AIR N ARC® BY VANAIR®

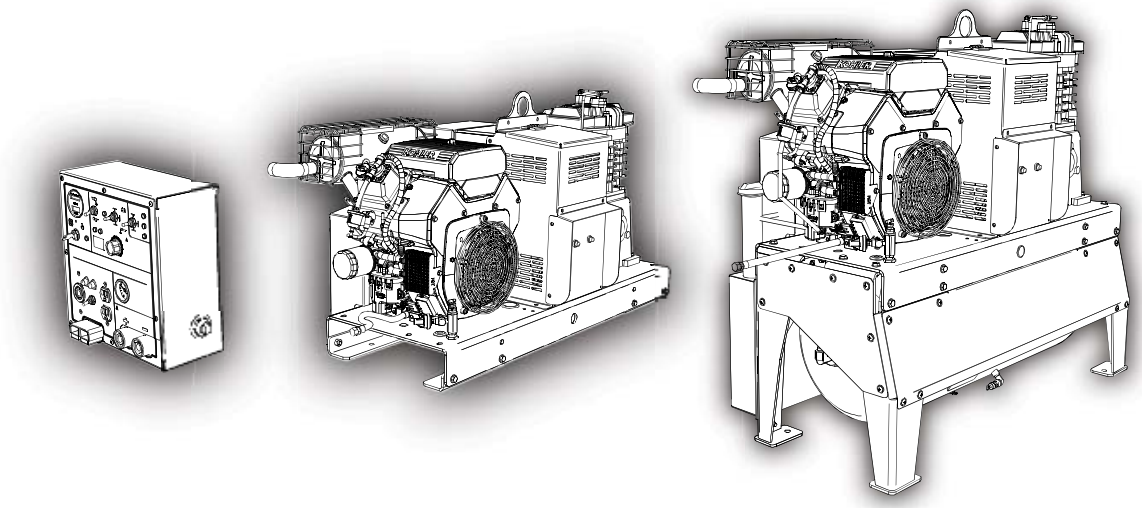
ALL-IN-ONE Power Systems®

AIR N ARC® 250

ALL-IN-ONE POWER SYSTEMS®

WELDER • GENERATOR • AIR COMPRESSOR • BATTERY BOOSTER

OPERATION MANUAL & PARTS LIST



NOTE:

THIS EXCERPT IS THE AIR-N-ARC 250 ADDENDUM TO THE AIR-N-ARC 200 MANUAL.

Vanair Manufacturing, Inc.
10896 West 300 North
Michigan City, IN 46360

www.vanair.com

Vanair Manufacturing, Inc.
Phone: (219) 879-5100
(800) 526-8817

Service Fax: (219) 879-5335
Parts Fax: (219) 879-5340
Sales Fax: (219) 879-5800

VANAIR®
AIR POWER TO GO™

Addendum 090044_r0
to Manual 090019-OP_r0
Effective Date:
4-2013

THE FOLLOWING ARE CHANGES IN SPECIFICATIONS THAT AFFECT THE AIR-N-ARC 250:

