



VAN AIR[®] USERS GUIDE

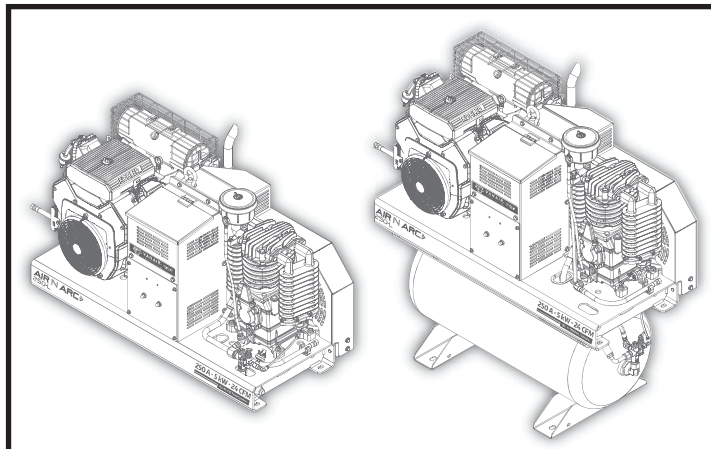
AIR N ARC[®] > **250-L**

ALL-IN-ONE POWER SYSTEMS[®]

AIR COMPRESSOR • GENERATOR • WELDER • BATTERY BOOSTER • BATTERY CHARGER
OPERATION MANUAL AND SERVICE PARTS LIST

NOTE

This publication contains the latest information available at the time of preparation. Every effort has been made to ensure accuracy. Vanair[®] Manufacturing, Inc. reserves the right to make design change modifications or improvements without prior notification.



Read this manual before installing, operating or servicing this equipment. Failure to comply with the operation and maintenance instructions in this manual will VOID THE EQUIPMENT WARRANTY.

NOTE

Use only Vanair Reciprocating Compressor Oil and Genuine Vanair Parts. Inspect and replace damaged components before operation. Substituting non-Vanair oil or non-genuine Vanair filter components WILL VOID THE COMPRESSOR WARRANTY!

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NOTE

Making unauthorized modifications to the system components WILL VOID THE WARRANTY! Always inform Vanair before beginning any changes to the Air N Arc 250-L Series system.



VAN AIR[®]
AIR POWER TO GO[™]

P/N: 090134-UG_r0

**KEEP THE MANUAL
WITH THE VEHICLE**

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Effective Date:
MAY - 2021

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SECTION 1:

! SAFETY

1.1 GENERAL INFORMATION

The products provided by Vanair® Manufacturing, Inc., are designed and manufactured for safe operation and maintenance. But it is ultimately the responsibility of the users and maintainers for safe use of this equipment. Part of this responsibility is to read and be familiar with the contents of this manual before operation or performing maintenance actions.

 IMPORTANT	
	Read this manual before operating or servicing the Hydraulic Power Unit system. Failure to do could result in damage equipment, bodily injury, or death.

1.2 ! DANGERS, WARNINGS, CAUTIONS, AND NOTES

 DANGER	
Identifies actions or conditions which, if not avoided, will cause death or severe bodily injury.	

 WARNING	
Identifies actions or conditions which, if not avoided, could cause death or severe bodily injury.	

 CAUTION	
Identifies actions or conditions which, if not avoided, could cause minor or moderate bodily injury.	

IMPORTANT	
Emphasized additional information (or existing information) which should be brought to the attention of operators/maintainers affecting safety, operation, maintenance, or warranty requirements.	

NOTE

Additional information (or existing information) which should be brought to the attention of operators/maintainers affecting safety, operation, maintenance, or warranty requirements.

1.3 ! INTERNATIONAL SAFETY SYMBOL

The symbols shown and defined in **Section 1: Safety** are used throughout this manual to call attention to and identify possible hazards.



The international warning symbol shown above is used on all decals, labels and signs that concern information pertaining to bodily harm. When you see the international warning symbol, pay extremely careful attention, and follow the given instructions or indications to avoid any possible hazard.

1.4 ! ARC WELDING HAZARDS

1.4.1 ! ELECTRICAL SHOCK CAN KILL



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

Do not touch live electrical parts.

Wear dry, hole-free insulating gloves and body protection.

Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.

Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.

Additional safety precautions are required when working in electrically hazardous conditions such as in damp locations or while wearing wet clothing; on metal structures such as floors, gratings, or scaffolds; when in cramped positions such as sitting, kneeling, or lying; or when there is a high risk of unavoidable or accidental contact with the work piece or ground.

Do not work alone!

Disconnect input power or stop engine before installing or servicing this equipment. Lock-out/tag out input power according to OSHA29 CFR1910.147 (see Section 1.9, Principal Safety Standards).

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

Always verify the supply ground: check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.

When making input connections, attach proper grounding conductor first and double-check connections.

Frequently inspect input power cord for damage or bare wiring; replace cord immediately if damaged—bare wiring can kill.

Turn off all equipment when not in use.

Do not use worn, damaged, undersized, or poorly spliced cables.

Do not drape cables over your body.

If earth grounding of the work piece is required, ground it directly with a separate cable.

Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.

Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit ac-

cording to manual.

Do not touch electrode holders connected to two welding machines at the same time since double open-circuit voltage will be present.

Wear a safety harness if working above floor level.

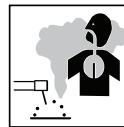
Keep all panels and covers securely in place.

Clamp work cable with good metal-to-metal contact to work piece or work table as near the weld as practical.

Insulate work clamp when not connected to work-piece to prevent contact with any metal object.

Do not connect more than one electrode or work cable to any single weld output terminal.

1.4.2 **FUMES AND GASES CAN BE HAZARDOUS**



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

Keep your head out of the fumes. Do not breathe the fumes.

If inside, ventilate the area and/or use local forced ventilation at the arc to remove welding fumes and gases.

If ventilation is poor, wear an approved air-supplied respirator.

Read and understand the Material Safety Data Sheets (MSDS's) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.

Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch person nearby.

Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.

Do not weld in locations near degreasing, cleaning, or spraying operations.

The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.

Do not weld on coated metals, such as galvanized, lead, or cadmium-plated steel, unless the coating is removed from the weld area, the area is well-ventilated, and while wearing an air-supplied respirator. The coatings and any metals

containing these elements can give off toxic fumes if welded.

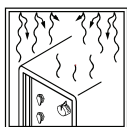
1.4.3 ▲ **BUILD UP OF GAS CAN INJURE OR KILL**



Shut off shielding gas supply when not in use.

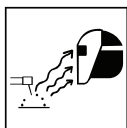
Always ventilate confined spaces or use approved air-supplied respirator.

1.4.4 ▲ **ENCLOSED SPACES CAN CAUSE A BUILD-UP OF NOXIOUS FUMES AND OVERHEATING**



Do not use in enclosed spaces where deadly exhaust gas can build up and machine can overheat, causing fire.

1.4.5 ▲ **ARC RAYS CAN BURN EYES AND SKIN**



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

Wear an approved welding helmet fitted with a proper shade of filter lenses to protect your face and eyes from arc rays and sparks when welding or watching.

(See ANSI Z49.1 and Z87.1 listed in Safety Standards). Wear approved safety glasses with side shields under your helmet.

Use protective screens or barriers to protect others from flash, glare, and sparks; warn others not to watch the arc.

Wear protective clothing made from durable, flame-resistant material (leather, heavy cotton, or wool) and foot protection.

1.4.6 ▲ **WELDING CAN CAUSE FIRE AND EXPLOSION**



Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equip-

ment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.

Do not weld where flying sparks can strike flammable material.

Protect yourself and others from flying sparks and hot metal.

Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.

Watch for fire, and keep a fire extinguisher nearby.

Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.

Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWSF4.1 (See **Section 1.9, Principal Safety Standards**).

Connect ground cable as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock, sparks, and fire hazards.

Do not use welder to thaw frozen pipes.

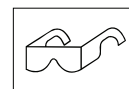
Remove stick electrode from holder or cut off welding wire at contact tip when not in use.

Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, boots, and a cap.

Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.

Follow requirements in OSHA1910.252 (a) (2) (iv) and NFPA 51B for hot work and have a fire watcher and extinguisher nearby.

1.4.7 ▲ **FLYING METAL CAN INJURE EYES**



Sparks and flying metal can be caused by welding, chipping, wire brushing, and grinding. As welds cool,

they can throw off slag.

Wear approved safety glasses with side shields even under your welding helmet.

1.4.8 ▲ **HOT PARTS CAN CAUSE SEVERE BURNS**



Do not touch hot parts bare handed. Allow cooling period before working on equipment.

1.4.9 ▲ **NOISE CAN DAMAGE HEARING**



To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.

Noise from some processes or equipment can damage hearing.

Wear approved ear protection if noise level is high.

1.4.10 ▲ **MAGNETIC FIELDS CAN AFFECT PACEMAKERS**



Pacemaker wearers keep away.

Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.

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

1.4.11 ▲ **CYLINDERS CAN EXPLODE IF DAMAGED**



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

Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.

Keep cylinders away from any welding or other electrical circuits.

Never drape a welding torch over a gas cylinder.

Never allow a welding electrode to touch any cylinder.

Never weld on a pressurized cylinder—explosion will result.

Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.

Turn face away from valve outlet when opening cylinder valve.

Keep protective cap in place over valve except when cylinder is in use or connected for use.

Use the right equipment, correct procedures, and sufficient number of persons to lift and move cylinders.

Read and follow instructions on compressed gas cylinders, associated equipment, and Compressed Gas Association (CGA) publication P-1 listed in Safety Standards.

1.5 ▲ **ENGINE HAZARDS**

1.5.1 ▲ **BATTERY EXPLOSION CAN BLIND**



Always wear a face shield, rubber gloves, and protective clothing when working on a battery.

Stop engine before disconnecting or connecting battery cables or servicing battery.

Do not allow tools to cause sparks when working on a battery.

Do not use weld mode to charge batteries or jump start vehicles.

Observe correct polarity (+ and -) on batteries.

Disconnect negative (-) cable first and connect it last.

1.5.2 ▲ **FUEL CAN CAUSE FIRE OR EXPLOSION**



Stop engine and let it cool off before checking or adding fuel.

Always keep nozzle in contact with tank when fueling.

Do not add fuel while smoking or if unit is near

any sparks or open flames.

Do not overfill tank—allow room for fuel to expand.

Do not spill fuel. If fuel is spilled, clean up before starting engine.

Dispose of rags in a fireproof container.

1.5.3 ▲ MOVING PARTS CAN CAUSE INJURY



Keep away from fans, belts, and rotors. Keep all doors, panels, covers, and guards closed and securely in place.

Stop engine before installing or connecting unit.

Have only qualified people remove doors, panels, covers, or guards for maintenance and troubleshooting as necessary.

Disconnect negative (–) battery cable from battery to prevent accidental starting during servicing.

Keep hands, hair, loose clothing, and tools away from moving parts.

Reinstall doors, panels, covers, or guards when servicing is finished and before starting engine.

Before working on generator, remove spark plugs or injectors to keep engine from kicking back or starting.

Block flywheel so that it will not turn while working on generator components.

1.5.4 ▲ HOT PARTS CAN CAUSE SEVERE BURNS



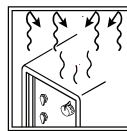
Do not touch hot parts bare handed. Allow cooling period before working on equipment.

1.5.5 ▲ ENGINE EXHAUST GAS CAN KILL



If used in a closed area, vent engine exhaust outside and away from any building air intakes.

1.5.6 ▲ ENCLOSED SPACES CAN CAUSE A BUILD-UP OF NOXIOUS FUMES AND OVERHEATING



Do not use in enclosed spaces where deadly exhaust gas can build up and machine can overheat, causing fire.

1.5.7 ▲ BATTERY ACID CAN BURN SKIN AND EYES



Do not tip battery.

Replace damaged battery.

Flush eyes and skin immediately with water.

1.5.8 ▲ ENGINE HEAT CAN CAUSE FIRE



Do not locate unit on, over, or near combustible surfaces or flammables.

Keep exhaust and exhaust pipes way from flammables.

1.5.9 ▲ EXHAUST SPARKS CAN CAUSE FIRE



Use approved engine exhaust spark arrester in required areas — see applicable codes.

1.6 ▲ COMPRESSED AIR HAZARDS

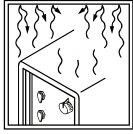
1.6.1 ▲ BREATHING COMPRESSED AIR CAN CAUSE SERIOUS INJURY OR DEATH



Do not use compressed air for breathing.

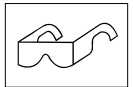
Use only for cutting, gouging, and tools.

1.6.2 ▲ **ENCLOSED SPACES CAN CAUSE A BUILD-UP OF NOXIOUS FUMES AND OVERHEATING**



Do not use in enclosed spaces where deadly exhaust gas can build up and machine can overheat, causing fire.

1.6.3 ▲ **COMPRESSED AIR CAN CAUSE INJURY**



Wear approved safety goggles.

Do not direct air stream toward self or others.

1.6.4 ▲ **TRAPPED AIR PRESSURE AND WHIPPING HOSES CAN CAUSE INJURY**



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

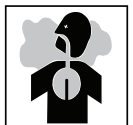
1.6.5 ▲ **HOT METAL FROM AIR ARC CUTTING AND GOUGING CAN CAUSE FIRE OR EXPLOSION**



Do not cut or gouge near flammables.

Watch for fire; keep extinguisher nearby.

1.6.6 ▲ **HOT PARTS CAN CAUSE SEVERE BURNS**



Do not touch hot parts bare handed.

Allow cooling period before working on equipment.

1.6.7 ▲ **READ INSTRUCTIONS**



Read Owner's Manual before using or servicing unit.

Stop engine and release air pressure before servicing.

Use only genuine Air N Arc replacement parts.

1.7 ▲ **ADDITIONAL SYMBOLS FOR INSTALLATION, OPERATION AND MAINTENANCE**

1.7.1 ▲ **FALLING UNIT CAN CAUSE INJURY**

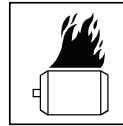


Use lifting bail to lift unit and properly installed accessories only.

Lift and support unit only with proper equipment and correct procedures.

If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.

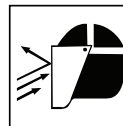
1.7.2 ▲ **OVERHEATING CAN DAMAGE TO MOTORS**



Turn off or unplug equipment before starting or stopping engine.

Do not let low voltage and frequency caused by low engine speed damage electric motors.

1.7.3 ▲ **FLYING SPARKS CAN CAUSE INJURY**

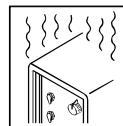


Wear a face shield to protect eyes and face.

Shape tungsten electrode only on grinder with proper guards in a safe location wearing proper face, hand, and body protection.

Sparks can cause fires—keep flammables away.

1.7.4 ▲ **OVERUSE CAN CAUSE OVERHEATING**

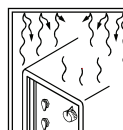


Allow cooling period; follow rated duty cycle.

Reduce current or reduce duty cycle before starting to weld again.

Do not block or filter airflow to unit.

1.7.5 ▲ **ENCLOSED SPACES CAN CAUSE A BUILD-UP OF NOXIOUS FUMES AND OVERHEATING**



Do not use in enclosed spaces where deadly exhaust gas can build up and machine can overheat, causing fire.

1.7.6 ▲ TILTING OF TRAILER CAN CAUSE INJURY



Use tongue jack or blocks to support weight.

Properly install unit onto trailer according to instructions supplied with trailer.

1.7.7 ▲ READ INSTRUCTIONS



Use only genuine Air N Arc replacement parts.

Perform engine and air compressor (if applicable) maintenance and service according to this manual and the engine/air compressor (if applicable) manuals.

1.7.8 ▲ H. F. RADIATION CAN CAUSE INTERFERENCE



High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.

Have only qualified persons familiar with electronic equipment perform this installation.

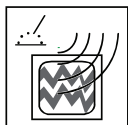
The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.

If notified by the FCC about interference, stop using the equipment at once.

Have the installation regularly checked and maintained.

Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.

1.7.9 ▲ ARC WELDING CAN CAUSE INTERFERENCE



Electromagnetic energy can interfere with sensitive electronic equipment such as microprocessors, computers, and computer-driven equipment such as robots.

Be sure all equipment in the welding area is electromagnetically compatible.

To reduce possible interference, keep weld cables as short as possible, close together, and

down low, such as on the floor.

Locate welding operation 100 meters from any sensitive electronic equipment.

Be sure this welding machine is installed and grounded according to this manual.

If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.

1.8 ▲ CALIFORNIA PROPOSITION 65 WARNINGS

Welding or cutting equipment produces fumes or gas which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)

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

For Gasoline Engines: Engine exhaust contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

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

1.9 ▲ PRINCIPAL SAFETY STANDARDS

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ih.com).

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping, American Welding Society Standard AWSF4.1, from Global Engineering Documents (phone: 1-877-413-5184, web site: www.global.ih.com).

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, P.O. Box 9101, 1 Battery March Park, Quincy, MA 02269-9101 (phone: 617-770-3000, web site:



www.nfpa.org and www.sparky.org).

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1735 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102 (phone: 703-412-0900, web site: www.cganet.com).

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3 (phone: 800-463-6727 or in Toronto 416-747-4044, web site: www.csainternational.org).

Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 11 West 42nd Street, New York, NY 10036-8002 (phone: 212-642-4900, web site: www.ansi.org).

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B, from National Fire Protection

Association, P.O. Box 9101, 1 Battery March Park, Quincy, MA 02269-9101 (phone: 617-770-3000, web site: www.nfpa.org).

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1926, Subpart J, from U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250 (there are 10 Regional Offices; phone for Region 5, Chicago, is 312-353-2220, web site: www.osha.gov).

1.10 ▲ EMF INFORMATION

Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields Welding current, as it flows through welding cables, will cause electromagnetic fields.

There has been and still is some concern about such fields. However, after examining more than 500 studies spanning seventeen years of research, a special blue ribbon committee of the National Research Council concluded that: "The body of evidence, in the committee's judgment, has not demonstrated that exposure to power-frequency electric and magnetic fields is a human-health hazard." However, studies are still going forth and evidence continues to be exam-

ined. Until the final conclusions of the research are reached, you may wish to minimize your exposure to electromagnetic fields when welding or cutting.

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

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

About Pacemakers:

Pacemaker wearers consult your doctor before welding or going near welding operations. If cleared by your doctor, then following the above procedures is recommended.

1.11 ▲ SAFETY DECALS

Safety decals are placed onto, or located near, system components that can present a hazard to operators or service personnel. All pertinent decals listed in **Section 5.2, Decals - Location & Identification**, are located near components or access paths. All information given on these decals is subject to respect in terms of safety precaution and awareness of hazardous conditions. Always heed the information noted on the safety decals.

▲ WARNING

DO NOT REMOVE OR COVER ANY SAFETY LABEL. Replace any safety label that becomes damaged or illegible.

▲ WARNING

If applicable: For machine packages that contain labels to be affixed after machine arrival, all safety decals MUST be placed on machine, in their appropriate positions respectively, as shown in the Decal Section (Section 5.2) of this manual.

1.12 DISPOSING OF MACHINE FLUIDS

Always dispose of machine fluids under the guidance of all applicable local, regional and/or federal law.

Vanair® encourages recycling when allowed. For additional information, consult the container for information.

In addition to the sections, also consult the Engine Operation Manual when performing maintenance.

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SECTION 2: OPERATION

2.1 GENERAL INFORMATION

The Vanair® Air N Arc 250-L Series All-In-One Power System® has a comprehensive array of controls and indicators for optimum machine performance. Understanding the correct operation of the system will help to distinguish between a properly functioning system, and a system that may be indicating the beginning of a malfunction. The information in the Operation Section will help the operator to recognize and interpret the readings to assure that the system is performing optimally.

▲ IMPORTANT



Before starting the Vanair Air N Arc 250-L, read this section thoroughly and familiarize yourself with the controls and indicators - their purpose, location and use.

▲ DANGER

Grounding must consist of a minimum 10 gauge wire between the instrument panel, the machine, and the vehicle chassis.

▲ WARNING

Follow all applicable safety recommendation as outlined in Section 1: Safety of this manual.

▲ WARNING

Before performing maintenance or repair operations on the machine, ensure that all power has been removed and locked out to prevent accidental start-up.

IMPORTANT

If start-up and shut-down procedures are not followed, damage to the system and its components may occur.

NOTE

If the generator or welder switches are set to ON prior to starting, and/or the pressure in the air tank is less than 10 PSI, the machine will start at full speed.

2.2 ENGINE START-UP AND SHUTDOWN PROCEDURE

Consult **Figure 2-1: Instrument Panel Functions** for use with operating procedures detailed in this section.

NOTE

Engine fault light will be on with the key switch turned to the ON position before starting the engine.

2.2.1 ENGINE START-UP

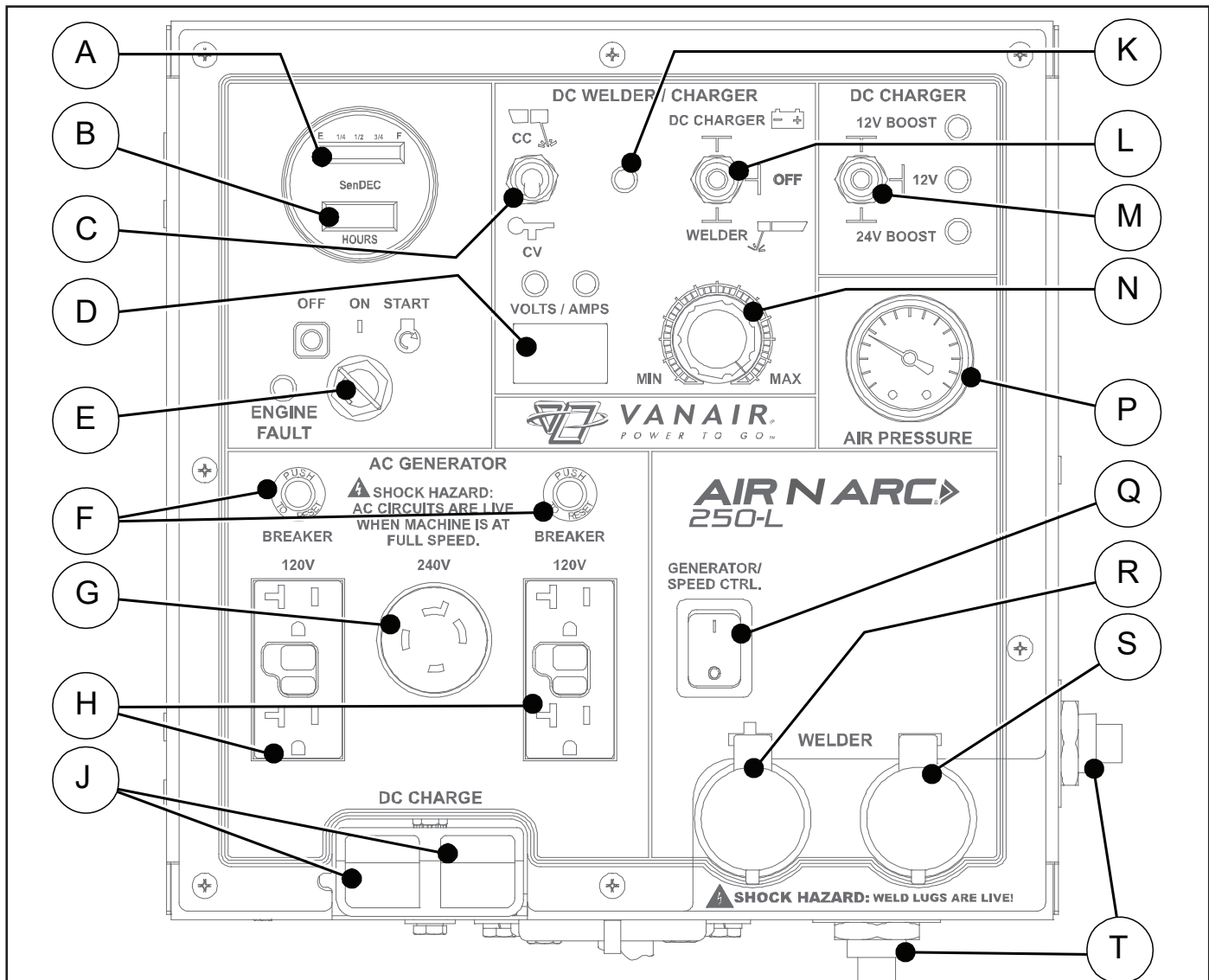
Consult **Figure 2-2**, and the following steps:

NOTE

Air compressor will start automatically with machine start-up.

