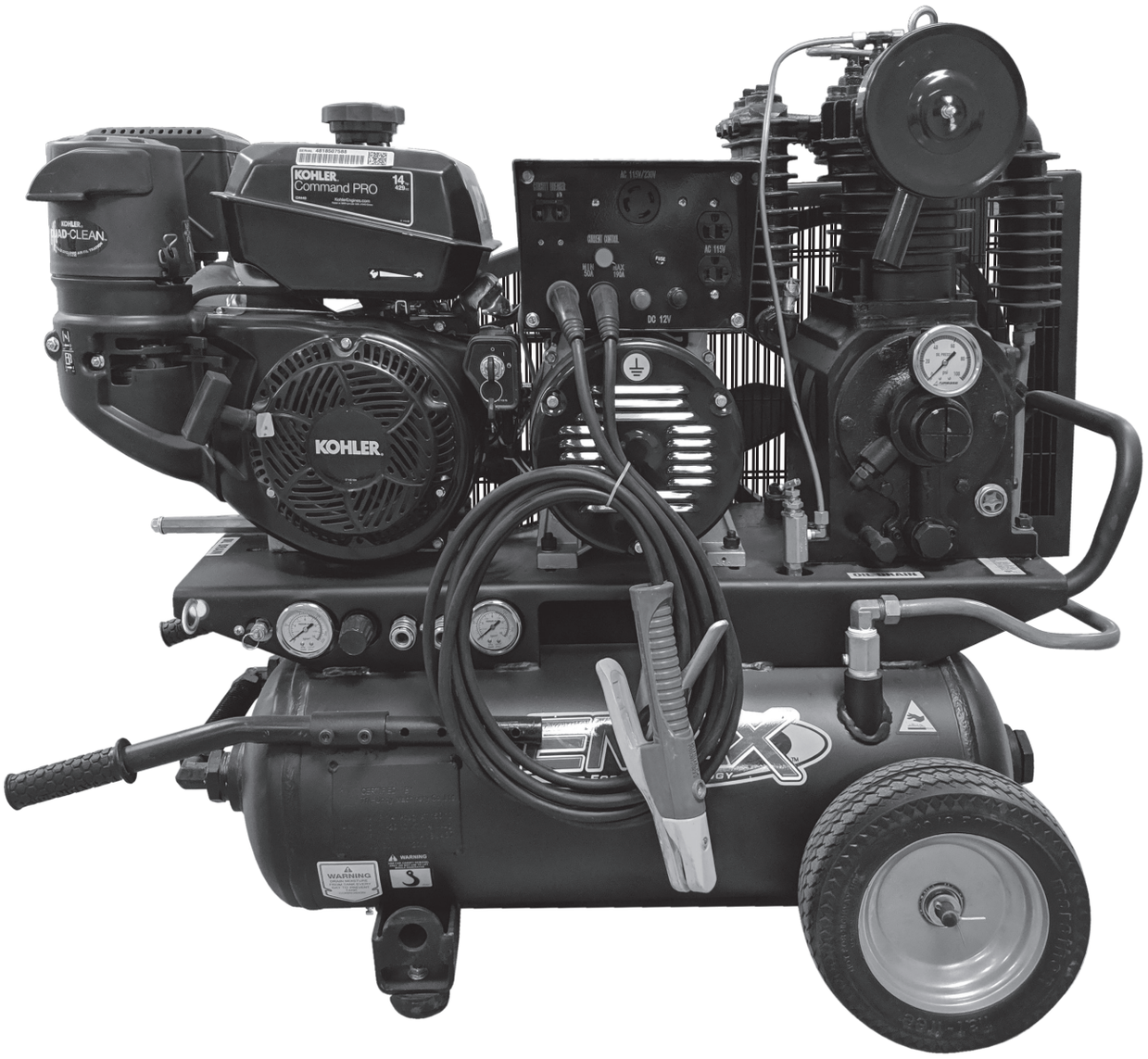
EMAX
AIR FORCE TECHNOLOGY
Since 1977
Energy efficiency & MAXimum performance

Operating Instructions

EGES14020T
3 IN 1
COMPRESSOR WELDER GENERATOR

EMAX designs and manufactures products for safe operation. However, operators and maintenance persons are responsible for maintaining safety. All safety precautions are included to provide a guideline for minimizing the possibility of accidents and property damage while equipment is in operation. ***Keep these instructions for reference.***



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Retain this information and your original purchase receipt for future reference

Record your machine's particulars here:

Serial Number:

Model Number:

Date of Purchase:

Model Specifications

EMAX Gas Powered 3-in-1 Compressor / Welder / Generator

Power	Type	4 stroke gasoline engine	
	Features	• OHV • Cast iron cylinder liner • Aluminum block - Low oil sentry: switch designed to prevent engine from starting in a low oil or no oil condition.	
	Horsepower	14 HP	10 kW
	Brand	Kohler Command Pro	
Compressor	Configuration	2 stage	
	Features	• Built in oil pump to give each pump bearing positive oil lubrication. • Inner stage cooler and after cooler. • Cast iron pump, head, cylinders, crankcase, connecting rods, HP piston and flywheel • Head unloaders- load-less start • Oil sight glass • Disc valves for durability and ease of maintenance • Dual roller bearings • Dual belt drive • 100% rebuildable. • 4 piston ring design for low 1 to 5 micron oil carry over.	
	Air production @ 175 psi	16.8 scfm	475.72 l/min
	Max. pressure	175 psi	1206.58 kPa
Air Reservoir	Tanks	2 x 10 gal.	2 x 37.85 liters
	Total	20 gal.	70.71 liters
Generator	120 volts AC 60 Hz.	20 amps	
	240 volts AC 60 Hz.	20 amps	
	12 volts DC	8.3 amps	
	Peak	5500 watts	
	Continuous	5000 watts	
	Duty cycle	80%	
Welder	DC welding power	190 amps	
	Duty cycle	80%	
	Welding cable	25 ft.	7.62 m
	Ground cable	25 ft.	7.62 m
Total	Features	• Dual port tank air regulator with liquid filled tank/regulator gauges and dual 1/4” quick disconnects. • Dual no-flat tires with grease fittings • Removable wheels and handle allow for stationary or for portable use. • Rubber tank isolator pads • Lifting hooks for lifting • All steel belt guard • Dual tank condensate drain valves	
	Weight	550 lb.	249.5 kg

Functional Description

The EGES14020T was designed as a mobile and stationary power source, providing power in the form of either compressed air or electricity, to drive pneumatic and electrical equipment, or for welding metals. Its base motive force is provided by an air-cooled 4 cycle 14 horsepower Kohler gasoline engine. In common with most generators, the engine is regulated to respond to demand, powering up when needed to produce electricity or air, and running at idle until needed again. As a compressor, it can provide an air volume of 16.8 scfm at 175 psi and with a 20 gallon reservoir. The generator produces 5000 continuous watts (5500 peak watts) of AC electrical power. Its electrical output will enable 190 amp DC stick welding with an 80% duty cycle.
Please use the photos below, opposite, and on the following pages to familiarize yourself with the various functions and locations of the salient parts of this unit.

NOTICE ***The compressor pump on this unit is oil lubricated, which gives a superior pump life, but, should an application be contemplated which requires oil-free air, an approriate filter must be applied to the air produced.***

NOTICE ***While running the generator and welder, the engine must be at full throttle to maintain 60 Hz electric power plus 190 amp welder. This will keep from damaging the generator, welder or the equipment it is operating.***

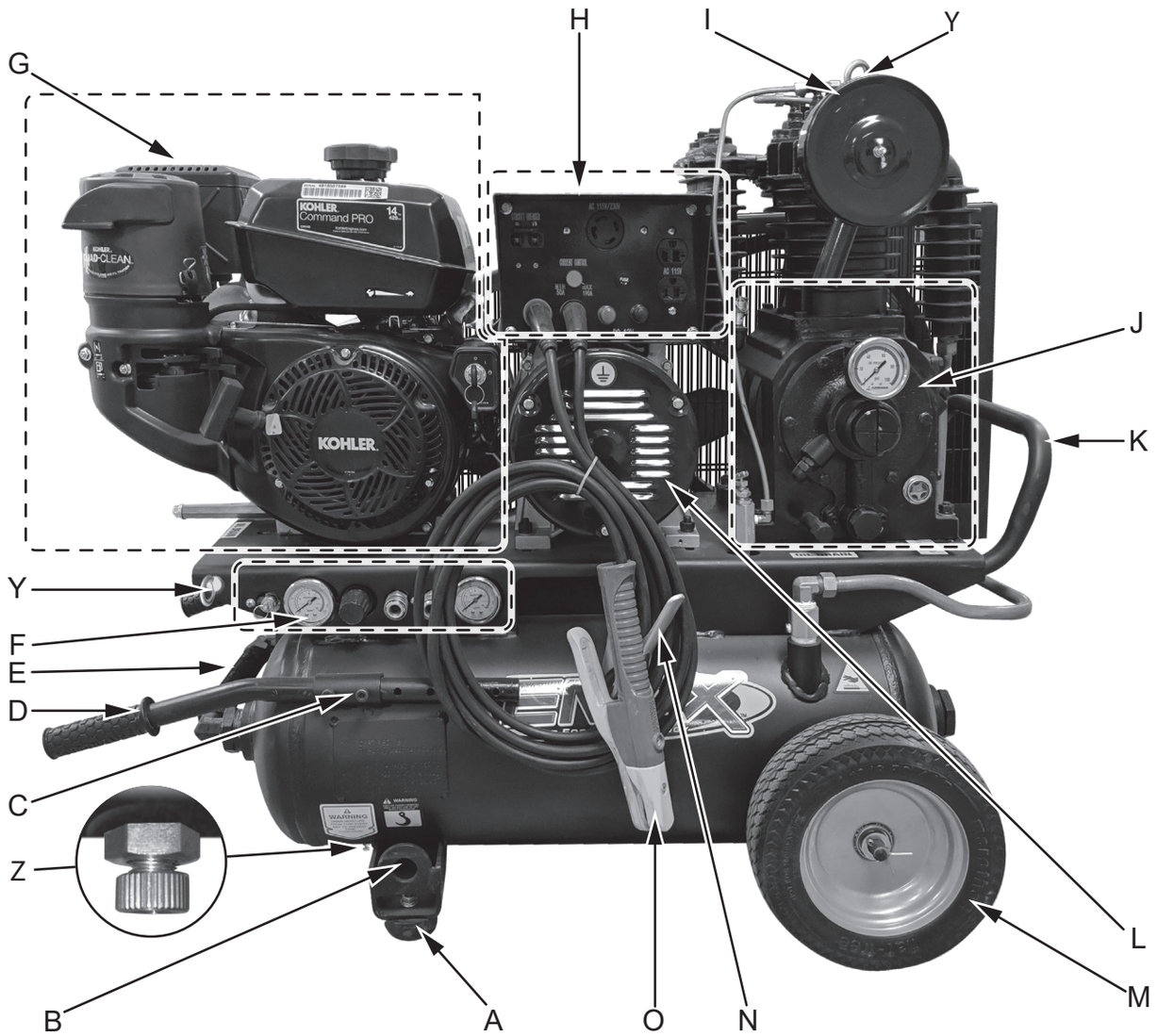

fig.1 Compressor/Welder/Generator: main areas

Functional Description

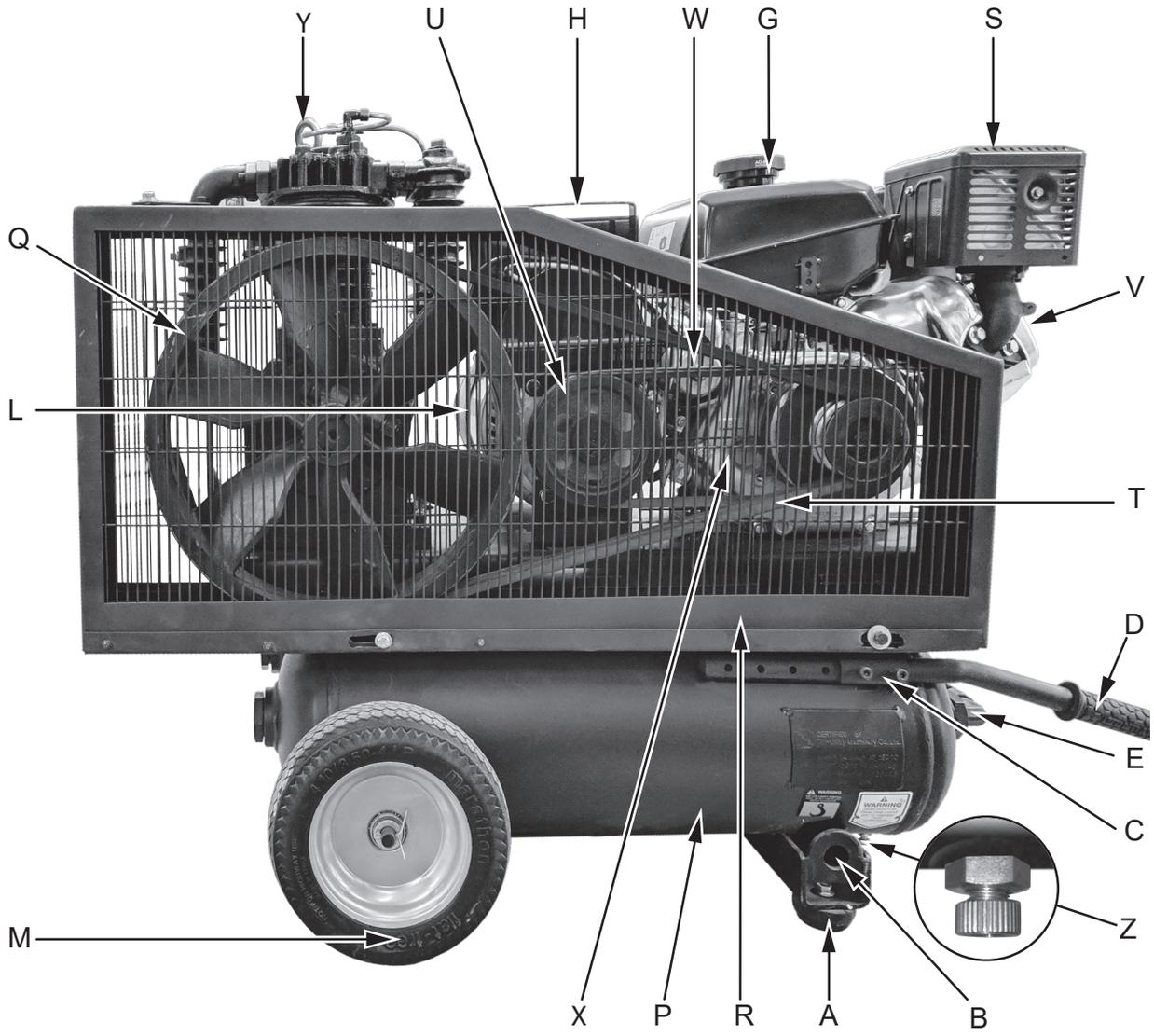

fig.2 Compressor/Welder/Generator: Functional description from back

Key Letter	Description
A	Rubber foot pad *
B	Anchor point (2)
C	Handle attachment point
D	Transport handle
E	Tank pressure equalization pipe
F	Air delivery cluster
G	Engine assembly
H	Generator/welder interface panel
I	Compressor pump air filter
J	Compressor pump details
K	Bumper/lift handle
L	Generator
M	Wheel (2)