1. RATED WELDER OUTPUT:

250A high Frequency DC/CC, DC/CV, 100% duty Cycle @ 250 Amps

2. OIL CAPACITY:

2 Quarts

3. WELDER MAX AMPERAGE:

250+/-5

4. VARIABLE POWER DIAL ADJUSTS THE WELDER AMPERAGE

Range: from 30 to 255 AMPS

5. MACHINE COMES STANDARD WITH A 30 GALLON AIR TANK.

6. OPTIONS NO LONGER AVAILABLE:

Welding Rod P/N M/A98018

Welding Rod P/N MA44890

Welding Rod P/N MA99727

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VANAIR® AIR POWER TO GO™

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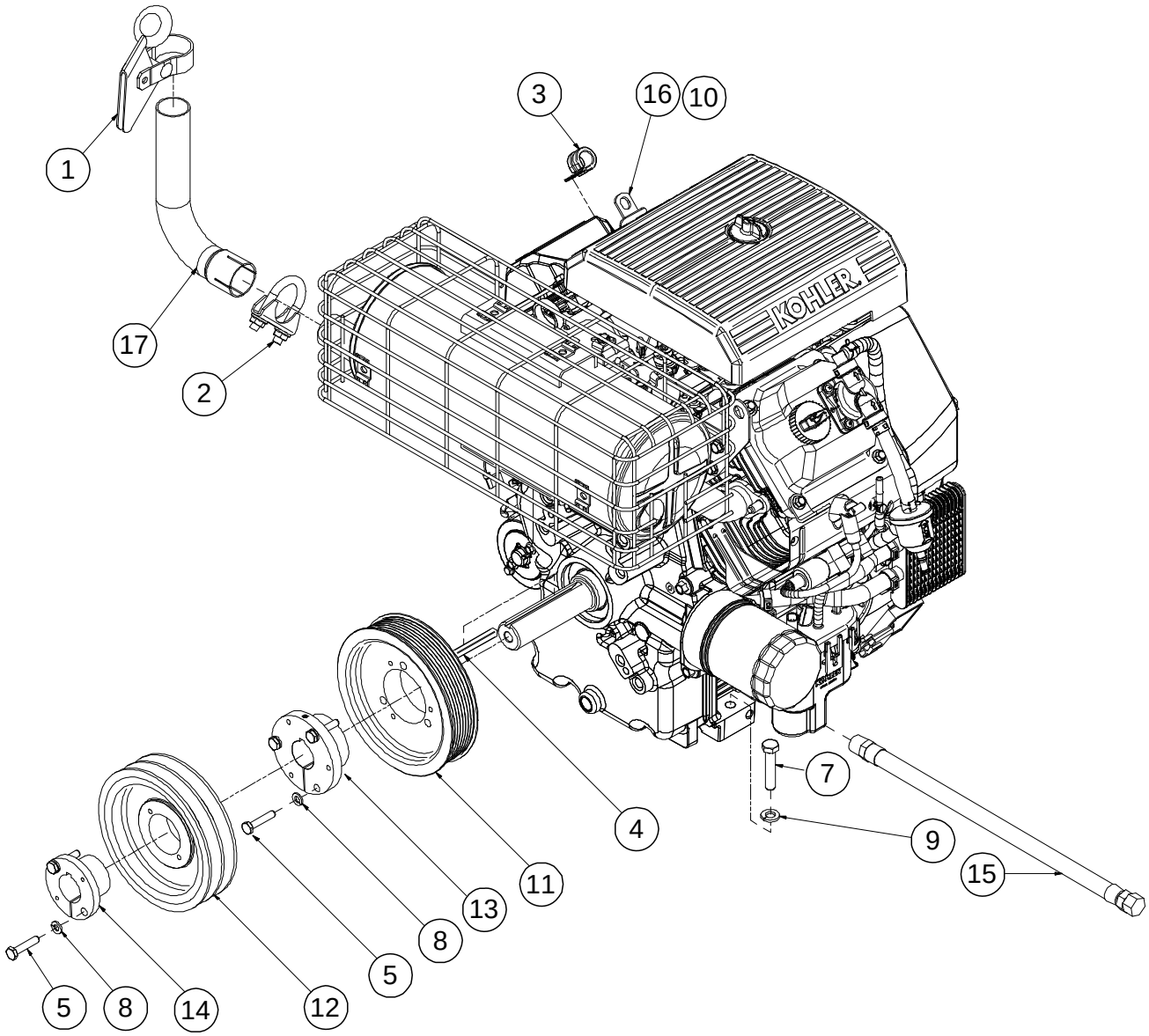
9.6 ENGINE AND DRIVE PARTS



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9.6 ENGINE AND DRIVE PARTS

ITEM	DESCRIPTION	PART NUMBER	QTY
1	CAP, RAIN 1-1/4” EXHAUST	262706	1
2	CLAMP, EXHAUST 1-1/4 REV.0	262906	1
3	CLAMP, LOOM #010 5/8”	268503	1
4	KEY, SQUARE 1/4 x 1/4 x 3	821104-300	1
5	CAPSCREW, HEX GR5 1/4-20 x 1-1/4	829104-125	5
6	CAPSCREW, HEX GR5 3/8-16 x 1.50	829106-150	1
7	CAPSCREW, HEX GR5 3/8-16 x 1.75	829106-175	3
8	WASHER, LOCK 1/4	838504-062	5
9	WASHER, LOCK 3/8	838506-094	4
10	OIL, MOTOR 10W30, 2.5 QUART	844300-001	1
11	SHEAVE, SERPENTINE, 8 GROOVE	A15891Z	1
12	SHEAVE, 2 GROOVE, 5.75 DOUBLE A, ZINC	DR76765Z	1
13	BUSHING, SDS, QD, 1-1/8 DIA.	DR85785Z	1
14	BUSHING, L, QD, 1-1/8 DIA., 2 BOLT	DR92958Z	1
15	HOSE, DRAIN 3/8 x 12” LG 3/8NPT	EN22698	1
16	ENGINE, GAS KOHLER 25HP EFI	EN270958	1
17	TUBE, EXHAUST 1.25 DIA.	TU270889	1