1. Check to make sure all switches (for Welder and Generator) are in the OFF position prior to starting.
2. Turn the engine control switch from the OFF to the ON position; wait 3-5 seconds for the fuel pump to prime the system.
3. Continue turning control switch to the START position until the engine starts (when the switch is let go, it will revert back to ON position).
4. Let engine run at idle for a 3-5 minutes to allow for warm up sequence. Engine may run at full speed until pressure builds up in the tank.

Continued on page 2 - 3...



KEY	DESCRIPTION	KEY	DESCRIPTION
A	FUEL GAUGE (OPTIONAL)	K	DC FAULT LIGHT
B	HOUR METER	L	DC WELDER/CHARGER TOGGLE SWITCH
C	WELDER CC/CV TOGGLE SWITCH	M	DC CHARGER 12V/24V TOGGLE SWITCH
D	VOLTAGE/AMPS DISPLAY	N	VOLTS/AMPS MANUAL ADJUSTMENT DIAL
E	ENGINE CONTROL (ON/OFF/START) SWITCH	P	AIR PRESSURE GAUGE
F	CIRCUIT BREAKER TRIP/RESET BUTTONS (x2)	Q	GENERATOR SPEED CONTROL
G	OUTLET RECEPTACLE (240V)	R	WELD CABLE RECEPTACLE - POSITIVE (+)
H	AC VOLTAGE OUTLET RECEPTACLE (120V) (x2)	S	WELD CABLE RECEPTACLE - NEGATIVE (-)
J	BATTERY CABLE RECEPTACLE	T	AUXILIARY SERVICE PORTS - 1/2" NPT (x2)

Figure 2-1: Instrument Panel Functions

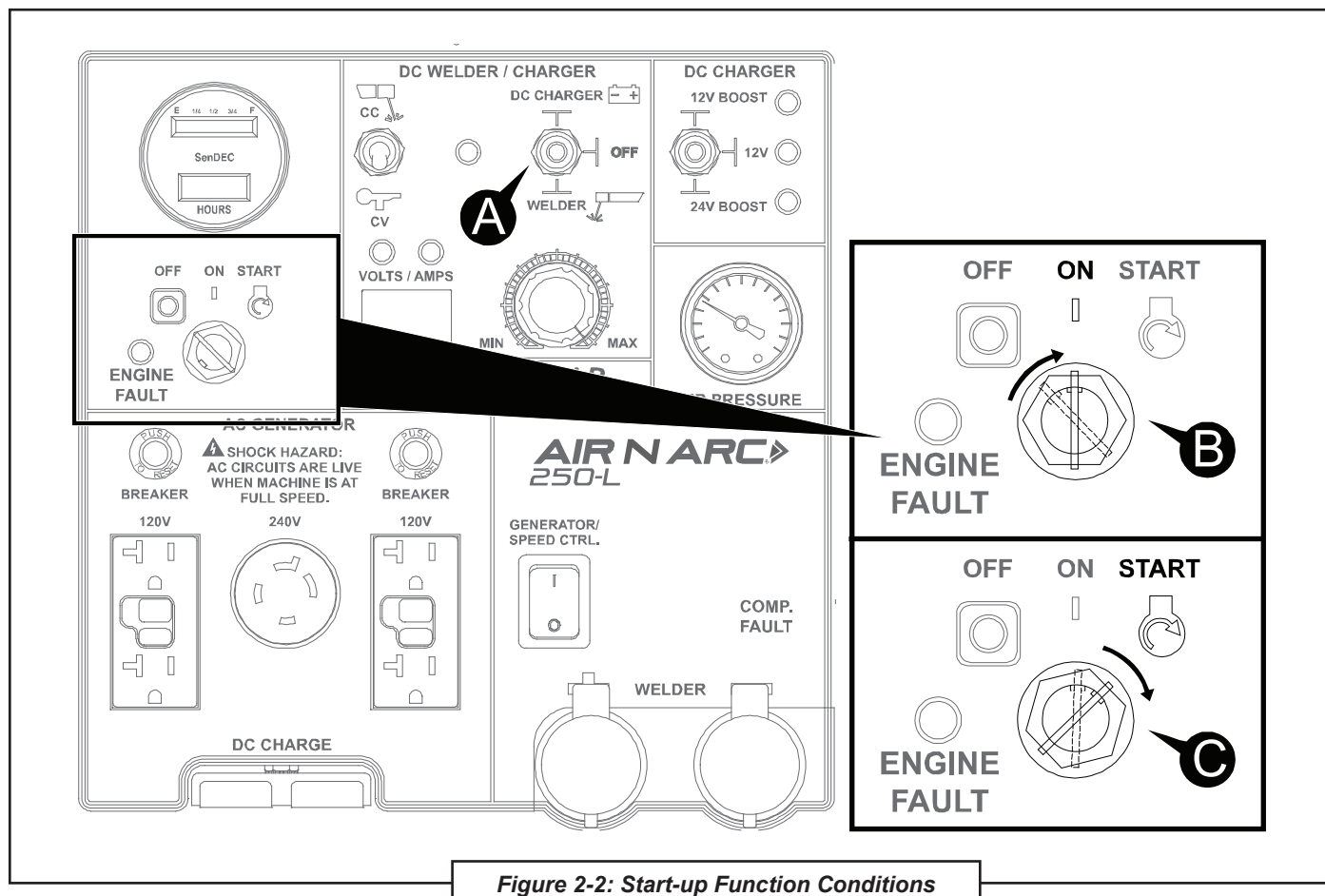


Figure 2-2: Start-up Function Conditions

NOTE

Regarding the compressor: once the machine has built up full pressure, it will immediately idle down.

2.2.2 ENGINE SHUTDOWN**CAUTION**

Compressors and engines generate heat and create hot surfaces. Use caution when operating and servicing equipment. Some surfaces and components may be hot.

NOTE

Refer to Engine Operator's Manual for additional information pertaining to the starting of the engine.

Consult **Figure 2-1**. To shut the engine off at any

time, turn the **Engine Control Switch [D]** to the OFF position. However, this method is best reserved for *emergency shutdown situations only*. Vanair recommends that the following procedure is used for routine shutdowns in order to keep the system in optimal condition, and minimize undue stress that may occur during the next start up session if some of the machine conditions were left in working mode(s) or had auxiliary power draws left intact (such as a tool receptacle left plugged into the generator, etc.).

To prepare the machine for shutdown:

1. Shut off any tools or other items that are drawing power from the generator, or compressed air from the air tank.
2. Close all service valves.
3. Turn the **Generator and Welder/Charger** switches on the control panel to their OFF positions.

4. Unplug any power cords that are plugged into the generator panel.
5. Allow machine to run at idle for a 3-5 minutes to allow for a cool down sequence.
6. Turn the **Engine Control Switch** to the OFF position. If no air leaks are present, the engine should start at idle speed the next time it is started.

2.3 ENGINE THROTTLE CONTROL FUNCTIONS

The engine speed is controlled by three factors:

- The level of air pressure in the tank and the position of the pilot valve switch, if applicable.
- The position of the welder switch on the unit control panel, and the use of the welder.
- The position of the generator switch on the control panel.

Consult **Table 2A: Engine Throttle Control Function Conditions** to understand how the engine speed relates to the demand(s) of the machine system's output functions.

2.4 OPERATING THE WELDER

Consult **Figure 3-3**. The variable power dial adjusts the welder amperage (30 to 250 amps), or voltage (15 to 40 volts) for the desired weld heat. Turning the power dial clockwise increases the amperage or voltage, and turning the power dial counterclockwise decreases the amperage or voltage. The power dial may be adjusted while

welding.

2.4.1 WELDER OPERATING PROCEDURE

NOTE

If a longer welding lead is desired, optional 50 ft. lead segments may be purchased from Vanair® Manufacturing, Inc. for a maximum lead length of 100 ft.

2.4.1.1 CC (CONSTANT CURRENT) MODE

CC (Constant Current) Mode is commonly referred to as - Stick Welding, Arc Welding, or Shielded Metal Arc Welding (SMAW)

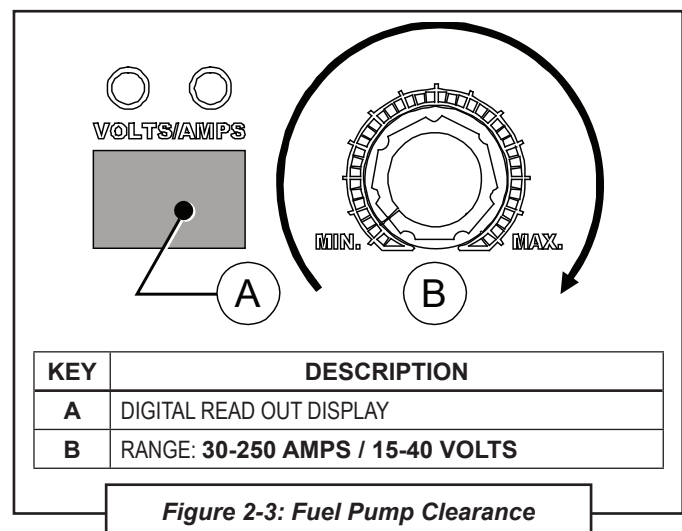


TABLE 2A: ENGINE THROTTLE CONTROL FUNCTION CONDITIONS

Air Pressure	Generator Switch	Welder Switch	Engine Speed Condition Result
Tank Pressure Below (<) 150 PSI or Set Pressure [†]	OFF	OFF	Engine runs at full throttle (3600 RPM).
Tank Pressure Above (>) 150 PSI or Set Pressure [†]	OFF	OFF	Engine runs at idle speed (2000 RPM), ready for application.
	OFF	ON	Welder can be activated by striking an arc, and Engine runs at idle speed (2000 RPM) unless CV Mode, ready for application.
	ON	OFF	Engine runs at full throttle speed (3600 RPM); generator is ready for use ^{††} .
	ON	ON	Full speed and all items available for use.

NOTE: Any combination of the 250 Power System output functions (compressor, generator, welder) used simultaneously at capacity will have an adverse affect on engine running at full throttle.

[†] Factory set pressure: 150 psi = ON / 175 psi = OFF

^{††} Consult **Appendix A, Section A.3, Wattage Requirements for Common Receptacle Units** for a listing of wattage requirements of various implements.

1. With the engine shut off, insert the twist lock connections of the ground clamp and the electrode holder cables into the welder connection ports on the control panel. For Direct Current Electrode Positive (DCEP) connect the electrode holder to the positive (+) port, and the ground clamp to the negative (-) port. For Direct Current Electrode Negative (DCEN) connect the electrode holder to the negative (-) port, and the ground clamp to the positive (+) port.
2. Select the appropriate electrode for the material and process being performed. See **Table 2B: Electrode Specifications**, for selecting an electrode.
3. Place the ground clamp on the work piece and insert the appropriate welding rod into the electrode clamp.
4. Start the engine (See **Section 2.2, Engine Start-up and Shutdown Procedure**).
5. On the control panel, place the CC/CV switch in CC mode. Place the DC Charger/Welder switch in welder mode.
6. Adjust the power dial to the appropriate amperage setting for the material and the electrode being used. (See **Table 4B** for electrode amperage ratings). At anytime during welding, the power dial may be adjusted to the desired amperage level.
7. When you strike the electrode against the material being welded, the engine will go to high idle and deliver the selected amperage through the electrode. Now you may begin to weld.

NOTE

For electrode striking technique, consult **Section A.6, Electrode Ignition Procedure in Appendix A**.

8. After a weld has been completed, and there is no contact between the electrode and the metal for 30 seconds, the engine will return to idle.

What the numbers mean that are used to identify a stick welding electrode:

Using E6010 for an example...

The “E” indicates Electrode because some welding rods are not electrodes. The ‘60’ in 6010 indicates the tensile strength in psi. 60,000 lbs.

The last two digits indicate position and polarity along with what type flux (See **Table 4C: Welding Rod Type, Polarity and Flux Codes**).

2.4.1.2 CV (CONSTANT VOLTAGE) MODE - USING A VOLTAGE SENSING SUITCASE FEEDER

CV (Constant Voltage) Mode – commonly referred to as - Wire Welding, MIG welding, or Gas Metal Arc Welding (GMAW)

1. With the engine shut off, insert the twist lock connection of the ground clamp into the negative (-) welder connection port on the control panel. Insert the power lead segment from the suitcase feeder into the positive (+) welder connection port on the control panel.
2. Place the ground clamp from the suitcase feeder and the ground clamp from the Air N Arc 250-L on the work piece.
3. Start the engine (See **Section 2.2, Engine Start-up and Shutdown Procedure**).
4. On the control panel, place the DC Charger/Welder switch in welder mode. Place the CC/CV switch in CV mode.
5. Adjust the power dial on the Air N Arc 250-L to the appropriate voltage setting for the material being welded. Adjust the power dial on the suitcase feeder for the material being welded. At anytime during welding, the power

TABLE 2B: ELECTRODE SPECIFICATIONS

METAL THICKNESS	ELECTRODE SIZE	WELDING AMPERES
1/16-1/8	3/32	50-90
1/8-1/4	1/8	90-140
1/4-3/8	5/32	120-180
3/8-1/2	3/16	150-230

**TABLE 2C: WELDING ROD TYPE, POLARITY AND FLUX CODES**

DIGIT	TYPE OF COATING	WELDING CURRENT
10	High cellulose sodium	DC+
11	High cellulose potassium	AC or DC+ or DC-
12	High titania sodium	AC or DC-
13	High titania potassium	AC or DC+
14	Iron powder titania	AC or DC- or DC+
15	Low hydrogen sodium	DC+
16	Low hydrogen potassium	AC or DC+
27	Iron powder iron oxide	AC or DC+ or DC-
18	Iron powder low hydrogen	AC or DC+
20	High iron oxide	AC or DC+ or DC-
22	High iron oxide	AC or DC-
24	Iron powder titania	AC or DC- or DC+
28	Low hydrogen potassium iron powder	AC or DC+

dial may be adjusted to the desired voltage level.

2.4.1.3 CV (CONSTANT VOLTAGE) MODE - USING A SPOOL GUN

CV (Constant Voltage) Mode – commonly referred to as - Wire Welding, MIG welding, or Gas Metal Arc Welding (GMAW)

NOTE

When using a spool gun, an adapter with contactor must be used. Please consult the spool gun manufacturer for appropriate adapter.

1. With the engine shut off, insert the twist lock connection of the ground clamp into the negative (-) welder connection port on the control panel. Insert the power lead segment from spool gun adapter into the positive (+) welder connection port on the control panel.
2. Place the ground clamp from the Air N Arc 250-L on the work piece.
3. Start the engine (See **Section 2.2, Engine Start-up and Shutdown Procedure**).
4. On the control panel, place the DC Charger/ Welder switch in welder mode. Place the CC/ CV switch in CV mode.

5. Adjust the power dial on the Air N Arc 250-L to the appropriate voltage setting for the material being welded. At anytime during welding, the power dial may be adjusted to the desired voltage level.

2.5 OPERATING THE AC GENERATOR

⚠ WARNING

Do not rely on the thermal overload circuit breakers on the generator to protect personnel, power tools, or the generator. The thermal overload circuit breakers on the generator require time to overheat when the generator is operating in an overload condition — they do not provide instant protection against short circuiting or overload conditions. Always use GFCI protected extension cords and power strips when using the generator.

IMPORTANT

The Power System is designed to support a multi-function project. However, if the generator is operating at a high percentage of its rated capacity, and the welder and air compressor are also being used, the resulting drop in engine speed may produce a low voltage condition that will damage the generator and power tools being used.

NOTE

Only plug power cords into the generator receptacles **AFTER** the engine is running at full speed.

NOTE

Be careful not to overload the rated capacity of the generator - 4,900 watts (20 amps @ 240V) continuous.

To operate the generator:

1. Start the engine.
2. Turn the Generator switch on the control panel to the ON position.

Combined output on all generator receptacles is limited to the total rated generator capacity. For example; if 1,500 watts (12.5 amps) is being drawn on the 120V duplex receptacle, only 1,800 watts (7.5 amps) is available at the 240V receptacle. Reference **Appendix A, Section A.3: Wattage Requirements for Common Receptacle Units**, for general information on the power requirements of common power tools, motors and extension cords. If the equipment is not listed in **Section A.3**, check the desired power tool, motor or extension cord manufacturer's specifications.

If the thermal overload circuit breakers on the generator are tripped due to an overload condition, press the white reset buttons on the generator panel to reset the breakers (**Figure 2-4**).

 WARNING

If one of the generator circuit breakers is tripped, the cause of the overload must be determined before the circuit breaker is reset and work is resumed.

2.6 OPERATING THE AIR COMPRESSOR

NOTE

The Air N Arc 250-L Power System unit features a high pressure, 175 PSI air system. Check the maximum air pressure rating on the air tools being used. The operator is responsible for regulating the air pressure when necessary (See **Section 3.4.1, Adjusting Compressor Cut-In/Cut-Out Pressure**).

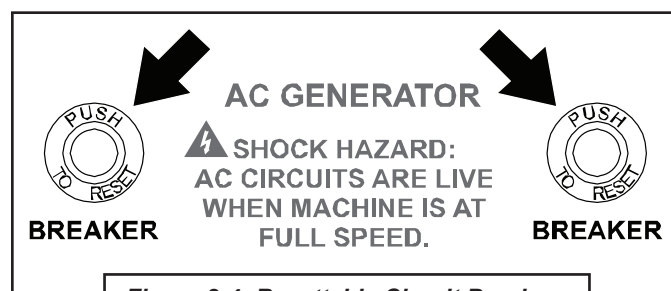


Figure 2-4: Resettable Circuit Breakers

 CAUTION

Exposed high pressure air lines on the unit become hot during operation— keep everyone clear.

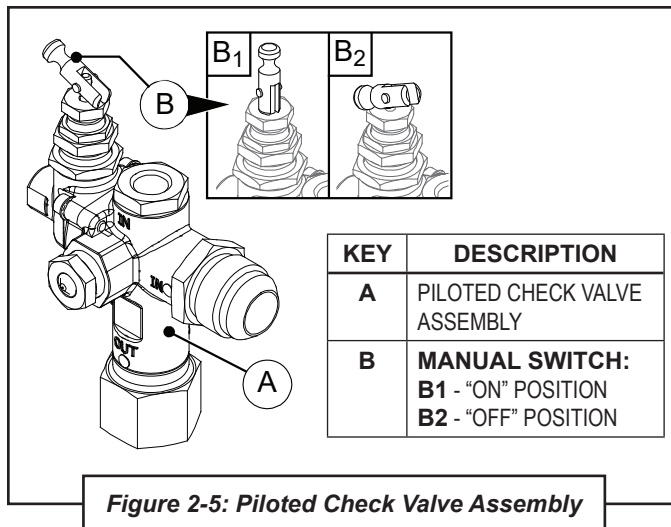
The air compressor on the Air N Arc 250-L Power System is a continuous-run compressor. This means that the compressor continues to turn at all times, even when it is not building pressure in the air storage tank. The compressor is controlled by a pilot valve that provides an air pressure signal to the pressure switch, which activates the throttle solenoid.

When the air tank pressure builds to 175 PSI, a spring loaded valve in the pilot valve opens, providing an air pressure signal to the head unloader valves of the compressor. This causes the air in the compressor to vent to the atmosphere. This air signal is also sent to the throttle pressure switch, energizing the throttle solenoid.

When the air tank pressure falls below 150 PSI, the pilot valve will close, stopping the air signal to the unload valves, allowing the compressor to start pumping air to the tank. This signal also causes the pressure switch to de-energize the throttle solenoid, forcing the engine to full speed.

A lever on the top of the pilot valve will allow the operator to manually stop the compression of air by the compressor during initial engine start-up or if operation does not require the use of compressed air (**Figure 2-5**). Since the head unloader valves require air pressure to operate, there must be a minimum of 10 psi in the air tank to allow the valves to operate properly.

For additional information on manually controlling the pilot valve function, consult **Section 3.4.1, Adjusting Compressor Cut-in / Cut-out Pressure**, and **Figure A-1: Pressure System Control - Functional Sequences** in the Appendix.

**NOTE**

The leading cause of component failure of the air control system is moisture. Air tanks must be drained daily as a minimum to eliminate condensation. Consult Section 3.4.3.11 for maintenance information.

When purchasing air tools or planning a project, the rated capacity of the compressor (24 CFM up to 175 psi) will need to be taken into consideration. See **Appendix A, Section A.4: Air Tool Air Consumption Chart**, for information on the compressed air requirements of common tools. If the equipment is not listed in **Section A.4**, check the desired power tool manufacturer's specifications. An air storage tank (30 gallon available) can allow additional air CFM output for intermittent use.

NOTE

The pressurized air system requires routine maintenance. See Table 3A: Maintenance Schedule and Procedure Table, for important maintenance procedures.

2.7 OPERATING THE BATTERY BOOSTER/CHARGER

The Vanair state-of-the-art battery charging module and the optional battery charging cables add further versatility to the 250-L Series Power System. The battery charging system operates off the

DC generator, and not the AC power generator.

 WARNING

DO NOT charge or boost while in Weld Mode. Personal injury or damage may occur.

IMPORTANT

To prevent damaging voltage spikes, the battery cables must be disconnected from the battery to be charged in any vehicle equipped with a computer, or any equipment with sensitive electronic components. Failure to follow this warning can result in damage or failure of any or all electronic components, thus voiding the warranty of the machine.

IMPORTANT

Never leave the machine unattended while charging a battery. Always carefully monitor the charging system while it is in use; the high amperage level that the unit produces can damage the battery being charged, or the other components, if the unit is left connected for an extended period of time.

The module has been factory-adjusted for 12 VDC charging, and a maximum current output of 200 amps.

The module output has been set at 14 VDC for the 12V charge option, 16 VDC for 12V boost, and 30 VDC for the 24V option. This output has been pre-set by the factory and can only be adjusted by authorized factory personnel.

During charging, if the machine begins to cycle between high and low idle, then the battery is fully charged.

2.7.1 CONNECTION - DISCONNECTION SEQUENCE AND OPERATION

 WARNING

NEVER disconnect boosting connections or cables while charging / boosting. This will cause a voltage spike on the machine. Failure to follow this warning can result in injury, and/or damage or failure of any or all electronic components, thus voiding the warranty of the machine.