Key Letter	Description
N	Welding ground lead clamp
O	Welding electrode holder
P	Air tanks
Q	Compressor pump flywheel/drive pulley
R	Belt guard
S	Muffler assembly
T	Drive belts
U	Generator drive pulley
V	Engine valve cover
W	Electric starter
X	Gear reduction system
Y	Lifting point eyebolts (3)
Z	Tank condensate pet cock (2)

* remove foot pads adjacent to tires if using the compressor for portable applications

Functional Description

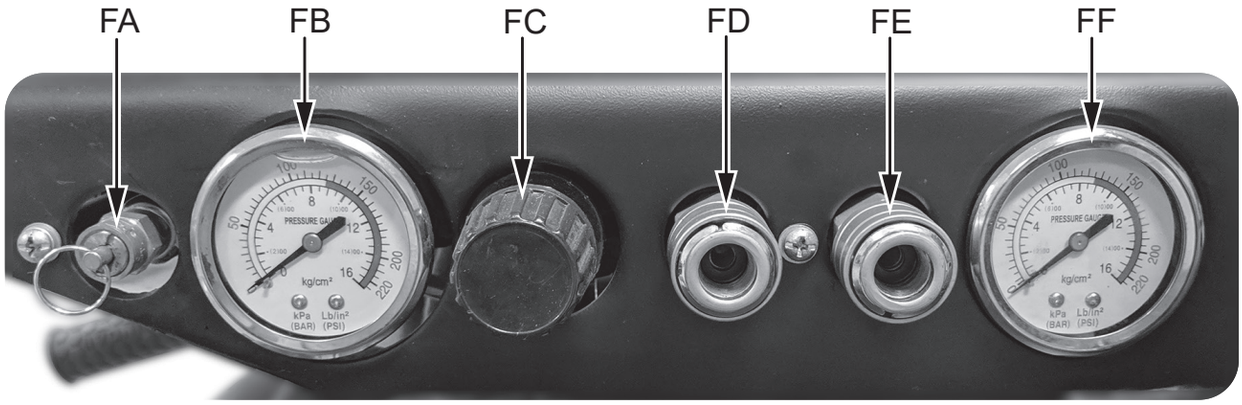

fig.3 Detail of Air Delivery Cluster

Key Letter	Description
FA	Safety valve
FB	Left air supply pressure gauge
FC	Supply pressure regulator

Key Letter	Description
FD	Left air supply quick-connect
FE	Right air supply quick-connect
FF	Right regulated pressure gauge

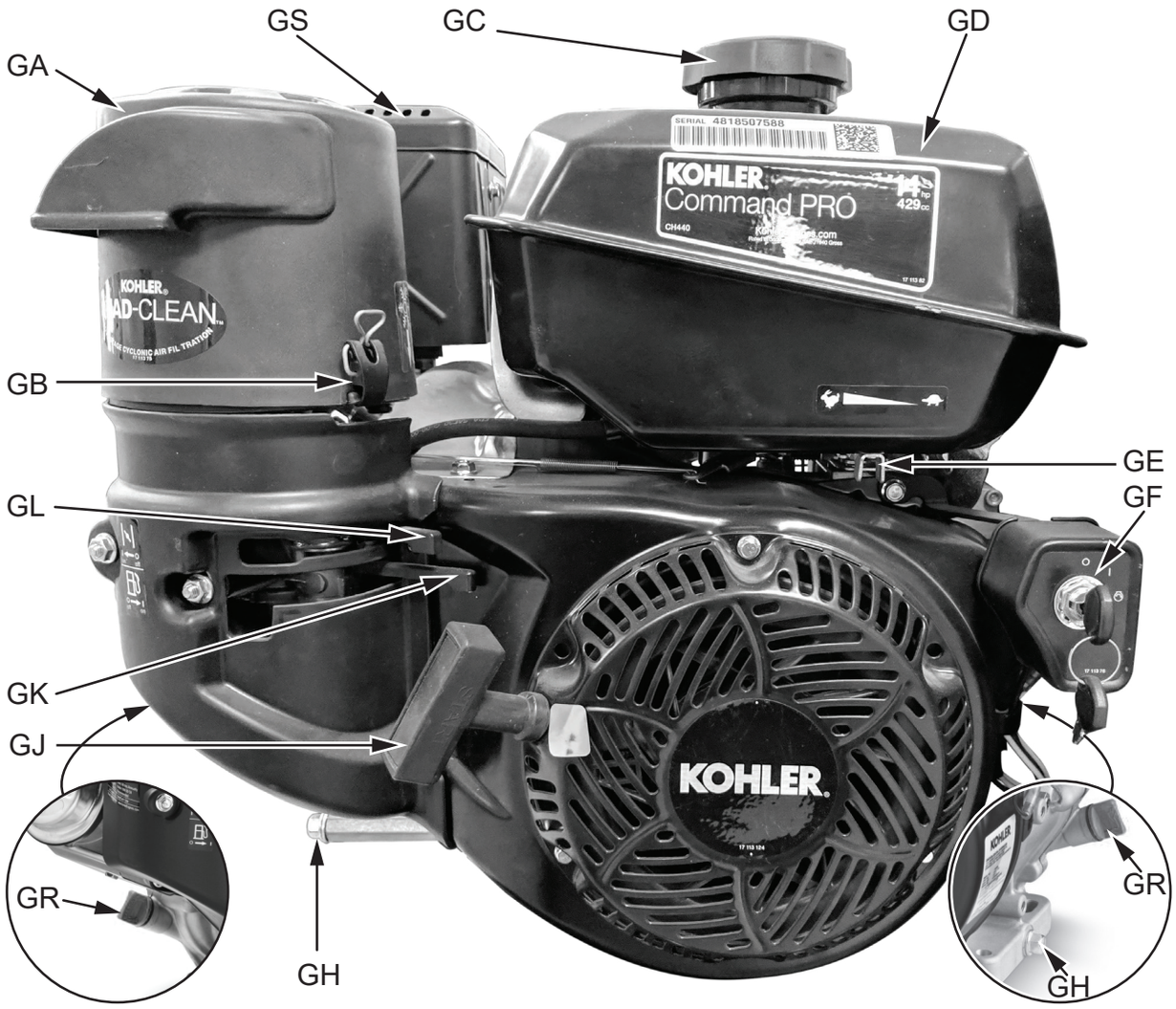

fig.4 Engine details

Functional Description

Key Letter	Description
GA	Air cleaner cover
GB	Bail
GC	Fuel cap
GD	Fuel tank
GE	Throttle lever
GF	On/Off switch with keys
GG	Dipstick/Oil fill plug
GH	Oil drain plug
GI	Retractable starter

Key Letter	Description
GJ	Starter handle
GK	Fuel shut-off valve
GL	Choke lever
GM	Clutch reduction
GN	Drain plug
GO	Gear box dipstick
GQ	Oil level/Drain plug (2 x)
GR	Oil fill plug (2 x)
GS	Muffler assembly

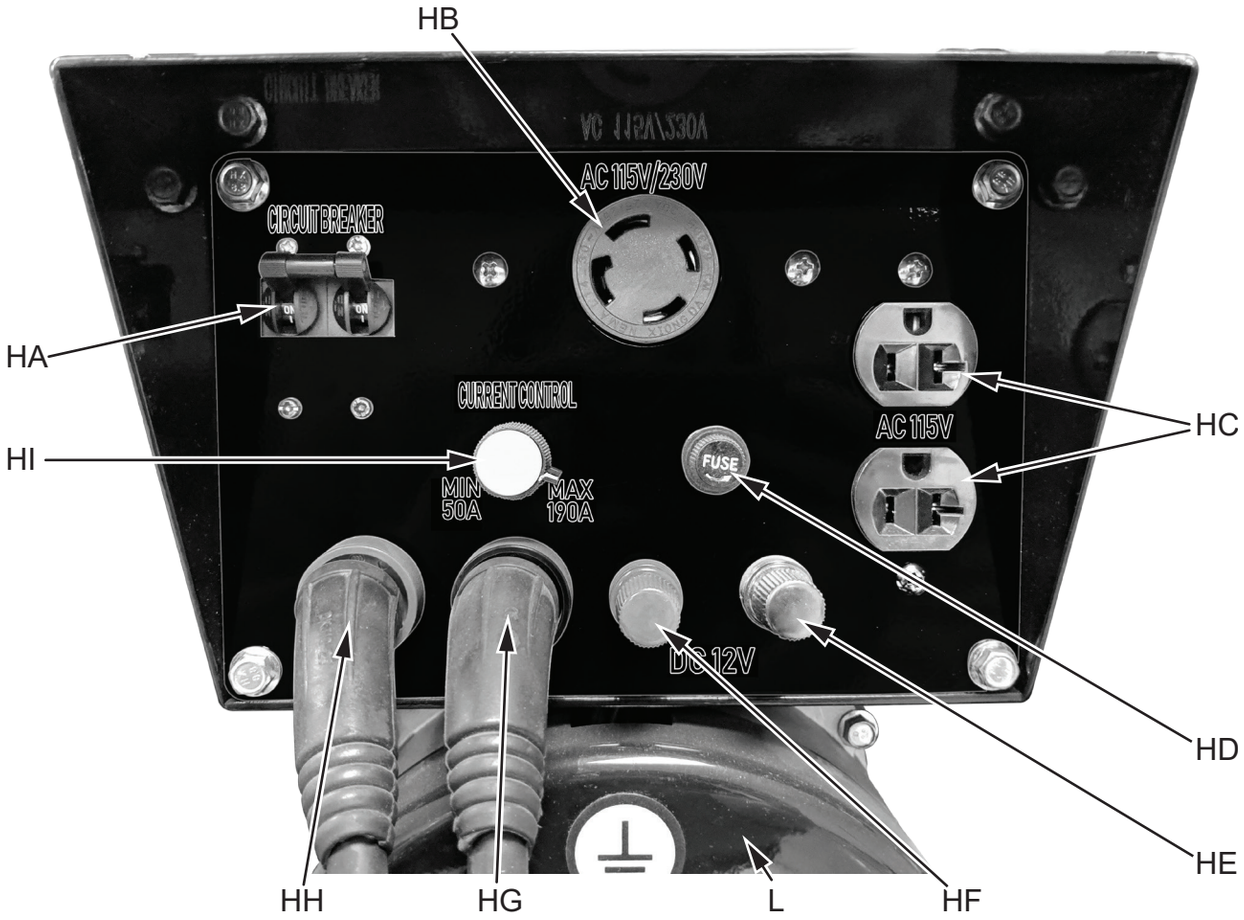

fig.5 Generator Welder Panel details

Key Letter	Description
HA	Dual circuit breakers
HB	20 amp 115 / 230 volt power supply for twist-lock plug
HC	115 volt power supply duplex socket
HD	Fuse
HE	12 V DC negative (black) terminal
HF	12 V DC positive (red) terminal
L	Alternator housing
HG	Welding ground clamp cable (black) plug-in
HH	Welding electrode cable (red) plug-in
HI	Welding power control

Functional Description

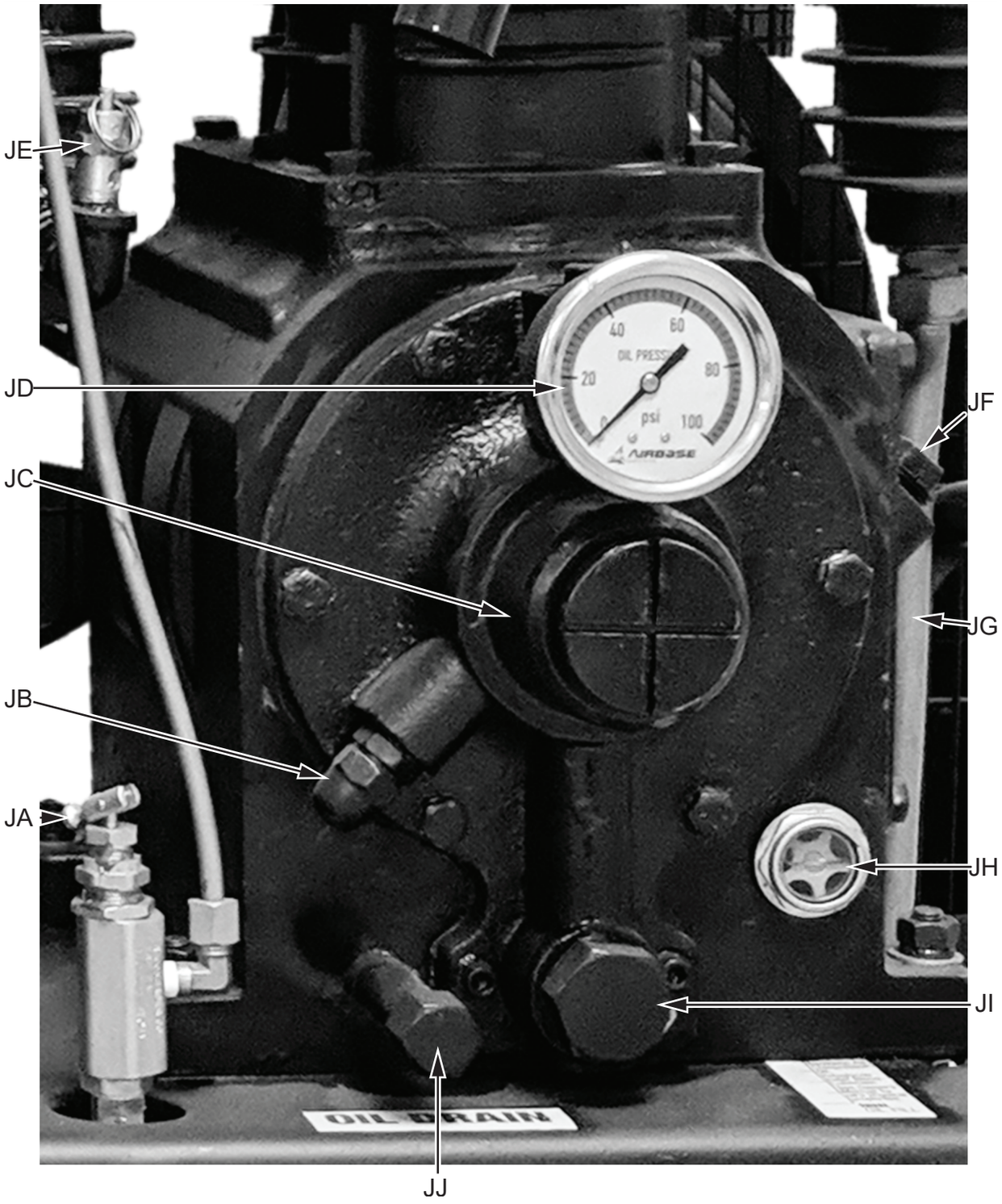

fig.6 Compressor Pump- salient points

Key Letter	Description
JA	Pilot valve (pressure relief)
JB	Oil regulator
JC	Oil pump
JD	Oil pressure gauge
JE	Safety valve