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

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AIR N ARC® BY VANAIR®

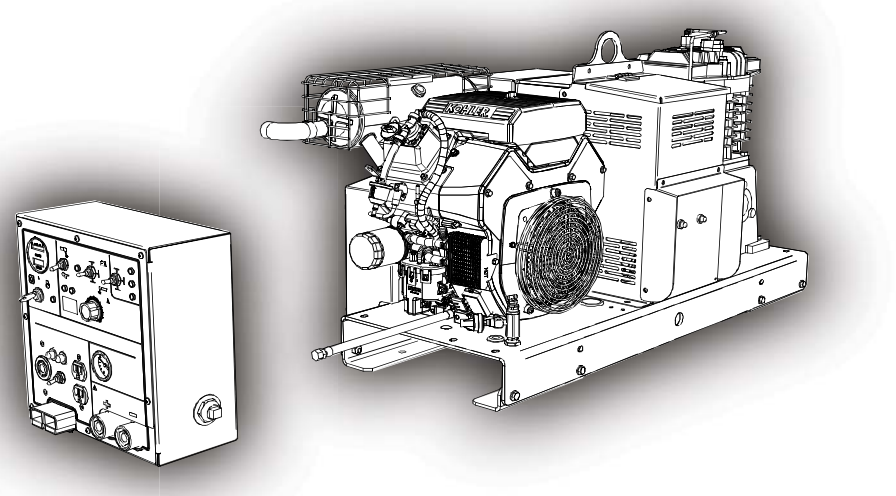
ALL-IN-ONE Power Systems®

AIR N ARC® 200

ALL-IN-ONE POWER SYSTEMS®

WELDER • GENERATOR • AIR COMPRESSOR • BATTERY BOOSTER

OPERATION MANUAL & PARTS LIST



NOTE

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.

KEEP THE MANUAL WITH THE VEHICLE

NOTE

Making unauthorized modifications to the system components WILL VOID THE WARRANTY!

Always inform Vanair Manufacturing, Inc., before beginning any changes to the Air N Arc system.

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Sales Fax: (219) 879-5800

www.vanair.com

NOTE

Use only Genuine Vanair Parts. Inspect and replace damaged components before operation. Substituting non-Vanair components WILL VOID THE COMPRESSOR WARRANTY!

VANAIR®
AIR POWER TO GO™

090019-OP_r0
Effective Date:
05-11

AIR N ARC®
ALL-IN-ONE POWER-SYSTEMS®

RELIANT™ SERIES

POWERFLEX™ SERIES

PRO SERIES

CONTRACTOR SERIES

VIPER™ SERIES

FST™ SERIES

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 preform 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.

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MICHIGAN CITY, IN 46360

(800) 526-8817

VANAIR.COM

EFFECTIVE: JAN 8, 2016
090088_r1

VANAIR®
MOBILE POWER SOLUTIONS™

TABLE OF CONTENTS

Continued on next page...

SECTION 1: SAFETY (CONTINUED)

Continued on next page...

Continued on next page...

SECTION 4: INSTALLATION (CONTINUED)

SECTION 5: OPERATION 41

SECTION 6: MAINTENANCE 55

Continued on next page...

SECTION 6: MAINTENANCE (CONTINUED)

Continued on next page...

SECTION 7: TROUBLESHOOTING (CONTINUED)

SECTION 8: DIAGRAMS 111

SECTION 9: ILLUSTRATED PARTS LIST 115

APPENDIX A: ADDITIONAL INFORMATION 147

APPENDIX B: MAINTENANCE AND SERVICE LOG 157

GLOSSARY: TERMS AND DEFINITIONS

G.1 GENERAL TERMS AND DEFINITIONS

Air/Oil Separator - Coalescer element.

CFM - Cubic Feet per Minute.

ft-lb - Foot Pound (torque measurement).

N.C. - Normally closed.

N.O. - Normally open.

RMA - Return Material Authorization (number). This number is assigned by a service technician, and is needed for warranty claims.

RPM - Revolutions Per Minute.

Speed Control - Governor.