⚠ WARNING



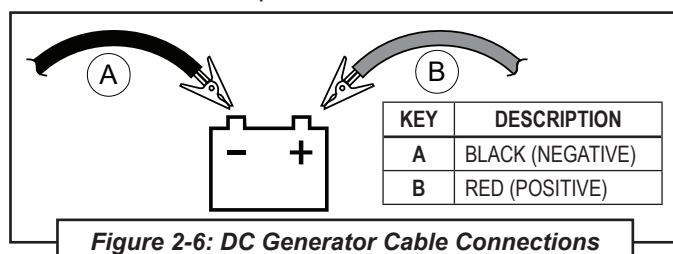
Always wear a face shield when connecting or disconnecting battery charging cables, and always follow the connection and disconnection sequence. Electrical sparks can cause a battery to explode, resulting in serious injury.

1. With the engine off, insure that the welder, DC charger switch, and any other engine control switch is in the OFF position.

IMPORTANT

Never attach boost cables to the panel before attaching to the battery. Always attach cables to the battery first.

2. Attach the clamps of the battery charge cable to the battery to be charged. RED to the positive terminal, BLACK to the negative terminal (*Figure 2-6*).
3. Plug the battery charge cables into the battery cable connection.
4. Start the engine and wait for all indicator lights to turn off. Place the DC Welder/Charger selector toggle switch in the DC Charger position, and then the DC Charger Mode switch to the correct position. The engine should come up to operating speed; the battery is being charged.
5. If the engine speed does not increase, check for residual battery voltage. No residual voltage indicates a battery not capable of accepting a charge, and will not allow the charge function to energize.
6. When machine begins to cycle between high and low idle then the battery is fully charged.
7. To disconnect the charging system, place the DC Welder/Charger selector toggle switch to the OFF position.



8. Allow engine to idle down, then shut down the engine.
9. Now it is safe to disconnect the clamps from the battery being charged, and the battery cable connection on the front of the machine.

2.8 EXTREME CONDITION OPERATION

When operating in extreme hot or cold conditions, extra attention should be given to any indications that could lead to a serious problem. Machine review and maintenance check schedules should be more frequent than the normal suggestions given in **Section 3, Table 3A: Maintenance Schedule and Procedure Table**.

Become familiar with the alternative operation procedures given in this section before operating the power system package in any type of extreme ambient conditions.

2.8.1 COLD WEATHER OPERATION

NOTE

For cold weather option augmentations, consult **Section A.5 (options list)** in the **Appendix** and **Vanair®** for details.

Additional care should be taken under consideration when operating the package in extreme cold weather environments or ambient temperatures.

Run machine with no load at full speed using the generator switch to warm up the machine.

2.8.2 ENGINE OPERATION

NOTE

For additional information on engine operation, consult the **Engine Operator's Manual**.

NOTE

Ethanol blended fuels, such as E85, are prohibited for use with the Kohler 25 EFI engine. **DO NOT** use ethanol-based fuels. Consult **Section 3** of this manual, and the **Engine Operator's Manual** for acceptable fuel specifications.

The standard recommendation of 10W-30 engine oil is suitable for temperatures down to -5°F. If



temperatures are consistently below 30°F, it is recommended that 5W-30 oil be used. If temperatures are below -25°F, a high-performance, fully synthetic oil, such as AMSOIL 5W-30 should be used which is suitable to temperatures of -55°F.

In below zero temperatures a fuel line deicer product may need to be used.

Check the fuel filter regularly to insure that it contains no water.

Drain the moisture from the tank when it is warm from extended operation.

2.8.3 HIGH TEMPERATURE OPERATION

The standard recommendation of 10W-30 engine oil is suitable for operation in temperatures up to 110°F.

Extra care should be taken to keep the engine and air compressor clean and to not restrict the air flow around the unit.

2.8.4 HIGH ALTITUDE OPERATION

Engine horsepower will decrease by 3.5% for every 1,000 ft. increase in altitude. At high altitude overall unit performance will deteriorate, and care will need to be taken not to overload the engine by using more than one function of the unit.



SECTION 3: MAINTENANCE

3.1 GENERAL INFORMATION

A strict maintenance program is the key to long life for the Air N Arc 250-L package. Below is a program that, when adhered to, should keep the package in top operating condition. Refer to **Section 3.5, Parts Replacement and Adjustment Procedures** in this section of the manual for detailed descriptions of specific compressor system components. The following table lists the main topics in order of appearance for this section:

WARNING

Follow all applicable safety recommendations as outlined in Section 1: Safety of this manual.

WARNING

DO NOT remove caps, plugs and/or other components when compressor is running or pressurized. Stop compressor and de-pressurize system prior to maintenance of system. Wear personal protective equipment such as gloves, work boots, and eye and hearing protection as required for the task at hand.

IMPORTANT

Follow and perform the prescribed routine maintenance schedule at the recommended intervals. Failure to follow the prescribed maintenance at the recommended intervals will impair the package safety, performance characteristics, shorten the package's life, and will negatively affect the warranty coverage of the package.

NOTE

Operating the machine package in a severe environment may require more frequent service intervals.

3.2 ROUTINE MAINTENANCE SCHEDULE

Vanair® Manufacturing, Inc., considers the maintenance schedule given in **Table 3A: Routine Maintenance Schedule**, to be part of the warranty agreement with the customer. This maintenance regimen must be followed in order to protect the warranty of the machine package.

Vanair especially requires that a consistent service regimen be established for engine oil changes, and engine and compressor air filter servicing. The service schedule given in **Table 3A** is designed so that many of the other maintenance tasks are completed when the engine and compressor air filters are serviced, and the engine oil is changed.

Please take a moment to acquaint yourself with the service schedule. There is also a corresponding service log (**Table 3B**) to assist the customer in establishing a maintenance routine log.

For assistance in obtaining routine maintenance or replacement parts, consult **Section 5.1, Parts Ordering Procedure**, and **Table 5A: Recommended Spare Parts List**.

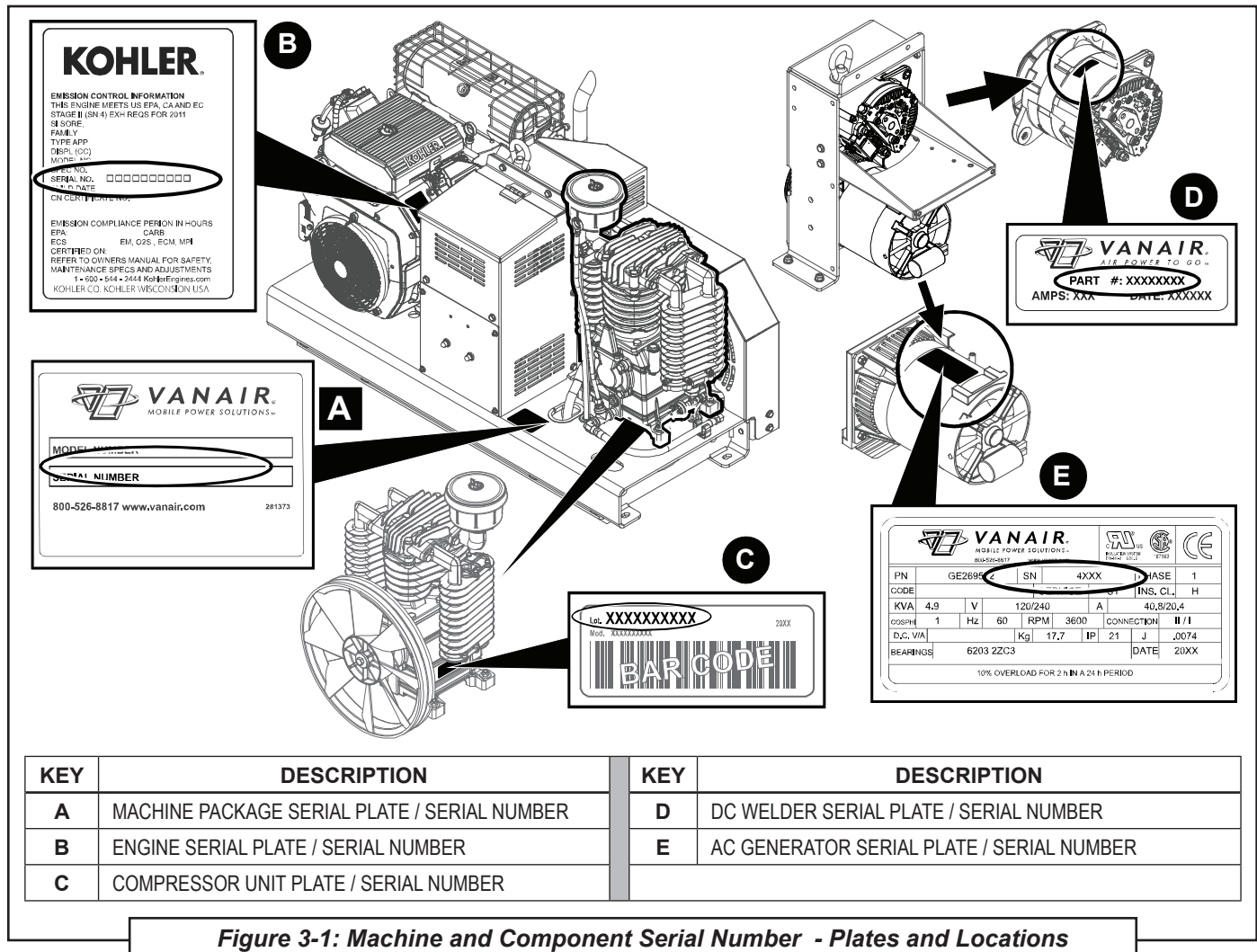
3.3 REPLACEMENT PARTS

Replacement parts should be purchased through your local Vanair® representative or where the 250-L Series All-In-One Power System was purchased. If, for any reason, parts are not available in this manner, they can be purchased through Vanair directly.

CONTACT

If there are any issues concerning operation, service or maintenance of the Air N Arc 250-L package, please have the serial number of the machine readily available when contacting Vanair, to quickly expedite assistance.

Figure 3-1 shows the location of the serial



plate(s) and serial number(s) of the machine and the major components of the Air N Arc 250-L for convenience. Vanair recommends that the customer have the needed serial number readily available to expedite assistance when calling the Vanair® Service or Parts Departments.

VANAIR MANUFACTURING, INC.

10896 West 300 N.

Michigan City, IN 46360

Telephone: (800) 526-8817

(219) 879-5100

Service: (844) VAN-SERV

(844) 826-7378

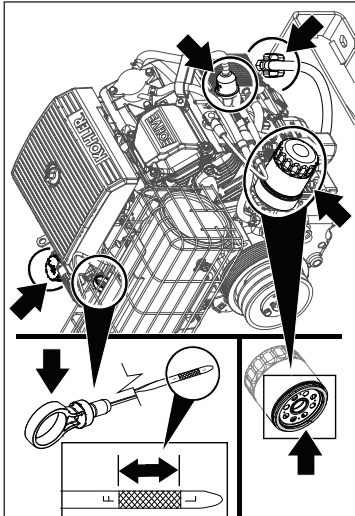
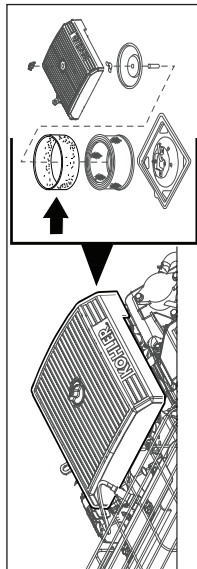
Service Fax: (219) 879-5335

Parts Fax: (219) 879-5340

Sales Fax: (219) 879-5800

www.vanair.com

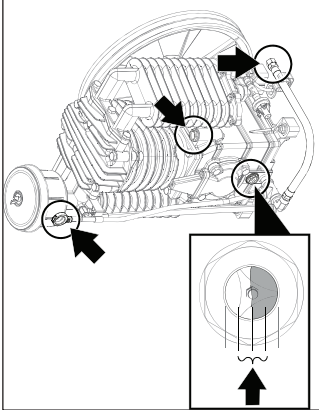
TABLE 3A: MAINTENANCE SCHEDULE AND PROCEDURE TABLE

WARNING		MAINTENANCE SCHEDULE					TABLE 3B: ROUTINE REPLACEMENT KIT ORDER INFORMATION ^z									
Before performing maintenance: Shut down machine, relieve all system pressure and lock out all power, as per the Safety Section of this manual.		Hourly or Calendar Period - whichever comes first ^z														
		After 8 Hours or Daily	After 40 Hours or Weekly	Every 100 Hours or One Year	Every 200 Hours	After 600 Hours	After 1000 Hours									
First 50 Hours of Operation		■	■	■	■			1	Kit, Engine Service (100 Hour Kit) ^{zz}	KIT1291	1	3	Kit, Compressor Service	KIT1281	1	
								2	Kit, Engine Service (200 Hour Kit) ^{zz}	KIT1119	1	4	Vanguard Reciprocating Compressor Oil	271856-1GAL	1	
For lock-out/tag-out disconnect the positive (+) battery cable.							^z If working in dusty or dirty conditions, reduce the recommended time intervals between servicing by half for engine and compressor oil replacement, and engine and compressor filter servicing.									
							^{zz} Engine kits KIT1291 and KIT1119 are alike, but kit KIT1119 also includes engine fuel filters.									
KEY	TASK	PLEASE NOTE: WHEN ORDERING PARTS, INDICATE MACHINE SERIAL NUMBER.														
ACTION TO TAKE																
1	Check tension of both compressor poly-link drive belts	■	Tighten belts if necessary. Consult Section 3.4.3 for test, tightening and replacement procedures.													
2	Change engine oil and engine filter	■	REFERENCE:  • Engine Oil Level Check Dipstick [↕] • Engine Oil Dipstick / Gauge [↕] ^z • Engine Oil Fill Port / Cap [↘] • Engine Oil Filter Element [↗] • Engine Oil Filter Seal Ring - coat with engine oil before mounting [↗] • Engine Oil Drain Tube / Cap [↘] ^z Proper level is shown between the indication arrows (F [full] & L [low]) PART REPLACEMENT: Order Engine Service Kit no. KIT1291. PROCEDURE: Consult the Engine Operation Manual for service procedures.													
3	Wash engine air pre-cleaner	■	REFERENCE: • Engine Air Pre-Cleaner [↗] PART REPLACEMENT: Order air pre-cleaner replacement no. 263675. 													
		Key #3 continued on next page...														
		Continued on next page														

Key #3 continued on next page...

Continued on next page

TABLE 3A: MAINTENANCE SCHEDULE AND PROCEDURE TABLE

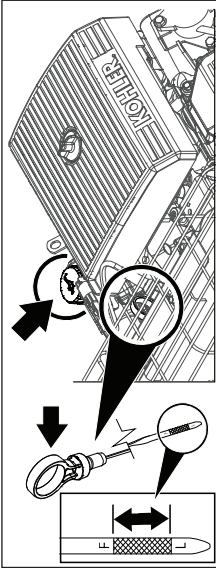
TABLE 3A: MAINTENANCE SCHEDULE AND PROCEDURE TABLE															
▲ WARNING		MAINTENANCE SCHEDULE					TABLE 3B: ROUTINE REPLACEMENT KIT ORDER INFORMATION ^z								
		BREAK- IN PERIOD	Hourly or Calendar Period - whichever comes first ^z				KEY NO.	DESCRIPTION	PART NO.	QTY					
Before performing maintenance: Shut down machine, relieve all system pressure and lock out all power, as per the Safety Section of this manual.	First 50 Hours of Operation	After 8 Hours or Daily	After 40 Hours or Weekly	Every 100 Hours or One Year	Every 200 Hours	After 600 Hours	After 1000 Hours	1	Kit, Engine Service (100 Hour Kit) ^{zz}	KIT1291	1	3	Kit, Compressor Service	KIT1281	1
		2	Kit, Engine Service (200 Hour Kit) ^{zz}	KIT1119	1	4	Vanguard Reciprocating Compressor Oil	271856-1GAL	1						
^z If working in dusty or dirty conditions, reduce the recommended time intervals between servicing by half for engine and compressor oil replacement, and engine and compressor filter servicing.															
^{zz} Engine kits KIT1291 and KIT1119 are alike, but kit KIT1119 also includes engine fuel filters.															
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE MACHINE SERIAL NUMBER.															
KEY	TASK	ACTION TO TAKE													
3	Wash engine air pre-cleaner (continued)	■						Key #3 continued from previous page...							
		PROCEDURE: Remove and wash engine air filter precleaner per procedure given in the Engine Operation Manual. Replace.													
4	Change compressor oil	■		■				REFERENCE:  - Compressor Oil Fill Port / Plug [↗] - Compressor Oil Level Sight Glass: Compressor Oil Level Optimum range is between 1/4 and 3/4 of sight glass [→] - Compressor Oil Level Dipstick Gauge (alternate oil level determination option) [↗] - Compressor Oil Drain Tube / Cap [↘] PART REPLACEMENT: Order proper amount of replacement, Vanair reciprocating compressor oil no. 271856-1GAL (one [1] gallon container; order two containers to meet the approximate 1.75 compressor capacity).							
		Key #4 continued on next page... Continued on next page													

⚠ WARNING

Before performing maintenance:
Shut down machine, relieve all system pressure and lock out all power, as per the Safety Section of this manual.

For lock-out/tag-out disconnect the positive (+) battery cable.

TABLE 3A: MAINTENANCE SCHEDULE AND PROCEDURE TABLE

WARNING		MAINTENANCE SCHEDULE Hourly or Calendar Period - whichever comes first ^z				TABLE 3B: ROUTINE REPLACEMENT KIT ORDER INFORMATION ^z			
		BREAK- IN PERIOD	After 8 Hours or Daily	After 40 Hours or Weekly	Every 100 Hours or One Year	Every 200 Hours	After 600 Hours	After 1000 Hours	
Before performing maintenance: Shut down machine, relieve all system pressure and lock out all power, as per the Safety Section of this manual.		First 50 Hours of Operation							
For lock-out/tag-out disconnect the positive (+) battery cable.									
KEY	TASK								
4	Change compressor oil (continued)	■		■					
PROCEDURE: Unclamp drain tube from clip, remove the end cap and allow the oil to drain (approximately 1.75 gallons) into a properly-sized container(s). Replace the end cap on the drain tube. Add fresh oil at the oil fill cap port, to the proper oil level range (usually at the half-way point of the sight glass, or within range of the dipstick gauge). DO NOT overfill. Once the oil level is achieved, replace and tighten the oil fill port plug. ♻️ Discard drained oil in accordance with proper and applicable recycling laws.									
5	Check engine oil level	■							
REFERENCE: • Engine Oil Level Check Dipstick [↕] • Engine Oil Dipstick/Gauge [↕] ^z • Engine Oil Fill Cap [↗] PART REPLACEMENT: Order Kohler motor oil no. 274439 (sold in quart containers; order x 2 for engine capacity coverage).									
									
PROCEDURE: Consult the Engine Operation Manual for oil service procedures.									
6	Check and maintain compressor oil level at proper amount shown in the sight glass	■							
PROCEDURE: Refer to Key #4 in this Table for service locations and replacement oil information. Compressor must operate at oil levels within the parameters shown, optimally between 1/4 and 3/4 level of the sight glass dimension. Do not overfill, or operate at low levels.									
Continued on next page									

⚠ WARNING

Before performing maintenance:
Shut down machine, relieve all system pressure and lock out all power, as per the Safety Section of this manual.

For lock-out/tag-out disconnect the positive (+) battery cable.

KEY TASK

4 Change compressor oil (continued)

Key #4 continued from previous page...

PROCEDURE:

Unc clamp drain tube from clip, remove the end cap and allow the oil to drain (approximately 1.75 gallons) into a properly-sized container(s). Replace the end cap on the drain tube. Add fresh oil at the oil fill cap port, to the proper oil level range (usually at the half-way point of the sight glass, or within range of the dipstick gauge). **DO NOT** overfill.

Once the oil level is achieved, replace and tighten the oil fill port plug.

♻ Discard drained oil in accordance with proper and applicable recycling laws.

5 Check engine oil level

REFERENCE:

- Engine Oil Level Check Dipstick [↕]
- Engine Oil Dipstick/Gauge [↕]^z
- Engine Oil Fill Cap [↕]

PART REPLACEMENT:

Order Kohler motor oil no. 274439

(sold in quart containers; order x 2 for engine capacity coverage).

PROCEDURE:

Consult the Engine Operation Manual for oil service procedures.

PROCEDURE:

Refer to Key #4 in this Table for service locations and replacement oil information. Compressor must operate at oil levels within the parameters shown, optimally between 1/4 and 3/4 level of the sight glass dimension.

Do not overfill, or operate at low levels.

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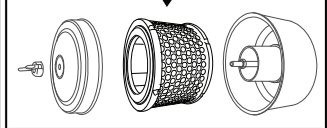
TABLE 3A: MAINTENANCE SCHEDULE AND PROCEDURE TABLE

TABLE 3B: ROUTINE REPLACEMENT KIT ORDER INFORMATION ^z						
KEY NO.	DESCRIPTION	PART NO.	QTY	KEY NO.	DESCRIPTION	PART NO.
1	Kit, Engine Service (100 Hour Kit) ^{zz}	KIT1291	1	3	Kit, Compressor Service	KIT1281
2	Kit, Engine Service (200 Hour Kit) ^{zz}	KIT1119	1	4	Vanguard Reciprocating Compressor Oil	271856-1GAL
^z If working in dusty or dirty conditions, reduce the recommended time intervals between servicing by half for engine and compressor oil replacement, and engine and compressor filter servicing.						
^{zz} Engine kits KIT1291 and KIT1119 are alike, but kit KIT1119 also includes engine fuel filters.						
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE MACHINE SERIAL NUMBER.						
KEY	TASK	ACTION TO TAKE				
7	Check air tank for water accumulation	■	After 8 Hours or Daily	■	After 40 Hours or Weekly	Every 100 Hours or One Year
8	Inspect unit for oil leaks or damage	■	After 8 Hours or Daily	■	After 40 Hours or Weekly	Every 100 Hours or One Year
9	Inspect cooler fins (both engine and compressor) for contamination	■	After 8 Hours or Daily	■	After 40 Hours or Weekly	Every 100 Hours or One Year
10	Inspect ventilation areas and surroundings	■	After 8 Hours or Daily	■	After 40 Hours or Weekly	Every 100 Hours or One Year
11	Check/clean all external parts of compressor and driver	■	After 8 Hours or Daily	■	After 40 Hours or Weekly	Every 100 Hours or One Year
12	Clean and inspect engine air filter	■	After 8 Hours or Daily	■	After 40 Hours or Weekly	Every 100 Hours or One Year
WARNING Before performing maintenance: Shut down machine, relieve all system pressure and lock out all power, as per the Safety Section of this manual. For lock-out/tag-out disconnect the positive (+) battery cable.						
PROCEDURE: Drain any water from the air tank, per procedure in Section 3.4.3.11. PROCEDURE: Visually note any leaks or evidence of leaks around the compressor unit and hose connections. Tighten any loose connection point where needed. Repair or replace any damaged part. PROCEDURE: Clean or clear as necessary. Refer to the Engine Operation Manual for engine cooler service procedure. PROCEDURE: Ensure ventilation areas and surroundings are not blocked or clogged with debris. Clean or clear as necessary. PROCEDURE: A daily visual inspection will help to prevent dirt and debris build-up, which can affect machine operation. When cleaning external parts, always wait for machine surfaces to cool down before wiping off.						
REFERENCE: • Engine Air Filter [➡] PART REPLACEMENT: If filter needs replacing, order Engine Air Filter replacement no. 262722. Note that the engine air filter, and the engine pre-(air) filter are both included with both engine service kits (no. KIT1291 and no. KIT1119).						
Key #12 continued on next page... Continued on next page						

TABLE 3A: MAINTENANCE SCHEDULE AND PROCEDURE TABLE

TABLE 3B: ROUTINE REPLACEMENT KIT ORDER INFORMATION ^z							
KEY NO.	DESCRIPTION	PART NO.	QTY	KEY NO.	DESCRIPTION	PART NO.	QTY
1	Kit, Engine Service (100 Hour Kit) ^{zz}	KIT1291	1	3	Kit, Compressor Service	KIT1281	1
2	Kit, Engine Service (200 Hour Kit) ^{zz}	KIT1119	1	4	Vanguard Reciprocating Compressor Oil	271856-1GAL	1
^z If working in dusty or dirty conditions, reduce the recommended time intervals between servicing by half for engine and compressor oil replacement, and engine and compressor filter servicing.							
^{zz} Engine kits KIT1291 and KIT1119 are alike, but kit KIT1119 also includes engine fuel filters.							
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE MACHINE SERIAL NUMBER.							

