23 (7-11)	11-15 (5-7)	
5/32 (4.0)	400-500		40-55	21-25 (10-12)	13-17 (6-8)	#8, #10
3/16 (4.8)	500-750		55-80	23-27 (11-13)	18-22 (8-10)	
1/4 (6.4)	750-1000		80-125	28-32 (13-15)	23-27 (11-13)	

(1) When used with argon gas. The current ranges shown must be reduced when using argon/helium or pure helium shielding gases.

(2) Tungsten electrodes are classified as follows by the American Welding Society (AWS):

- Pure EWP
- 1% Thoriated EWTh-1
- 2% Thoriated EWTh-2

Though not yet recognized by the AWS, Ceriated Tungsten is now widely accepted as a substitute for 2% Thoriated Tungsten in AC and DC applications.

(3) DCEP is not commonly used in these sizes.

(4) TIG torch nozzle "sizes" are in multiples of 1/16ths of an inch:

- # 4 = 1/4 in. (6 mm)
- # 5 = 5/16 in. (8 mm)
- # 6 = 3/8 in. (10 mm)
- # 7 = 7/16 in. (11 mm)
- # 8 = 1/2 in. (12.5 mm)
- # 10 = 5/8 in. (16 mm)

(5) TIG torch nozzles are typically made from alumina ceramic. Special applications may require lava nozzles, which are less prone to breakage, but cannot withstand high temperatures and high duty cycles.

AUXILIARY POWER:

Start the engine and set the IDLER control switch to the desired operating mode. Full power is available regardless of the welding control settings providing no welding current is being drawn.

Simultaneous Welding and Auxiliary Power Loads

The auxiliary power ratings are with no welding load. Simultaneous welding and power loads are specified in the following table. The permissible currents shown assume that current is being drawn from either the 120 VAC or 240 VAC supply (not both at the same time).

TABLE B.6

CROSS COUNTRY 300 Simultaneous Welding and Power Loads							
Weld Amps	1 PHASE		3 PHASE		BOTH 1 & 3 PHASE		
	WATTS	AMPS	WATTS	AMPS	WATTS	AMPS	
0	10,000	42	11,000	27	10,000	-	
100	8300	35	8500	20	8300	-	
200	5300	22	5700	14	5300	-	
250	3500	15	3500	8	3500	-	
300	400	2	800	2	400	-	
400	0	0	0	0	0	0	

TABLE B.5 CROSS COUNTRY 300 Extension Cord Length Recommendations
(Use the shortest length extension cord possible sized per the following table.)

Current (Amps)	Voltage Volts	Load (Watts)	Maximum Allowable Cord Length in ft. (m) for Conductor Size											
			14 AWG		12 AWG		10 AWG		8 AWG		6 AWG		3004 AWG	
15	120	1800	30	(9)	40	(12)	75	(23)	125	(38)	175	(53)	225	(91)
20	120	2400			30	(9)	50	(15)	88	(27)	138	(42)	600	(69)
15	240	3600	60	(18)	75	(23)	150	(46)	225	(69)	350	(107)	450	(183)
20	240	4800			60	(18)	100	(30)	175	(53)	275	(84)	225	(137)
44	240	9500					50	(15)	90	(27)	150	(46)		(69)

Conductor size is based on maximum 2.0% voltage drop.

FIELD INSTALLED OPTIONS / ACCESSORIES

K2641-2 FOUR WHEELED STEERABLE YARD TRAILER - For in plant and yard towing. Comes standard with a Duo-Hitch™, a 2" Ball and Lunette Eye combination Hitch.

K2636-1 TRAILER - Two-wheeled trailer with optional fender and light package. For highway use, consult applicable federal, state, and local laws regarding possible additional requirements. Comes standard with a Duo-Hitch™, a 2" Ball and Lunette Eye combination hitch. Order:

K2636-1 Trailer

K2639-1 Fender & Light Kit

K2640-1 Cable Storage Rack

K1898-1 SPARK ARRESTOR - Easily mounts to standard muffler.

K704 ACCESSORY SET - Includes 35 ft. (10m) of electrode cable and 30 ft. (9.1m) of work cable, headshield, work clamp electrode holder. Cables are rated at 400 amps, 100% duty cycle.

K4268-1 125 ft (30.4m) DETACHABLE REMOTE CONTROL w/ 120V RECEPTACLE - Portable control provides same dial range as the output control on the welder. Second adjustment knob sets the low end setpoint for increased resolution. Has a 6 pin plug for easy connection to the welder and 120V receptacle.

K4330-1 125 ft (30.4m) DETACHABLE REMOTE CONTROL - Portable control provides same dial range as the output control on the welder. Second adjustment knob sets the low end setpoint for increased resolution. Has a 6-pin plug for easy connection to the welder.

K802N POWER PLUG KIT - Provides four 120 volt plugs rated at 20 amps each and one dual voltage, full KVA plug rated at 120/240 volts, 50 amps.

K802R POWER PLUG KIT - Provides four 120 volt plugs rated at 15 amps each and one dual voltage, full KVA plug rated at 120/240 volts, 50 amps.

T12153-9 50 AMP, 120/240V POWER PLUG (1-Phase)

T12153-10 50 AMP, 240V POWER PLUG (3-Phase)

K1816-1 FULL KVA ADAPTER KIT - Plugs into the 120/240V NEMA 14-50R receptacle on the case front (which accepts 4-prong plugs) and converts it to a NEMA 6-50R receptacle, (which accepts 3-prong plugs.) For connection of Lincoln equipment with NEMA 6-50 Plug.

K4212-1 VRD Kit - Provides additional safety in the CV-Wire Welding mode for environments with a higher risk of electrical shock. Reduces the open circuit voltage at the output terminals when not welding.

K4213-1 Cold Weather Kit - For starting and operation in extreme cold weather conditions down to -40° F (-40°C) (with use of 0W40 synthetic oil and arctic fuel). Includes 120V AC pan heater and radiator grill tarp.

WIRE FEEDER OPTIONS**K2613-5 LN-25 PIPE PORTABLE WIRE FEEDER -**

The MAXTRAC® wire drive enhances performance, while the replacement case, and many other upgrade options that can be installed in less than five minutes aid in the serviceability.

KP1697-5/64 Drive Roll Kit- Includes: 2 polished U groove drive rolls, outer wire guide and inner wire guide for solid core wire. (Used on LN-25 Pro)

KP1697-068 Drive Roll Kit- Includes: 2 polished U groove drive rolls, outer wire guide and inner wire guide for solid core wire. (Used on LN-25 Pro)

KP1696-1 Drive Roll Kit- Includes: 2 V groove drive rolls and inner wire guide for Steel Wires. (Used on LN-25 Pro)

K449 LN-25 - Includes internal contactor for across the arc operation (no control cable). Provides "cold" electrode until gun trigger is pressed. Includes gas solenoid.