Key Letter	Description
JF	Compressor sump oil fill
JG	Compressed air output tube
JH	Compressor pump oil sight glass
JI	Compressor pump reusable screen oil filter
JJ	Oil drain

Safety Symbols

This manual contains very important information to know and understand. This is provided for SAFETY and to PREVENT EQUIPMENT PROBLEMS. To help understand this information, observe the following:

⚠ DANGER ***Danger indicates an imminently hazardous situation which, if not avoided,* will *result in death or serious injury.***

⚠ WARNING ***Warning indicates a potentially hazardous situation which, if not avoided,* could *result in death or serious injury.***

⚠ CAUTION ***Caution indicates a potentially hazardous situation which, if not avoided,* may *result in minor or moderate injury.***

NOTICE ***Notice indicates important information, that if not followed, may cause damage to* equipment*.***

Read all manuals included with this product carefully. Be thoroughly familiar with the controls and the proper use of the equipment.

Basic Guidelines

1. Allow only trained, authorized persons who have read and understood these operating instructions to use this equipment. Failure to follow the instructions, procedures and safety precautions in this manual can result in accidents and injuries.
2. NEVER start or operate the equipment under unsafe conditions. Tag the equipment, disconnect and lock out all power to it to prevent accidental start-up until the condition is corrected.
3. Install, use and operate the equipment only in full compliance with all pertinent OSHA regulations and all applicable Federal, State & Local Codes, standards and regulations.
4. NEVER modify the equipment and/or controls in any way.
5. Keep a first aid kit in a convenient place. Seek medical assistance promptly in case of injury. Avoid infection by caring for any small cuts and burns promptly.

California Proposition 65 Warnings

⚠ WARNING ***This product can expose you to chemicals including DEHP, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.***

⚠ DANGER ***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 and Safety Code Section 25249.5 et seq.).***

⚠ DANGER ***Batteries, battery posts, terminals and related accessories (which must be supplied by the owner) contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Wash hands after handling.***

⚠ DANGER ***Gasoline engine exhaust contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.***

⚠ WARNING ***When using electric tools, machines or equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock, and personal injury.***

Read all instructions before using this tool

1. **OBSERVE THE SAFETY REGULATIONS,** the assembly instructions and the operating instructions in this manual.
2. **ALL PERSONS WHO USE AND SERVICE** the machine must be acquainted with this manual and be informed about the tool's potential hazards.
3. **READ INSTRUCTIONS CAREFULLY.** Be familiar with the controls and the proper use of the equipment.
4. **SAVE THIS MANUAL** for future reference and refer to it frequently to ensure you fully understand and heed the advice given in the additional important safety rules for this equipment.
5. **USE THE MACHINE ONLY** according to the instructions given in this manual. This machine is designed for certain applications only. We strongly recommend that it not be modified and/or given any use other than that for which it was designed. If you have questions relating to a particular questionable application, DO NOT use the machine before you contact us to determine if it can be performed with this machine.

Inspection

⚠ WARNING ***Inspect equipment prior to any use. Check for external damage that might have occurred during transit.*** **Be careful of moving parts** ***then test pulley by turning it freely by hand. Report any damage to delivery carrier immediately.***

Lifting Safety

1. **CAREFULLY INSPECT ALL LIFTING EQUIPMENT** and make sure it is in good condition. Rated capacity should exceed compressor weight. Make sure lifting hook has a functional safety latch or equivalent and is properly attached to lifting feature.
2. **MAKE SURE LIFTING POINT EYEBOLTS ARE IN GOOD CONDITION** and tighten any loose nuts or bolts before lifting.
3. **USE PROVIDED LIFTING FEATURE OR APPROPRIATE SLING.** A sling must be used when moving compressor with a helicopter or other air-borne equipment. Be sure to follow OSHA standards 29 CFR 1910 Subpart N.
4. **USE GUIDE ROPES OR EQUIVALENT** to prevent twisting or swinging of the compressor while it is in the air and NEVER attempt to lift in high winds. Keep compressor as low to the ground as possible.
5. **KEEP PERSONS AWAY** and make sure no one is under the compressor while it is lifted.
6. **ONLY USE LIFTING FEATURES PROVIDED FOR ENTIRE COMPRESSOR PACKAGE.** NEVER use bolts or other hooks on invididual components to move the compressor.
7. **MAKE SURE TO PUT COMPRESSOR ON A LEVEL SURFACE** that can support the weight of the compressor and loading equipment.

Gasoline Engine Safety

This unit is powered by a gasoline engine. The use of a gasoline engine to power the pump brings a particular set of safety considerations into play, primarily dictating outdoor use only.

1. **FOLLOW** all the gasoline engine manufacturer's instructions, guidelines and recomendations, which come in a manual separate from this one.
2. **CHOOSE A SUITABLE SITE FOR YOUR COMPRESSOR / WELDER / GENERATOR** to prevent possible death from carbon monoxide poisoning, injury from fire or explosion, hot surfaces and equipment tip-over.
3. **USE PROPER FUEL STORAGE AND HANDLING PROCEDURES.** Gasoline fuel and fumes are flammable, and potentially explosive. Do not store fuel or other flammable materials nearby.
4. **HAVE MULTIPLE ABC CLASS FIRE EXTINGUISHERS NEARBY.**
5. **OPERATION OF THIS EQUIPMENT MAY CREATE SPARKS THAT CAN START FIRES AROUND DRY VEGETATION.** A spark arrestor may be required. Contact local fire agencies for laws or regulations relating to fire prevention requirements.
6. **SET UP AND USE ONLY ON A FLAT, LEVEL SURFACE** in a well ventilated area.
7. **DO NOT ALLOW TO BE EXPOSED** to rain, snow, or direct sunlight.
8. **BE SURE NO FLAMMABLE VAPORS, DUSTS, AND GASES** are present.
9. **MAINTAIN 7 FEET (2.1 M) DISTANCE** from combustible materials
10. **KEEP A MINIMUM OF 20 FEET (6.1 M)** from residences, away from windows, vents and air intakes.
11. **PLACE AWAY FROM OTHER HEAT-GENERATING EQUIPMENT.**

Positioning

1. **THE EQUIPMENT SHOULD BE MOUNTED ON A DRY, FIRM, AND LEVEL SURFACE.** It must sit level and be stabilized so it will not slide or shift during operation. On transport vehicles, prevent the unit from rolling, slipping, and tilting.
2. **SITUATE SO THERE IS ADEQUATE PULLING ROOM** for starting the engine using the recoil starter, at least in some situations. Attempting to pull at an odd angle may rip off grip cord and/or cause injuries to the operator.

Airflow

1. **AVOID LOCATION WITH DUSTY/DIRTY CONDITIONS.** Do not allow debris to accumulate or block airflow.
2. **THE LOCATION SHOULD ALLOW FOR ADEQUATE, UNOBSTRUCTED AIRFLOW** for cooling and combustion air.
3. **DO NOT INSTALL IN SMALL, ENCLOSED AREAS** without an ample circulation of supply air.
4. **DO NOT OPERATE WITH A TARP, BLANKET, OR COVER** surrounding the machine.
5. **DO NOT PLACE ANY OBJECTS AGAINST OR ON TOP OF THE UNIT.**

Exhaust

⚠WARNING ***Exhaust modification hazard***

1. **NEVER ATTEMPT TO ATTACH DUCTWORK TO THE MUFFLER SYSTEM** to allow for installation inside an enclosure. This could cause heat build-up and increased exhaust back-pressure, resulting in possible exhaust leakage or damage to the equipment.
2. **PLACE THE UNIT SO THAT THE EXHAUST FUMES WILL NOT BE DIRECTED TOWARDS PEOPLE OR BUILDING AIR INTAKES.**
3. **KEEP A FIRE EXTINGUISHER RATED "ABC" NEARBY** which is properly charged. Be familiar with its use.
4. **PROVIDE BATTERY-OPERATED OR BATTERY BACK-UP TYPE CARBON MONOXIDE ALARMS** in any structure that is in close proximity to the running engine.

⚠ DANGER  ***Asphyxiation. Running engines produce carbon monoxide (CO), a colorless, odorless poisonous gas. The CO generated by the engine can rapidly accumulate, even in areas that appear to be well ventilated, resulting in dangerous and <u>fatal</u> concentrations within minutes.***

5. **NEVER RUN GASOLINE POWERED EQUIPMENT INSIDE ANY ENCLOSED OR SEMI-ENCLOSED SPACES**, including homes, garages, basements, sheds, boxes, pick-up truck beds, RVs, or boats. These spaces can trap poisonous gases, EVEN if you run a fan or open windows. If you start to feel sick, dizzy, or weak while using this equipment, shut off the engine and get to fresh air RIGHT AWAY. See a doctor. You may have carbon monoxide poisoning.

⚠ DANGER  ***Fire Hazard! Do not fill gas tank while engine is running. Do not operate if gasoline has been spilled. Clean spilled gasoline before starting engine. Do not operate near pilot light or open flame.***

6. **DO NOT TOUCH ENGINE DURING USE.** Let engine cool down after use.
7. **ENGINE CAN PRODUCE HIGH NOISE LEVELS.** Prolonged exposure to noise levels above 85 dBA is hazardous to hearing. Always wear ear protection when operating or working around the gas engine in operation.

⚠WARNING ***Do not operate unit if it appears damaged during shipping, handling or use. Damage may cause bursting and injury or property damage.***

Compressor Safety

Breathable Air

1. **NEVER USE AIR FROM THIS EQUIPMENT FOR BREATHABLE AIR** except in full compliance with OSHA Standards 29 CFR 1910 and any other Federal, State or Local codes or regulations.

⚠ DANGER ***Death or serious injury can result from inhaling compressed air without using proper safety equipment. See OSHA standards on safety equipment.***

2. **DO NOT USE AIR LINE ANTI-ICER SYSTEMS** in air lines supplying respirators or other equipment used to produce breathable air. DO NOT discharge air from these systems in unventilated or other confined areas.

Pressurized Components

This equipment is supplied with an ASME-designed pressure vessel protected by an ASME-rated relief valve. Pull the ring before each use to make sure the valve is functional. Refer to figure 7. DO NOT attempt to open valve while the machine is under pressure.

Personal Protective Equipment

Be sure all operators and others around the compressor and its controls comply with all applicable OSHA, Federal, State and local regulations, codes and standards relating to personal protective equipment. This includes respiratory protective equipment, protection for the extremities, protective clothing, protective shields and barriers, electrical protective equipment, and personal hearing protective equipment.

Installation Area

Install this unit in a clean, dry and well-lit area. Be sure installation area can maintain a temperature range between 35º and 110º F (2º and 43º C).

⚠ CAUTION ***If ambient temperature drops below 32° F (0° C), be sure to protect safety/relief valves and drain valves from freezing. NEVER operate compressor with temperatures below 15° F or above 125° F (below minus 9.4° C or above 51.7° C).***

1. **ALLOW SUFFICIENT SPACE AROUND THE UNIT FOR MAINTENANCE ACCESS.** Mount unit with pulley towards wall and leave a minimum of 15 inches (38.1 cm) of clearance.
2. **USE SHIMS TO LEVEL THE UNIT IF INSTALLATION AREA IS NOT FLAT.** This will avoid excessive vibration and premature pump wear.

⚠ DANGER ***DO NOT install compressor in boiler room, paint spray room, or area where sandblasting occurs. Make sure inlet air is away from exhaust fumes or other toxic, noxious or corrosive fumes or substances.***

3. **IF ACID IS USED IN OPERATING ENVIRONMENT OR AIR IS DUST LADEN,** pipe the intake to outside, fresh air. Increase pipe size by one size for every 20 feet (6.1 m) of run. Be sure to install protective hood around intake filter.
4. **INSULATE COLD WATER OR OTHER LOW TEMPERATURE PIPES** that pass overhead to avoid condensation dripping on compressor which could cause rust and/or motor shorting.

Piping

Safety Steps

1. **INSTALL APPROPRIATE FLOW-LIMITING VALVES** as necessary according to pipe size(s) used and run lengths. This will reduce pressure in case of hose failure, per OSHA Standard 29 CFR 1926.302(b)(7).

Piping / Tank Installation

⚠ WARNING ***Place tank feet on 1/4" thick rubber pads. Thicker padding will increase vibration and the possibility of cracking the tank or other unit damage. Do not place unit on dirt floor or uneven surface.***

- Fasten anchor bolts snugly but do not overtighten so normal vibration will not damage unit.