MAINTENANCE SCHEDULE Hourly or Calendar Period - whichever comes first ^z				ACTION TO TAKE			
BREAK-IN PERIOD	After 8 Hours or Daily	After 40 Hours or Weekly	Every 100 Hours or One Year	Every 200 Hours	After 600 Hours	After 1000 Hours	
First 50 Hours of Operation							
		■					
		■					
			■				

KEY	TASK	PROCEDURE:	REFERENCE:	PART REPLACEMENT:	PROCEDURE:
12	Clean and inspect engine air filter	Clean and inspect engine air filter			
13	Clean and inspect compressor air filter	Clean and inspect compressor air filter		Order Compressor Air Filter replacement no. 277608-001. Air filter is also included with the full compressor service kit no. KIT1281.	Loosen and remove the wingnut at the top of the air filter housing. Remove air filter housing lid. Remove air filter element and inspect. Replace with new filter if necessary; seat filter into housing, replace lid and replace and tighten wingnut.
14	Inspect air compressor drive belts, and serpentine welder drive belt for wear, damage or excessive cracking	Ensure that drive belts are in satisfactory operating condition, and are tensioned adequately (refer to Section 3.4.3.3). Should the compressor and/or generator drive belts need to be replaced, consult the main drive belts' sub-sections under Section 3.4.3.			

Continued on next page

TABLE 3A: MAINTENANCE SCHEDULE AND PROCEDURE TABLE

TABLE 3B: ROUTINE REPLACEMENT KIT ORDER INFORMATION ^z						
KEY NO.	DESCRIPTION	PART NO.	QTY	KEY NO.	DESCRIPTION	PART NO.
1	Kit, Engine Service (100 Hour Kit) ^{zz}	KIT1291	1	3	Kit, Compressor Service	KIT1281
2	Kit, Engine Service (200 Hour Kit) ^{zz}	KIT1119	1	4	Vanguard Reciprocating Compressor Oil	271856-1GAL

^z If working in dusty or dirty conditions, reduce the recommended time intervals between servicing by half for engine and compressor oil replacement, and engine and compressor filter servicing.

^{zz} Engine kits KIT1291 and KIT1119 are alike, but kit KIT1119 also includes engine fuel filters.

PLEASE NOTE: WHEN ORDERING PARTS, INDICATE MACHINE SERIAL NUMBER.

ACTION TO TAKE	
REFERENCE:	• Engine Primary Fuel Filter (70 μ) [↓] • Engine Fuel Pump [↘]* • Engine In-line Fuel Filter (75 μ) [↗] ^z • Location Reference: Engine Oil Filter [↘] ^z Used with remote fuel source machines only.
FOR PART REPLACEMENT:	Order engine service kit no. KIT1119 . Note that this full engine kit includes an engine air pre-cleaner, air filter element, gas and inline fuel filters, and an engine oil filter replacements.
PROCEDURE:	Consult the procedure in the Engine Operation Manual on how to change the engine fuel, oil and air filters.
REFERENCE:	Refer to Key #3 for engine air pre-cleaner, and Key #12 for air filter in this table, for location and access information.
PART REPLACEMENT:	Order Engine Air Filter Replacement no. 262722 ; order Air Pre-cleaner Replacement no. 263675 .

Key #16 continued on next page...

Continued on next page

KEY	TASK	BREAK-IN PERIOD	MAINTENANCE SCHEDULE Hourly or Calendar Period - whichever comes first ^z					
			First 50 Hours of Operation	After 8 Hours or Daily	After 40 Hours or Weekly	Every 100 Hours or One Year	Every 200 Hours	After 600 Hours
15	Replace engine fuel filter				■			
16	Replace engine air filter					■		

TABLE 3A: MAINTENANCE SCHEDULE AND PROCEDURE TABLE

⚠ WARNING		BREAK-IN PERIOD		MAINTENANCE SCHEDULE Hourly or Calendar Period - whichever comes first ^x					TABLE 3B: ROUTINE REPLACEMENT KIT ORDER INFORMATION ^x								
Before performing maintenance: Shut down machine, relieve all system pressure and lock out all power, as per the Safety Section of this manual. For lock-out/tag-out disconnect the positive (+) battery cable.		First 50 Hours of Operation	After 8 Hours or Daily	After 40 Hours or Weekly	Every 100 Hours or One Year	Every 200 Hours	After 600 Hours	After 1000 Hours	KEY NO.	DESCRIPTION	PART NO.	QTY	KEY NO.	DESCRIPTION	PART NO.	QTY	
									1	Kit, Engine Service (100 Hour Kit) ^{xx}	KIT1291	1	3	Kit, Compressor Service	KIT1281	1	
									2	Kit, Engine Service (200 Hour Kit) ^{xx}	KIT1119	1	4	Vanguard Reciprocating Compressor Oil	271856-1GAL	1	
									^x If working in dusty or dirty conditions, reduce the recommended time intervals between servicing by half for engine and compressor oil replacement, and engine and compressor filter servicing.								
									^{xx} Engine kits KIT1291 and KIT1119 are alike, but kit KIT1119 also includes engine fuel filters.								
									PLEASE NOTE: WHEN ORDERING PARTS, INDICATE MACHINE SERIAL NUMBER.								
									ACTION TO TAKE								
16	Replace engine air filter			■					Key #16 continued from previous page.... Note that the engine air filter, and the engine pre-(air) cleaner are both included with the engine service kits no. KIT1291 and no. KIT1119. PROCEDURE: Consult the Engine Operation Manual for instructions on how to change the air, oil and fuel filters.								
17	Check battery cables and connections	■				■			PROCEDURE: Clean and tighten as necessary. Replace any worn cables.								
18	Inspect unit mounting bolts	■				■			PROCEDURE: Tighten any loose mounting bolts as necessary.								
19	Blow out the DC welding generator and AC generator					■			PROCEDURE: Use compressed air to clear out generators (NOTE: carry out every 100 hours if operating in dirty environmental conditions.)								
20	Check compressor cut-in and cut-out pressures						■		PROCEDURE: Ensure that the cut-in and cut-out pressure settings are correct. Adjust if necessary, per Section 3.4.1.								
21	Replace engine spark plugs (Check at 200 hours)						■		PROCEDURE: Consult the procedure in the Engine Operation Manual on how to change the spark plugs.								
22	Check the engine speed						■		PROCEDURE: Ensure that the engine speed is running at correct interval. Adjust if necessary, per Section 3.4.2.								
23	Inspect the welding leads and battery charging cables						■		PROCEDURE: If so equipped, ensure that welding leads are satisfactory for operation (no cracks or advanced wear). Repair or replace as necessary.								
		Continued on next page															



TABLE 3A: MAINTENANCE SCHEDULE AND PROCEDURE TABLE

TABLE 3B: ROUTINE REPLACEMENT KIT ORDER INFORMATION ^z						
KEY NO.	DESCRIPTION	PART NO.	QTY	KEY NO.	DESCRIPTION	PART NO.
1	Kit, Engine Service (100 Hour Kit) ^{zz}	KIT1291	1	3	Kit, Compressor Service	KIT1281
2	Kit, Engine Service (200 Hour Kit) ^{zz}	KIT1119	1	4	Vanguard Reciprocating Compressor Oil	271856-1GAL
^z If working in dusty or dirty conditions, reduce the recommended time intervals between servicing by half for engine and compressor oil replacement, and engine and compressor filter servicing.						
^{zz} Engine kits KIT1291 and KIT1119 are alike, but kit KIT1119 also includes engine fuel filters.						
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE MACHINE SERIAL NUMBER.						
ACTION TO TAKE						
KEY	TASK					
24	Inspect welding electrode clamp and ground clamp	After 8 Hours or Daily	After 40 Hours or Weekly	Every 100 Hours or One Year	Every 200 Hours	After 600 Hours
25	Replace the air compressor and generator drive belts	First 50 Hours of Operation	After 1000 Hours			
26	Inspect the generators and the automatic belt tensioner					
27	Change the compressor oil					
28	Inspect compressor head valves. Clean the carbon from valves and head if necessary					
29	Check and tighten all bolts, nuts, etc., if necessary					
30	Check compressor unloader valve(s) operation					
NOTE: Should any part of the compressor package become damaged or inoperable that is not listed in This Table, or the Spare Parts List Table (Section 5, Table 5A), consult the Vanair Service Department.						

3.4 PARTS REPLACEMENT AND ADJUSTMENT PROCEDURES

3.4.1 ADJUSTING COMPRESSOR CUT-IN / CUT-OUT PRESSURE

The Cut-in pressure is defined as the pressure in which the compressor starts pumping. Anytime the pressure in the tank falls below this pressure the compressor is allowed to start pumping.

The Cut-out pressure is defined as the pressure in which the compressor stops pumping. When the pressure in the air tank rises above this pressure the compressor is signaled to stop pumping.

Pressure settings for both the minimum and maximum rated capacity levels for this machine are adjusted at the factory before shipping, and should not need to be adjusted. However, a situation may occur where it is necessary to manually adjust or reset either or both of these settings. For such cases, consult Vanair.

IMPORTANT

DO NOT adjust the compressor cut-in/cut-out pressure unless absolutely necessary.

WARNING

Relieve pressure from the compressor system before performing maintenance on any components.

3.4.2 ADJUSTING THE ENGINE SPEED

Consult the Vanair® Service Department for issues relating to adjustment of engine speed.

NOTE

DO NOT tamper with the governor setting to increase the maximum engine speed. Overspeed is hazardous and will void the engine warranty. The maximum allowable high idle speed no load for the engine is 3600 RPM.

3.4.3 REPLACING AND RE-TENSIONING THE COMPRESSOR AND/OR GENERATOR DRIVE BELTS

WARNING

Relieve pressure from the compressor system before performing maintenance on any components.

WARNING

Before performing maintenance or repair operations on the machine, ensure that all power has been removed and locked out to prevent accidental start-up.

Refer to **Figure 3-2**. The compressor and generator are driven by the engine via the use of two drive belt types. The compressor utilizes a poly-link, chain-type belt, whereas the generator uses a serpentine v-belt. The belts will generally not need replacement during the service life of the system. However, over time they become loose and need to be tightened. Consult **Section 3.4.5.3** for instruction on how to check the compressor belt(s) tension.

3.4.3.1 ACCESSING THE DRIVE BELTS - REMOVING THE BELT GUARD SHIELD

WARNING

Never under any circumstances operate the machine with the belt guard removed. When performing service with the belt guard removed, always ensure that the negative battery cable is disconnected.

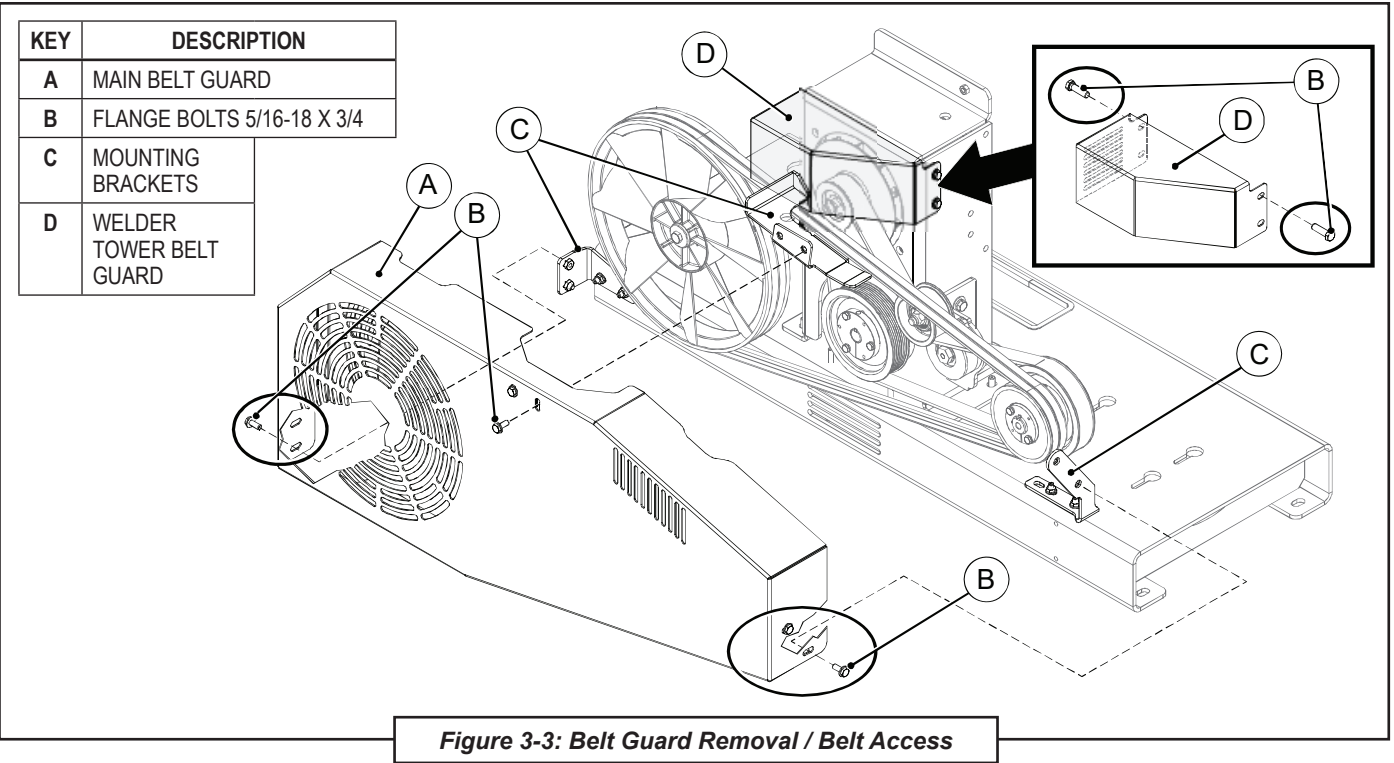
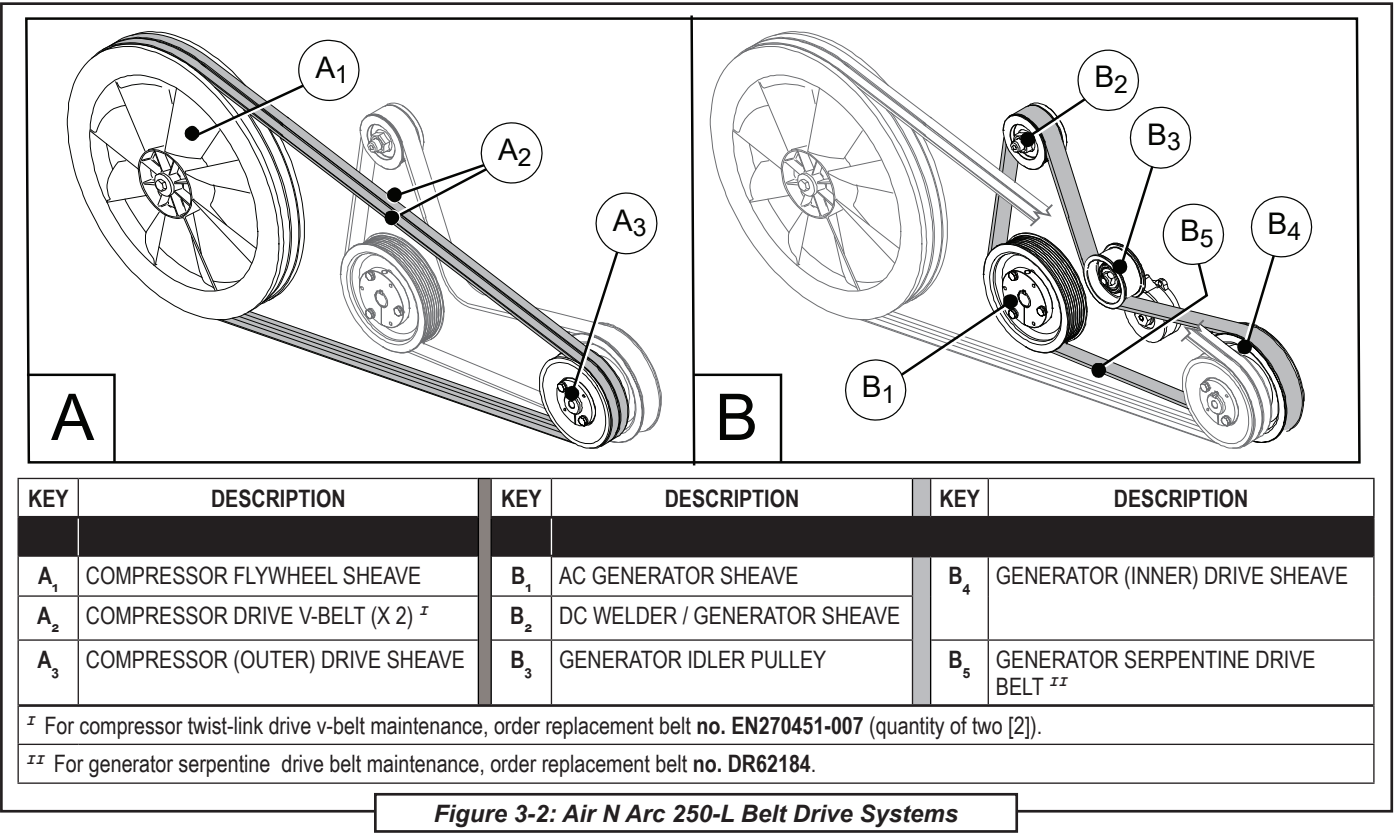
Consult **Figure 3-3**. The belt guard must be removed to access the drive belts. The Air N Arc 250-L Series All-In-One Power System utilizes two poly link series v-belts to drive the compressor unit, and a single serpentine v-belt to drive the generator system. Consult **Figure 3-4**, and the following procedure to access the drive belts:

1. Disconnect the battery ground cable.
2. Remove the ten (10) truss head screws and washer pairs securing the belt guard to the frame.
3. Remove the shield and place it in a safe location.

3.4.3.2 REPLACING THE BELT GUARD SHIELD

After the belts have been serviced, the belt guard must be secured back into position before the operating the machine. To re-secure the belt guard, refer to **Figure 3-3**, follow these instructions:

1. Align the shield's holes with the holes in the frame.



2. Secure the shield to the frame by placing a truss head screw through a nylon washer, and hand-tightening each pair until all ten (10) pairs are securing the guard into place.
3. Tighten all screws with a screw driver or drill bit driver.
4. Reconnect the ground wire to the battery.
5. Log any maintenance entry into the Maintenance and Service Log found in **Appendix B**.

3.4.3.3 RE-TENSIONING THE AIR COMPRESSOR DRIVE BELT(S)

The poly link v-belts used for the compressor drive do not require a separate tensioner. Rather, the belts are directly sized by the amount of links in the belt. Proper tension on a poly link v-belt is 3/8 to 1/2 inch “give”. Consult **Figures 3-4, 3-5, 3-6, 3-7**, and the following procedure:

NOTE

Since the compressor drive system consists of two adjacent belts, each belt should have nearly equal amounts of deflection.

NOTE

Whether removing a link or replacing a belt, Vanair® recommends changing both belts at the same time.

1. With the machine off and the ground wire disconnected from the battery, remove the belt guard shield per **Section 3.4.3.1**.
2. Check the deflection of each belt for looseness by applying pressure with a finger at the center location between the pulleys, as shown in **Figure 3-4**. The “give” should be in the range of 3/8 to 1/2 inch for each belt.
3. In order to remove a link or replace a belt, the belt has to be removed from the pulleys. Refer to **Figure 3-5**: For belt removal, grip the outer belt with the right hand (perform procedure on one belt at a time).
4. While twisting the belt outward [C₁], manually rotate the compressor pulley with the left hand [C₂] in the direction indicated in the figure. The belt will slide free.

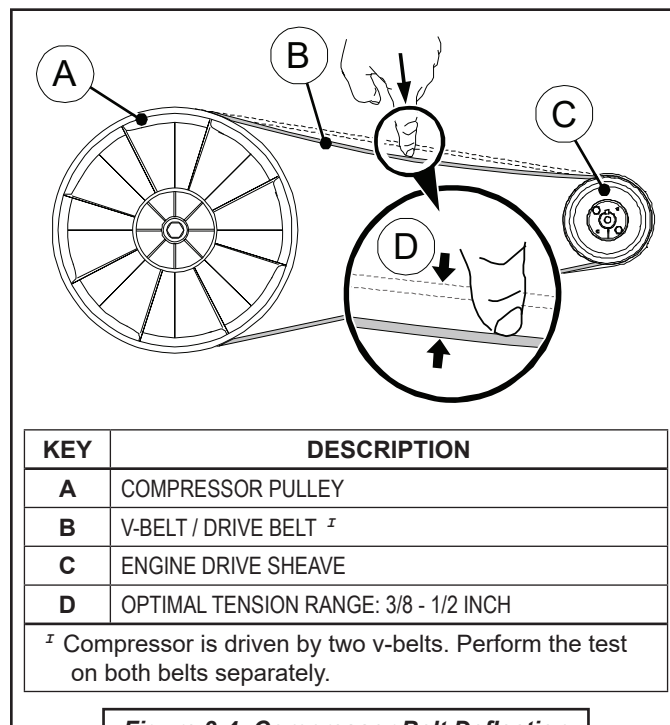


Figure 3-4: Compressor Belt Deflection

5. Repeat steps #3 and #4 to remove the inner belt.

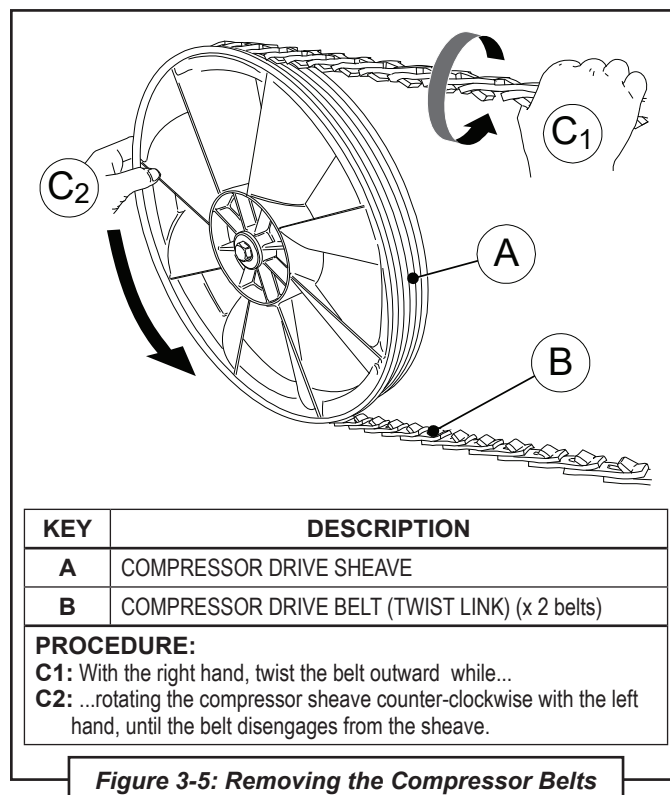


Figure 3-5: Removing the Compressor Belts

6. If a belt is too loose, then it will need to be resized. Consult **Section 3.4.3.4** to re-size a poly-link belt.

3.4.3.4 COMPRESSOR BELT SIZING

When sizing a new compressor drive belt, first remove the worn belt as explained in **Section 3.4.3.3**, Step #3 through Step # 5. Then consult **Figures 3-7** and **3-8**, and the following procedure:

The poly-link belts are placed so that the tab ends of the links are facing inward, toward the pulleys, as shown in [C] and [D].