TIG OPTIONS**K1783-9 Pro -Torch® PTA-26V TIG Torch**

Air Cooled 200 amp torch (2 piece) equipped with valve for gas flow control. 25 ft. (7.6m) length.

KP509 Magnum Parts Kit for PTA-26V TIG Torch

Magnum Parts Kit provides all the torch accessories you need to start welding. Parts kit provides collets, collet bodies, a black cap, alumina nozzles and tungstens in a variety of sizes, all packaged in an easy to carry reclosable sack.

K870 Foot Amptrol®**K963-3 Hand Amptrol®****K2535-1 Precision TIG 225 Ready-Pak(For AC TIG)****K2350-2 Invertec® V205-T AC/DC One-Pak™ Package (For AC TIG)****PLASMA CUTTING****K2807-1 Tomahawk® 625**

Cuts metal using the AC generator power from the engine driven welder. Requires the T12153-9 Full KVA Power Plug (1-phase).

SAFETY PRECAUTIONS

WARNING

- Have qualified personnel do all maintenance and troubleshooting work.
- Turn the engine off before working inside the machine or servicing the engine.
- Remove guards only when necessary to perform maintenance and replace them when the maintenance requiring their removal is complete. If guards are missing from the machine, obtain replacements from a Lincoln Distributor. (parts.lincolnelectric.com)







Read the Safety Precautions in the front of this manual and in the Engine Owner's Manual before working on this machine.

Keep all equipment safety guards, covers, and devices in position and in good repair. Keep hands, hair, clothing, and tools away from the gears, fans, and all other moving parts when starting, operating, or repairing the equipment.


ROUTINE MAINTENANCE

At the end of each day's use, refill the fuel tank to minimize moisture condensation in the tank. Running out of fuel tends to draw dirt into the fuel system. Also, check the crankcase oil level and add oil if indicated.

FIGURE D.1

EVERY DAY OR EVERY 8 HOURS						ENGINE SERVICE ITEMS KUBOTA V1505 (22 HP) GENUINE PARTS, SERVICE, DISTRIBUTOR USA (800) 532-9808 CANADA (905) 294-7477 www.kubotaengine.com		
FIRST SERVICE (50 HOURS)								
EVERY 100 HOURS OR 3 MONTHS								
EVERY 200 HOURS OR 4 MONTHS								
EVERY 400 HOURS OR 9 MONTHS								
EVERY 500 HOURS OR ANNUALLY								
EVERY 1000 HOURS OR 2 YEARS								
ENGINE SERVICE (NOTE 2)								
MAINTENANCE ITEM						TYPE, QTY. OR SERVICE NOTE		
	I					Coolant level	Check at overflow bottle.	
					C	Radiator core		
						R	Coolant	50/50 Mixture ethylene glycol/water
							Engine oil level	
	I					Engine oil (1)	6.3 quarts, 6.0L (including filter)	
	R	R				Engine oil filter	Kubota# HH160-32093/LECO# S30694-1 *	
	R	R				Water separator / fuel sedimenter	Kubota# 15831-43380/LECO# S30694-3 *	
				R		Fuel filter (in-line)	Kubota# 12581-43012/LECO# S30694-2 *	
				R		Air filter element	Donaldson # P822686/LECO#M19801-1A *	
			I		R	Fan belt	Kubota# 16282-97010 (37.5'')/LECO#S30694-4	
	I	I				Battery	BCI Group 34	
					I			

I = Inspect C = Clean R = Replace (1) Consult Engine Operators Manual for oil recommendations.

 See Engine Manual for complete engine care. Give Engine Specification and Serial Number when ordering parts. These preventive maintenance periods apply to average conditions of operation. If necessary use shorter periods.

* Items Included in K3599-1 engine service kit

S26073 VM

ENGINE OIL CHANGE

Drain the engine oil while the engine is warm to assure rapid and complete draining. It is recommended that each time the oil is changed the oil filter be changed as well.

- Be sure the unit is off. Disconnect the negative battery cable to ensure safety.
- Locate oil drain hose and valve in bottom of base and pull through the hole in the battery access panel on the welder.
- Remove the cap from the drain valve. Push valve in and twist counterclockwise. Pull to open and drain the oil into a suitable container for disposal.
- Close the drain valve by pushing in and twisting clockwise. Replace the cap.
- Re-fill the crankcase to the upper limit mark on the dipstick with the recommended oil (see engine operation manual OR engine service items decal OR below). Replace and tighten the oil filler cap securely.
- Push oil drain hose and valve back into unit, re-connect negative battery cable, and close doors and engine top cover before restarting unit. Wash your hands with soap and water after handling used motor oil. Please dispose of used motor oil in a manner that is compatible with the environment. We suggest you take it in a sealed container to your local service station or recycling center for reclamation. DO NOT throw it in the trash; pour it on the ground or down a drain.

Use motor oil designed for diesel engines that meets requirements for API service classification CC/CD/CE/CF/CF-4/CG-4 or CH-4.

ACEA E1/E2/E3. Always check the API service label on the oil container to be sure it includes the letters indicated. (Note: An S-grade oil must not be used in a diesel engine or damage may result. It IS permissible to use an oil that meets S and C grade service classifications.)

SAE 10W30 is recommended for general, all temperature use, 5F to 104F (-15C to 40C).

See engine owner's manual for more specific information on oil viscosity recommendations.

OIL FILTER CHANGE

- Drain the oil.
- Remove the oil filter with an oil filter wrench and drain the oil into a suitable container. Discard the used filter. Note: Care should be taken during filter removal to not disrupt or damage in any way the fuel lines.
- Clean the filter mounting base and coat the gasket of the new filter with clean engine oil.
- Screw the new filter on by hand until the gasket contacts the mounting base. Using an oil filter wrench, tighten the filter an additional 1/2 to 7/8 of a turn.
- Refill the crankcase with the specified amount of the recommended engine oil. Reinstall the oil filler cap and tighten securely.
- Start the engine and check for oil filter leaks.
- Stop the engine and check the oil level. If necessary, add oil to the upper limit mark on the dipstick.



WARNING

Never use gasoline or low flash point solvents for cleaning the air cleaner element. A fire or explosion could result.



CAUTION

Never run the engine without the air cleaner. Rapid engine wear will result from contaminants, such as dust and dirt being drawn into the engine.

AIR CLEANER

The diesel engine is equipped with a dry type air filter. Never apply oil to it. Service the air cleaner as follows:

Replace the element every 500 hours of operation. Under dusty conditions, replace sooner.

Service Instructions

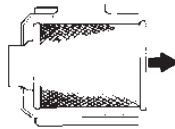
Single- and Two-Stage Engine Air Cleaners

1 Remove the Filter



Rotate the filter while pulling straight out.