G.2 WELDING TERMS AND DEFINITIONS

Air Carbon Arc Cutting (CAC-A) - A cutting process by which metals are melted by the heat of an arc using a carbon electrode. Molten metal is forced away from the cut by a blast of forced air.

Alternating Current (AC) - An electrical current that reverses its direction at regular intervals, such as 60 cycles alternating current (AC), or 60 hertz.

Amperage - The measurement of the amount of electricity flowing past a given point in a conductor per second. Current is another name for amperage.

Arc - The physical gap between the end of the electrode and the base metal. The physical gap causes heat due to resistance of current flow and arc rays.

Constant Current (CC) Welding Machine - These welding machines have limited maximum short circuit current, with consistent amperage regardless of the voltage output.

Constant Voltage (CV) Welding Machine - This type of welding machine output maintains a relatively stable, consistent voltage regardless of the amperage output. It results in a relatively flat volt-amp curve.

Current - Another name for amperage. The amount of electricity flowing past a point in a conductor every second.

Direct Current (DC) - Flows in one direction and does not reverse its direction of flow as alternating current does.

Direct Current Electrode Negative (DCEN) - The direction of current flow through a welding circuit when the electrode lead is connected to the negative terminal and the work lead is connected to the positive terminal of a DC welding machine. Also called direct current, straight polarity (DCSP).

Direct Current Electrode Positive (DCEP) - The direction of current flow through a welding circuit when the electrode lead is connected to a positive terminal and the work lead is connected to a negative terminal to a DC welding machine. Also called direct current, reverse polarity (DCRP).

Duty Cycle - The number of minutes out of a 10-minute time period an arc welding machine can be operated at maximum rated output. An example would be 60% duty cycle at 250 amps. This would mean that at 250 amps the welding machine can be used for 6

minutes and then must be allowed to cool with the fan motor running for 4 minutes.

Flux Cored Arc Welding (FCAW) - An arc welding process which melts and joins metals by heating them with an arc between a continuous, consumable electrode wire and the work. Shielding is obtained from a flux contained within the electrode core. Added shielding may or may not be provided from externally supplied gas or gas mixture.

Hertz - Hertz is often referred to as "cycles per second". In the United States, the frequency or directional change of alternating current is usually 60 hertz.

KVA (Kilovolt-amperes) - Kilovolt-amperes. The total volts times amps divided by 1,000, demanded by a welding power source from the primary power furnished by the utility company.

KW (Kilowatts) - Primary KW is the actual power used by the power source when it is producing its rated output. Secondary KW is the actual power output of the welding power source. Kilowatts are found by multiplying volts and amps and dividing by 1,000 and taking into account any power factor.

Microprocessor - One or more integrated circuits that can be programmed with stored instructions to perform a variety of functions.

MIG Welding (GMAW or Gas Metal Arc Welding) - Also referred to as solid wire welding. An arc welding process which joins metals by heating them with an arc. The arc is between a continuously fed filler metal (consumable) electrode and the work piece. Externally supplied gas or gas mixtures provide shielding.

Open-Circuit Voltage (OCV) - As the name implies, no current is flowing in the circuit because the circuit is open. The voltage is impressed upon the circuit, however, so that when the circuit is completed, the current will flow immediately.

Plasma Arc Cutting - An arc cutting process which severs metal by using a constricted arc to melt a small area of the work. This process can cut all metals that conduct electricity.

Pounds Per Square Inch (psi) - A measurement equal to a mass or weight applied to one square inch of surface area.

Rated Load - The amperage and voltage the power source is designed to produce for a given specific duty cycle period. For example, 275 amps, 25 load volts, at 60% duty cycle.

Stick Welding (SMAW or Shielded Metal Arc) - An arc welding process which melts and joins metals by heating them with an arc, between a covered metal electrode and the work. Shielding gas is obtained from the electrode outer coating, often called flux. Filler metal is primarily obtained from the electrode core.

TIG Welding (GTAW or Gas Tungsten Arc) - Often called TIG welding (Tungsten Inert Gas), this welding process joins metals by heating them with a tungsten electrode which should not become part of the completed weld. Filler metal is sometimes used and argon inert gas or inert gas mixtures are used for shielding.

Voltage - The pressure or force that pushes the electrons through a conductor. Voltage does not flow, but causes amperage or current to flow. Voltage is sometimes termed electromotive force (EMF) or difference in potential.

Voltage-Sensing Wire Feeder - Feeder operates from arc voltage generated by welding power source.