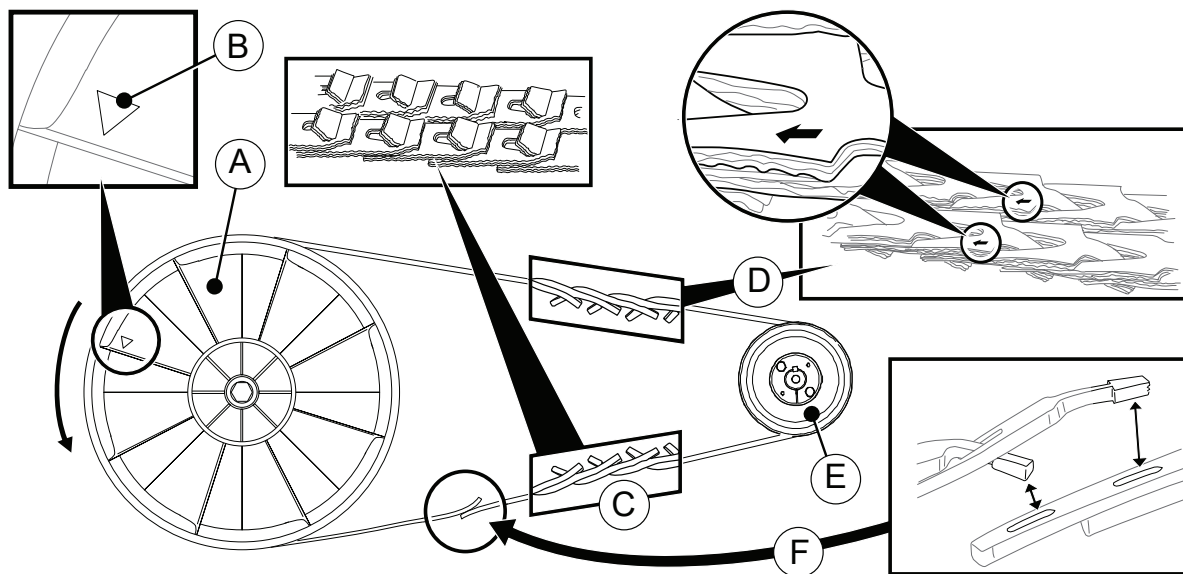
NOTE

Every tenth link is designated with an arrow ([D] in **Figure 3-6**).
For multiple belt drives, ensure that each belt has the same number of links.

IMPORTANT

Over-tightening the compressor poly-link belt(s) will result in overloading of the motor and belt failure, while a loose belt will be slipping and resulting in an unstable speed, overheating of the belt, and high amp draw.

1. Wrap new belt as shown in **Figure 3-6**, and pull it tight around the pulleys. To determine the length, overlap the last two holes of one end of the belt with two tabs of the other end, matching links as shown in [F].
2. Use a marker to place an identifying mark where the excess link begins.
3. Once the belt is sized correctly, the excess overlapping link(s) will need to be removed before assembling the sized belt into a completed loop. Follow the procedure given in **Section 3.4.3.6, Compressor Belt Assembly**, to remove excess belt links.



KEY	DESCRIPTION	KEY	DESCRIPTION
A	COMPRESSOR PULLEY	D	OUTER SIDE OF BELT TRACK [‡]
B	COMPRESSOR PULLEY DIRECTION OF ROTATION ARROW	E	ENGINE PULLEY
C	BELT PLACEMENT - TABS FACE INSIDE, TOWARD PULLEYS	F	OVERLAP: TO ALIGN LAST TWO HOLES WITH TWO TABS

[‡] Arrows printed on the links point in the SAME direction as compressor flywheel direction of rotation arrow [B].

Figure 3-6: Compressor Drive V-Belt - Determining Sizing and/or Link Removal

3.4.3.5 COMPRESSOR BELT LINK DISENGAGEMENT

NOTE

To completely disconnect excess links from a belt, two adjacent tabs will need to be freed to disengage the link.

In *Figure 3-7*, Tab [B₁] represents the first tab, and Tab [B₂] represents the second tab.

Refer to *Figure 3-7*, and the following procedure:

1. Hold belt tab-side up with one hand; bend back as far as possible to expose tab [B₁].
2. With the tab now turned parallel to the slot, push down on the tab [C] while pulling up on the link's end [D].
3. Rotate the belt end with tab [B₂] so that the tab is turned parallel to the slot.
4. Push down on the tab [F], while pulling up on the link's end [G].

3.4.3.6 COMPRESSOR BELT ASSEMBLY

Once the proper length of the belt has been de-

termined (refer to **Section 3.4.3.4**), and the belt is shortened to its fitted length (refer to **Section 3.4.3.5**), then the belt's ends are linked together to form the completed belt. Refer to *Figure 3-8*, and the following procedure:

1. Place tab [A] corner against the inside of the link hole [B] (nearest to thumb [D]).
2. With thumb [C], push on the tab's edge in the direction indicated.
3. Simultaneously with Step #2 above, push on link end [B] with thumb [D] in the direction indicated. NOTE: Inset [E] shows how the pressure applied from both thumbs causes the tab to "rotate" toward the slot position.
4. When tab is positioned parallel with the slot, push it/pull it through the slot.
5. After the tab is through the slot, twist it 90°, as shown in [F], to secure it into place.

3.4.3.7 ROUTING COMPRESSOR BELTS ONTO PULLEY GROOVES

Refer to *Figure 3-9*, and the following procedure to mount the compressor link drive belts onto the compressor and engine pulleys.

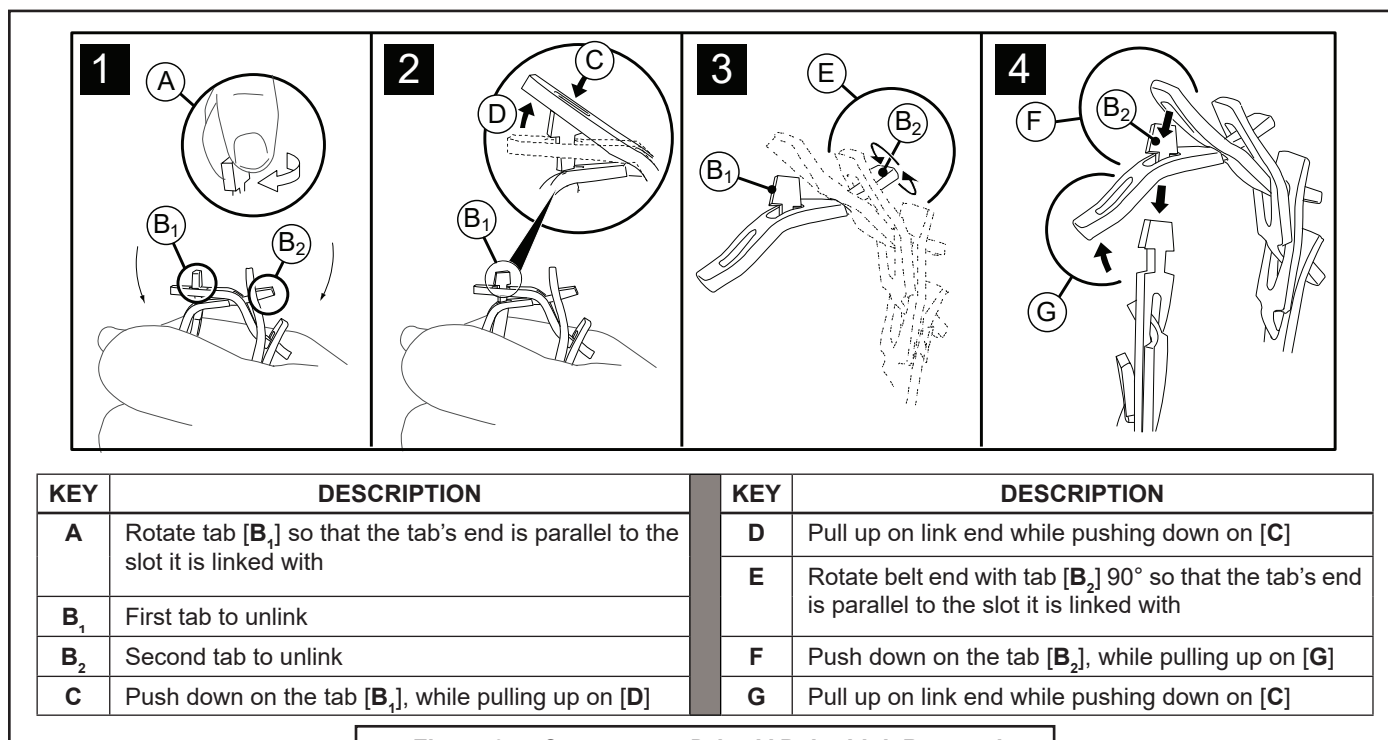


Figure 3-7: Compressor Drive V-Belt - Link Removal

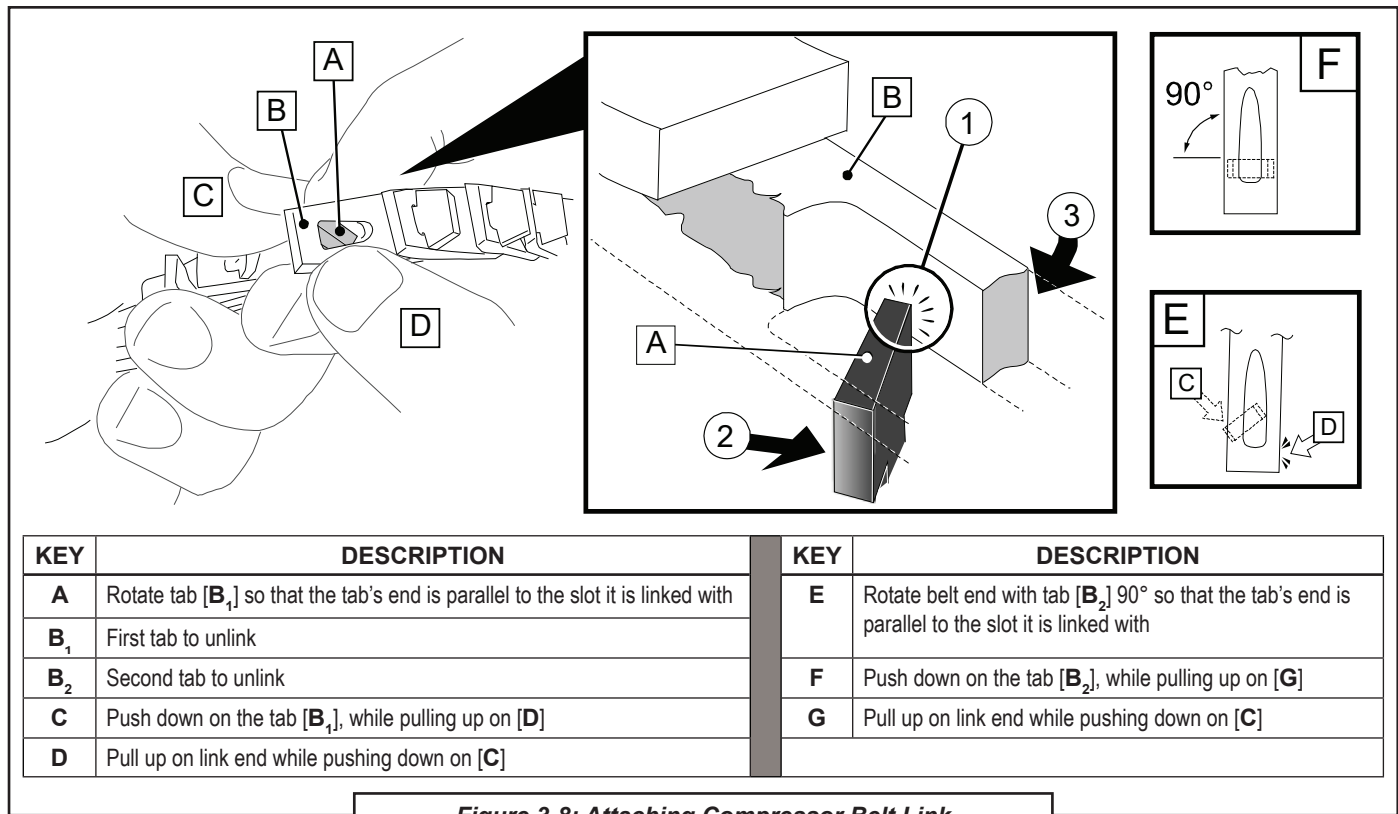


Figure 3-8: Attaching Compressor Belt Link

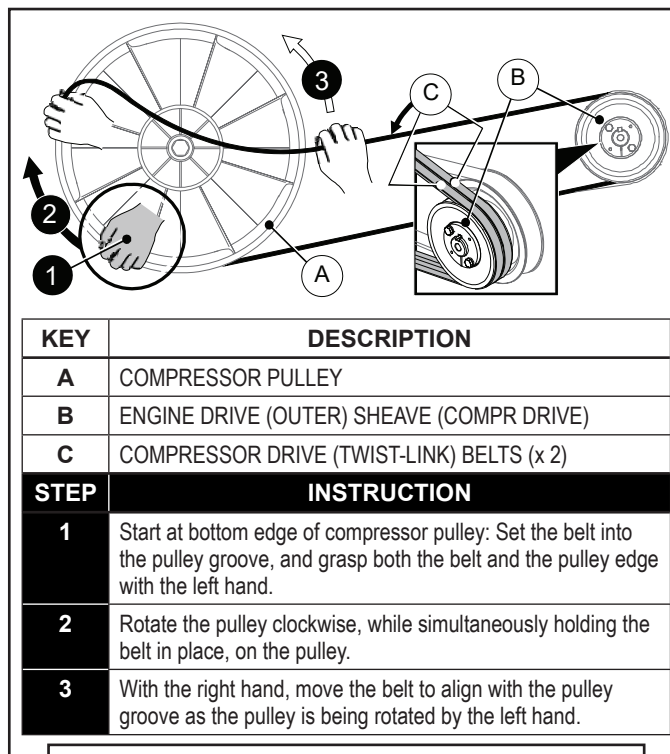


Figure 3-9: Setting Compressor Belt(s) into Place

NOTE

Since there are two compressor drive belts, assemble the inner belt (ergo, drive tracks closest to the compressor and engine) first. Also ensure that the first belt to be set aligns properly (inner or outer) to the grooves of the compressor pulley and drive sheave.

1. Make certain that the belt is sized correctly before setting it into place on the pulleys. Consult **Sections 3.4.3.4 through 3.4.3.6** to size and assemble the belt.
2. The belt should be linked as a completed loop prior to setting it onto the pulley tracks. Run belt around the proper belt groove on the engine pulley, taking care that the belt's tabs are facing inward toward the pulley, and the arrows on the belt point in the same direction as the arrow of rotation on the compressor pulley (see **Figure 3-6**, [B] and [D]).
3. Start at the bottom edge of the pulley as per **Figure 3-9**: Continue to set the belt into the proper groove on the compressor pulley (inside belt to inside track; outside belt to out-

side track as in **Figure 3-9**).

- After the belt is seated into the compressor pulley groove, hold the belt and the pulley with the left hand, while rotating the pulley in the direction shown. At the same time, feed the belt upward with the right hand as the pulley is turned.
- The belt will slip into place once the left hand, which is holding the belt, reaches near the top of the compressor pulley.

3.4.3.8 SERVICING THE GENERATOR SERPENTINE BELT

The generator is driven by the engine using a serpentine belt. This belt will generally not need replacement during the service life of the generator system. However, over time it become loose and need to be tightened. The proper tension can be determined by using a tension tester to measure the deflection from a given force.

The belt guard must be removed to access the drive belt. The Air N Arc 250-L Series All-In-One Power System® utilizes a single serpentine v-belt to drive the generator system. Consult **Section 3.4.3.1, Accessing the Drive Belts**, for instructions on how to remove the belt guard.

3.4.3.9 RE-TENSIONING THE GENERATOR SERPENTINE DRIVE BELT

Refer to **Figure 3-10** to identify the main components of the generator drive system. once the generator drive belt is established onto the engine, generator and idler pulleys, the spring ten-

sioner on the idler pulley will self-adjust the belt to the proper fit, so there is no additional adjustment required.

However, over time the belt or the tensioner assembly can become worn, lose proper operation tension, and need to be replaced.

3.4.3.10 REPLACING THE GENERATOR SERPENTINE DRIVE BELT

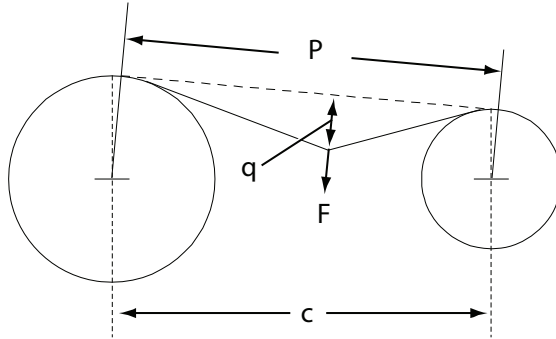
NOTE

In order to replace the generator serpentine belt, the compressor belts will need to be removed. Consult Section 3.4.3.3, Steps #3 and #4 to remove the compressor belts.

Once the compressor drive belt is removed, the worn generator serpentine belt can be replaced. Refer to **Figures 3-2** and **3-9**, and the following steps:

- Locate the generator auto-tensioner in **Figure 3-10 [B]**. Using a socket wrench, apply pressure downward to loosen the belt tension, as shown.
- When belt is loose enough to clear the sheave(s), retain pressure on the socket wrench (auto-tensioner) in order to remove the belt from the drive track.
- Obtain a replacement belt and ensure that the grooved side of the belt runs on the inside to directly contact the drive pulleys, then position and route the new generator serpentine belt as shown in **Figure 3-10**. Note that the auto-tensioner will need to be positioned with the aid of the socket wrench in order to allow

TABLE 3C: MEASURING BELT DEFLECTION

		P	Span Length	
		c	Center Distance	
		F	Deflection Force	
		q	Deflection Distance	
			DEFLECTION FORCE (lbs)	
SPAN LENGTH (in)	DEFLECTION DISTANCE (in)	ALL RIBS		TORQUE TO IN-LB TENSION
		RE-TENSION		NEW INSTALL
		RE-TENSION		NEW INSTALL

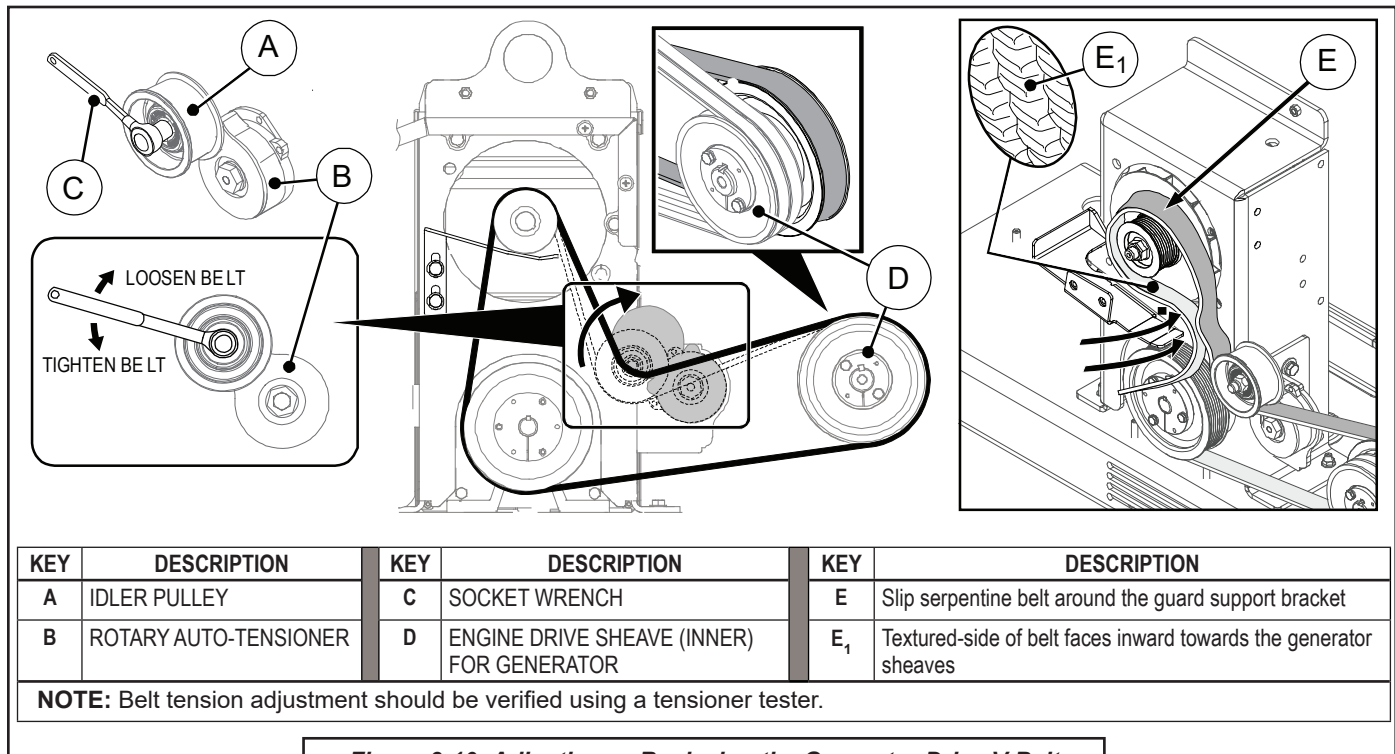


Figure 3-10: Adjusting or Replacing the Generator Drive V-Belt

the belt to fit to the generator drive system.

- Replace the compressor v-drive belts.

NOTE

After generator belt has been replaced, the compressor belts will have to be re-established. Always recheck compressor belt tension after resetting the compressor belts on the pulleys (refer to Section 3.4.3.7).

- After the compressor belts have been reset and their tensions confirmed, replace the belt guard shield as per Section 3.4.3.2.

NOTE

If a new generator belt is installed, recheck the tension after 10-20 hours of operation, to assure that the auto-tensioner is working properly.

NOTE

Proper alignment of all pulleys on the serpentine belt is crucial. A chirping or squeaking sound after replacing the belts may indicate an alignment problem. Always inspect and replace the belts as recommended in the maintenance section of this manual.

3.4.3.11 DRAINING THE AIR TANK

The air tank reservoir may accumulate a moisture build-up on the inside due to the compression of air. The air tank should be checked daily and allowed to drain by opening the drain cock on the tank valve. For areas of high ambient moisture content the valve may need to be checked more than once per day. This valve may be accessed at any time, including while the machine is in operation.

3.4.3.12 SERVICING THE SYSTEM FUSES AND CIRCUIT BREAKERS

⚠ DANGER

Fuses will need to be replaced if they are blown. When changing any fuse, or dealing directly with any function of the electrical system maintenance, always be aware of the safety warnings given in Section 1, Safety.