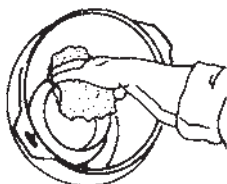
Unfasten or unlatch the service cover. Because the filter fits tightly over the outlet tube to create the critical seal, there will be some initial resistance, similar to breaking the seal on a jar. Gently move the end of the filter back and forth to break the seal then rotate while pulling straight out. Avoid knocking the filter against the housing.



If your air cleaner has a safety filter, replace it every third primary filter change. Remove the safety filter as you would the primary filter. Make sure you cover the air cleaner outlet tube to avoid any unfiltered contaminant dropping into the engine.

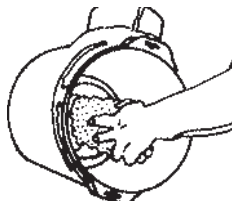
2 Clean Both Surfaces of the Outlet Tube and Check the Vacuator™ Valve

Use a clean cloth to wipe the filter sealing surface and the inside of the outlet tube. Contaminant on the sealing surface could hinder an effective seal and cause leakage. Make sure that all contaminant is removed before the new filter is inserted. Dirt accidentally transferred to the inside of the outlet tube will reach the engine and cause wear. Engine manufacturers say that it takes only a few grams of dirt to "dust" an engine! Be careful not to damage the sealing area on the tube.



Outer edge of the outlet tube

Wipe both sides of the outlet tube clean.



Inner edge of the outlet tube

If your air cleaner is equipped with a Vacuator Valve

Visually check and physically squeeze to make sure the valve is flexible and not inverted, damaged or plugged.



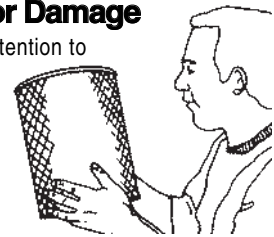
3 Inspect the Old Filter for Leak Clues

Visually inspect the old filter for any signs of leaks. A streak of dust on the clean side of the filter is a telltale sign. Remove any cause of leaks before installing new filter.



4 Inspect the New Filter for Damage

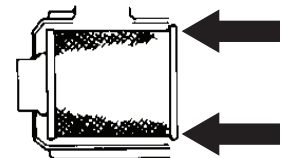
Inspect the new filter carefully, paying attention to the inside of the open end, which is the sealing area. NEVER install a damaged filter. A new Donaldson radial seal filter may have a dry lubricant on the seal to aid installation.



5 Insert the New Radial Seal Filter Properly

If you're servicing the safety filter, this should be seated into position before installing the primary filter.

Insert the new filter carefully. Seat the filter by hand, making certain it is completely into the air cleaner housing before securing the cover in place.



The critical sealing area will stretch slightly, adjust itself and distribute the sealing pressure evenly. To complete a tight seal, apply pressure by hand at the outer rim of the filter, not the flexible center. (Avoid pushing on the center of the urethane end cap.) No cover pressure is required to hold the seal. NEVER use the service cover to push the filter into place! Using the cover to push the filter in could cause damage to the housing, cover fasteners and will void the warranty.

If the service cover hits the filter before it is fully in place, remove the cover and push the filter (by hand) further into the air cleaner and try again. The cover should go on with no extra force.

Once the filter is in place, secure the service cover.



Caution

NEVER use the service cover to push the filter into place! Using the cover to push the filter in could cause damage to the housing, cover fasteners and will void the warranty.



6 Check Connectors for Tight Fit

Make sure that all mounting bands, clamps, bolts, and connections in the entire air cleaner system are tight. Check for holes in piping and repair if needed. Any leaks in your intake piping will send dust directly to the engine!

COOLING SYSTEM**WARNING****HOT COOLANT can burn skin.**

- Do not remove cap if radiator is hot.

Check the coolant level by observing the level in the radiator and recovery bottle. Add 50/50 antifreeze / water solution if the level is close to or below the "LOW" mark. do not fill above the "FULL" mark. Remove radiator cap and add coolant to radiator. Fill up to the top of the tube in the radiator filler neck which includes a connecting hose coming from the thermostat housing.

To drain the coolant, open the valve at the bottom of the radiator. Open the radiator cap to allow complete drainage. (Tighten the valve and refill with a 50/50 antifreeze/water solution.) Use an automotive grade (low silicate) ethylene glycol antifreeze. The cooling system capacity is 4.8 qts. (4.5L.). Squeeze upper and lower radiator hoses while filling to bleed air from system coolant. Replace and tighten the radiator cap.

CAUTION

Always premix the antifreeze and clean tap water before adding to the radiator. It is very important that a precise 50/50 solution be used with this engine year round. This gives proper cooling during hot weather and freezing protection to -34° F (-37° C).

Cooling solution exceeding 50% ethylene glycol can result in engine overheating and damage to the engine. Coolant solution must be premixed before adding to radiator.

Periodically remove the dirt from the radiator fins.

Periodically check the fan belt and radiator hoses. Replace if signs of deterioration are found.

TIGHTENING THE FAN BELT

If the fan belt is loose, the engine can overheat and the battery lose its charge. Check tightness by pressing on the belt midway between the pulleys. It should deflect about .25 in.(6.4 mm) under a load of 20 lbs.(9 Kg).

FUEL

DIESEL FUEL ONLY-Low sulphur fuel or ultra low sulphur fuel in U.S.A. and Canada.

At the end of each day's use, refill the fuel tank to minimize moisture condensation and dirt contamination in the fuel line. Do not overfill; leave room for the fuel to expand.

Use only fresh No. 2D diesel fuel, the use of No. 1D diesel fuel is recommended in place of No. 2D at temperatures below 23°F (-5°C). Do not use kerosene.

See the Engine Operator's Manual for instructions on replacing the fuel filter.

BLEEDING THE FUEL SYSTEM

You may need to bleed air from the fuel system if the fuel filter or fuel lines have been detached, the fuel tank has been ran empty or after periods of long storage. It is recommended that the fuel shutoff valve be closed during periods of non-use.

WARNING

To avoid personal injury, do not bleed a hot engine. This could cause fuel to spill onto a hot exhaust manifold, creating a danger of fire.

Bleed the fuel system as follows:

1. Fill the fuel tank with fuel.
2. Open the fuel shut off valve.
3. Open bleed fitting on fuel sedimenter, the sedimenter should gravity fill itself with fuel.
4. Tighten the bleed fitting on fuel sedimenter after sedimenter fills with fuel.
5. Loosen bleed fitting on the fuel injector manifold.
6. Operate hand priming lever until fuel comes out the bleed screw on the injector manifold. This could take 20-30 seconds of rapid operation of the priming lever. Tighten bleed fitting on injector manifold.
7. Follow normal STARTING procedures until engine starts.

FUEL FILTER

1. Check the fuel filter and fuel pre-filter for water accumulation or sediment.
2. Replace the fuel filter if it is found with excessive water accumulation or sediment. Empty fuel pre-filter.