Wire Feed Speed - Expressed in in/min or mm/s, and refers to the speed and amount of filler metal fed into a weld. Generally speaking the higher the wire feed speed, the higher the amperage.

G.3 AIR COMPRESSOR TERMS AND DEFINITIONS

Aftercoolers - devices for removing the heat of compression of the air or gas after

compression is completed. They are one of the most effective means of removing moisture from compressed air.

Air Receivers - tanks into which the compressed air is discharged from the air compressor. Receivers help to eliminate pulsations in the discharge line and also act as storage capacity during intervals when the dean

Air Regulator - Used to control the amount of pressure received from the tank.

Check Valve - Ensures the air flows in one direction.

Discharge Pressure - This is the absolute pressure of the air at outlet (delivery) of a compressor.

Free Air Delivery (FAD) - Free air delivery is the volume of air delivered under the conditions of temperature and pressure existing at the compressor intake. This generally taken as 1.0332 kg/cm square abs & 15 degree Centigrade.

Inlet Pressure - This is the absolute pressure of the air at inlet (suction) to a compressor.

Intercoolers - devices for removing the heat of compression of the air or between consecutive stages of multistage air compressors.

Line Pressure Gauge - Reads amount of pressure in the air hose, which supplies the tool with air.

Moisture Separators - devices for collecting and removing moisture precipitated from the air or gas during the process of cooling.

Piston - Compresses the air by pulling air into the cylinder of the pump when it moves downward and the pushes the air out when it moves upward.

Pressure Switch - Stops the motor when the tank is full (cut out pressure) and starts the motor when the pressure falls to a specific setting (cut in pressure).

PSIG - pounds per square inch gauge

Pump - Part that compresses the air and pushes it into the tank.

Reciprocating Air Compressors - those in which each compressing element consists of a piston moving back and forth in a cylinder.

Rotary Air Compressors - those which utilize two inter-meshing helical rotors to trap a volume of air, then compress it to a higher pressure.

Single Stage Air Compressors - those in which compression from initial to final pressure is complete in a single step or stage.

Tank - Holds the compressed air until used by an air tool or for some other purpose.

Tank Pressure Gauge - Indicates amount of pressure in tank.

Two Stage Air Compressors - those in which compression from initial to final pressure is completed in two distinct steps or stages.

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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 on the base floor, near to the compressor mounting and the generator tower canopy (see ***Figures W-1*** and ***W-2***).
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:**
3. **Contact the Vanair Service Department by phone (1-219-879-5100) to speak with a Service Technician.**
4. **Vanair Service will troubleshoot the problem based on the information provided by the customer.**
5. **If the unit cannot be returned to service, and Vanair determines this matter may be a warranty issue, the Service Technician may 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.**
6. **Vanair will need a P.O. or credit card number to cover the cost of the part and shipping before sending a part to a customer for warranty consideration.**
7. **If the returned item, which in Vanair's judgment is proven to be defective as warranted, than Vanair will**

NOTE

The unit's serial number is important to determine the proper configuration of the machine.

IMPORTANT

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.