Consult **Figure 3-11** to determine the location of the engine and generator breakers, and **Figure 3-12** for the location of the relay bank and power system fuse housing.

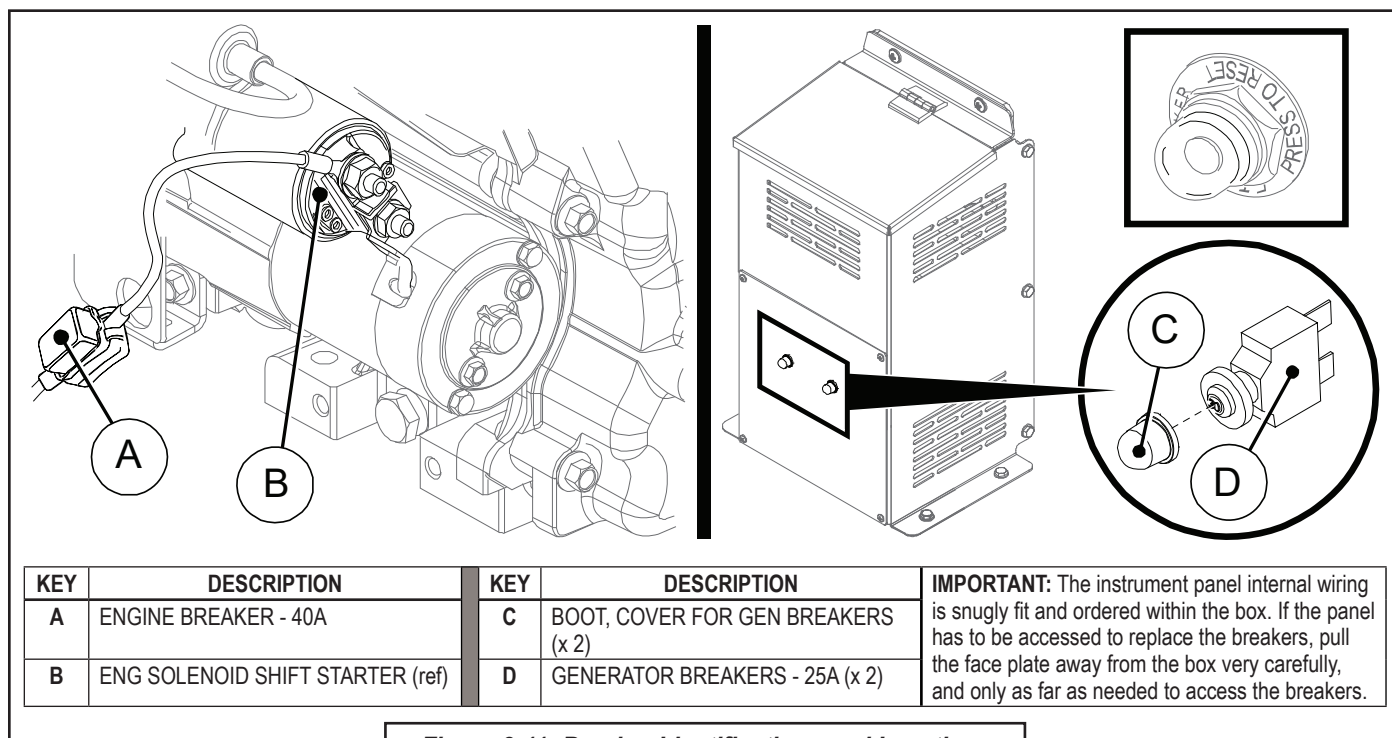


Figure 3-11: Breaker Identifications and Locations

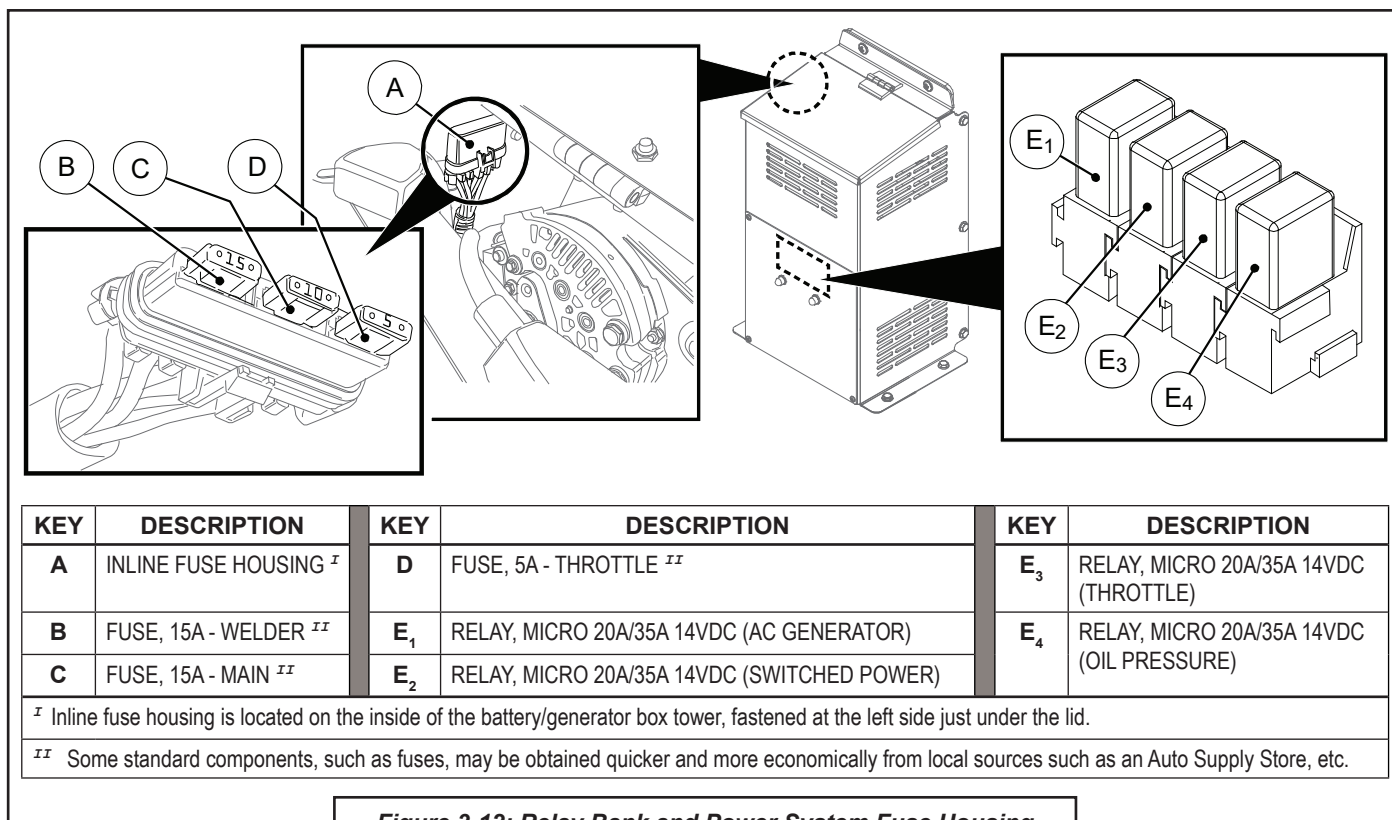


Figure 3-12: Relay Bank and Power System Fuse Housing

 WARNING

Before performing maintenance:
Shut down machine, relieve all system pressure and lock out all power, as per the Safety Section of this manual. If machine is hot, allow package to cool before removing any panel.
Always clearly tag the start-up instrumentation against accidental system start-ups during maintenance.

NOTE

There are also two (2) 20A circuit breakers located on the instrument panel. Refer to Section 2, *Figure 2-1 [F]*.

3.5 STORAGE AND INTERMITTENT USE

 CAUTION

Parts can wear or degrade over time. Do not operate with worn or degraded equipment parts.
Replace as needed.

3.5.1 INTERMITTENT USE

If the unit is not used very regularly always treat the fuel with a fuel stabilizer.

Check all belts and hoses for signs of deterioration such as visible surface cracks, stiffness or discoloration.

3.5.2 LONG TERM STORAGE

Disconnect the battery cable that is connected to the positive (+) side of the battery.

De-pressurize the air tank and open the drain valve on the tank.

If fuel tank present, fill the fuel tank with fuel and fuel stabilizer to prevent moisture build-up in the tank, and start up to cycle fuel stabilizer through-out engine before storing.

SECTION 4:

TROUBLESHOOTING

4.1 GENERAL INFORMATION

The information contained in this section has been compiled from years' worth of information gathered from the field. It contains symptoms and usual causes for the most common types of problems that may occur. All available data concerning the trouble should be systematically analyzed before undertaking any repairs or component replacement.

A visual inspection is worth performing for almost all problems and may avoid unnecessary additional damage to the machine. The procedures which can be performed in the least amount of time and with the least amount of removal or disassembly of parts should be performed first.

Although Vanair® strives to anticipate situations that may occur during the operation life of the machine package, the Troubleshooting Guide may not cover all possible situations. Be aware that additional troubleshooting information may be found in other sources, such as the Engine Operation Manual. Should the situation remain unresolved after exhausting available sources, contact the Vanair Service Department at:

Toll Free: (800) 526-8817
Phone: (219) 879-5100
Service: (844) VAN-SERV
(844) 826-7378
Service Fax: (219) 879-5335

NOTE

When contacting the Vanair Service Department, please have machine serial number on hand to quickly expedite service. See *Figure 4-1* for machine serial plate location.

Machine serial number also displays on instrument panel at start-up, on the hours screen.

⚠ WARNING

DO NOT operate any of the Air N Arc 250 Series' functions if there is a known unsafe condition. Disable the equipment by disconnecting it from its power source. Install a lock-out tag to identify the equipment as inoperable to other personnel to prevent accidental application.

⚠ WARNING

Before starting, performing maintenance, or replacing parts, relieve the entire system pressure by opening the air tank drain/vent valve, which will vent all pressure to the atmosphere.

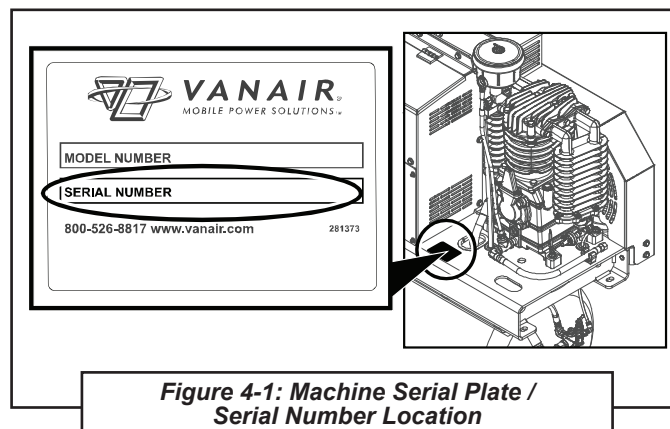


Figure 4-1: Machine Serial Plate / Serial Number Location



4.2 TROUBLESHOOTING GUIDE

Fault/Malfunction	Possible Cause	Corrective Action
ENGINE [†]		
Engine will not crank	Faulty battery connection.	Check for proper battery connections and battery charge.
	Battery out of power	Recharge or replace battery.
	Engine fuse blown or faulty	Check engine fuse: See Section 3.4.3.12, Servicing the System Fuses and Circuit Breakers , and/or consult the Engine Operation Manual.
	Faulty starter connection	Check for proper electrical connections at starter.
Engine will crank, but not start	Low fuel and/or oil supply	Check fuel gauge. Check engine oil level; refer to Table 3A, Key #5 . Replenish as necessary. Consult the Engine Operation Manual for additional information.
	Wrong fuel type fill	Use only clean, automotive grade gasoline—do not use E85, etc. Refer to Engine Operation Manual for information on engine fuel type to use.
	Pinched fuel line	Replace or reroute if necessary.
	Fuel filter(s) and/or fuel lines partly plugged	Replace fuel filter or lines. Refer to Engine Operation Manual for assistance with replacing the engine gas and in-line filters.
	Low battery voltage	Recharge or replace if necessary.
		Loose connections; tighten connections.
		Dirty connections; clean connections.
	Restricted engine air filter	Check that the air pre-cleaner and filter elements, and all components are properly secured (air pre-cleaner: Table 3A, Key #3 , and air filter: Table 3A, Key #12). Clean or replace as necessary.
	Defective oil pressure switch	Check continuity, and replace Kohler® Oil Sentry Protection switch, if necessary (refer to Engine Operation Manual).
		Remove wire—if it runs, the switch is faulty.
	Blown fuse	Check continuity, and replace if necessary. See Section 3.4.3.12, Servicing the System Fuses and Circuit Breakers , and/or consult the Engine Operation Manual.
	Poor ground connection	Check and clean/renew connection.
	Fouled spark plug	Check spark plug and replace if necessary. Refer to Engine Operation Manual.
Improper Control Operation: Engine does not speed up	Throttle solenoid stuck	Check throttle solenoid. Replace if necessary.
		Check throttle relay; replace if necessary. Refer to Section 3.4.3.12, Servicing the System Fuses and Circuit Breakers .
	Faulty throttle solenoid	Check throttle solenoid; replace if necessary.
		Check throttle relay; replace if necessary. Refer to Section 3.4.3.12, Servicing the System Fuses and Circuit Breakers .

[†] Do not attempt to service or replace major engine components, or any items that require special timing or adjustment procedures. Contact the Engine manufacturer. For additional information concerning the engine, consult the Engine Operation and/or Service Manual(s).

Continued on next page...



4.2 TROUBLESHOOTING GUIDE

Fault/Malfunction	Possible Cause	Corrective Action
ENGINE (CONTINUED)^x		
Improper Control Operation: Engine does not speed up (continued)	Governor stuck	Free governor and lubricate if necessary.
	Fuel filter(s) and/or fuel lines partly plugged	Replace fuel filter or lines. Refer to Engine Operation Manual for assistance with replacing the engine gas and in-line filters.
	Unloader valve(s) sticking or faulty	Consult the Vanair Service Department.
	Blown system fuse	Check system fuse; replace if necessary. See Section 3.4.3.12, Servicing the System Fuses and Circuit Breakers , and/or consult the Engine Operation Manual.
	Broken or faulty wiring	Check harness connections and wiring condition.
Improper Control Operation: Engine does not slow down	Leak in control line	Check for leaks; replace line if necessary.
	Pressure control out of adjustment or malfunctioning	Pressure settings may need to be reset. Consult Section 3.4.1, Adjusting Compressor Cut-in / Cut-out Pressure .
	Unloader valve(s) sticking or faulty	Valves may need to be cleaned or rebuilt/replaced. Consult the Vanair Service Department.
	Defective oil pressure switch	Check continuity, and replace Kohler® Oil Sentry Protection switch, if necessary (refer to Engine Operation Manual).
	Throttle solenoid stuck	Check throttle solenoid. Replace if necessary.
		Check throttle relay; replace if necessary. Refer to Section 3.4.3.12, Servicing the System Fuses and Circuit Breakers .
Engine overheats	Broken or faulty wiring	Check harness connections and wiring condition.
	Located too close to obstruction	Move further from obstruction, or move obstructing obstacle(s).
	Restricted engine oil filter	Replace engine oil filter. Refer to Table 3A, Key #2 . Also refer to the Engine Operation Manual.
	Low oil level	Check engine oil level; refer to Table 3A, Key #5 . Replenish as necessary. Consult the Engine Operation Manual for additional information.
	Restricted engine air filter	Check that the air pre-cleaner and filter elements, and all components are properly secured (air pre-cleaner: Table 3A, Key #3 , and air filter: Table 3A, Key #12). Clean or replace as necessary.
	Restricted cooling air in or out	Clean engine intake grill. Refer to the Engine Operation Manual.
Engine stops during operation	Engine oil cooler plugged	Clear debris/dirt from cooler core/flush shroud. Refer to the Engine Operation Manual.
	Low oil level	Check engine oil level; refer to Table 3A, Key #2 . Replenish as necessary. Consult the Engine Operation Manual for additional information.
	Low fuel	Check fuel gauge. Fill as necessary.
	Fuel filter(s) and/or fuel lines partly plugged	Replace fuel filter or lines. Refer to Engine Operation Manual for assistance with replacing the engine gas and in-line filters.
	Wrong fuel type fill	Use only clean, automotive grade gasoline—do not use E85, etc. Refer to Engine Operation Manual for information on engine fuel type to use.

^x Do not attempt to service or replace major engine components, or any items that require special timing or adjustment procedures. Contact the Engine manufacturer. For additional information concerning the engine, consult the Engine Operation and/or Service Manual(s).

Continued on next page...

4.2 TROUBLESHOOTING GUIDE

Fault/Malfunction	Possible Cause	Corrective Action
ENGINE (CONTINUED)[†]		
Engine stops during operation (continued)	Restricted engine air filter	Replace.
	Overtemp switch active or faulty	Allow to cool; replace if necessary.
	Restricted cooling air in or out	Clean engine intake grill. Refer to the Engine Operation Manual.
	Fouled spark plug	Check spark plug and replace if necessary. Refer to Engine Operation Manual.
Gradual loss of engine power	Contaminated fuel	Drain and replace fuel supply.
	Wrong fuel type fill	Use only clean, automotive grade gasoline—do not use E85, etc. Refer to Engine Operation Manual for information on engine fuel type to use.
	Engine air filter contaminated	Check that the air pre-cleaner and filter elements, and all components are properly secured (air pre-cleaner: Table 3A, Key #3 , and air filter: Table 3A, Key #12). Clean or replace as necessary.
	Fuel filter(s) and/or fuel lines partly plugged	Replace fuel filter or lines. Refer to Engine Operation Manual for assistance with replacing the engine gas and in-line filters.
	Vapor lock	Machine overloading. Allow to cool. Refer to “Engine overheats” section in this Troubleshooting Guide.
	Defective oil pressure switch	Check continuity, and replace Kohler® Oil Sentry Protection switch, if necessary (refer to Engine Operation Manual).
	Fouled spark plug	Check spark plug and replace if necessary. See Engine Operation Manual.
COMPRESSOR		
Flywheel rotation slows down	Belt(s) slipping	Re-tension or replace belts.
Severe vibration	Bent crankshaft	Remove and replace. Contact Vanair for details.
Abnormal noise	Loose valve assembly	Tighten valve bolt and lock nut.
	Piston hits cylinder cover	Check piston & rod assembly for excessive wear.
	Worn connecting rod bearing.	Replace bearing.
Compressor overheats	Low compressor oil level	Check oil level and refill to proper level if necessary. Refer to Table 3A, Key #4 . Do not overfill.
	Obstructed or restricted intake air flow	Check for obstructions (frame, body, etc.) to air filter vents. Replace air filter if necessary. Refer to Table 3A, Key #13 .
	Unloader valve(s) sticking or faulty	Valves may need to be cleaned or rebuilt/replaced. Consult the Vanair Service Department.
Compressor will not build up pressure	Worn valve plate	Repair or replace valve plate.
	Valve springs have lost their temper	Replace valve springs.
	Dirt on the valve plate	Remove and clean it.
	Leaks from safety valve	Repair or replace safety valve.
[†] Do not attempt to service or replace major engine components, or any items that require special timing or adjustment procedures. Contact the Engine manufacturer. For additional information concerning the engine, consult the Engine Operation and/or Service Manual(s).		
Continued on next page...		



4.2 TROUBLESHOOTING GUIDE

Fault/Malfunction	Possible Cause	Corrective Action
COMPRESSOR (CONTINUED)		
Compressor will not build up pressure (continued)	Leaks from bolt holes	Tighten the nuts even with packing.
	Uneven valve seat surface	Remove and lap the surface.
	Excessive blow by on piston rings	Replace with new ones.
	Bad packing (gasket too thick)	Replace packing (gasket).
	Excessive air leaks	Eliminate air leaks.
	Compressor system is not receiving enough operating power	If running more than one function simultaneously, turn off competing function.
	Air demand too high	Check for leaks and take corrective action.
		Check air tools for wear, damage, or malfunctions. Replace or repair.
	Pressure control out of adjustment or malfunctioning	Pressure settings may need to be reset. Consult Section 3.4.1, Adjusting Compressor Cut-in / Cut-out Pressure.
	Compressor capacity too low to accommodate demand	Substitute larger capacity compressor system.
	Obstructed or restricted intake air flow	Check for obstructions (frame, body, etc.) to air filter vents. Replace air filter if necessary. Refer to Table 3A, Key #13.
	Belt(s) slipping	Re-situate and adjust belts for tension, or replace belts if necessary. Consult Section 3.4.3, Replacing and Re-tensioning the Compressor and/or Generator Drive Belts , and its sub-sections.
	Engine governor stuck	Free governor and lubricate if necessary. Consult the Engine Operation Manual.
	Unloader valve(s) sticking or faulty	Valves may need to be cleaned or rebuilt/replaced. Consult the Vanair Service Department.
	Pressure relief valve not operating properly	Replace if necessary.
	Leak in air system	Inspect air system for leaks.
	Faulty throttle solenoid	Check throttle solenoid; replace if necessary.
		Check throttle relay; replace if necessary. Refer to Section 3.4.3.12, Servicing the System Fuses and Circuit Breakers.
	Service valve is open	Close service valve.
	Pressure gauge is malfunctioning	Check pressure gauge function/control line routing; adjust, repair or replace as necessary.
Slipping of belts	Pressure gauge is malfunctioning (continued)	Check for proper operation with an auxiliary air source. Replace if necessary.
	Discharge piping leaks	Tighten connections; replace faulty piping.
	Working pressure too high	Lower working pressure.
	Improper belt tension	Re-situate and adjust belts for tension, or replace belts if necessary. Consult Section 3.4.3, Replacing and Re-tensioning the Compressor and/or Generator Drive Belts , and its sub-sections.
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4.2 TROUBLESHOOTING GUIDE

Fault/Malfunction	Possible Cause	Corrective Action
COMPRESSOR (CONTINUED)		
Slipping of belts (continued)	Worn belt	Replace with new ones.
Inaccuracy of pressure gauge	Pressure gauge damaged	Replace.
Excessive moisture in the compressed air	Moisture accumulating in air tank	Drain water from air tank. Refer to Section 3.4.3.11, Draining the Air Tank.
Compressor system over-pressures and/or relief valve opens	Damaged/kinked control line	Check line for damage (wear, kinks, etc.). Re-route, re-tie or replace if necessary.
	Restriction in control line	Clean if soiled; if ice is present, clear and remove.
	Control line connections are not properly seated/poor connection quality	Check lines for proper seating/ensure line ends have been cut cleanly and are square (DO NOT use wire cutters: use a loom cutting tool or a clean, sharp razor blade).
	Pilot valve out of adjustment or malfunctioning	Pressure settings may need to be reset. Consult Section 3.4.1, Adjusting Compressor Cut-in / Cut-out Pressure.
	Pressure gauge is malfunctioning	Check for proper operation with an auxiliary air source. Replace if necessary.
		Check pressure gauge function/control line routing: adjust, repair or replace as necessary.
	Defective safety valve	Replace safety valve.
No service air output	If equipped, OSHA valve/velocity fuse, not functioning properly	Reset or replace OSHA valve.
	Belt(s) not adjusted properly, worn or slipping	Belt(s) out of position or malfunctioning. Consult Section 3.4.3, Replacing and Re-tensioning the Compressor and/or Generator Drive Belts , and its sub-sections.
System operating pressure below specified minimum	Air demand too high	Check air tools for wear, damage, or malfunctions. Replace or repair.
	Compressor capacity too low to accommodate demand	Substitute larger capacity compressor system.
	Pressure control out of adjustment or malfunctioning	Pressure settings may need to be reset. Consult Section 3.4.1, Adjusting Compressor Cut-in / Cut-out Pressure.
	System leaks or is damaged	Inspect for leaks. Repair and/or replace damaged parts as necessary. Use Section 9, Illustrated Parts List to visually confirm/identify any part that needs to be replaced before ordering part.
	Pressure switch set too low/malfunction	Pressure settings may need to be reset. Consult Section 3.4.1, Adjusting Compressor Cut-in / Cut-out Pressure.
	Input rpm too low	Adjust to proper setting.
	Clogged compressor air filter	Check air filter. Replace if necessary; Refer to Table 3A, Key #13.
	Incorrect engine speed	Reduce load. Refer to Section 3.4.2, Adjusting the Engine Speed.
	Pilot valve stuck open	Check valve; clean or replace if necessary.
Excess amount of oil in air discharge	Compressor oil level too high	The correct oil level is the half-way mark on the sight glass with the compressor shut down, and the machine on a level surface. Drain excess oil to correct level. Consult Table 3A, Key #4.
Excessive oil consumption	Worn piston ring	Replace. Order Compressor Rebuild Kit no. 277608-005.
Continued on next page...		