ENGINE ADJUSTMENT

Adjustments to the engine are to be made only by a Lincoln Service Center or an authorized Field Service Shop.

OVERSPEED IS HAZARDOUS

The maximum allowable high idle speed for this machine is 1890 RPM no load. Do NOT tamper with governor components or setting or make any other adjustments to increase the maximum speed. Severe personal injury and damage to the machine can result if operated at speeds above maximum.

BATTERY MAINTENANCE

To access the battery, remove the battery tray from the front of the machine with 3/8" nut driver or flat head screw driver. Pull the tray out of machine far enough to disconnect the negative and then positive battery cables. The tray can then be tilted and lifted to remove the entire tray and battery from the machine for easy service.

WARNING



GASES FROM BATTERY can explode.

- Keep sparks, flame and cigarettes away from battery.

To prevent EXPLOSION when:

- **INSTALLING A NEW BATTERY** — disconnect negative cable from old battery first and connect to new battery last.
- **CONNECTING A BATTERY CHARGER** — remove battery from welder by disconnecting negative cable first, then positive cable and battery clamp. When reinstalling, connect negative cable last.

Keep well ventilated.

- **USING A BOOSTER** — connect positive lead to battery first then connect negative lead to negative battery lead at engine foot.

BATTERY ACID can burn eyes and skin.



- Wear gloves and eye protection and be careful when working near battery.
- Follow instructions printed on battery.

CLEANING THE BATTERY

Keep the battery clean by wiping it with a damp cloth when dirty. If the terminals appear corroded, disconnect the battery cables and wash the terminals with an ammonia solution or a solution of 1/4 pound (0.1113 kg) of baking soda and 1 quart (0.9461) of water. Be sure the battery vent plugs (if equipped) are tight so that none of the solution enters the cells.

After cleaning, flush the outside of the battery, the battery compartment, and surrounding areas with clear water. Coat the battery terminals lightly with petroleum jelly or a non-conductive grease to retard corrosion.

Keep the battery clean and dry. Moisture accumulation on the battery can lead to more rapid discharge and early battery failure.

CHECKING THE ELECTROLYTE LEVEL

If battery cells are low, fill them to the neck of the filler hole with distilled water and recharge. If one cell is low, check for leaks.

CHARGING THE BATTERY

When you charge, jump, replace, or otherwise connect battery cables to the battery, be sure the polarity is correct. Improper polarity can damage the charging circuit. The CROSS COUNTRY 300 positive (+) battery terminal has a red terminal cover.

If you need to charge the battery with an external charger, disconnect the negative cable first, then the positive cable before you attach the charger leads. After the battery is charged, reconnect the positive battery cable first and the negative cable last. Failure to do so can result in damage to the internal charger components.

Follow the instructions of the battery charger manufacturer for proper charger settings and charging time.

SERVICING OPTIONAL SPARK ARRESTOR

Clean every 100 hours.

WELDER / GENERATOR MAINTENANCE

STORAGE: Store in clean, dry protected areas.

CLEANING: Blow out the generator and controls periodically with low pressure air. Do this at least once a week in particularly dirty areas.

WARNING

- **MUFFLER MAY BE HOT**
- **ALLOW ENGINE TO COOL BEFORE INSTALLING THE SPARK ARRESTER!**
- **DO NOT OPERATE ENGINE WHILE INSTALLING THE SPARK ARRESTER!**

BRUSH REMOVAL AND REPLACEMENT: It's normal for the brushes and slip rings to wear and darken slightly. Inspect the brushes when a generator overhaul is necessary.

CAUTION

Do not attempt to polish slip rings while the engine is running.

WARNING

Service and Repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions.

GFCI TESTING AND RESETTING PROCEDURE

The GFCI should be properly tested at least once every month or whenever it is tripped. To properly test and reset the GFCI:

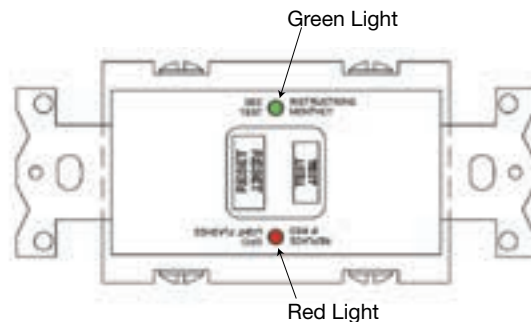
- If the GFCI has tripped, first carefully remove any load and check it for damage.
- If the equipment has been shut down, it must be restarted.
- The equipment needs to be operating at high idle speed and any necessary adjustments made on the control panel so that the equipment is providing at least 80 volts to the receptacle input terminals.
- The circuit breaker for this receptacle must not be tripped. Reset if necessary.
- Push the "Reset" button located on the GFCI. This will assure normal GFCI operation.

- Plug a night-light (with an "ON/OFF" switch) or other product (such as a lamp) into the Duplex receptacle and turn the product "ON".
- Push the "Test" button located on the GFCI. The night-light or other product should go "OFF".
- Push the "Reset" button, again. The light or other product should go "ON" again.

If the light or other product remains "ON" when the "Test" button is pushed, the GFCI is not working properly or has been incorrectly installed (miswired). If your GFCI is not working properly, contact a qualified, certified electrician who can assess the situation, rewire the GFCI if necessary or replace the device.

For GFCI Models that have the appearance as shown in Figure D.2, please use the following information and troubleshooting guide listed below. For all other GFCI models, please use the GFCI testing and resetting procedure listed previously.

FIGURE D.2



- The GFCI automatically monitors ground fault circuit interrupting functionality every (3) hours or less, and it also automatically tests within (5) seconds of power to the device.
- If the GFCI device can no longer provide GFCI protection it will deny power and provide a visual indication that it no longer can provide protection.

TROUBLESHOOTING GUIDELINES:

- If the line conductor is incorrectly wired to the load terminal, power to the receptacle will be denied. This includes initial installation and any subsequent reinstallations.
- Visual indicators: Green LED on represents power at the face of the receptacle; solid Red LED on indicates a trip condition and load is off. A flashing red LED indicates that the GFCI is no longer functioning and needs replaced.
- Reverse Wire Safety Feature: The GFCI will not have power at both the face and downstream if the line and load are reverse wired. Additionally, the unit will not be able to reset under a reversed wiring condition. If the line conductor is incorrectly wired to the load terminal, power to the receptacle will be denied. This includes initial installation and any subsequent reinstallations.
- (GFCI no longer functioning): A rapid flashing red LED will indicate that the unit can no longer provide ground fault protection. This indication will occur regardless of the specific test mode that is being conducted, automatic or manual.
- If your GFCI is no longer working properly, contact a qualified, certified electrician who can assess the situation and rewire the GFCI if necessary or replace the device.