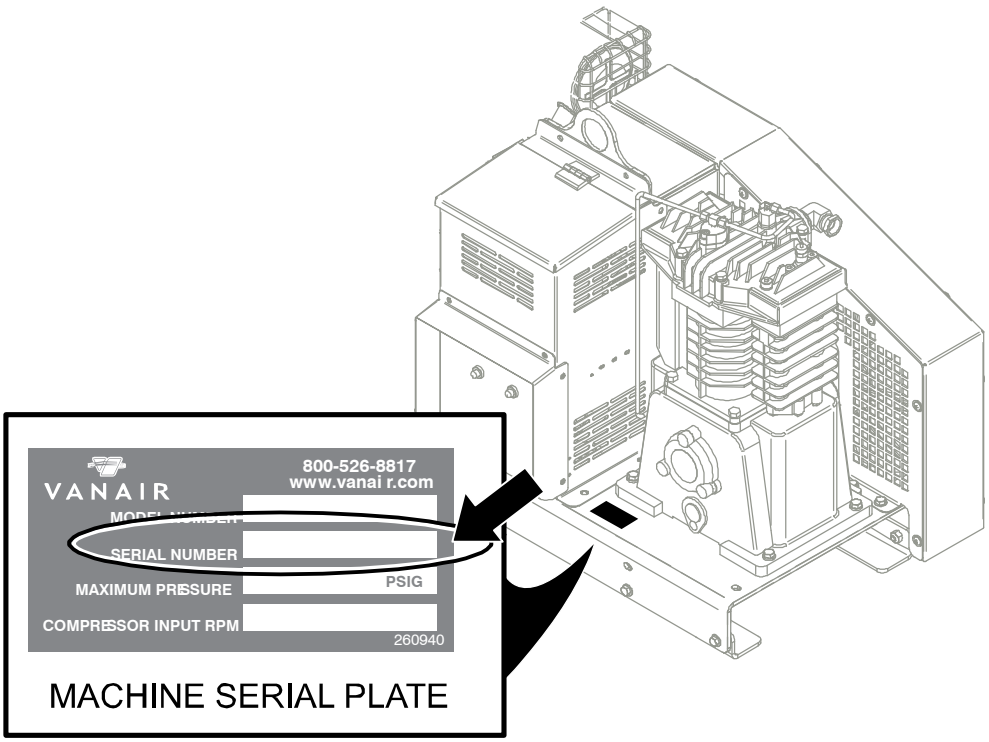

Figure W-1: Machine Serial Number Location

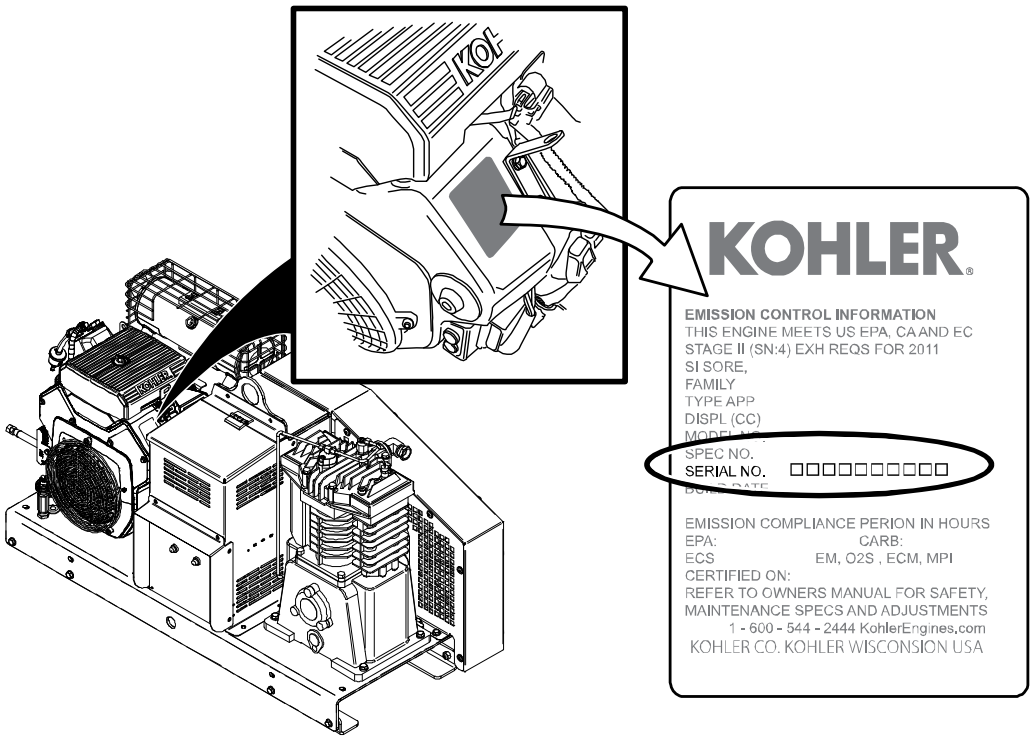

Figure W-2: Engine Serial Number Location

issue a credit for the cost of that item to the customer.

8. **Returned parts eligible for warranty must have the RMA number on the packing slip.**

   No items can be returned “freight collect”. The customer pays any additional costs for warranty parts delivered through expedited services (i.e., Next Day, Second day).

   Vanair Manufacturing strives to continuously improve its customer service. Please forward any questions, comments, or suggestions to Vanair Service (219-879-5100) or e-mail us (service@vanair.com).

NOTE

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

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.