4.2 TROUBLESHOOTING GUIDE

Fault/Malfunction	Possible Cause	Corrective Action
COMPRESSOR (CONTINUED)		
Excessive oil consumption (continued)	Worn piston	Replace; consult Vanair® Service Department for piston ring and cylinder maintenance procedures.
	Worn cylinder	Replace; consult Vanair Service Department for piston ring and cylinder maintenance procedures.
DC GENERATOR		
Welder and/or battery charger behave erratically	Connection cables or receptacles are soiled/contaminated	Check for twisted cables and/or soiled/contaminated or loose receptacle connections.
	Connection cables or receptacles are soiled/contaminated (continued)	Untwist and/or straighten out any suspected cable tensions. Carefully wipe off any contaminants to receptacle connectors before re-connecting. Replace any worn or damaged cables or receptacles. Contact Vanair Mfg., Inc. Service Department if behavior persists.
	Welding function is not drawing enough operating power	If running more than one function simultaneously, turn off competing function.
No welder output	Fuse at welder field blown	Replace the welder field fuse. Refer to Section 3.4.3.12, Servicing the System Fuses and Circuit Breakers .
Display not working	Loose or faulty wiring	Check wiring: Loose—secure; faulty—replace.
Lights do not turn off	Battery charge low	Flip AC generator switch to bring engine to high rpm, and charge battery.
AC GENERATOR		
No AC generator output	Serpentine belt out of position or malfunctioning	Re-situate and adjust belt tension, or replace belt if necessary. Consult Section 3.4.3, Replacing and Re-tensioning the Compressor and/or Generator Drive Belts , and its sub-sections.
	Loose or faulty wiring	Check wiring: Loose—secure ; faulty—replace.
	Circuit breaker blown	Replace the circuit breaker. Refer to Section 3.4.3.12, Servicing the System Fuses and Circuit Breakers .
Low AC voltage	Engine speed too low for demand	Adjust speed control. Consult Section 3.4.2, Adjusting the Engine Speed , and the Engine Operation Manual.
High AC voltage	Engine speed too high for demand	Adjust speed control. Consult Section 3.4.2, Adjusting the Engine Speed , and the Engine Operation Manual.

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SECTION 5: ILLUSTRATED PARTS LIST

5.1 PARTS ORDERING INFORMATION

Part orders should be placed through the distributor from whom the unit was purchased. If for any reason parts cannot be obtained in this manner, contact the factory directly at the address or phone numbers below.

When ordering parts always indicate the Serial Number of the machine package. This can be obtained from the Bill of Lading for the machine package, or from the unit's serial number plate. See **Figure 5-1** for location of machine package serial plate. **Consult Table 5A: Recommended Spare Parts List** on the next page for a listing of replacement parts.

Vanair Manufacturing, Inc.

10896 West 300 North

Michigan City, IN 46360

Telephone (toll free): (800) 526-8817

Service (toll free): (844) VAN-SERV

(844) 826-7378

Telephone: (219) 879-5100

Service Fax: (219) 879-5335

Parts Fax: (219) 879-5340

Sales Fax: (219) 879-5800

www.vanair.com

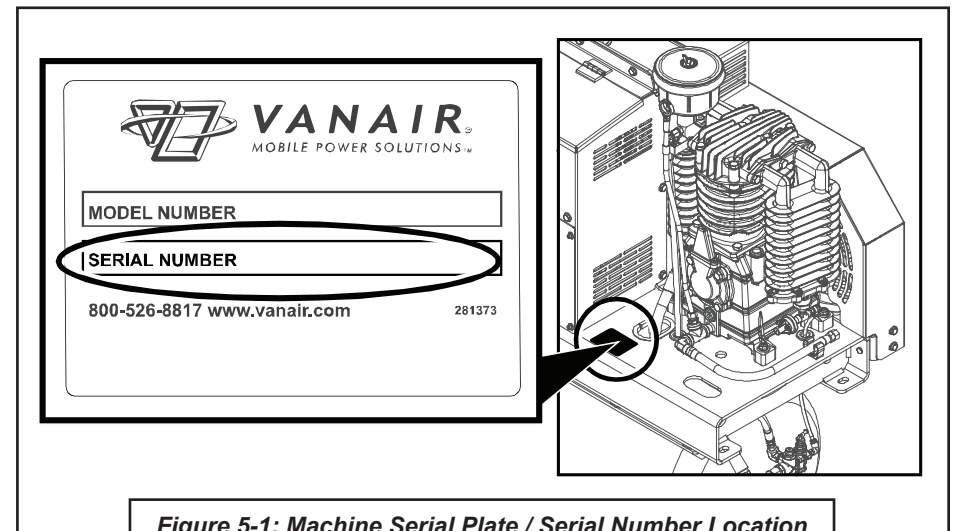


Figure 5-1: Machine Serial Plate / Serial Number Location

TABLE 5A: RECOMMENDED SPARE PARTS LIST

KEY NO.	DESCRIPTION	PART ORDER NO.	QTY	KEY NO.	DESCRIPTION	PART ORDER NO.	QTY
ROUTINE/SCHEDULED MAINTENANCE ITEMS							
1	Element, Engine Air Filter Replacement	270764	1	4	Filter, Engine In-line Fuel (75 µ)	RC81465	1
2	Filter, Engine Oil	269136	1	5	Oil, Compressor Vanair® Reciprocating (gallon) ^x	271856-1GAL	-
3	Filter, Engine Gas (10 µ)	RC77662	1	6	Element, Compressor Air Filter Replacement	277608-001	1
MAINTENANCE SERVICE KITS							
7	Kit, 100 Hour Maintenance for Engine Filters ^{xx}	KIT1291	1	9	Kit, Compressor Head Rebuild ^{xv}	277608-005	1
8	Kit, 200 Hour Maintenance for Engine Filters ^{xxx}	KIT1119	1	10	Kit, Complete Compressor Rebuild ^v	277608-006	1
INDIVIDUAL MAINTENANCE ITEMS							
11	Oil, Engine 10W30 (quart) ^{vx}	274439	1	20	Valve, Piloted Check Assembly	278211	1
12	Belt, Compressor Twist-link Drive Replacement ^{vii}	EN270451-007	2	21	Switch, Pressure (N.O.)	2646901	1
13	Belt, Generator Serpentine Drive Replacement	DR62184	1	22	Gauge, Air Dry	CO89649	1
14	Breaker, Circuit with Studs 40A without Bracket	270492	1	23	Gauge, Fuel / Hour Meter	CO269748	1
15	Relay, Micro 20A/35A 14VDC	EL274682	4	24	Relay, 500A, (control panel)	EL270483	1
16	Boot, Breaker Generator Panel Mount 7/16" Replacement	PR81817	2	25	Fuse, Mini 5A ^{viii}	-	1
17	Breaker, 25A (generator)	CO270786	2	26	Fuse, Mini 10A ^{viii}	-	1
18	Boot, circuit breaker (instr panel location)	PR270548	2	27	Fuse, Mini 15A ^{viii}	-	1
19	Breaker, manual reset 20A (panel mount)	CO62617	2	28	Battery, 12V (lead acid) ^x	-	1

NOTES

ⁱ Compressor oil capacity at oil change is approximately 1.1 quarts; oil is sold in gallon containers. **DO NOT** overfill.

^{xx} Engine 100 Hour Kit (**no. KIT1291**) consists of: air pre-cleaner replacement no. 263675, air filter replacement no. 262722, oil filter replacement element no. 270757, 10W30 motor oil no. 274439 (quart sized; quantity of two [2]). Do not mix different oil weights.

^{xxx} Engine 200 Hour Kit (**no. KIT1119**) consists of: air pre-cleaner replacement no. 263675, air filter replacement no. 262722, oil filter replacement element no. 270757, 10µ engine gas filter no. EN269654, 75µ in-line fuel filter no. RC81465.

^{xv} For information on Compressor Head Rebuild Kit (no. 277608-005) contact the Vanair Service Department.

^v For information on Compressor Complete Rebuild Kit (no. 277608-006) contact the Vanair Service Department.

^{vii} The compressor is driven by two Twist-link V- belts. Whether removing a link or replacing a belt, Vanair recommends changing both belts at the same time.

^{viii} Some standard components, such as fuses, may be obtained quicker and more economically from local sources such as an Auto Supply Store, etc.

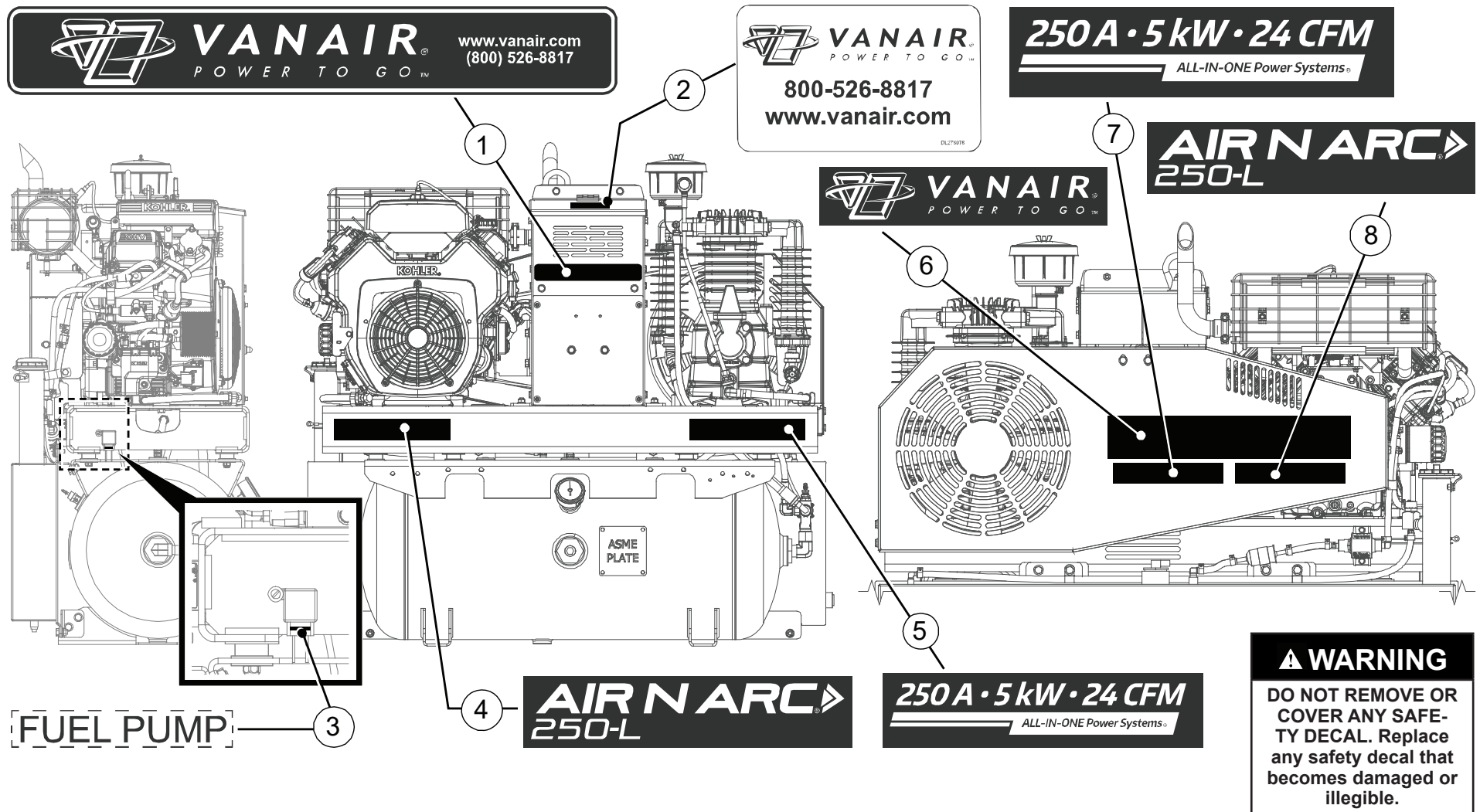
^{ix} Please contact the Vanair Service Department to obtain order part number for this item.

^x Due to shipping regulations and restrictions pertaining to lead acid batteries, Vanair recommends procuring a replacement battery from a localized source. Two possible replacement models include BatteriesPlus® no. SLI96R, and NAPA battery no. BAT 7590.

IMPORTANT: If additional spare parts are being stored for future use, ensure that they are stored in proper containers that allow for protection against contamination, and kept in a clean area of moderate temperature reading. For information on storing the machine package for periods of non-use, consult **Section 3.5.2, Long Term Storage**.

PLEASE NOTE: WHEN ORDERING PARTS, INDICATE MACHINE SERIAL NUMBER.

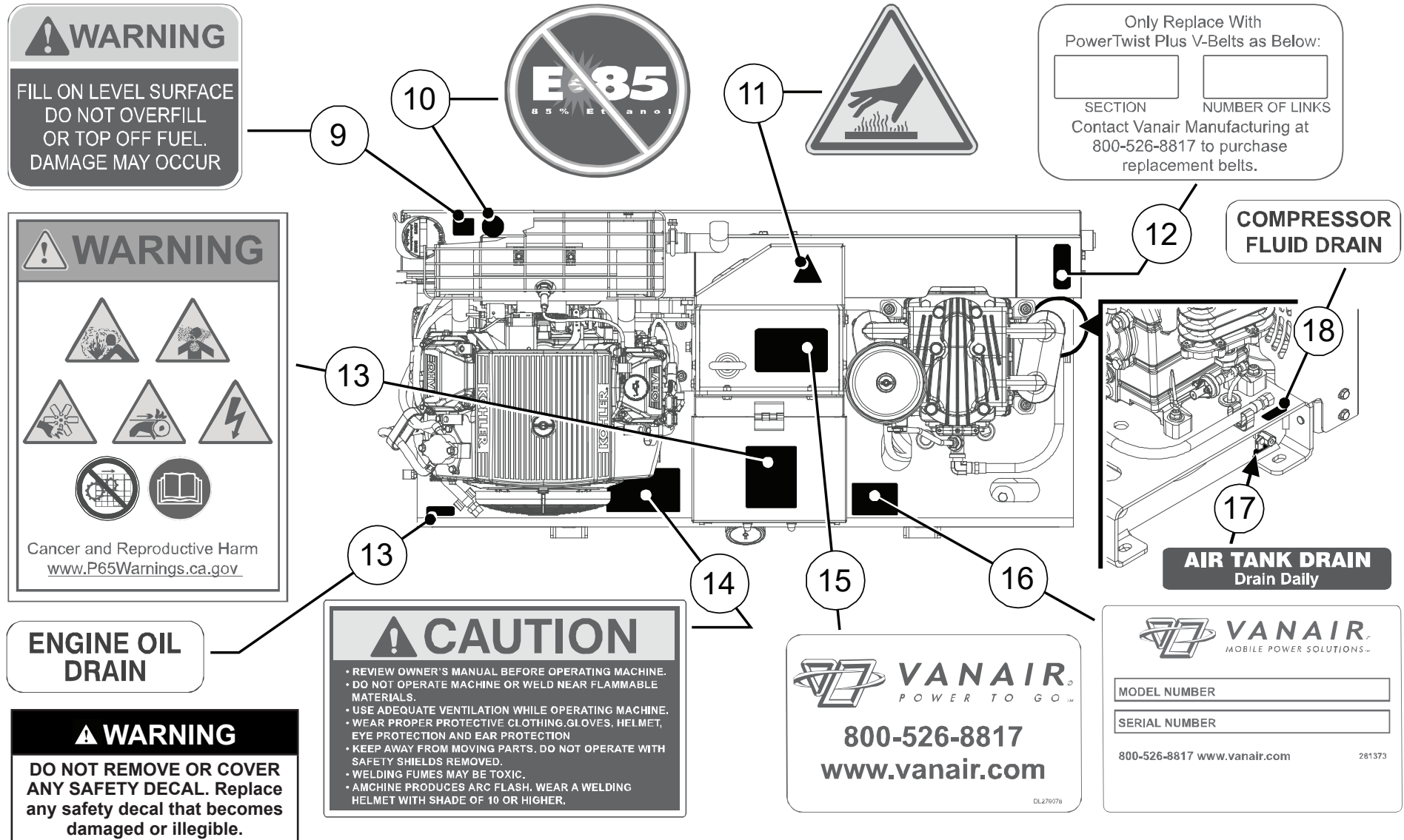
5.2 DECALS - LOCATION & IDENTIFICATION - 1 OF 2



5.2 DECALS - LOCATION & IDENTIFICATION - 1 OF 2

ITEM	DESCRIPTION	PART NUMBER	QTY
1	DECAL, INFO VANAIR	DL271081	1
2	DECAL, LOGO/CONTACT INFO HORIZ WHITE	DL276078	1
3	DECAL, FUEL PUMP	280957	1
4	LOGO, ANA 250-L BRANDING (10.49X1.88)	280031-D	1
5	BADGE, AIR N ARC 250 (10.5X1.88)	277589-B	1
6	LOGO, VANAIR HRZ - POWER TO GO (19.5X3.43)	275040-D	1
7	BADGE, AIR N ARC 250 (8.82X1.58)	277589-B	1
8	LOGO, ANA 250-L BRANDING (8.8X1.58)	280031-D	1
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE MACHINE SERIAL NUMBER.			

5.2 DECALS - LOCATION & IDENTIFICATION - 2 OF 2



5.2 DECALS - LOCATION & IDENTIFICATION - 2 OF 2

ITEM	DESCRIPTION	PART NUMBER	QTY
9	DECAL, DO NOT TOP OFF	272649	1
10	DECAL, NO E85 GAS CAP LOGO	DL270183	1
11	DECAL, WARNING HOT TRIANGLE 2.0"	280032	1
12	DECAL, PWRTWST BELT INFO WHITE	DL269689	1
13	DECAL,GOODALL WARNINGS	279408	1
14	DECAL, ENGINE OIL DRAIN	275053	1
15	DECAL, CAUTION ANA	DL270120	1
16	DECAL, LOGO/CONTACT INFO HORIZ WHITE	DL276078	1
17	DECAL, COMPRESSOR FLUID DRAIN	275054	1
18	DECAL, AIR TANK DRAIN	DL269676	1
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE MACHINE SERIAL NUMBER.			

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WARRANTY CLAIMS PROCEDURE

CLAIMS PROCESS FOR WARRANTED VANAIR® PARTS

This process must be used by owners of Vanair equipment in situations where a warranted item needs repair or replacement under the terms of the purchase warranty. Do not return items to Vanair without prior authorization from the Vanair Warranty Administrator.

PROCEDURE:

When a customer needs assistance in troubleshooting a system and/or returning parts, follow the steps below.

1. Locate the machine's serial number:

The machine package serial number plate is located inside the machine compartment on the floor near to the generator mounting location (see **Figure W-1**).

The engine and the compressor also have individual serial numbers respectively (see **Figure W-1**). For engine warranty issues, consult the Engine Operation Manual for the engine's limited warranty details. For particular compressor unit issues, the compressor serial number may be needed. In any case, engine and/or compressor issues can be confirmed using the machine serial number as found in **Figure W-1**.

2. Have a list of the symptoms/condition/malfunctions along with any applicable temperature and pressure readings, and also the number of operational hours available:

Note that the above information will also need to be included on the Return Material Authorization Form (per **Step #6**); this form is necessary for warranty processing if the warranty claim is deemed valid by the service case review.

3. Contact the Vanair Service Department by phone (1-844-VANSERV or 1-219-879-5100) to speak with a Service Technician.

4. Vanair Service will troubleshoot the prob-

lem based on the information provided by the customer, and attempt to return the unit to service as quickly as possible.

5. If the unit cannot be returned to service, and Vanair determines this matter is a warranty issue, the Service Technician will assign an RMA (Return Material Authorization) number that will provide for the return of the item to Vanair for analysis and a final determination as to the item's warranty status.

NOTE

The RMA number must be placed on the outside of the package being returned.

6. **Warranty Claims are solicited via a Return Material Authorization (RMA) Form.** This form can be obtained via download from the web site, or requested directly from the Vanair Service Department:

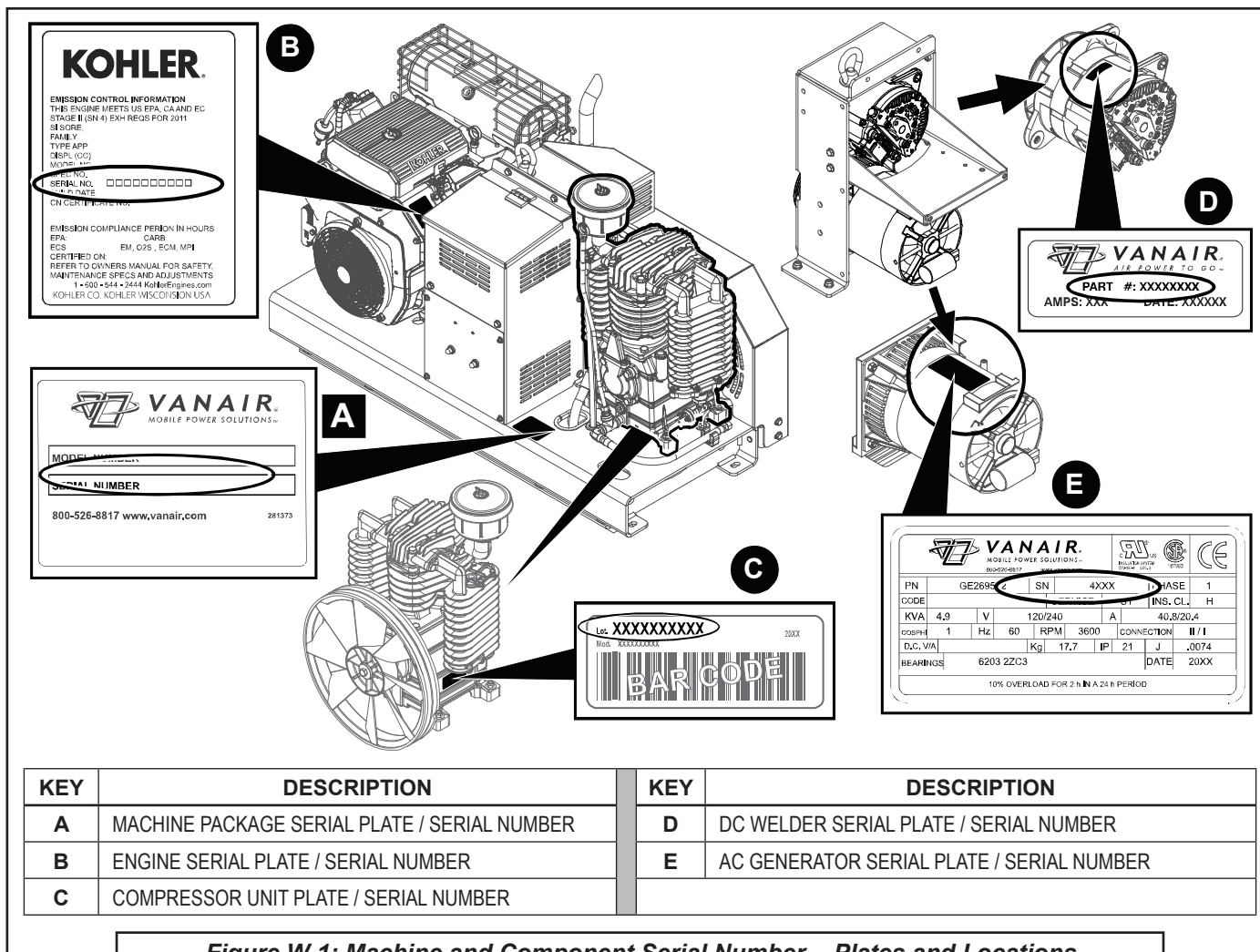
Once a current form has been obtained, follow the instructions given on the form to fill in the information needed. This form is used for the purpose of soliciting a warranty case. All of the field information except for the bottom section block fields, which includes Disposition of Goods, Notifications and Additional Notes, will be required.