HOW TO USE TROUBLESHOOTING GUIDE

WARNING

Service and Repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

Warranty work performed on the engine contained in this machine, if not billable to the engine manufacturer, should be pre-approved by calling The Lincoln Electric Company at 888-935-3877

This Troubleshooting Guide is provided to help you locate and repair possible machine malfunctions. Simply follow the three-step procedure listed below.

Step 1. LOCATE PROBLEM(SYMPTOM).

Look under the column labeled "PROBLEM (SYMPTOMS)". This column describes possible symptoms that the machine may exhibit. Find the listing that best describes the symptom that the machine is exhibiting.

Step 2. POSSIBLE CAUSE.

The second column labeled "POSSIBLE CAUSE" lists the obvious external possibilities that may contribute to the machine symptom.

Step 3. RECOMMENDED COURSE OF ACTION

This column provides a course of action for the Possible Cause, generally it states to contact your local Lincoln Authorized Field Service Facility.

If you do not understand or are unable to perform the Recommended Course of Action safely, contact your local Lincoln Authorized Field Service Facility.



If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your Lincoln Authorized Service Facility for technical troubleshooting assistance before you proceed.

WWW.LINCOLNELECTRIC.COM/LOCATOR

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
Major Physical or Electrical Damage is Evident.	1. Contact your local Lincoln Authorized Field Service Facility.	If all recommended possible areas of misadjustment have been checked and the problem persists, Contact your local Lincoln Authorized Field Service Facility.
Engine will not "crank".	1. Battery is low, Charge Battery. 2. Loose battery cable connections. Inspect, clean and tighten terminals. 3. Faulty engine starter motor. Contact authorized local Engine Service Shop.	
Engine will "crank" but not start.	1. Fuel shut off valve on Main Fuel Filter in the OFF position. Open valve (vertical) position of handle. 2. Fuel Filters dirty/clogged. Check and replace main filter element and/or Inline Fuel Filter. 3. Out of fuel. Fill tank and bleed fuel system. 4. High coolant temperature or low oil pressure. (indicator lights lit) Check oil and coolant levels. Fill if required. Check for loose or broken fan belt. 5. ON/OFF switch on for more then 60 seconds before starting. The ON/OFF switch will need to be switched off and turned back on. 6. Faulty fuel shutdown solenoid. Check that shutdown solenoid is functioning properly and not binding / contact authorized engine service shop. 7. Faulty fuel pump. Check for fuel flow through filters. Contact authorized local Engine Service Shop.	
Engine shuts down shortly after starting.	1. High coolant temperature or low oil pressure. (indicator light lit) Change oil and oil filters and fill to proper level. Check and fill coolant level. Check for loose or broken fan belt. Start engine and look for leaks. 2. Faulty oil pressure switch or other engine component. Contact authorized local Engine Service Shop. 3. Faulty Idler/Protection Board.	



If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your Lincoln Authorized Service Facility for technical troubleshooting assistance before you proceed.

WWW.LINCOLNELECTRIC.COM/LOCATOR

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
Engine shuts down while under a load.	<ol style="list-style-type: none"> 1. High radiator coolant temperature. Reduce load if it is exceeding machine rating. Add coolant to system if low. Clean fins on radiator if dirty. Tighten fan belt if loose. Remove objects blocking or close to intake openings on both sides of base and exhaust end (case back). 	<p>If all recommended possible areas of mis-adjustment have been checked and the problem persists, Contact your local Lincoln Authorized Field Service Facility.</p>
Engine runs rough.	<ol style="list-style-type: none"> 1. Dirty fuel or air filters. Inspect and clean/replace filters as needed. Inspect and clean/replace filters as needed. 2. Water in fuel. If water found in tank. Empty fuel tank and refill then purge fuel lines. 	
Battery does not stay charged. Engine alternator trouble light is on while machine is running.	<ol style="list-style-type: none"> 1. Faulty battery. Replace. 2. Loose connections at battery or alternator. Clean and tighten connections. 3. Faulty engine alternator or charger module. Consult authorized Engine Service Shop. 	
Engine will not idle down to low speed.	<ol style="list-style-type: none"> 1. Idler switch in High idle position. Set switch to Auto. 2. External load on welder or auxiliary power. Remove all external loads. 3. Faulty PC board or idler solenoid. 	
Engine will not go to high idle when attempting to weld.	<ol style="list-style-type: none"> 1. Poor work lead connection to work. Make sure work clamp is tightly connected to clean base metal. 2. "Contactor" switch is in wrong position. Set to "Welding On" when welding without a control cable. Refer to Operations chapter for proper use of this switch. 3. Faulty PC board. Low idle speed set to low. 	



If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your Lincoln Authorized Service Facility for technical troubleshooting assistance before you proceed.

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Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
Engine will not go to high idle when using auxiliary power.	<ol style="list-style-type: none"> 1. Auxiliary power load is less than 100 watts. Idler may not respond with less than a 100 watt load. Set idler to "High". 2. Faulty PC board.(Control or Idler). 	<p>If all recommended possible areas of mis-adjustment have been checked and the problem persists, Contact your local Lincoln Authorized Field Service Facility.</p>
Engine will not go to high idle under weld or auxiliary loading.	<ol style="list-style-type: none"> 1. Faulty idler solenoid. Check for bent linkage or broken spring. 2. Faulty PC board.(Control or Idler). 	
Engine does not develop full power. Engine runs rough.	<ol style="list-style-type: none"> 1. Fuel filter clogged, Replace. 2. Air filter clogged, clean or replace. 3. High idle setting incorrect, check and adjust if required. 4. Valves out of adjustment. 5. Fuel contaminated with water or sediment. Check fuel pre-filter and empty of water, bleed fuel system. Replace fuel in tank if needed. 	
Engine will not go to high idle when attempting to weld or using auxiliary power. Switching to manual high idle does not work.	<ol style="list-style-type: none"> 1. Broken spring on Idle Solenoid, solenoid linkage binding, low idle speed set too low on idle solenoid. 2. Faulty PC Board (Control or Idler). 	
Engine will not shut off.	<ol style="list-style-type: none"> 1. Fuel Shutdown solenoid not functioning properly / linkage binding. Stop engine by shutting off valve located on main fuel filter. Contact authorized local Engine Service Shop. 	
Engine will not shut off when using wireless remote	<ol style="list-style-type: none"> 1. Batteries in transmitter may be low on power. Replace if necessary. 2. Blown fuse in receiver box. Replace blown fuse. 	<ol style="list-style-type: none"> 1. Turn off wireless remote using the ON / OFF toggle switch on the receiver box to shut engine down. 2. If issue persists contact Tru-Remote