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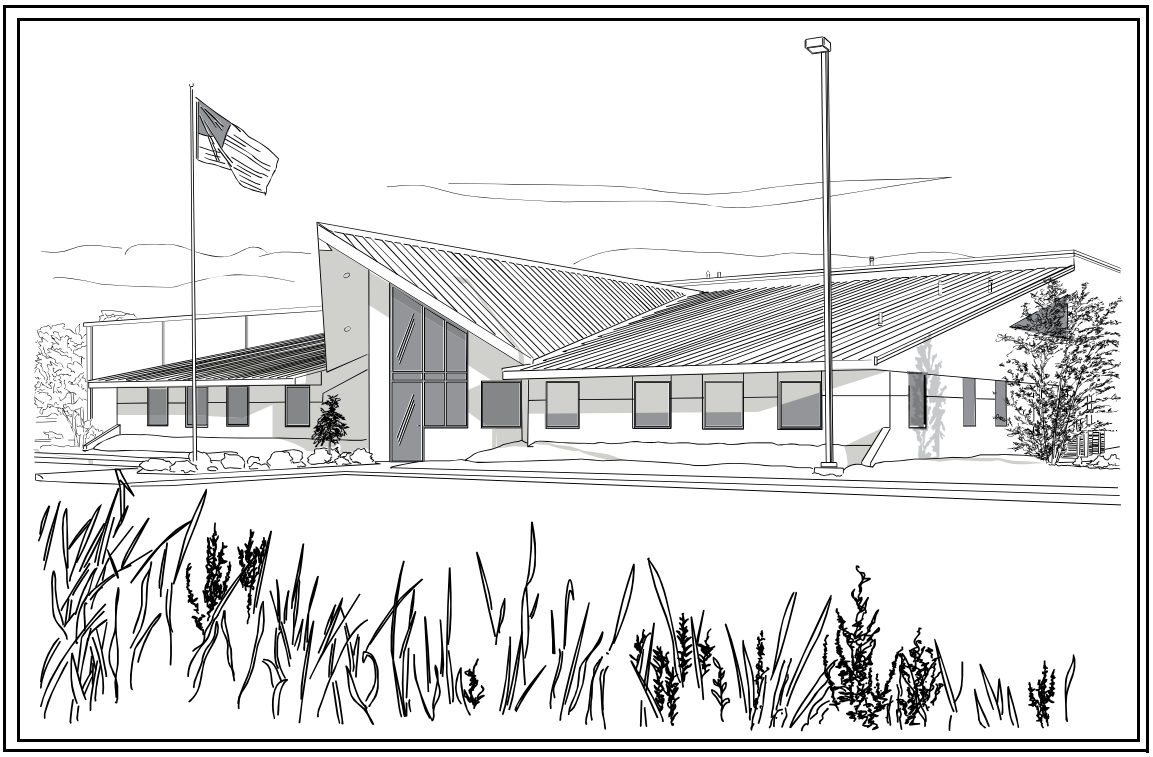


EXPERIENCE THE VANAIR® AIR N ARC ALL-IN-ONE POWER SYSTEM ADVANTAGE!

The Air N Arc All-In-One Power System is designed to provide compressed air, DC welding output, AC power, and battery boosting/charging in one easy to use interface.

This unit is designed to operate in an industrial environment, and with proper maintenance it should provide years of reliable service. This unit is weather-resistant and able to operate in temperature extremes ranging from -20°F to 110°F (see **Section 6.7, Extreme Condition Operation**).

The AC generator features a brushless, maintenance-free design, and is completely separate from the DC welding generator.

The All-In-One Power System can support a multi-user operation. However, simultaneously using any two functions to their maximum output will cause a drop in

NOTE

Due to the caustic nature of "un-sealed" lead acid batteries Vanair® Mfg., Inc. does not recommend the use of this style of battery. Acid fumes can cause damage to the machine and void the warranty.

RPM of the engine. This RPM drop will reduce the voltage output of the AC generator, which can cause damage to power tools being used. The operator must monitor the AC voltage at all times to ensure proper voltage output.

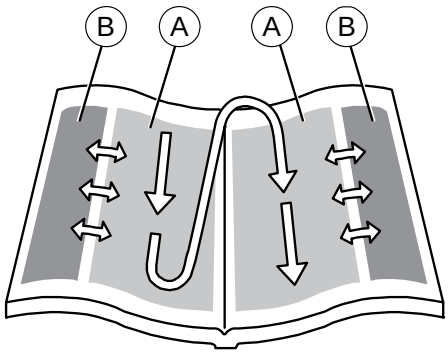
This publication contains the latest information available at the time of preparation. Every effort has been made to ensure accuracy. However, Vanair® Manufacturing, Inc. takes no responsibility for errors or consequential damages caused by reliance on the information contained herein.