Customers have 30 days after the RMA number is issued to return the item. If the part is not returned within this period, the RMA is void and any claims will be denied.

NOTE

All labor claims or invoices must be approved by the Vanair Warranty Administrator prior to starting repair work along with the cost of the repair. All paper work associated with the returned item and warranty repair cost must reference the RMA number issued against the part, and be forwarded to Vanair within 30 days of the completion of work.

Before sending a warranty part to a customer,



Vanair® will need a P.O. or credit card number to cover the cost of the part and shipping. After the part is analyzed and deemed to be covered under warranty, Vanair will issue credit to the customer. All parts eligible for warranty must have the RMA number on the invoice at the time of purchase.

No items can be returned “freight collect”. Freight costs will be addressed at the time the claim is closed. The customer pays any additional costs for warranty parts delivered through expedited services (i.e., Next Day, Second Day).

IMPORTANT

Vanair will never accept any invoices for parts returned. Any parts returned via invoice will be returned freight collect. No parts are to be returned freight collect!

Vanair Mfg., Inc. strives to continuously improve its customer service. Please forward any questions, comments, or suggestions to:

**Vanair Service Toll Free: 1-844-VAN-SERV
1-844-826-7378**

Vanair Service Direct: 1-219-879-5100, ext. 400

Vanair Service FAX: 1-219-879-5335

E-mail: service@vanair.com

APPENDIX A: ADDITIONAL INFORMATION

A.1: ELECTRIC MOTOR CHART - STARTING WATTS [†]

HORSEPOWER	RUNNING WATTS	UNIVERSAL MOTOR (sm. appliance)	INDUCTION MOTOR	CAPACITOR MOTOR	SPLIT PHASE MOTOR
1/6	275	400	600	850	1200
1/4	400	500	850	1050	1700
1/3	450	600	950	1350	1950
1/2	600	750	1300	1800	2600
3/4	850	1000	1900	2600	X
1	1000	1250	2300	3000	X
1 1/2	1600	1750	3200	4200	X
2	2000	2350	3900	5100	X
3	3000	X	5200	6800	X
5	4800	X	7500	9800	X

[†] Approximate current requirements.

NOTE: For pumps, air compressors, air conditioners, inverters add at least 25% to starting current.

A.2: EXTENSION CORD CHART

CONTINUOUS LOAD (use either Amps or Watts below)			MINIMUM GAUGE (AWG)		
AMPS	@120 volts	@240 volts	0-50 feet	50-100 feet	100-150 feet
2	240	480	22	20	18
3	360	720	22	18	16
4	480	960	20	16	16
5	600	1200	18	16	14
6	720	1440	18	16	14
8	960	1920	16	14	12
10	1200	2400	16	12	12
12	1440	2880	16	12	10
14	1680	3660	14	12	10
16	1920	3840	14	10	10
18	2160	4320	14	10	8
20	2400	4800	12	10	8
22	2640	5280	12	10	8
25	3000	6000	12	10	6
30	3600	7200	10	8	6
35	4200	8400	10	8	4
40	4800	9600	8	6	2
50	6000	12000	6	4	2
60	7200	14400	4	2	



A.3: WATTAGE REQUIREMENTS FOR COMMON RECEPTACLE UNITS

COMMON RECEPTACLE UNIT		WATTAGE	
		STARTING	RUNNING
Battery charger, 10 amps		—	200
Drill	- 1/4"	400	300
	- 3/8"	650	475
	- 1/2"	900	750
	- 1"	1250	1000
Welder 100 amps DC		—	3600
Floodlight		—	1000
Grain cleaner, 1/4 HP		1000	650
Grain elevator, 3/4 HP		3000	1400
Grinders (by motor size)			
Heater radiant portable		—	1300
Heater portable liquid fuel	- 50,000 btu	675	225
	- 100,000 btu	1260	420
	- 150,000 btu	1875	625
Impact wrench	- 1/2"	750	600
	- 3/4"	900	750
	- 1"	1400	1200
Milk cooler		1800	1100
Mixer, 3 ½ cubic feet		2300	1000
Motors			
Belt sander		2600	1200
Disc sander		2600	1200
Orbital sander		2600	1200
Chain saw			
6" circular saw		2200	950
7 ¼" circular saw		2600	1200
8 ½" circular saw		3000	1500
10" circular saw		3900	2000
Sump pump		1300	400
Water pump submersible	- 3000 gph	1750	500
	- 5000 gph	2500	650
	- 10000 gph	3750	1000
	- 15000 gph	5000	1500
Water pump non-submersible	- 3000 gph	2250	600
	- 5000 gph	2850	750
	- 10000 gph	4100	1100
	- 15000 gph	5250	1600

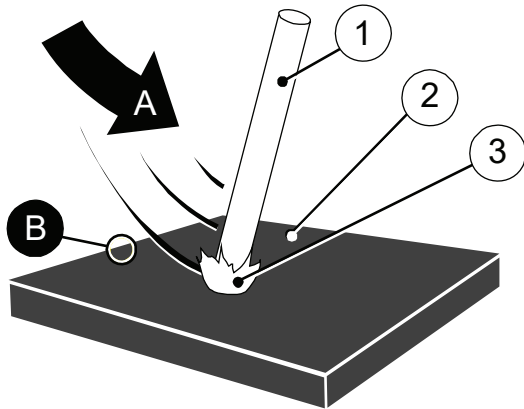
A.4: AIR TOOL CONSUMPTION CHART

TOOL	AIR REQUIRED CFM @ 90 PSI
Dual Action (DA) Sanders	28.8 - 43.2 SCFM
5" High Speed Sanders	28.8 - 43.2 SCFM
Jitterbug Sanders	28.8 SCFM
Straight Line Sanders	28.8 SCFM
Air Belt Sanders	28.8 - 43.2 SCFM
Gasket Scrapers	43.2 SCFM
Air Punch and Flange Tool	28.8 SCFM
3/8" Drill	28.8 SCFM
1/2" Drill	28.8 SCFM
Screw Driver	18 SCFM
Impact Screw Driver	28.8 SCFM
Speed Saw	36 - 43.2 SCFM
Body Saw	57.6 SCFM
Jig Saw	43.2 SCFM
16 Gauge Nibbler	28.8 SCFM
Cut off Tool	28.8 SCFM
150 mm Air Hammer	28.8 SCFM
190 mm Air Hammer	30.24 SCFM
High Speed Grinder	57.6 SCFM
Mini Air Grinder	21.6 SCFM
Mini Angle Head Grinder	21.6 SCFM
1/4" Angle Head Grinder	57.6 SCFM
Tire Buffer	28.8 SCFM
1/4" Ratchet Wrench	21.6 SCFM
3/8" Ratchet Wrench	28.8 SCFM
3/8" Butterfly Impact Wrench	21.6 SCFM
1/2" Impact Wrench	28.8 SCFM
1/2" Heavy Duty Impact Wrench	39.60 SCFM
3/4" Impact Wrench	54 SCFM
3/4" Impact Wrench with 6" anvil	54 SCFM
30 lb Pavement Breaker	37 SCFM
60 lb Pavement Breaker	48 SCFM
90 lb Pavement Breaker	68 - 85 SCFM
4" Piercing Tool	60 SCFM
60 lb 1650 BPM Rock Drill	95 SCFM
50 lb 1800 BPM Rock Drill	123 SCFM
Chipping Hammer	26 - 33 SCFM

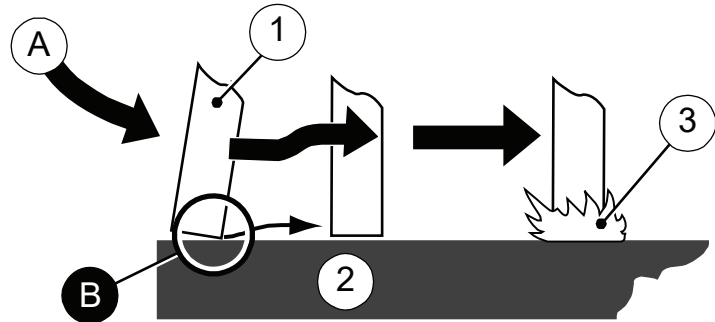
**A.5: AIR N ARC 250-L SERIES AVAILABLE OPTIONS LIST**

KEY NO.	OPTION ITEM	DESCRIPTION	PART ORDER NUMBER	QTY
1	REMOTE PANEL MOUNT	This bracket is used for remote panel installation to space panel off from truck body.	A16738P	1
3	COLD WEATHER OPTION KIT	This kit (factory install) extends cold weather temperature operation range from 0°F to -40°F (-18° to -40°C).	032793	1
4	BATTERY BOOST CABLES	These cables are 25 feet in length, with quik-connect ends.	MA269938	1 set
5	30 GALLON REMOTE AIR TANK ASSEMBLY	This remote-mounted air option allows for an additional capacity for air storage, in addition to the standard four gallon air tank on the machine.	OA49645	1
6	DUAL 14 GALLON (28 GALLON TOTAL) AIR TANK ASSEMBLY	This remote-mounted air option allows for an additional capacity for air storage, in addition to the standard four gallon air tank on the machine.	032708	1
7	SINGLE 14 GALLON AIR TANK ASSEMBLY	This remote-mounted air option allows for an additional capacity for air storage, in addition to the standard four gallon air tank on the machine.	032707	1
8	BATTERY	12 volt, 35 amp, sealed lead acid.	MA31821	1
9	BATTERY	LTV, dry cell 100 KSI	MA44454	1
10	EXTENSION SEGMENT FOR WELD CABLE	50 feet in length, 1/0 cable with connectors	MA269942	1
11	WELD HELMET	2 x 4 auto-darkening lens, solid color (blue)	MA269903	1
12	WELD HELMET LENSE	Replacement lens for welding shield	MA270500	
13	WELD LEAD	25 feet in length, 1/0 cable with electrode holder and connector - 330 amp	MA269814-25	1
14	WELD LEAD	50 feet in length, 1/0 cable with electrode holder and connector - 330 amp	MA269814-50	1
15	WELD LEAD	25 feet in length, 1/0 cable with ground clamp, and connector - 330 amp	MA269815-25	1
16	WELD LEAD	50 feet in length, 1/0 cable with ground clamp, and connector - 330 amp	MA269815-50	1
17	WELDING ROD	LaGrange 100 KSI 1/8" blue	MA98018	per pound
18	WELDING ROD	LaGrange 100 KSI 3/32" blue	MA44890	per pound
19	WELDING ROD	LaGrange 100 KSI 5/32" blue	MA99727	per pound
20	ISOLATOR (BOLT DOWN)	Used to dampen vibration transferred from direct mounting of package. One per mounting bolt (x 4) needed.	PR93969	4
21	REMOTE FUEL PUMP	For vehicle set-up without a fuel tank, where an additional fuel pump is required.	MA57870	1
22	COLD WEATHER KIT	Heater installations for vital components of Air N Arc 200 System; recommended for cold ambient environment and/or seasonal cold climate operation.	032793	1

A.6: ELECTRODE IGNITION PROCEDURE



PROFILE OF ELECTRODE IGNITION SEQUENCE



KEY	DESCRIPTION	KEY	ACTION
1	ELECTRODE	A	Direction of striking: electrode is dragged across the work piece in a similar manner to striking a match
2	WORK PIECE SURFACE	B	Electrode is lifted slightly when it touches the work piece, but continues on with the striking motion
3	ARC		

NOTES	
If arc goes out, electrode was lifted too high; repeat with electrode closer to work piece surface	
If electrode sticks to work piece surface, quickly twist the electrode to free it.	

A.7: PROCESS/CONTACTOR SWITCH SETTINGS

Switch Setting	Process	Output On/Off Control
Electrode Hot - Wire	MIG (GMAW)	Electrode Hot
Electrode Hot - Stick	Stick (SMAW)	
Select Preferred Dig	Electrode Hot	
Electrode Hot - Stick	Air Carbon Arc (CAC-A) Cutting and Gouging Select Any Dig	Electrode Hot
Electrode Hot - Lift Arc w/Auto-Crater	TIG (GTAW) Lift Arc w/Auto-Crater (GTAW) (DC only)	Electrode Hot
Electrode Hot - Lift Arc w/Auto-Stop	TIG (GTAW) Lift Arc w/Auto-Stop (GTAW) (DC only)	Electrode Hot
TIG - Remote On/Off	TIG (GTAW) With HF Unit, Pulsing Device, or Remote Control (AC or DC)	At Remote Receptacle
Stick - Remote On/Off	Stick (SMAW) with Remote On/Off	At Remote Receptacle
Wire - Wire Feeder (CV) Using Remote	MIG (GMAW)	At Remote Receptacle

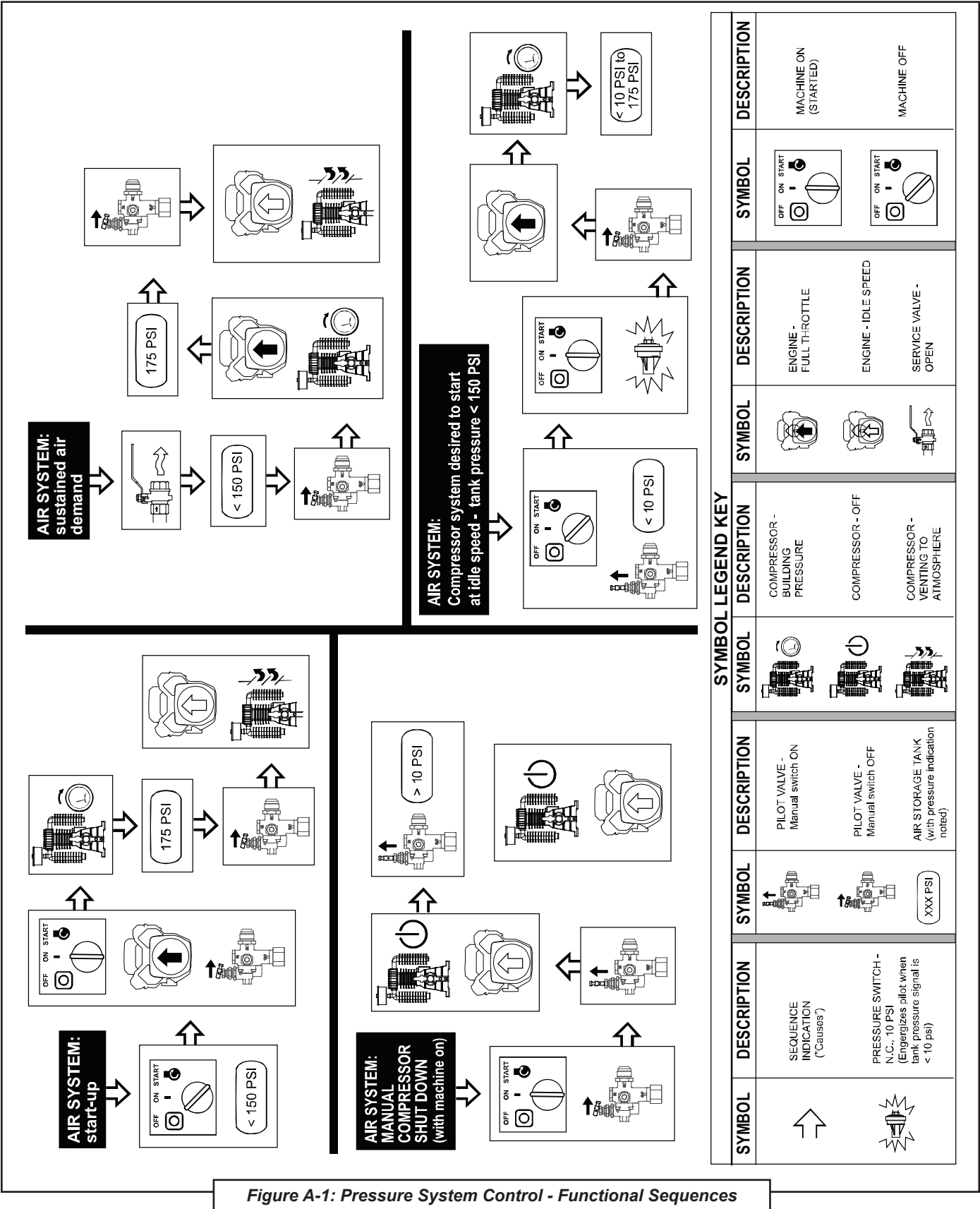


Figure A-1: Pressure System Control - Functional Sequences

AIR N ARC®
ALL-IN-ONE POWER-SYSTEMS®

RELIANT™ SERIES
POWERFLEX™ SERIES
PRO SERIES CONTRACTOR
CONTRACTOR SERIES
VIPER™ SERIES
FST™ SERIES

(844) VAN - SERV
SERVICE@VANAIR.COM
PARTS@VANAIR.COM

10896 W. 300 N.
MICHIGAN CITY, IN 46360

(800) 526-8817

VANAIR.COM

EFFECTIVE: JAN 8, 2016

090088_r1

VANAIR VANTAGE WARRANTY

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

LIMITED WARRANTY—Subject to the expressed terms and conditions set forth below, Vanair Mfg., Inc. ("Vanair"), of Michigan City, Indiana (USA), warrants to the original retail purchaser of new Vanair equipment that such equipment is free from defects in materials and workmanship when shipped by Vanair.

For warranty claims received by Vanair within the applicable warranty periods described below, Vanair will repair or replace any warranted equipment, parts or components that fail due to defects in material or workmanship or refund the purchase price for the equipment, at Vanair's discretion. Vanair is not responsible for time or labor to gain access to the machine to perform work. **WARRANTY WILL BE VOID IF GENUINE VANAIR PARTS AND FLUIDS ARE NOT USED.**

Vanair must be notified in writing within thirty (30) days of any such defect or failure. No warranty work or returns without prior authorization is allowed. Vanair will provide instructions on the warranty claim procedures to be followed.

Warranty will commence upon receipt of the Warranty Registration Card. If the Warranty Registration Card is not received within six (6) months of shipment from Vanair, the warranty commencement date shall be thirty (30) days from the date of shipment from Vanair. Records of warranty adherence are the responsibility of the end user.

1. Lifetime Warranty Parts – 3 Years Labor
 - Rotary Screw Air Compressor Air End
2. 6 Years Parts – 3 Years Labor
 - • Vanair Super Capacitor (VSC)
3. 3 Years Parts – 1 Year Labor
 - Reciprocating Compressor Air End
 - Generators
 - Welders
4. 2 Years Parts – 1 Year Labor
 - Hydraulic Motors
 - Hydraulic Pumps
5. 1 Year Parts – 1 Year Labor
 - All electronics including, but not limited to:
 - I) I/O Boards
 - II) Modules
 - III) Panel Boxes
 - IV) Instrumentation
 - V) Clutches
 - VI) Solenoids
 - VII) Running Gear/Trailers
 - VIII) Compressor/Hydraulic Coolers, including Fan and Radiator Core

This Limited Warranty shall not apply to:

1. Consumable components, such as shaft seals, valves, belts, filters, capacitors, contactors, relays, brushes or parts that fail due to normal wear and use.
2. Items furnished by Vanair, but manufactured by others, such as engines and trade accessories (these items are covered by the manufacturer's warranty, if any).

3. Equipment that has been modified by any party other than Vanair or equipment which has not been used and maintained in accordance with Vanair's specifications.
4. Equipment which has been improperly installed and/or improperly operated, based upon Vanair's specifications for the equipment or industry standards.
5. Equipment installed by non-authorized or third party personnel.

Vanair products are intended for purchase and use by commercial/industrial users and persons trained and experienced in the use and maintenance of industrial equipment.

In the event of a warranty claim covered by this Limited Warranty, the exclusive remedies shall be, at Vanair's sole discretion: (i) repair; or (ii) replacement; (iii) where authorized in writing by Vanair in appropriate cases, the reasonable cost of repair or replacement at an authorized Vanair service facility; or (iv) payment of (or credit for) the purchase price (less reasonable depreciation based upon actual use) upon return of the equipment at the warranty claimant's risk and expense.

Vanair will pay standard ground freight for any warranty item shipped to and from Vanair or (Vanair designated facility) within the first year of the applicable warranty period. Any additional expedited freight cost is the responsibility of the purchaser.

TO THE GREAT EXTENT PERMITTED BY APPLICABLE LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES APPLICABLE TO THE VANAIR EQUIPMENT. IN NO EVENT SHALL VANAIR BECOME LIABLE FOR DIRECT, INDIRECT, SPECIAL, PUNITIVE, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT OR LOST BUSINESS OPPORTUNITY), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY. IN NO EVENT SHALL VANAIR BECOME OBLIGATED TO PAY MORE ON ANY WARRANTY CLAIM THAN THE PURCHASE PRICE ACTUALLY PAID BY THE ORIGINAL RETAIL PURCHASER.

THIS LIMITED WARRANTY IS MADE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR PURPOSE, OR ANY OTHER WARRANTY OR GUARANTY ARISING BY OPERATION OF LAW. ANY WARRANTY NOT EXPRESSLY PROVIDED HEREIN, IMPLIED WARRANTY, GUARANTY AND ANY REPRESENTATION REGARDING THE PERFORMANCE OF THE EQUIPMENT, AND ANY REMEDY FOR BREACH OF CONTRACT, IN TORT, OR ANY OTHER LEGAL THEORY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE, OR COURSE OF DEALING ARE EXCLUDED AND DISCLAIMED BY VANAIR.

Some states in the United States of America do not allow limitations of how long an implied warranty lasts, or the exclusion of incidental, indirect, special or consequential damages, and as such, the above limitations and exclusions may not apply to you. This warranty provides specific legal rights. Other rights may be available to you, but may vary from state to state.

In Canada, legislation in some provinces provides for certain additional warranties or remedies other than as stated herein, and to the extent that they may not be saved, the limitations and exclusions set out forth above may not apply. This Limited Warranty provides specific legal rights, and other rights may be available, but may vary from province to province.



VANAIR®
MOBILE POWER SOLUTIONS™



VANAIR®
P O W E R T O G O™

 VANAIR® USERS GUIDE

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Printed in the U.S.A.

Specifications subject to
change without prior notice

051651

051833

051828

051876

UG-MAY-2021