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PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
Engine does not develop full power. Low weld and auxiliary output. Engine runs rough.	<ol style="list-style-type: none"> 1. Fuel filter dirty/clogged. Replace. 2. Air filter dirty/clogged. Replace Air Filter Element. 3. Fouled fuel injector(s). Contact authorized Engine Service Shop. 4. Fuel contaminated with water. Check Main Filter Bowl and Inline Fuel filters for water. Clean and replace as needed. Replace fuel in tank. 5. Cracked or loose fuel hose. Replace hose and tighten clamps. 6. Valves out of adjustment. Contact authorized local Engine Service Shop. 	
No welding power output.	<ol style="list-style-type: none"> 1. Poor work lead connection to work. Make sure work clamp is tightly connected to clean base metal. 2. "Weld Terminals" switch in wrong position. Place switch in "Weld Terminals On" position when welding without control cable. 3. Faulty PC board or welder alternator. 	If all recommended possible areas of misadjustment have been checked and the problem persists, Contact your local Lincoln Authorized Field Service Facility.
Welder has output but no control.	<ol style="list-style-type: none"> 1. Poor remote/control cable connection to 6-pin connector. Check connections. 2. Faulty remote or faulty wire feeder or wire feeder cable. Replace if necessary. 3. Faulty control potentiometer or PC board. 	
Wireless remote is not functioning properly	<ol style="list-style-type: none"> 1. Blown fuse inside of receiver box 2. Batteries in transmitter low on power. Replace if needed. 	

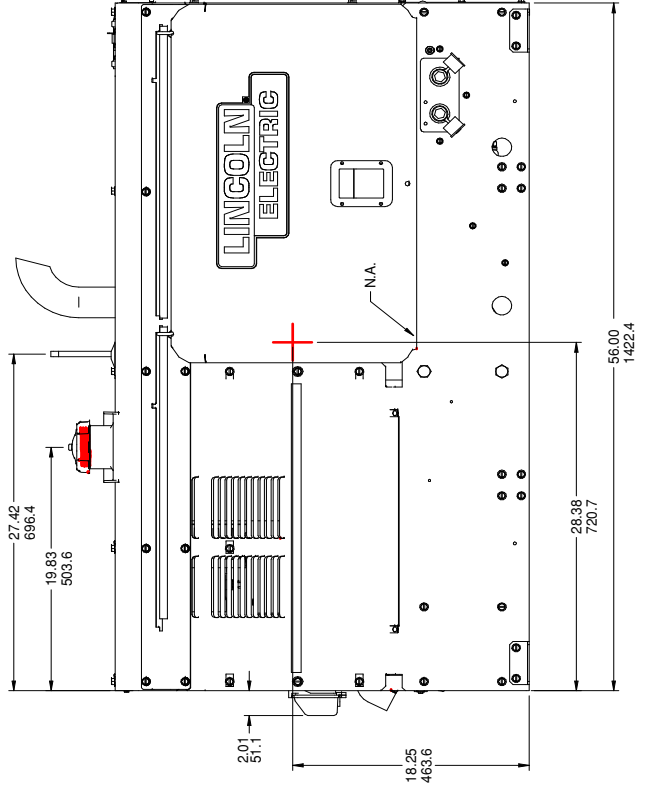
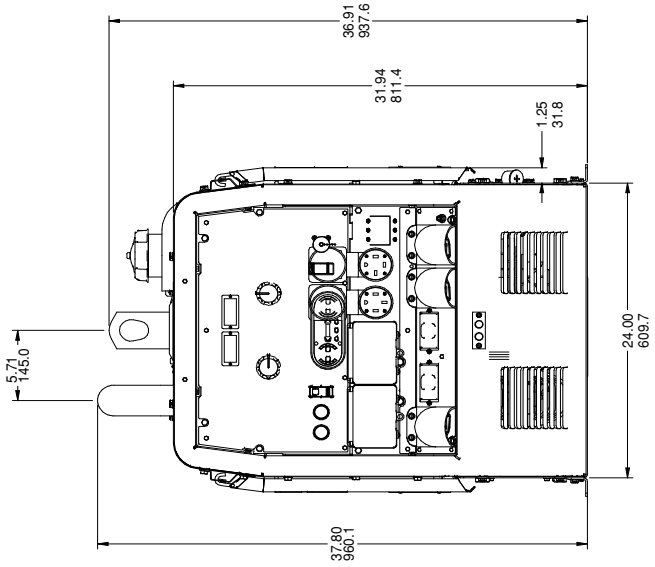
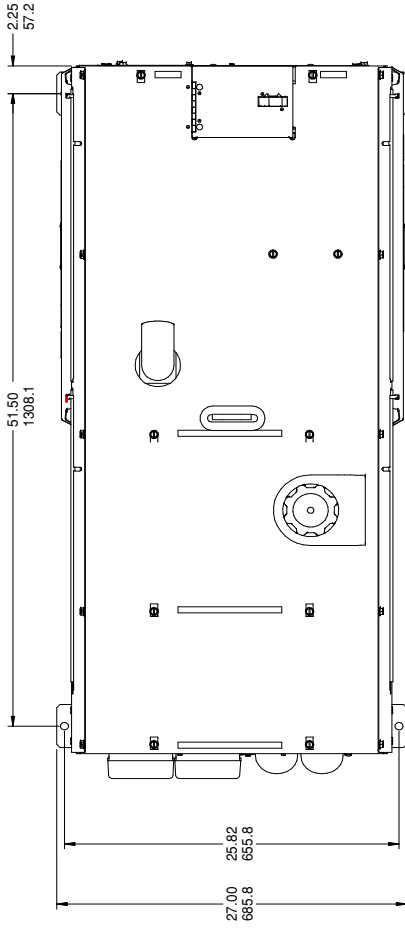