⚠ DANGER ***This unit is somewhat top heavy and should be bolted to solid, flat surface to avoid falling and premature pump wear. Splash lubrication will not operate properly if unit is not level.***

1. **USE A FLEXIBLE CONNECTOR** between compressor tank and any piping system to minimize noise, vibration, unit damage, and pump wear.
2. **INSTALL APPROPRIATE ASME-CODE SAFETY VALVES** and make sure piping system is equipped with adequate condensate drains. See figure 3.

⚠ WARNING ***Never install a shut-off valve such as a globe or gate valve, between the pump discharge and the air tank unless a safety valve is installed in the line between valve and pump.***

3. **MAKE SURE** any tube, pipe or hose connected to the unit can withstand operating temperatures and retain pressure.

⚠ WARNING ***Never use plastic (PVC) pipe for compressed air. Serious injury or death could result.***

4. **NEVER USE REDUCERS IN DISCHARGE PIPING.** Keep all piping and fittings the same size in the piping system.
5. **FOR PERMANENT INSTALLATIONS OF COMPRESSED AIR SYSTEMS, DETERMINE TOTAL LENGTH OF SYSTEM AND SELECT CORRECT PIPE SIZE.** Make sure underground lines are buried below frost line and avoid areas where condensation could build up and freeze.
6. **TEST ENTIRE PIPING SYSTEM** before any underground lines are buried. Be sure to find and repair all leaks before using compressor.

⚠ WARNING ***Never exceed recommended pressure or speed while operating compressor.***

⚠ WARNING ***Be sure to install beltguard on unit after pump installation is complete.***

Truck Installation

This unit can be installed on a truck for convenience and portability. Be sure to follow these additional safety precautions:

1. **BOLT COMPRESSOR TO TRUCK BED** with 1/4” (6.35 mm) thick rubber pads under tank feet. Thicker padding will increase vibration and the possibility of cracking the tank or other unit damage.
2. **PORTABLE COMPRESSORS MUST BE SECURED** during transport and while operating to avoid unit damage.

⚠ DANGER ***If installation is in a box truck or other enclosed area, be sure to vent exhaust fumes away from operating area. Gasoline powered motors will develop hydro-carbons which can be fatal if inhaled.***

⚠ DANGER ***Prevent electric shock. Always ground the generator directly; from its frame or its grounding lug (gg, fig.9) to a proper physical electrical ground or to the vehicle frame.***

⚠ DANGER ***Bed liners, pallets, as well as some of the vehicle's running gear may form unwarranted insulation between this Compressor/Welder/Generator and your truck or vehicle frame. Always connect a ground wire from the equipment grounding terminal to the vehicle frame's freshly bared metal.***

⚠ CAUTION ***If any generator unit does not have GFCI receptacles' for your safety, use a GFCI-protected extension cord.***

Battery Component

Most EMax compressors are equipped with an electric starter but require a customer supplied, 12 volt motorcycle-style battery for operation. Be sure to follow safety steps and use proper procedures when connecting battery.

Safety Steps

⚠ WARNING ***Batteries contain caustic acid.Use extreme care when handling to avoid contact with battery acid. If contact occurs, flush immediately with water then use baking soda to neutralize.***

1. **WEAR EYE PROTECTION** at all times when handling battery.
2. **BATTERIES CAN GIVE OFF EXPLOSIVE GASES.** NEVER smoke or install battery near sparks or other ignition sources.

⚠ CAUTION ***NEVER touch both battery terminals at the same time with hands or any non-insulated tools. Always follow proper sequence for connecting and disconnecting battery.***

⚠ CAUTION ***ALWAYS connect the negative terminal last.***

Generator Safety

⚠ DANGER ***The engine that powers this generator produces poisonous carbon monoxide gas when running. This gas is both odorless and colorless. Even if you do not see or smell gas, carbon monoxide may still be present. Breathing this poison can lead to headaches, dizziness, drowsiness, and eventually death.***

1. **USE OUTDOORS ONLY** in non-confined areas.
2. **KEEP SEVERAL FEET OF CLEARANCE ON ALL SIDES** to allow proper ventilation of the generator.

⚠ WARNING ***This generator may emit highly flammable and explosive gasoline vapors, which can cause severe burns or even death. A nearby open flame can lead to explosion even if not directly in contact with gas.***

3. **DO NOT OPERATE NEAR OPEN FLAME.**
4. **DO NOT SMOKE NEAR GENERATOR.**
5. **ALWAYS OPERATE ON A FIRM, LEVEL SURFACE.**
6. **ALWAYS TURN GENERATOR OFF BEFORE REFUELING.** Allow generator to cool for at least 2 minutes before removing fuel cap. Loosen cap slowly to relieve pressure in tank.
7. **DO NOT OVERFILL GAS TANK.** Gas may expand during operation. Do not fill to the top of the tank. Leave 5/8" (16 mm) of air space below the filler neck.
8. **ALWAYS CHECK FOR AND CLEAN UP SPILLED GAS** before operating.
9. **EMPTY GASOLINE TANK BEFORE STORING OR TRANSPORTING** the generator.
10. **BEFORE TRANSPORTING, MOVE FUEL SHUT-OFF VALVE TO OFF AND DISCONNECT SPARK PLUG.**

⚠ WARNING ***This generator produces powerful voltage, which can result in electrocution.***

11. **ALWAYS GROUND THE GENERATOR** before using it (see the “Ground the Generator” portion of the “PREPARING THE GENERATOR FOR USE” section).
12. **GENERATOR SHOULD ONLY BE PLUGGED INTO ELECTRICAL DEVICES,** either directly or with an extension cord. NEVER connect to a building electrical system without a qualified electrician. Such connections must comply with local electrical laws and codes. Failure to comply can create a backfeed, which may result in serious injury or death to utility workers.
13. **USE A GROUND FAULT CIRCUIT INTERRUPTER (GFCI)** in highly conductive areas such as metal decking or steel work. GFCIs are available in-line with some extension cords.
14. **DO NOT USE IN RAINY OR WET CONDITIONS.**
15. **DO NOT TOUCH BARE WIRES OR RECEPTACLES (OUTLETS).**
16. **DO NOT ALLOW CHILDREN OR NON-QUALIFIED PERSONS TO OPERATE.**

⚠ WARNING ***This generator produces heat when running. Temperatures near exhaust can exceed 150° F (65° C).***

17. **DO NOT TOUCH HOT SURFACES.** Pay attention to warning labels on the generator denoting hot parts of the machine.
18. **ALLOW GENERATOR TO COOL** several minutes after use before touching engine or areas which heat during use.

⚠ CAUTION ***Misuse of this generator can damage it or shorten its life.***

19. **USE GENERATOR ONLY FOR ITS INTENDED PURPOSES.**
20. **OPERATE ONLY ON DRY, LEVEL SURFACES.**
21. **ALLOW GENERATOR TO RUN FOR SEVERAL MINUTES** before connecting electrical devices.
22. **SHUT OFF AND DISCONNECT ANY MALFUNCTIONING DEVICES** from generator.
23. **DO NOT EXCEED THE WATTAGE CAPACITY** of the generator by plugging in more electrical devices than the unit can handle.
24. **DO NOT TURN ON ELECTRICAL DEVICES UNTIL AFTER** they are connected to the generator.
25. **TURN OFF ALL CONNECTED ELECTRICAL DEVICES** before stopping the generator.

IMPORTANT: ***In addition to the above safety notices, please familiarize yourself with the safety and hazard markings on the generator.***

Welder Safety

The following safety information is intended to be guidelines which can help you operate your new welder as safely as possible. Any piece of equipment that uses electrical power can be potentially dangerous in use when safety or safe handling instructions are not known or ignored. Welding processes in particular can be dangerous not only to the operator, but to anyone located near the equipment, if safety and operating rules are not observed in the strictest sense. To use this equipment properly, you must observe the safety regulations, the assembly instructions and the operating instructions to be found in this manual. All persons who use and service the machine must be acquainted with this manual and must be informed about its potential hazards. Children should not be in the area in which the tool is being used at all because they cannot be safely supervised by the operator. It is also imperative that you observe the accident prevention regulations in force in your area. The same applies for general rules of occupational health and safety.

Work area

1. **KEEP WORK AREA CLEAN** and well-lit. Cluttered benches and dark areas invite accidents.
2. **REMOVE ALL COMBUSTIBLE MATERIALS FROM THE WELDING AREA** before commencing work. Keep the environment in which you plan to be welding free from flammable materials. Do not work in explosive atmospheres such as in the presence of flammable liquids, gases, or dust.
3. **ALWAYS KEEP A PROPERLY-RATED FIRE EXTINGUISHER** at hand.
4. **BE SURE THE AREA IS CLEAN, DRY AND WELL-VENTILATED.** Do not operate the welder in humid, wet or poorly ventilated areas.
5. **WELDING SHOULD BE DONE IN A CLOSED AREA** that does not open into other working areas.
6. **KEEP THE HARMFUL ARC RAYS THE WELDER PRODUCES SHIELDED** from the view of others.
7. **KEEP CHILDREN AND BYSTANDERS AWAY.** Endeavour to always be aware of your work environment and keep other people, particularly children, away from you while welding.
8. **MAKE YOUR WORKSHOP CHILDPROOF** by using padlocks, master switches or removing starter keys.
9. **STORE THE WELDER OUT OF THE REACH** of children and infirm people when not in use.
10. **ALWAYS DISCONNECT** the equipment from the power supply when leaving it unattended. Never leave the equipment running unattended. Switch it off and do not walk away until it comes to a complete stop.

⚠ WARNING ***Always be sure the welding area is secured and free of potential hazards (sparks, flames, glowing metal or slag) prior to leaving. The welder and all other equipment must be turned off and ready for the next use. Coil the cables loosely and out of the way of possible tripping hazard and insulation damage. Be sure all metal and slag have cooled.***

Electrical Safety

1. **FOLLOW ALL WIRING CODES** and recommended electrical connections to prevent shock or electrocution.
2. **DO NOT EXPOSE ELECTRICAL POWER TOOLS TO MOISTURE.** Rain or wet conditions can cause water to enter the tool and lead to electric shock.
3. **DO NOT ABUSE THE CORD.** Never carry or pull your tool by the cord or pull on the cord to unplug it. Protect the cord from potential sources of damage: heat, oil and solvents, sharp edges or moving parts. Replace damaged cords immediately. Do not use the tool if the cord is damaged or worn.
4. **WHEN WORKING OUTDOORS, USE AN OUTDOOR-RATED EXTENSION CORD.** An extension cord rated for outdoor use must be grounded and marked “W-A” or “W”.

⚠ DANGER ***Electric shock can be fatal. If a person is found unconscious and electric shock is suspected, do not touch the person if they are in contact with any electrical wires. Disconnect power from the machine and then use First Aid. Dry wood, and any other insulating material can be used to move electrical cables away from the person if necessary.***

Personal safety

N.B. *If you are new to the welding process, or not an experienced welding professional, you may want to take advantage of any welding course of instruction that may be available through your local technical institute or from your welding equipment supplier. In addition, there are a number of useful video demonstrations available on YouTube that can improve both your knowledge and your safe handling of welding equipment.*

1. **DISCONNECT THE PLUG FROM THE POWER SUPPLY WHEN MOUNTING ACCESSORIES.** Use only recommended accessories as required, otherwise personal injury may result.

2. **DRESS PROPERLY.** Operators should protect their body by wearing dry, closed, non-flammable protective clothing, without pockets or pants without turned-up cuffs. Protective, non-electrically conductive, robust, non-skid footwear is recommended when working. Wear protective hair covering to contain long hair and keep it from harm.
3. **WEAR EYE PROTECTION.** The operator should never look at the welding arc without the correct protection for the eyes. Always wear goggles or safety glasses with rigid side shields that comply with ANSI safety standard Z87.1 to protect from flying particles. Everyday eyeglasses only have impact resistant lenses, they are NOT safety glasses.
4. **WEAR A NON-FLAMMABLE FULL-COVERAGE HELMET WITH LENS OF AN APPROPRIATE SHADE** (see ANSI Z87.1 safety standard) designed so as to shield the face and neck as far as the backs of your ears. It is necessary to always keep the protective lens clean and to replace it when broken or cracked. It is advisable to put a transparent glass between the lens and the welding area, plus ANSI-approved safety glasses with side shields while welding.
5. **WEAR BREATHING PROTECTION.** If ventilation is found not adequate to exchange all fumes and gases generated during welding with clean, fresh air, do not weld unless you, the operator, and all bystanders wear air-supplied respirators.
6. **WEAR HEARING PROTECTION,** protecting especially from extended periods and repeated exposure.
7. **DISCONNECT THE PLUG FROM POWER BEFORE LEAVING THE TOOL IDLE OR MAKING ANY ADJUSTMENTS.** Changing attachments or accessories can be dangerous if the tool should accidentally start.
8. **DON'T OVERREACH.** Keep proper footing and balance at all times. Proper footing and balance enable better control of the tool in unexpected situations. Do not reach over or across machines that are running.
9. **NEVER STAND ON TOOL.** Serious injury could occur if the tool is tipped or if the welding tool is unintentionally contacted.
10. **STAY ALERT.** Watch what you are doing & use common sense. Do not operate any tool when you are tired, sick, or under the influence of alcohol or other drugs.
11. **OBSERVE THE ACCIDENT PREVENTION REGULATIONS** in force in your area.
12. **OBSERVE THE GENERAL RULES** of occupational health and safety in force in your area.