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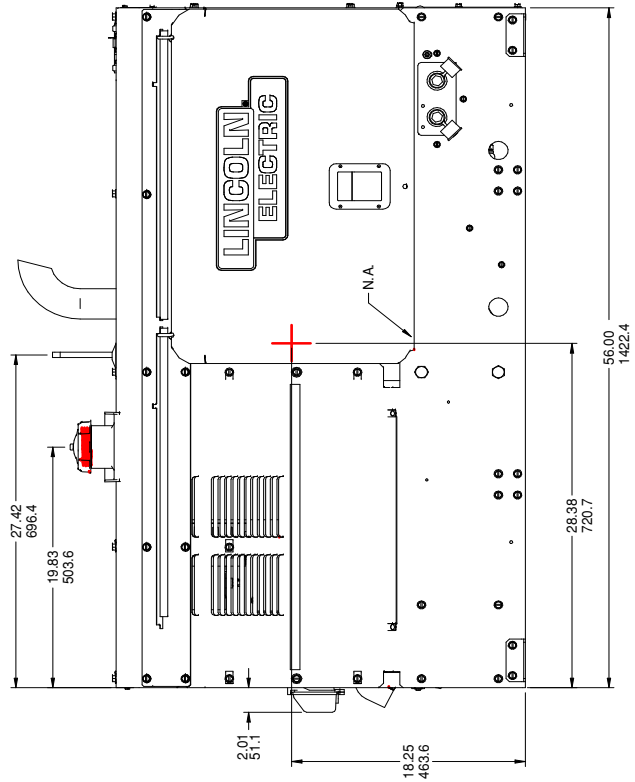
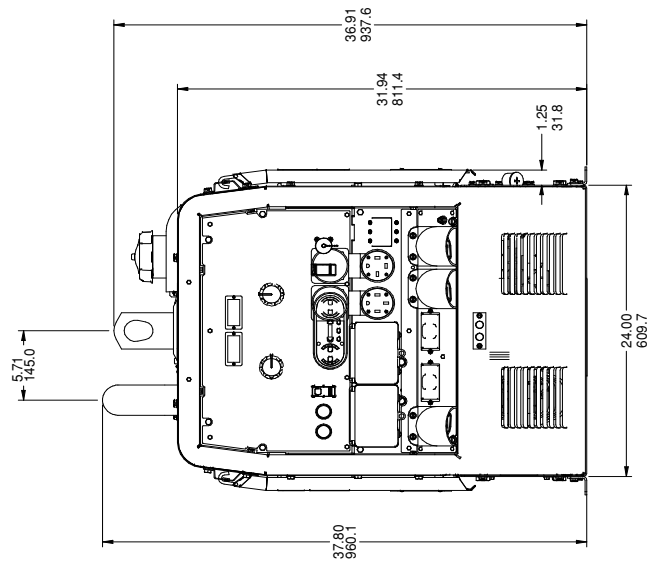
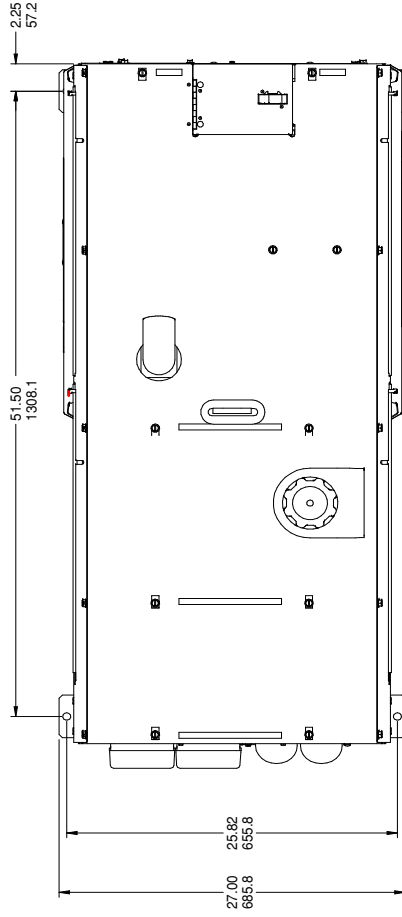
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N.A. CENTER OF GRAVITY WITH OIL IN ENGINE, COOLANT IN RADIATOR, AND EMPTY FUEL TANK.



CROSS COUNTRY 300 DIMENSION PRINT FOR CODE 12555

N.A. CENTER OF GRAVITY WITH OIL IN ENGINE, COOLANT IN RADIATOR, AND EMPTY FUEL TANK.



			
<p>0 □+□□</p>	<ul style="list-style-type: none"> Do not touch electrically live parts or electrode with skin or wet clothing. Insulate yourself from work and ground. 	<ul style="list-style-type: none"> Keep flammable materials away. 	<ul style="list-style-type: none"> Wear eye, ear and body protection.
<p>C4AIF: □/□(□□)+□□□.□□□</p>	<ul style="list-style-type: none"> No toque las partes o los electrodos bajo carga con la piel o ropa mojada. Aíslese del trabajo y de la tierra. 	<ul style="list-style-type: none"> Mantenga el material combustible fuera del área de trabajo. 	<ul style="list-style-type: none"> Protéjase los ojos, los oídos y el cuerpo.
<p>BAG; □-□□-□□</p>	<ul style="list-style-type: none"> Ne laissez ni la peau ni des vêtements mouillés entrer en contact avec des pièces sous tension. Isolez-vous du travail et de la terre. 	<ul style="list-style-type: none"> Gardez à l'écart de tout matériel inflammable. 	<ul style="list-style-type: none"> Protégez vos yeux, vos oreilles et votre corps.
<p>8E@4A 0 □+□. □</p>	<ul style="list-style-type: none"> Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung! Isolieren Sie sich von den Elektroden und dem Erdboden! 	<ul style="list-style-type: none"> Entfernen Sie brennbares Material! 	<ul style="list-style-type: none"> Tragen Sie Augen-, Ohren- und Körperschutz!
<p>BH: HBF8 □-□□NV(</p>	<ul style="list-style-type: none"> Não toque partes elétricas e electrodos com a pele ou roupa molhada. Isole-se da peça e terra. 	<ul style="list-style-type: none"> Mantenha inflamáveis bem guardados. 	<ul style="list-style-type: none"> Use proteção para a vista, ouvido e corpo.
<p>C4A8F8 注意事項</p>	<ul style="list-style-type: none"> 通電中の電気部品、又は溶材にヒブやぬれた布で触れないこと。 施工物やアースから身体が絶縁されている様にして下さい。 	<ul style="list-style-type: none"> 燃えやすいものの側での溶接作業は絶対にしてはなりません。 	<ul style="list-style-type: none"> 目、耳及び身体に保護具をして下さい。
<p>A8F8 警告</p>	<ul style="list-style-type: none"> 皮肤或湿衣物切勿接觸帶電部件及焊條。 使你自已與地面和工作件絕緣。 	<ul style="list-style-type: none"> 把一切易燃物品移離工作場所。 	<ul style="list-style-type: none"> 佩戴眼、耳及身體勞動保護用具。
<p>B4A 위험</p>	<ul style="list-style-type: none"> 전도체나 용접봉을 젖은 헝겍 또는 피부로 절대 접촉치 마십시오. 오재와 접지를 접촉치 마십시오. 	<ul style="list-style-type: none"> 인화성 물질을 접근 시키지 마십시오. 	<ul style="list-style-type: none"> 눈, 귀와 몸에 보호장구를 착용하십시오.
<p>E5B تحذير</p>	<ul style="list-style-type: none"> لا تلمس الأجزاء التي يمرى فيها التيار الكهربائى أو الألكترود بجدد الجسم أو بالمعالب المبللة بالماء. ضع عازل على جسمك خلال العمل. 	<ul style="list-style-type: none"> ضع المواد القابلة للاشتعال فى مكان بعيد. 	<ul style="list-style-type: none"> ضع أدوات وملابس واقية على عينيك وأذنيك وجسمك.

READ AND UNDERSTAND THE MANUFACTURER'S INSTRUCTION FOR THIS EQUIPMENT AND THE CONSUMABLES TO BE USED AND FOLLOW YOUR EMPLOYER'S SAFETY PRACTICES.