Equipment Use and Safety

1. **THE TOOL MUST BE FULLY ASSEMBLED** before connecting it to a power supply.
2. **KNOW YOUR EQUIPMENT.** Read and understand the owner's manual and the labels attached to the tool. Learn its application and limitations as well as the specific potential hazards peculiar to this tool.
3. **HAVE A QUALIFIED PERSON** who can install and earth the welder according to all the applicable regulations set up this equipment.
4. **HAVE YOUR WELDER MAINTAINED** in accordance with local, provincial, state, and national codes by a qualified technician.
5. **DISCONNECT THE TOOL FROM THE POWER SUPPLY SOURCE** before carrying out maintenance or cleaning work.
6. **DO NOT OPERATE THE WELDER** if the output cable, electrode, electrode holder, or ground cable is wet. Do not immerse them in water. These components and the welder must be completely clean and dry before attempting to use them.
7. **KEEP THE WELDER SWITCH IN THE OFF POSITION WHEN NOT IN USE** and always switch it off and disconnect the power cord from the power source before moving the machine to another location.
8. **DO NOT USE THE WELDER IF IT CANNOT BE SWITCHED ON OR OFF.** Have your tool repaired before using it.
9. **KEEP GUARDS IN PLACE** and in working order.
10. **UNCOIL WELDING AND GROUND CABLES** before use to prevent overheating and resultant damage to cable insulation.
11. **STORE IDLE EQUIPMENT.** Store equipment in a dry area to inhibit rust. Equipment also should be in a high location or locked up to keep out of reach of children.
12. **USE THE RIGHT TOOL.** Don't force the tool. It will do the job better and safer working at the rate for which it was designed. Don't force a small tool or attachment to do the work of a larger industrial tool. Don't use a tool for a purpose for which it was not intended.
13. **USE ONLY FOR ITS PRESCRIBED PURPOSE.** Any use other than those mentioned in this manual will be considered a case of misuse. The user and not the manufacturer shall be liable for any damage or injury resulting from such cases of misuse.
14. **SECURE WORK.** Whenever possible, use clamps or a vise to hold the work. It is safer than using your hands and it frees both hands to operate the tool.
15. **CONNECT THE GROUND LEAD** as close to the area being welded as possible to ensure a good ground.
16. **CHECK FOR DAMAGED PARTS.** Before using this tool, any part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check the ground cable, power cord

and welding cable to be sure the insulation is free from damage. Replace or repair damaged components before using the welder.

17. **CHECK ALL COMPONENTS** to ensure they are clean and in good operating condition before use.
18. **CHECK FOR MISALIGNMENT OF MOVING PARTS,** binding of moving parts, breakage of parts, mountings and other conditions that may affect tool operation. Inspect screws and tighten any that are loose. Any part that is damaged should be properly repaired or replaced by an authorized service centre unless otherwise indicated elsewhere in the instruction manual. Have defective switches replaced by an authorized service center. Do not use the tool if the switch does not turn it on and off properly.

Safety while Servicing

⚠ DANGER ***Be sure the spark plug is always disconnected when working on internal components.***

1. **INSPECT AND MAINTAIN THIS EQUIPMENT REGULARLY.** Have it repaired only by an authorized repair technician.
2. **DO NOT TOUCH OR HANDLE THE PC BOARD** without being properly grounded using a wrist strap. Put PC board in static-proof bag to transport or ship it.
3. **ENSURE THE VENTILATION OPENINGS** are kept clear of debris.
4. **IF THE CABLES ARE DAMAGED HAVE THEM REPAIRED** only by an authorized service center.
5. **SERVICE AND REPAIRS SHOULD BE MADE BY QUALIFIED REPAIR TECHNICIANS** at an authorized repair center. Improperly repaired tools could cause serious shock or injury.
6. **REPLACEMENT PARTS.** When servicing, use only identical replacement parts.
7. **USE ONLY THE MANUFACTURER'S RECOMMENDED REPLACEMENT PARTS** and accessories.
8. **THE MANUFACTURER SHALL NOT BE LIABLE** for any changes made to the machine, nor for any damage resulting from such changes.

Wiring

1. **CONNECT THE GROUND LEAD** as close to the area being welded as possible to ensure a good ground.
2. **DO NOT ALLOW ANY PART OF YOUR BODY TO COME INTO CONTACT WITH THE ELECTRODE OR WELDING WIRE** if you are also in contact with the material being welded, the ground or the electrode or welding wire of another welder.
3. **DO NOT WELD FROM AN AWKWARD POSITION.** Maintain a secure stance while welding to prevent accidents. If you are working above ground, wear a safety harness to prevent injury from possible falls.
4. **DO NOT DRAPE OR COIL WELDING CABLES** over or around your body.
5. **WEAR A NON-FLAMMABLE FULL-COVERAGE HELMET WITH LENS OF AN APPROPRIATE SHADE** (see ANSI Z87.1 safety standard) that will cover the face and neck as far as the backs of your ears, plus ANSI-approved safety glasses with side shields while welding.
6. **WEAR APPROPRIATE GLOVES AND PROTECTIVE CLOTHING TO PROTECT YOUR SKIN** from exposure to hot metals, slag, UV and IR rays.
7. **DO NOT OVERUSE OR OVERHEAT YOUR WELDER.** Always use this welder following the rated duty cycle to prevent excessive heat and failure and allow the proper cooling times between duty cycles. .
8. **THE WELDER MUST NEVER BE RUN WITHOUT ITS PANELS CLOSED.** Doing so could cause serious injury to the operator as well as damage the equipment.
9. **DO NOT POINT THE ELECTRODE AT ANY BODY PART** of yourself or at anyone else.

Specific Areas of Danger

Electrical Shock

⚠ DANGER  ***Electric shock may be fatal! To reduce the risk of death or serious injury from electric shock, read, understand, and follow the following safety instructions. Also, make certain that anyone else who may use this welding equipment, or any bystander in the welding area understands and follows them as well.***

Be aware that an electric arc welder can produce a shock that may cause serious injury or death. While welding, all metal components connected to the wire are part of the welding current circuit and are electrically live. Touching any of these electrically live parts can cause fatal shocks and severe burns. Poor ground connections are also a hazard, so be sure to secure the ground lead before welding.

⚠ DANGER 

To reduce your risk of death, injury, or property damage, do not operate this welding equipment until you have read and understood the following safety summary.

1. **INSULATE YOURSELF FROM BOTH THE GROUND AND FROM THE WORKPIECE.** Avoid contacting either. Do not allow yourself to come into physical contact with any part of the welding current circuit in any manner. This welding current circuit includes the workpiece and any conductive material in contact with it, the

ground clamp, the electrode, and any metal parts on the electrode holder.

2. **DO NOT TOUCH THE WELDING WIRE AND THE GROUND** or grounded workpiece at the same time.
3. **WEAR DRY PROTECTIVE CLOTHING:** coat, shirt, gloves and insulated footwear. Do not touch live electrical parts or electrodes with bare skin, gloves or wet clothing. Do not weld if any part of your clothing or body is wet.
4. **DO NOT WELD IN A DAMP ENVIRONMENT** or come into contact with a moist or wet surface.
5. **DO NOT ALLOW THE WELDING EQUIPMENT TO COME INTO CONTACT WITH ANY WATER OR MOISTURE.**
6. **DO NOT DRAG THE WELDING CABLES, THE ELECTRODE HOLDER, OR THE WELDER'S POWER CORD THROUGH NOR LET THEM COME INTO CONTACT WITH ANY WATER OR MOISTURE.**
7. **DO NOT TOUCH THE WELDER NOR ATTEMPT TO TURN WELDER ON OR OFF, IF ANY PART OF YOUR BODY OR CLOTHING IS MOIST** or if you are in actual physical contact with water or moisture.
8. **DO NOT CONNECT THE WELDER WORKPIECE GROUND CLAMP** to or weld on electrical conduit.
9. **NEVER USE THE WELDER TO THAW FROZEN PIPES.**
10. **DO NOT MAKE ANY CHANGES TO THE POWER CORD** or the power cord plug in any manner.
11. **DO NOT TRY TO PLUG** the welder into any power source if the ground prong on power cord plug is bent, broken off, or missing.
12. **DO NOT ALLOW THE WELDER TO BE CONNECTED TO ANY POWER SOURCE** or attempt to weld if the welder, welding cables, welding site, or welder power cord are exposed to any form of atmospheric precipitation, or to salt water spray.
13. **LAY OUT COILED OR TANGLED WELDING CABLE BEFORE USE** in order to avoid overheating and consequent damage to insulation.
14. **DO NOT CARRY OR HOLD COILED WELDING CABLES AROUND YOUR SHOULDERS**, or any other part of your body, when the cables are plugged into the welder.
15. **DO NOT MAKE ANY MODIFICATIONS** to any wiring, ground connections, switches, or fuses in this welding equipment.
16. **WEAR DRY WELDING GLOVES** to help insulate hands from welding circuit.
17. **KEEP ALL CONTAINERS OF LIQUIDS FAR** enough away from the welder and work area so that if spilled, those liquids cannot possibly come into contact with any part of the welder or any part of the electrical welding circuit.
18. **INSPECT ALL CABLES AND CORDS FOR ANY EXPOSED WIRE**. and If found, replace any cracked, abraded, or damaged parts such as welding cables, power cord, or electrode holder that are insulated or act as insulators IMMEDIATELY, using only recommended replacement cables and cords.
19. **NEVER ATTEMPT ANY REPAIRS OR MAINTENANCE** on the welder while it is connected to power.
20. **ALWAYS ATTACH GROUND CLAMP TO THE WORKPIECE OR WORK TABLE AS CLOSE TO THE WELD AS POSSIBLE** to prevent any unknown, unintended paths of electrical current from causing electrical shock and fire hazards.

Fumes and Gases

⚠ WARNING ***Fumes, gases, and vapours may be very hazardous to your health. They can cause discomfort, illness and death! In addition, fumes emitted from the welding process displace clean air and so can produce injury or death.***

1. **TO REDUCE THE RISK OF DISCOMFORT, ILLNESS, OR DEATH**, read, understand, and follow the following safety instructions. Do not inhale the fumes emitted by the welding process. Make sure your breathing air is clean and safe. Make certain as well, that anyone else that uses this welding equipment or is a bystander in the welding area understands and follows these safety instructions.
2. **WELD ONLY IN A WELL-VENTILATED AREA** or use a ventilation device to remove welding fumes from the environment where you will be working. Do not weld in any area until it has been checked for sufficient ventilation in accordance with ANSI standard# Z49.1. If ventilation is found not adequate to exchange all fumes and gases generated during welding with clean, fresh air, do not weld unless you, the operator, and all bystanders wear air-supplied respirators.
3. **DO NOT WELD, CUT, OR EVEN HEAT LEAD, ZINC, CADMIUM, MERCURY, BERYLLIUM**, or similar metals without seeking professional advice and inspection of the welding area. These metals will produce extremely toxic fumes which can cause symptoms ranging from discomfort and illness up to and including death.
4. **DO NOT HEAT METALS THAT MAY BE COATED WITH OR CONTAIN, MATERIALS THAT PRODUCE TOXIC FUMES** (such as galvanized steel, paint, galvanized, cadmium-plating or containing zinc, mercury, chromium, graphite, lead, cadmium, beryllium, or barium); unless coated and that coating is removed. They will emit fumes that are very dangerous to breathe. Make certain the operator and all bystanders are wearing air-supplied respirators. Refer to the MSDS (material safety data sheet) for the manufacturer's instructions.

5. **VAPOURS FROM MANY CLEANERS, SPRAYS, AND DEGREASERS CAN BE HIGHLY TOXIC WHEN HEATED.** Parts degreased with a solvent must be thoroughly dry before welding.
6. **DO NOT PERFORM WELDING OR CUTTING OPERATIONS ANYWHERE NEAR CHLORINATED SOLVENTS.** Vapours from chlorinated hydrocarbons, such as trichloroethylene and perchloroethylene can be broken down by the heat of an electric arc or by its ultraviolet radiation. This can cause phosgene, a highly toxic gas used in World War I as the chemical weapon, mustard gas, to be produced, as well as other lung and eye-irritating gases. Working with the welder anywhere these solvent vapours can be drawn into the work area or where the ultraviolet radiation can reach into areas containing even small amounts of these vapours. must be avoided. Refer to the MSDS (material safety data sheet) for the manufacturer's instructions.
7. **DO NOT WELD IN ANY CONFINED AREA UNLESS IT IS ACTIVELY AND ADEQUATELY VENTILATED** or if the operator, and everyone else present is wearing an air-supplied respirator.
8. **STOP WELDING IMMEDIATELY IF YOU NOTICE EVEN MOMENTARY EYE, NOSE, OR THROAT IRRITATION** because this points to inadequate ventilation. Stop work and improve the fresh air supply in the welding area. Do not resume welding if your physical discomfort persists.

Flash Hazards; UV and IR Arc Rays

⚠WARNING ***The welding arc operations produce ultraviolet (UV) and infrared (IR) rays. These arc rays can injure your eyes and burn your skin. To reduce the risk of injury from arc rays, read, understand, and follow the following safety instructions. In addition, make certain that everyone else that uses this welding equipment, or is a bystander in the welding area also understands and follows these safety instructions. Headshields or helmets and filter lens should conform to ANSI Z87.1 standards.***

1. **DO NOT LOOK AT AN ELECTRIC ARC WITHOUT PROPER EYE PROTECTION.** Welding arcs produce extremely bright, intense energy and, with inadequate or no eye protection, the eye's retina can be quickly burned, leaving a permanent dark spot in the field of vision. Operators and lookers-on must use a shield or helmet with a number 12 shade filter lens (minimum) installed.
2. **PROVIDE BYSTANDERS WITH SHIELDS OR HELMETS FITTED WITH A #10 SHADE FILTER LENS** and do not strike a welding arc until all bystanders and you (the operator) have welding shields and/or helmets in place. Use a lens that meets ANSI standards and safety glasses with side shields. For welders such as this one, above 160 Amps, use a shade 12. (Under 160 Amps output, use a shade 10 lens.) Refer to the ANSI standard Z87.1 for more information.
3. **DO NOT USE A CRACKED OR BROKEN HELMET.** Replace it and replace any cracked or broken filter lenses IMMEDIATELY.
4. **COVER ALL BARE SKIN AREAS EXPOSED TO THE ARC WITH PROTECTIVE CLOTHING AND SHOES.** Wear protective dark clothing of heavy material. The intense light of the welding arc can burn the skin in much the same way as the sun, even through light-weight clothing. Flame-retardant cloth or leather long-sleeved shirts, coats, pants or coveralls should be used for protection, the collar kept buttoned to protect chest and neck.
5. **USE A HELMET THAT COVERS YOUR FULL FACE** from the neck to top of head and to the backs of the ears.
6. **TAKE CARE NOT TO ALLOW AN UNINSULATED PORTION OF THE ELECTRODE HOLDER TO TOUCH THE GROUND CLAMP** or grounded work to prevent an arc flash from being created on contact before you are protected.
7. **CONSIDER YOU SHOULD ALSO PROTECT YOURSELF AGAINST REFLECTED ARC RAYS.** Arc rays can be reflected off shiny surfaces such as a glossy painted surface, polished aluminum, stainless steel, and glass. It is possible for your eyes to be injured by reflected arc rays even when wearing a protective helmet or shield. If welding with a reflective surface behind you, arc rays can bounce off that surface, off the inside surface of the filter lens on the inside of your helmet or shield, and then into your eyes. These reflected arc rays can also cause skin burn in addition to eye injury. If you find a reflective surface in your welding area, either remove it or cover it with something non-flammable and non-reflective.
8. **USE SCREENS OR OTHER BARRIERS** to protect other people from the arc rays emitted by your welding.
9. **WARN PEOPLE NEAR YOUR WELDING AREA** when you are going to strike an arc so they can take measures to protect themselves.

Fire Hazards

⚠ DANGER ***Fire or explosion can cause death, injury, and property damage.***

To reduce the risk of death, injury, or property damage from fire or explosion, read, understand, and follow the following safety instructions. In addition, make certain that anyone else that uses this welding equipment, or is a bystander in the welding area, understands and follows these safety instructions as well.

⚠ WARNING ***Arc welding, by nature, produces sparks, hot spatter, molten metal drops, hot slag, and hot metal parts that can start fires, burn the skin, and damage the eyes.***

1. **DO NOT HAVE ON YOUR PERSON ANY COMBUSTIBLE ITEMS**, such as lighters or matches.
2. **DO NOT WEAR FLAMMABLE HAIR PREPARATIONS.**
3. **DO NOT WELD IN ANY AREA UNTIL YOU HAVE CHECKED AND CLEARED IT OF COMBUSTIBLE AND/OR FLAMMABLE MATERIALS.** Remember that sparks and slag can fly 35 feet (10.7 m) and that these can be small enough to fly through very small openings. If work and combustibles cannot be moved or separated by a minimum of 35 feet (10.7 m), protect combustibles against ignition with suitable, snug-fitting, fire resistant covers or shields.
4. **DO NOT WELD ON WALLS WITHOUT HAVING CHECKED FOR AND REMOVING COMBUSTIBLES** against the other side of those walls.
5. **DO NOT WELD, CUT, OR PERFORM OTHER SUCH WORK ON USED BARRELS, DRUMS, TANKS, PIPES, OR OTHER CONTAINERS** that may have at one time contained a flammable or toxic substance. Removing flammable substances and vapours to make a used container safe for welding or cutting, is quite complex and requires a professional with special education and training.
6. **NEVER STRIKE AN ARC ON A COMPRESSED GAS OR AIR CYLINDER OR OTHER PRESSURE VESSEL.** Doing so will create a brittle area that can result in a violent rupture immediately or at a later time to someone else as a result of an accidental knock.
7. **DO NOT WELD OR CUT IN AREAS** where flammable or explosive dust (such as grain dust), flammable or explosive gases, or flammable or explosive liquid vapours (such as gasoline) may be present.
8. **DO NOT HANDLE HOT METAL**, such as a workpiece, slag, or electrode pieces, with bare hands.
9. **WEAR LEATHER GLOVES, HEAVY LONG SLEEVE SHIRT, CUFFLESS TROUSERS, HIGH-TOPPED SHOES, HELMET, AND CAP.** If necessary, additional protective clothing such as leather jacket or sleeves, fire-resistant leggings, or apron can be brought into play. Hot sparks or metal can lodge in rolled up sleeves, trouser cuffs, or pockets. Sleeves and collars should be kept buttoned closed and no pockets should be on the shirt front.
10. **DO NOT WEAR GLOVES OR OTHER CLOTHING THAT CONTAIN OIL**, grease, or other flammable substances.
11. **HAVE FIRE EXTINGUISHING EQUIPMENT READY** to hand for immediate use! DO NOT USE WATER. A portable type ABC chemical fire extinguisher is recommended.
12. **WHEN WELDING ABOVE YOUR HEAD, WEAR EAR PLUGS** to prevent spatter or slag from falling into your ears.
13. **MAKE SURE THE WELDING AREA HAS A GOOD, SOLID, SAFE FLOOR**, preferably concrete or masonry, not tiled, carpeted, or made of any other flammable material.
14. **PROTECT ANY FLAMMABLE WALLS, CEILINGS, AND FLOORS** with heat-resistant covers or shields.
15. **AFTER WELDING, CHECK THE AREA** to make sure it is free of sparks, glowing metal or slag, and flames before leaving.
16. **KEEP THE WORK GROUND LEAD CONNECTED AS CLOSE TO THE WELD AREA AS POSSIBLE** to prevent any unknown, unintended paths of electrical current from causing electrical shock and fire hazards.

Hot Materials

⚠ WARNING ***Welded materials are hot and can cause severe burns if handled improperly. Do not touch welded materials with bare hands and skin until they have completely cooled.***

1. **DO NOT TOUCH THE ELECTRODE AND ELECTRODE HOLDER AFTER WELDING** until they have had time to cool down.
2. **SPARKS/FLYING DEBRIS.** Welding creates hot sparks that can cause injury to the operator and bystanders.
3. **SLAG CAN BE OCCASIONALLY BE SPONTANEOUSLY THROWN OFF** welds as the materials cool.
4. **CHIPPING SLAG OFF WELDS CREATES FLYING DEBRIS.**
5. **WEAR PROTECTIVE APPAREL AT ALL TIMES**, including when chipping or grinding welds: ANSI-approved safety glasses or shield, plus a welder's helmet and ear plugs to keep sparks out of ears and hair.

Electromagnetic Fields

1. **THE MAGNETIC FIELDS CREATED BY HIGH CURRENTS MAY AFFECT THE OPERATION OF CARDIAC PACEMAKERS.** Wearers of vital electronic equipment such as pacemakers should consult their physician before beginning any electric arc welding, cutting, gouging or spot welding operations. Keep people with pacemakers away from your welding area when welding.
2. **DO NOT WRAP CABLE AROUND YOUR BODY WHILE WELDING.**
3. **KEEP THE WELDING CABLE AND GROUND CABLE TOGETHER AND ON THE SAME SIDE OF YOUR BODY** whenever possible, taping them together if practical.

Other Sources of Welding Safety and Standards Information

This manual is meant to inform operators about safety and general use for this unit only. Other sources can provide further and vital information about welding safety. Please refer to the following standards and comply with them if they are applicable.ANSI Standard Z49.1 — SAFETY IN WELDING AND CUTTING
obtainable from:
American Welding Society
550 NW Le Jeune Road, Miami, FL 33126
Tel. (800) 443-9353
Fax (305) 443-7559
www.amweld.org or www.aws.org

ANSI STANDARD Z87.1 — SAFE PRACTICE FOR OCCUPATION AND EDUCATIONAL EYE AND FACE PROTECTION
available from:
American National Standards Institute (ANSI)
11 West 42nd St.
New York, NY 10036
Tel. (212) 642-4900
Fax (212) 398-0023
www.ansi.org

NFPA STANDARD 51B — CUTTING AND WELDING PROCESS
available from:
National Fire Protection Association,
1 Batterymarch Park, P.O. Box 9101
Quincy, MA 02269-9101
Tel. (617) 770-3000
Fax (617) 770-0700
www.nfpa.org

OSHA STANDARD 29 CFR, PART 1910, SUBPART Q. — WELDING, CUTTING AND BRAZING
available from your state OSHA office or from:
U. S. Dept. of Labor
OSHA, Office of Public Affairs Room
N3647, 200 Constitution Ave. NW
Washington, DC 20210
www.osha.gov

CSA STANDARD W117.2 — Code for SAFETY IN WELDING AND CUTTING
available from:
Canadian Standards
Association, 178 Rexdale Blvd.,
Etobicoke, Ontario M9W 1R3
www.csa.ca

AMERICAN WELDING SOCIETY STANDARD A6.0 — WELDING AND CUTTING CONTAINERS WHICH HAVE HELD COMBUSTIBLES

AMERICAN WELDING SOCIETY —SAFETY AND HEALTH FACT SHEETS (particularly No.29, Grounding of Portable And Vehicle Mounted Welding Generators)
available from:
American Welding Society,
550 NW Le Jeune Road
Miami, FL 33126
Tel. (800) 443-9353
Fax (305) 443-7559
www.amweld.org or www.aws.org

For welding beginners, informative videos on welding are available for viewing on YouTube.

Though we have tried to foresee common problems, it is not possible that the Danger, Warning, Caution, and Notice notifications and instuctions in this manual cover all conditions that could occur. It must be understood by the operator that caution and common sense are factors that connot be built into this product, but must be supplied by the operator.

Unpacking

Unpacking your EGES14020T, check it thoroughly for any damage that it may have incurred in transit. Be sure all fittings, bolts, etc. are present, as well as tight and secure.

⚠ WARNING ***Do not operate this equipment if any damage is discovered.***

Lifting this equipment

1. Carefully inspect all lifting equipment and make sure it is in good condition. Rated capacity for each component should exceed compressor weight of 550 lb. (249.5 kg).
2. Use chains or cables with shackles to attach them to the three compressor lifting point eyebolts (Y, fig.1 and fig.2).

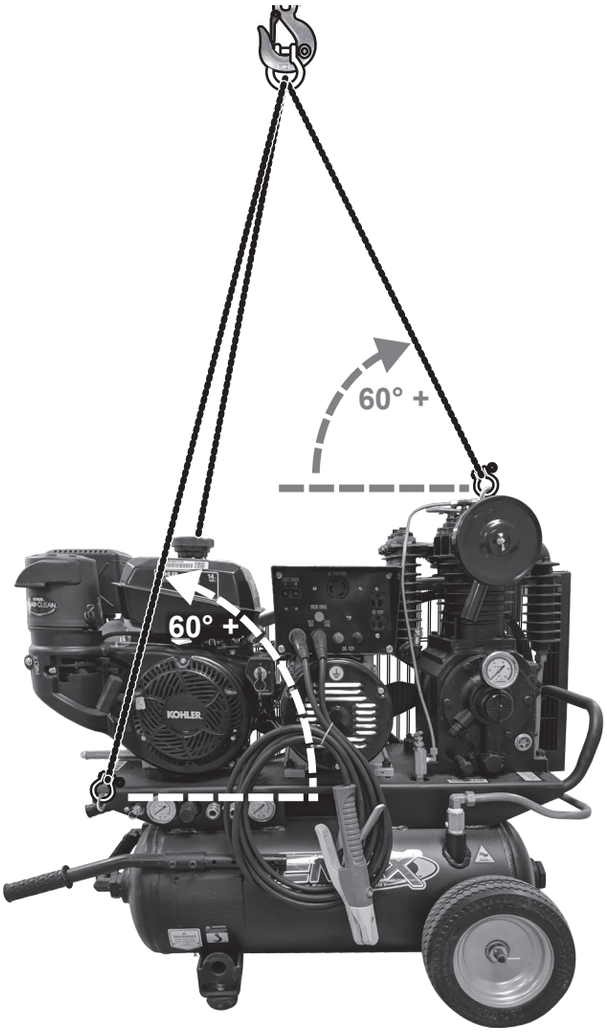

fig.7 Set-up for lifting and lowering

3. The three slings should each be long enough that their angle when gathered at the top should ideally be greater than 60° to the horizontal.
4. Make sure lifting point eyebolts are in good condition and tighten any loose nuts or bolts before lifting.

⚠ WARNING ***Make sure to use all three lifting hooks while lifting the compressor-welder. Failure to do this can cause injury.***

5. The lifting hook must have a functioning safety latch or equivalent.
6. Attach a guide rope to prevent the unit rotating when the lift is in the air. Getting too close to steady it by hand exposes you to danger should it fall.
7. Increase the strain on the slings and lifting points slowly and evenly. Be sure to keep the unit horizontal when lifting.

Pre-operation set-up

Placement

- Locate the unit as close to where air, electrical power, or welding is needed as is practical, while keeping in mind the dangers and cautions presented in the preceding safety sections.
- Install this unit in a clean, dry and well-lit area. Be sure installation area can maintain a temperature range between 35º and 110º F (2º and 43º C).
- The maximum allowable angle of operation for the engine is 25°

If the compressor is to be connected to a network of piping to carry compressed air, set up that system with the following in mind:

1. **INSTALL APPROPRIATE FLOW-LIMITING VALVES** as necessary according to pipe size(s) used and run lengths. This will reduce pressure in case of hose failure, per OSHA Standard 29 CFR 1926.302(b)(7).
2. **FLOW-LIMITING VALVES ARE LISTED BY PIPE SIZE AND RATED CFM.** Select appropriate valves accordingly, in accordance with the manufacturer's recommendations.
3. **PLACE FEET ON 1/4" (6 mm) THICK RUBBER PADS.** Thicker padding will increase vibration and the possibility of cracking the tank or other unit damage. Do not place unit on dirt floor or uneven surface.

NOTICE ***Do not install rubber feet adjacent to wheels if compressor is used in portable applications.***

4. **FASTEN ANCHOR BOLTS SNUGLY BUT DO NOT OVERTIGHTEN** so normal vibration will not damage unit.

⚠ DANGER ***This unit is somewhat top heavy and should be bolted to solid, flat surface to avoid falling and premature pump wear. Splash lubrication will not operate properly if unit is not level.***

5. **USE A FLEXIBLE CONNECTOR** between compressor tank and any piping system to minimize noise, vibration, unit damage, and pump wear.

6. **INSTALL APPROPRIATE ASME-CODE SAFETY VALVES** and make sure piping system is equipped with adequate condensate drains.

Piping / Tank Installation

Minimum Pipe Size for Compressed Air Lines		Length of Piping System							
Standard air volume		25 ft.	7.6 m	50 ft.	15.2 m	100 ft.	30.5 m	50 ft.	76.2 m
20 CFM	566.34 L/min	3/4 in.		3/4 in.		3/4 in.		1 in.	
40 CFM	1132.67 L/min	3/4 in.		1 in.		1 in.		1 in.	
60 CFM	1699.01 L/min	3/4 in.		1 in.		1 in.		1 in.	
100 CFM	2831.68 L/min	1 in.		1 in.		1 in.		1-1/4 in.	
125 CFM	3539.61 L/min	1-1/4 in.		1-1/4 in.		1-1/4 in.		1-1/2 in.	

⚠WARNING ***Never install a shut-off valve such as a globe or gate valve, between the pump discharge and the air tank unless a safety valve is installed in the line between valve and pump.***

7. **MAKE SURE** any tube, pipe or hose connected to the unit can withstand operating temperatures and retain pressure.