SE RECOMIENDA LEER Y ENTENDER LAS INSTRUCCIONES DEL FABRICANTE PARA EL USO DE ESTE EQUIPO Y LOS CONSUMIBLES QUE VA A UTILIZAR, SIGA LAS MEDIDAS DE SEGURIDAD DE SU SUPERVISOR.

LISEZ ET COMPRENEZ LES INSTRUCTIONS DU FABRICANT EN CE QUI REGARDE CET EQUIPMENT ET LES PRODUITS A ETRE EMPLOYES ET SUIVEZ LES PROCEDURES DE SECURITE DE VOTRE EMPLOYEUR.

LESEN SIE UND BEFOLGEN SIE DIE BETRIEBSANLEITUNG DER ANLAGE UND DEN ELEKTRODENEINSATZ DES HERSTELLERS. DIE UNFALLVERHÜTUNGSVORSCHRIFTEN DES ARBEITGEBERS SIND EBENFALLS ZU BEACHTEN.

			
<ul style="list-style-type: none"> ● Keep your head out of fumes. ● Use ventilation or exhaust to remove fumes from breathing zone. 	<ul style="list-style-type: none"> ● Turn power off before servicing. 	<ul style="list-style-type: none"> ● Do not operate with panel open or guards off. 	<p>0 □+□□□</p>
<ul style="list-style-type: none"> ● Los humos fuera de la zona de respiración. ● Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración para gases. 	<ul style="list-style-type: none"> ● Desconectar el cable de alimentación de poder de la máquina antes de iniciar cualquier servicio. 	<ul style="list-style-type: none"> ● No operar con panel abierto o guardas quitadas. 	<p>, C4AUF; □/□ (□□□) +□□□. □□□ □</p>
<ul style="list-style-type: none"> ● Gardez la tête à l'écart des fumées. ● Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail. 	<ul style="list-style-type: none"> ● Débranchez le courant avant l'entretien. 	<ul style="list-style-type: none"> ● N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés. 	<p>□BA6; □- - □□- □ □</p>
<ul style="list-style-type: none"> ● Vermeiden Sie das Einatmen von Schweißrauch! ● Sorgen Sie für gute Be- und Entlüftung des Arbeitsplatzes! 	<ul style="list-style-type: none"> ● Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öffnen; Maschine anhalten!) 	<ul style="list-style-type: none"> ● Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen! 	<p>8E@4A 0 □+□. □</p>
<ul style="list-style-type: none"> ● Mantenha seu rosto da fumaça. ● Use ventilação e exaustão para remover fumo da zona respiratória. 	<ul style="list-style-type: none"> ● Não opere com as tampas removidas. ● Desligue a corrente antes de fazer serviço. ● Não toque as partes elétricas nuas. 	<ul style="list-style-type: none"> ● Mantenha-se afastado das partes moventes. ● Não opere com os painéis abertos ou guardas removidas. 	<p>) BEH: H8F8 □- □□NV(</p>
<ul style="list-style-type: none"> ● ヒュームから顔を離すようにして下さい。 ● 換気や排煙に十分留意して下さい。 	<ul style="list-style-type: none"> ● メンテナンス・サービスに取りかかる際には、まず電源スイッチを必ず切ってください。 	<ul style="list-style-type: none"> ● パネルやカバーを取り外したまま機械操作をしないで下さい。 	<p>□A4A8F8 注意事項</p>
<ul style="list-style-type: none"> ● 頭部遠離煙霧。 ● 在呼吸區使用通風或排風器除煙。 	<ul style="list-style-type: none"> ● 維修前切斷電源。 	<ul style="list-style-type: none"> ● 儀表面板打開或沒有安全罩時不準作業。 	<p>□; □A8F8 警告</p>
<ul style="list-style-type: none"> ● 얼굴로부터 용접가스를 멀리하십시오. ● 호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시오. 	<ul style="list-style-type: none"> ● 보수전에 전원을 차단하십시오. 	<ul style="list-style-type: none"> ● 판넬이 열린 상태로 작동하지 마십시오. 	<p>□BB4A 위험</p>
<ul style="list-style-type: none"> ● بعد رأسك بعيداً عن الدخان. ● استعمل التهوية أو جهاز ضغط الدخان لتخارج لكي تبعد الدخان عن المنطقة التي تتنفس فيها. 	<ul style="list-style-type: none"> ● قطع التيار الكهربائي قبل القيام بأية صيانة. 	<ul style="list-style-type: none"> ● لا تشغيل هذا الجهاز إذا كانت الأغطية الحديدية الوالفة ليست عليه. 	<p>□E5E تحذير</p>

LEIA E COMPREENDA AS INSTRUÇÕES DO FABRICANTE PARA ESTE EQUIPAMENTO E AS PARTES DE USO, E SIGA AS PRÁTICAS DE SEGURANÇA DO EMPREGADOR.

使う機械や溶材のメーカーの指示書をよく読み、まず理解して下さい。そして貴社の安全規定に従って下さい。

請詳細閱讀並理解製造廠提供的說明以及應該使用的銀擇材料，並請遵守貴方的有關勞動保護規定。

이 제품에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

اقرأ بتعمن وافهم تعليمات المصنع المنتج لهذه المعدات والمواد قبل استعمالها واتبع تعليمات الوقاية لصاحب العمل.

CUSTOMER ASSISTANCE POLICY

The business of Lincoln Electric is manufacturing and selling high quality welding equipment, automated welding systems, consumables, and cutting equipment. Our challenge is to meet the needs of our customers, who are experts in their fields, and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for information or technical information about their use of our products. Our employees respond to inquiries to the best of their ability based on information and specifications provided to them by the customers and the knowledge they may have concerning the application. Our employees, however, are not in a position to verify the information provided or to evaluate the engineering requirements for the particular weldment, or to provide engineering advice in relation to a specific situation or application. Accordingly, Lincoln Electric does not warrant or guarantee or assume any liability with respect to such information or communications. Moreover, the provision of such information or technical information does not create, expand, or alter any warranty on our products. Any express or implied warranty that might arise from the information or technical information, including any implied warranty of merchantability or any warranty of fitness for any customers' particular purpose or any other equivalent or similar warranty is specifically disclaimed.

Lincoln Electric is a responsive manufacturer, but the definition of specifications, and the selection and use of specific products sold by Lincoln Electric is solely within the control of, and remains the sole responsibility of the customer. Many variables beyond the control of Lincoln Electric affect the results obtained in applying these types of fabrication methods and service requirements.

WELD FUME CONTROL EQUIPMENT

The operation of welding fume control equipment is affected by various factors including proper use and positioning of the equipment, maintenance of the equipment and the specific welding procedure and application involved. Worker exposure level should be checked upon installation and periodically thereafter to be certain it is within applicable OSHA PEL and ACGIH TLV limits.



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