⚠WARNING ***Never use plastic (PVC) pipe for compressed air. Serious injury or death could result.***

8. **NEVER USE REDUCERS IN DISCHARGE PIPING.** Keep all piping and fittings the same size in the piping system.
9. **FOR PERMANENT INSTALLATIONS OF COMPRESSED AIR SYSTEMS, DETERMINE TOTAL LENGTH OF SYSTEM AND SELECT CORRECT PIPE SIZE.** Make sure underground lines are buried below frost line and avoid areas where condensation could build up and freeze.
10. **TEST THE ENTIRE PIPING SYSTEM** before any underground lines are buried. Be sure to find and repair all leaks before using compressor.

⚠WARNING ***Never exceed recommended pressure or speed while operating compressor.***

⚠WARNING ***Re-install the beltguard on unit after pump installation is complete.***

Lubrication

Be sure the engine is supplied with the correct lubricating oils in the correct places as mentioned in the engine manual:

1. Engine crankcase lubricant: 10W-30 high quality detergent oil is a good most-cases choice. Check the maintenance section of the Kohler engine service manual for details. Be sure the crankcase is filled to the appropriate mark on the oil dipstick, not overfilled. It should be changed out after the engine break-in period, i.e. after the first five hours.

Low-oil shutdown

The low-oil shut-down feature on this piece of machinery applies only to the gas engine. It is intended to prevent accidental running of the engine when the oil is insufficient to lubricate it properly and cause it to over-heat. However, this does not mean the operator should not always keep watch on the engine oil level. Do not rely on Oil Sentry™ to shut the engine down. In addition, there is also a continuing need to monitor and maintain oil levels in the reduction gearing and in the compressor pump.

NOTICE ***The low-oll switch is designed to prevent engine from starting in a low oil or no oil condition. Oil Sentry™ may not shut down a running engine before damage occurs.***

2. Oil-bath air cleaner: Check oil level in oil reservoir cup; add oil if below oil level mark; do not overfill. Use the same oil as for the engine crankcase.

Be sure the compressor pump is lubricated correctly. This unit is shipped with compressor pump break-in oil and should be ready to operate.

3. Check the oil level. It should show in center of the compressor pump oil sight glass. Refer to JF, fig.6 and fig.8, below.

4. Do not over-fill the oil.

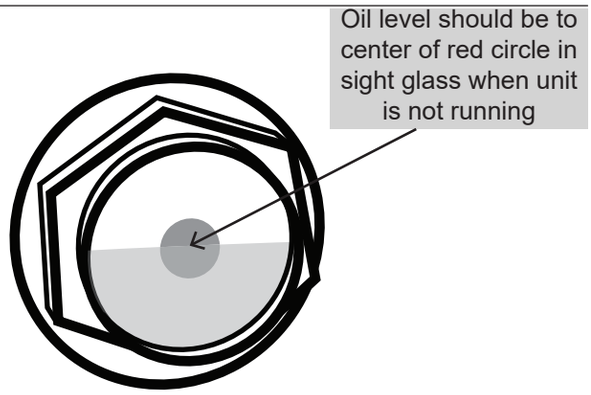

fig.8 Check proper oil level

NOTICE ***Use only EMAX USA oil (PN: OIL004) for the compressor pump. Use of any other product will cause product damage and void the warranty.***

Battery Set-up and connections

This unit can be started using the re-coil (pull) start, and will run by supplying its own power, but for convenience, most owners will want to use theelectric start option, which will require a 12 volt battery of the type commonly used for motorcycles. The space available will allow a batteryto fit behind the Generator/Welder Panel. Be sure the battery you choose will fit in the 5" wide x 3" deep x 5" high (127 x 76.2 x 127 mm) space (fig.9) with room to connect the cabling.

Connecting Battery

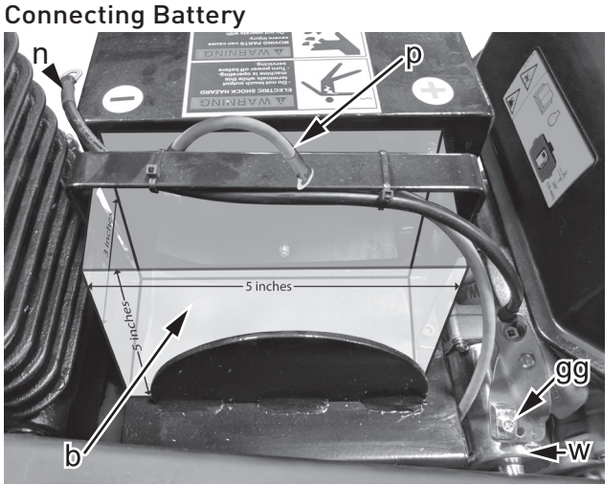

fig.9 Back view- battery & starter wiring

1. The battery must be fully charged before use.
2. Use the supplied cables to connect to the battery.
3. You'll find the red positive (+) cable connected to the starter solenoid on engine.
4. The black negative (-) cable is connected to one of the engine bolts.
5. Connect other end of red positive (+) cable to positive (+) battery terminal.
6. Connect other end of black negative (-) cable to negative (-) battery terminal.

Disconnecting Battery

1. Disconnect negative (-) cable from negative (-) battery terminal first.
2. Then disconnect positive (+) cable from positive (+) battery terminal.

Grounding

- You will require insulated copper wire of #10 AWG or thicker of sufficient length and use it to make a cable connection from the equipment ground terminal (gg, fig.9) directly to the metal vehicle frame or directly to actual ground (earth).
- Scrape off paint and dirt to be sure you create a good electrical bond from the generator frame to the vehicle frame by metal-to-metal contact.

Operation

Safety Rules

1. Make sure all operators receive product training, read and understand all instructions.

⚠ WARNING ***Keep all flammable, combustible, poisonous and noxious materials away from operating area. Make sure there are no oily rags, trash, leaves, litter or other combustible materials in operating area. Keep suitable, fully charged fire extinguishers nearby when servicing and operating the compressor.***

2. NEVER allow modifications to the structure or controls of this unit.
3. Keep all ignition sources away from exposed electrical parts.
4. Keep all persons clear of 3-in-1 Compressor / Welder / Generator during start-up and operation.
5. NEVER operate the compressor with the fan, coupling or other guards removed.
6. DO NOT engage in horseplay with air hoses as ***death or serious injury may result.***
7. Make sure to provide adequate ventilation and use proper lubricant while operating the compressor. If lubricant or other combustible substances are spilled, clean up immediately.
8. When checking or adding lubricant or when refilling air line anti-icer systems with antifreeze compound, shut off compressor and allow it to cool. Keep sparks, flames and other ignition sources away and DO NOT permit smoking in the vicinity.
9. Stop compressor and disconnect power if a hazardous condition arises.
10. Wear snug-fitting clothing and confine long hair when around compressor. Keep all body parts and clothing away from couplings, flywheel and other moving parts of the equipment.

⚠ WARNING ***Keep all persons away from the discharge opening of hoses or tools or other points of compressed air discharge. If the machine is installed in an enclosed area, be sure to vent the relief valve outside of the structure or to an unoccupied area.***

11. DO NOT use air tools that are rated below the maximum rating of the compressor. Select air tools, air hoses, pipes, valves, filters and other fittings accordingly. DO NOT exceed manufacturer's rated safe operating pressures for these items.
12. Make sure all hose connections are adequately secured to prevent tools or hose ends from being accidentally disconnected.

⚠ CAUTION ***Thoroughly read and understand engine owner's manual. Be sure to follow manufacturer's safety precautions and proper operating procedures.***

Start-up

1. Consult the engine manual and be sure to follow run-in procedure.
2. At every start-up, check oil level on the engine, reduction gear and compressor pump. Do not rely on the oil pressure shutdown system as a monitor of the oil level.
3. Do not over-fill the oil.
4. Check for proper belt tension. There should be 1/2 inch (12.7 mm) of slack when about 10 lb. (4.5 kg) of force is applied (use your thumb) to the twin drive belts at about halfway between the motor's drive pulley and the driven flywheel on the compressor.
   Refer to fig.10.
5. Check that the tank condensate petcocks (Z, fig.1 and fig.2) are closed.
6. Pull the safety pressure relief valve ring before each use to make sure the valve is functional. It prevents dangerous excess pressure buildup in the air tanks. Refer to JC, fig.6.

See maintenance section if adjustment is necessary.

⚠ WARNING ***Always make sure main power is off before touching belts or other moving parts of compressor.***

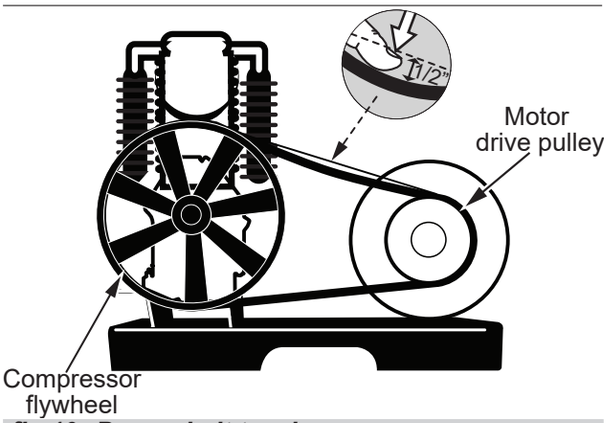

fig.10 Proper belt tension

7. Before the first start, add fresh gasoline to the tank (see maintenance label for specifications). Fill it to 5/8" (16 mm) below the gas tank filler

neck, leaving the top of the gas tank and neck empty to allow expansion room.

⚠ WARNING ***To prevent having to refuel a hot engine, check the fuel level on a cold engine before use each day.***

8. Make sure no tools are attached to air hose nor to the generator before starting engine.
9. Pull the compressor pressure relief knob to up position (JA, fig.6 and fig.11) to release head pressure and for easy starting. Failure to open

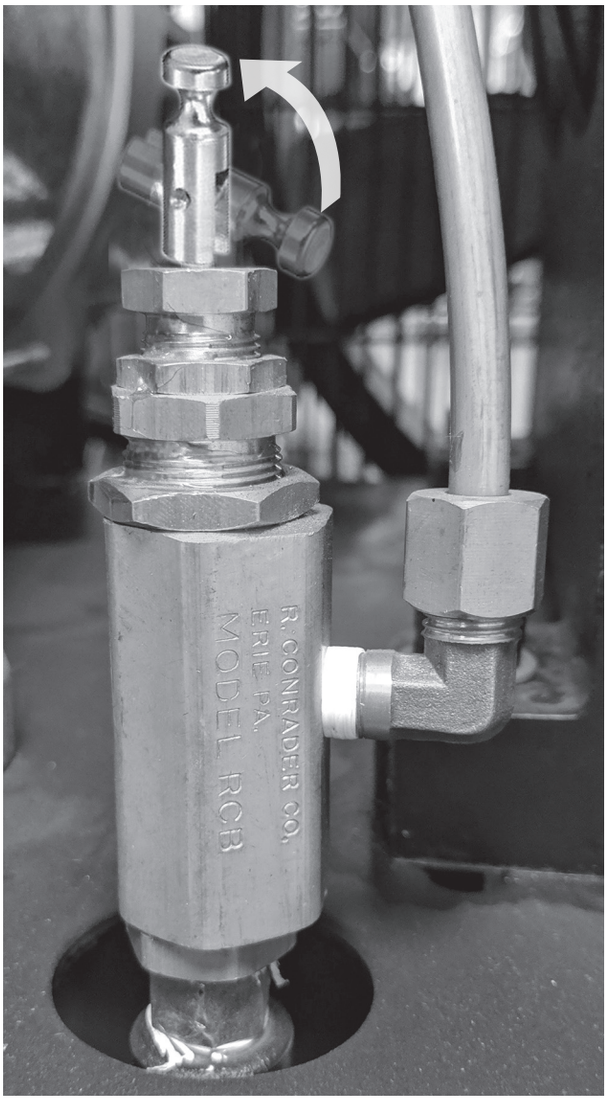

fig.11 Pressure relief knob- pull up to start

pressure relief valve will cause electric start motor to overheat.

10. Turn on (move to the right) the fuel valve lever (1, fig.12).
11. For cold engine start, move choke lever all the way left to the full choke (closed) position (2, fig.12). For engines that are already warm, place lever in half choke or run position.

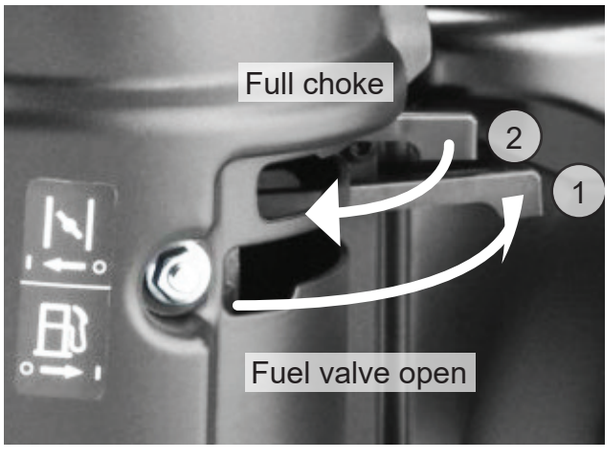

fig.12 Choke and fuel positions for cold start

12. Turn the key (or pull recoil start handle) to start engine.
13. After unit is warm, put the compressor pressure relief valve back into run position (fig.13).

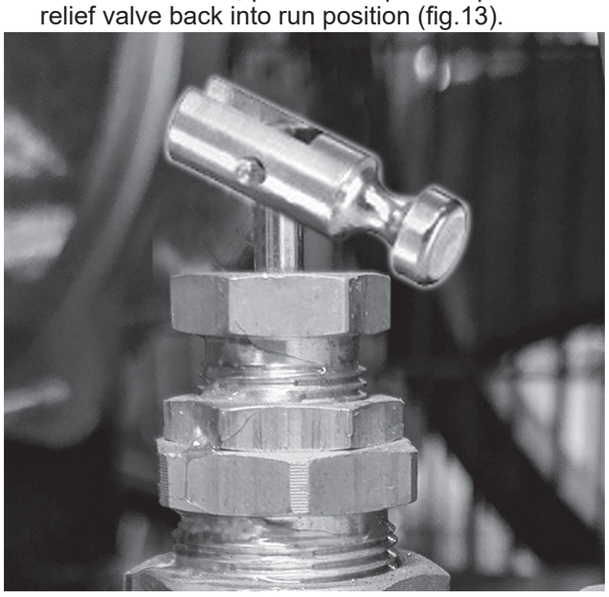

fig.13 Pressure relief knob- run position

Engine Throttle

- Make sure, when starting the engine, to set the engine throttle to the 1/4 postion. Unit is equipped with a centrifugal clutch that engages and disengages based on the rpms of the engine. At 1/4 throttle position, the engine is disengaged from the compressor, welder, and generator for no-load starting. Allow motor to warm up under cold starts, for easy start-ups.
- While running the generator and welder, the engine must be at full throttle to maintain 60 Hz electric power and 190 amp welder. This will keep from damaging the generator, welder, or the equipment it is operating.

Engine Break-in

Be sure to follow the engine break-in procedures outlined in the Kohler Engine Manual.

Compressor Break-in

This compressor is shipped with break-in oil. Change this oil within first 50 hours or 30 days of operation, whichever comes first.

Shut-off

Moving the fuel valve (1, fig.12) to the left, to the closed position will shut off the engine.

- If you are performing any work on the unit, disconnect the battery to prevent the starter engaging
- Disconnect the spark plug to prevent the engine running.

Welding

Selecting the proper electrode

There is no specific rule that determines the correct rod or exact heat setting required for every situation.

- The type and thickness of metal and the position of the workpiece determine the electrode type and the amount of heat needed in the welding process.
- Heavier and thicker metals require more amperage.
- Rate of travel over the work also affects the weld. To ensure proper penetration and enough deposition of rod, the arc must be moved slowly and evenly along the weld seam.

NOTICE ***The proper welding rods must be selected for this welder. The welder is DC and special DC welding rods must be used. Improper welding rods used will cause defective welds.***

It is best to practice your welds on scrap metal similar to the metal you intend to work with to determine correct heat setting and electrode choice.

Maintenance

Safety Steps

⚠ WARNING ***Accidental Starts can cause severe injury or death. Disconnect and ground spark plug lead(s) before servicing, then release all pressure from the system before attempting to install, service, relocate or perform ANY maintenance.***

1. Before working on the engine or the connected equipment, disable engine as follows:
   1. Disconnect spark plug lead.
   2. Disconnect negative (–) battery cable from battery.
3. Turn the engine key switch off and remove key from compressor.
4. Close the shut-off valve (block valve) between receiver and compressor, or receiver and air system, to prevent any back-up of air flow into the area to be serviced.
5. Lock open the manual vent valve and wait until the pressure in the area to be serviced (compressor, receiver, etc.) has been completely relieved before starting service. The manual vent valve may be the drain valve in the receiver. NEVER remove a plug to relieve the pressure.
6. Relieve all internal pressure prior to opening any line, fitting, hose, valve, drain plug, connection or other component, such as filters and line oilers, and before refilling optional air line anti-icer systems with antifreeze compound.
7. Open both manual tank condensate drain valves.
8. Wait for the unit to cool before servicing. Temperatures as low as 176º F (80º C) are hot enough to burn the skin in less than a second. Some surface temperatures on this unit exceed 400º F (205º C) when the compressor is runnng.
9. Make sure repairs are done in a clean, dry, well lighted and ventilated area.
10. When cleaning, use air pressure less than 30 psig (2.1bar). NEVER use flammable solvents for cleaning purposes. Also use effective chip guarding and personal protective equipment per OSHA standard 29 CFR 1910.242 (b).
11. Clean up all oils spills immediately to prevent slipping. (Mark spill area accordingly.)

⚠ CAUTION ***Compressor components can become hot during operation. Avoid bodily contact with hot liquids, hot surfaces and sharp edges and corners.***

Maintenance

Abridged Combined Maintenance Schedule	
Daily	☐ Check compressor pump oil level ☐ Check for unusual operation and correct before damage occurs ☐ Check safety valve operation ☐ Drain air receiver and traps of condensate
After first 5 hours	☐ Change engine oil
Weekly	☐ Clean compressor pump air filter ☐ Check for unusual operation and correct before damage occurs ☐ Generally clean external parts of compressor and engine
After first 50 hours or 30 days	☐ Change compressor oil
Every 50 hours or annually (whichever comes first)	☐ Service/replace Quad-Clean™ pre-cleaner
Monthly	☐ Check and tighten all bolts and fasteners as required ☐ Check all connections for air leaks ☐ Check belts for proper tension, wear, and alignment ☐ Inspect oil for contamination. Change if necessary. ☐ Check all unloading lines for leaks.
Every 90 days (3 months)	☐ Change oil (sooner if oil becomes visibly milky) ☐ Inspect valve assemblies
Every 3 months or 1000 hours (whichever comes first)	☐ Clean compressor pump reuseable screen oil filter (see JI, fig.6) to prevent damage to pump from dirty oil
Every 100 hours or annually (whichever comes first- more often under severe, dusty, dirty conditions)	☐ Change engine oil ☐ Clean engine cooling areas
Every 200 hours	☐ Replace Quad-Clean™ air cleaner element
Every 300 hours	☐ Check engine fuel filters (tank outlet and in-line filter), clean or replace if needed ☐ Check and adjust engine valve clearance (authorized Kohler dealer service)
Every 500 hours or annually (whichever comes first)	☐ Replace spark plug and set gap (more often in dirty conditions)

Belt Adjustment

⚠ WARNING ***Be sure to relieve all system pressure then lock out power and tag compressor to prevent unexpected movement of the unit.***

Inspect belt tension after first 30 hours of operation, then every 30 days.

1. Proper belt tension is determined by pressing on belt midway between motor pulley and flywheel. There should be approximately 1/2 inch (12 mm) of deflection. Refer to figure 3, pg. 4.
2. Always replace all belts with the same brand, at the same time. Make sure belts are unimatched. Do not replace belts independently.
3. Do not splash lubricating oil on belts or pulleys when adjusting or replacing belts.

Changing Compressor Oil

This compressor is shipped with break-in oil. Change oil within first 50 hours or 30 days of operation, whichever comes first.

DO NOT use automotive-type oil.

NOTICE ***Use only EMAX USA oil (PN: OIL004).***

Use of any other lubricant will cause product damage and void the warranty.

1. Change oil every 90 days or if oil becomes milky.
2. High humidity and excessive temperature changes can cause moisture to form in the pump. This moisture will cause oil to break down and become milky.
3. Be sure to check oil regularly for proper lubrication.
4. Dispose of used parts such as oil and filters in accordance with all applicable regulations.

Maintenance

Maintenance Procedures Rationale

Daily:

1. Check pump oil level- The compressor pump sight glass (see JF, fig.6) shows the oil level on a non-running unit. It should be no lower than half way on the sight glass. If it is lower, add oil until it is at least half way up the sight glass.
2. Check for unusual operation and correct before damage occurs- Listen for hissing, knocking or ringing sounds and visually check anything that is out of the ordinary in the usual operation of your compressor/generator/welder. Investigate and correct any anomaly before operating.
3. Check safety valve operation- Pull the ring on the safety valves (JC, fig.6) -with the system de-pressurized- to ensure they are not stuck and will function properly if there is an unwarranted pressure build-up.
4. Drain the air receivers- Condensation will accumulate in the tanks and piping traps daily, and should be drained at least once a day using the the petcocks on the bottoms of each tank (Z, fig.1). This is done to reduce corrosion of the tanks from the inside. Always wear protective eye wear when unscrewing the petcocks to drain the tanks.

After first 5 hours

1. Change engine oil- Oil used for breaking in the engine will carry higher concentrations of debris and should be removed before it causes damage.

Weekly:

1. Clean compressor pump air filter (see I, fig.1)- This will ensure that no dirt or heavy particulate that has lodged in the filter makes its way further into the compressor's valve assemblies and that the air intake is not impeded unduly.
2. Clean external parts of compressor and engine- This helps to ensure proper cooling and helps prevent corrosive moisure from gathering on critical parts.

Monthly:

1. Check and tighten fasteners. Bolts, nuts and other connections may loosen with time under a regime of continuous vibration. Parts may be lost and air system components could fail with catastrophic results.
2. Inspect the entire air system -both on this unit and downstream- for leaks using soapy water: do this to ensure the compressor does not run beyond its duty cycle due to air leaking somewhere in the system.
3. Check tension on all the belts: done primarily to ensure the belts do not fail pre-maturely due to slippage, but also to ensure connections between the engine the generator as well as the pump are as efficient as possible. Tighten the belts as needed to ensure they do not slip.
4. Inspect all the various lubricants for contamination: do this to ensure that harmful deposits do not build up in the oil and damage internal components of either the compressor pump, the reduction gearing, or the engine.
5. Check all unloading lines for leaks. Air leaks in unloader lines will cause unloaders and pilot valve to chatter and could cause short cycling of motor.

Every 3 Months Or 1000 hours

(whichever comes first):

1. Change the oil: this is done to ensure that the compressor has both the proper oil level and that the oil in the machine continues to lubricate moving parts, not deteriorating past factory specifications.
2. Un-screw and remove compressor pump reuseable screen oil filter (see JI, fig.6) and clean it. This will help prevent damage to the pump due to its inability to filter dirty oil.
3. Inspect the valve assemblies: done to prevent premature valve failure and carbon build-up that can form in older valves. Clean out impurities that interfere with efficient operation of the pump.

Storage Of This Equipment:

Before storing this Compressor/Welder/Generator for a prolonged period of time;

- ☐ Use an air blow gun to clean all debris from the unit.
- ☐ Shut off the engine'
- ☐ Drain air tank tank pressure, clean air filter, drain old oil and replace with new oil.
- ☐ Cover the unit to prevent dust and moisture from collecting on it.
- ☐ If compressor will be unused for extended period of time (7 days or more) disconnect battery to extend battery life and remember to properly charge it before next use.

Troubleshooting Chart

Problem	Possible Causes	Resolutions
Engine does not start	1. Low / no fuel	1. Fill gas tank
	2. Clogged / leaking fuel line	2. Check fuel line, clean or replace as needed
	3. Water in fuel	3. Drain fuel tank, then fill with fresh fuel
	4. Unloader valve(s) stuck	4. Check for proper operation, repair or replace valves if necessary
	5. Spark plug not operating	5. Change spark plug
	6. Low oil shutdown feature on gas engine is activated	6. Add oil to engine
	7. Compressor pump has run dry	7. Add lubricating oil, then check for proper operation. Replace pump if necessary. ***Notice: Use only EMAX USA oil (PN: OIL004).*** Use of any other product will cause product damage and void the warranty.
Low air pressure	1. Pilot valve not set properly	1. Call EMAX Service or local dealer to adjust valve
	2. Head unloader sticking	2. Lubricate valve with industrial grade grease
	3. Intake or exhaust valves not functioning properly	3. Repair or replace valves as needed
	4. Air leak(s) in system	4. Use soapy water to locate leaks, replace or tighten threaded parts
	5. Engine running too slow	5. Adjust throttle linkage
	6. Clogged air filter	6. Replace air filter
	7. Application exceeds rated air output of compressor	7. Check CFM requirements, change tool or use compressor with higher air output
Excessive vibration	1. Improper compressor mounting	1. Ensure tank is located on properly sized rubber padding
	2. Loose drive pulleys	2. Ensure drive pulleys fit snugly, shaft keys are functioning correctly, and there is no slippage or wobble
	3. Loose belts or other system component	3. Adjust belt tension, tighten mounting and /or other bolts as necessary
	4. Engine running too fast	4. Adjust throttle linkage
Overheating	1. Duty cycle exceeded	1. Keep duty cycle at 60/40 to maintain pump life
	2. Head valve(s) not seating properly	2. Clean or replace
	3. Blown cylinder head gasket(s)	3. Replace gasket(s)
	4. Restriction in head, intercooler or check valve	4. Clear blockage
	5. Low oil	5. Add oil to the compressor pump. Ensure oil level is at middle of sight glass. See fig.8. ***Notice: Use only EMAX USA oil (PN: OIL004).*** Use of any other product will cause product damage and void the warranty.
	6. Dirt in intercooler fins or cylinder fins	6. Use low pressure air to blow dirt away from compressor
	7. Poor ventilation / ambient temperature too high	7. Increase ventilation around operating area. Ensure compressor has adequate clear space from walls and other possible obstructions. Ambient temperature should not exceed 110˚ F (37.8˚ C).

Warranty

EMAX USA makes the following RECIPROCATING PUMP WARRANTY STATEMENT:

*only effective with pumps purchased after January 1st, 2011
EMAX USA warrants that each new reciprocating pump sold and used under normal use and service, will be free from defects in material and workmanship for a period of 5 years from the date of purchase. EMAX USA obligation under this warranty period shall be limited to repair and replacement. EMAX USA is not responsible for downtime during warranty period. If downtime is necessary, it is the customers discretion and obligation to have a redundant equipment. Shipping expense on warranty parts or returns are covered the first 90 days of your warranty. Thereafter the customer is responsible for all transportation charges in connection with any warranty work. EMAX USA specially formulated oil must be used in order not to void your warranty. If any other oil is used your warranty will default to a coverage of only (2) years.

LIMITATIONS AND EXCLUSIONS: Warranty shall not apply to:

- Repair or replacement due to running the unit out of oil
- Failure to comply with this warranty and fully comply with the manual herein
- Failure to routinely change oil and to maintain clean filters
- Exceeding 70% duty cycle resulting in overheating and excess wear and tear
- Exposing electrical components to rain or water
- Installing in hostile environments such as acid vapors or any caustic or abrasive matter that could be ingested into the pump
- Repairs due to Installing unit in an enclosed area where lack of cooling ventilation is present, where ambient air exceeds 100 F (37.8 C)
- Repairs due to prolonged storage including damage caused by old or contaminated oil.
- Any pump that has been subject to negligence, misuse, accident, mis-application or over-speeding.
- Any pump that has been installed, repaired or altered by anyone in a manner which EMAX USA judgement that adversely affects its performance or reliability
- Any pump that has been fitted with or repaired with parts or components not manufactured or approved by EMAX USA.

Further exclusions of specific note are where the product is used, where granite and/or concrete work is performed, or conditions are dusty the product is required to be housed in a separate room from the adverse conditions where the product has access to fresh air intake.

EMAX USA reserves the right to modify, alter or improve any pump or parts without incurring any obligation to modify or replace, any pumps or parts previously sold without such modification, alternating or improvement.

All warranties are nontransferable unless with written approval from EMAX USA.