Vanair Manufacturing, Inc. reserves the right to make design change modifications or improvements without prior notification.

A NOTE ON MANUAL LAYOUT NAVIGATION

Refer to ***Figure M-1***. This manual is presented in a two-column per page sequence. As shown in the figure, the inner columns represent the machine application data in a continuous page-by-page flow. The outer columns are reserved for auxiliary information relating to the specific data put forth in the inner column. This auxiliary data can, for example, be a relative warning or note detail. It will support the concept which is listed nearby in the inner column.

Sometimes, if an illustration is too large to fit in the outer column, or if a large table matrix is present, it may occupy the two-column space of a page. In such cases the inner column will always be continued on the next available page after the illustration.



KEY	DESCRIPTION
A	**INNER PAGE COLUMNS:** Main text flow of information layout represents the main body of machine applications divided into sections and sub-sections.
B	**OUTER PAGE COLUMNS:** Contain auxiliary information such as notes, warnings, and small illustrations. This information is related, and will be located in proximity, to the main, inner page column application.

Figure M-1: Manual Layout Navigation

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

It is mandatory that all operators read this manual before operating or servicing the Air N Arc 200 Series All-In-One Power System. Failure to do so could result in death, bodily injury or damage to equipment.

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.

NOTE

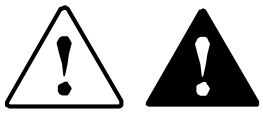
Additional information (or existing information) which should be brought to the attention of operators/maintainers affecting safety, operation, maintenance, or warranty requirements.

IMPORTANT

Emphasized 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. Lockout/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 according to manual.

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

Wear a safety harness if working above floor level.

Keep all panels and covers securely in place.

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

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

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

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

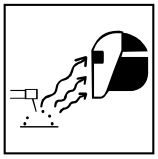
Shut off shielding gas supply when not in use.

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

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

Do not weld where flying sparks can strike flammable material.

Protect yourself and others from flying sparks and hot metal.

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

Watch for fire, and keep a fire extinguisher nearby.

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

Do not 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.

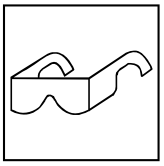
Remove stick electrode from holder or cut off welding wire at contact tip when not in use.

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.

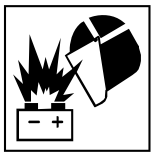
Read and follow instructions on compressed gas cylinders, associated equipment, and Compressed Gas Association (CGA) publication P-1 listed in Safety Standards.

1.5 ENGINE HAZARDS

⚠ IMPORTANT

It is mandatory that all operators read this manual before operating or servicing the Air N Arc 200 Series All-In-One Power System. Failure to do so could result in death, bodily injury or damage to equipment.

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.

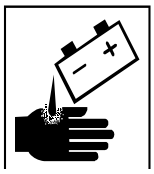
1.5.5 ⚠ ENGINE EXHAUST GASES CAN KILL

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 gases 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 gases 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

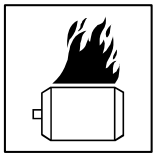
1.7.1 ⚠ FALLING UNIT CAN CAUSE INJURY

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.

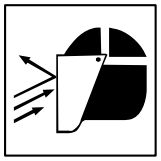
1.7.2 ⚠ OVERHEATING CAN DAMAGE MOTORS



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

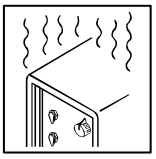


Wear a face shield to protect eyes and face.

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 gases 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 gases 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.ihs.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.ihs.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 StandardW117.2, 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, 11West 42nd Street, New York, NY10036-8002 (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 examined. 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 9.11, Decal and Plate Locations**, 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 9.11) 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.

For further information on machine fluid maintenance, consult the following:

MAINTENANCE TASK	SECTION LOCATION / FIGURE
ENGINE OIL[I]:	**6.5.9.2, Checking the Engine Oil**
	6.5.9.3, Replacing the Engine Oil
	Figure 6-21
COMPRESSOR OIL:	**6.5.2 Compressor Oil Maintenance**
	Figure 6-2 (drain plug location)

[I] **In addition to the sections, also consult the Engine Operator's Manual when performing maintenance.**

Figure 2-1: MAJOR MACHINE COMPONENTS LOCATIONS

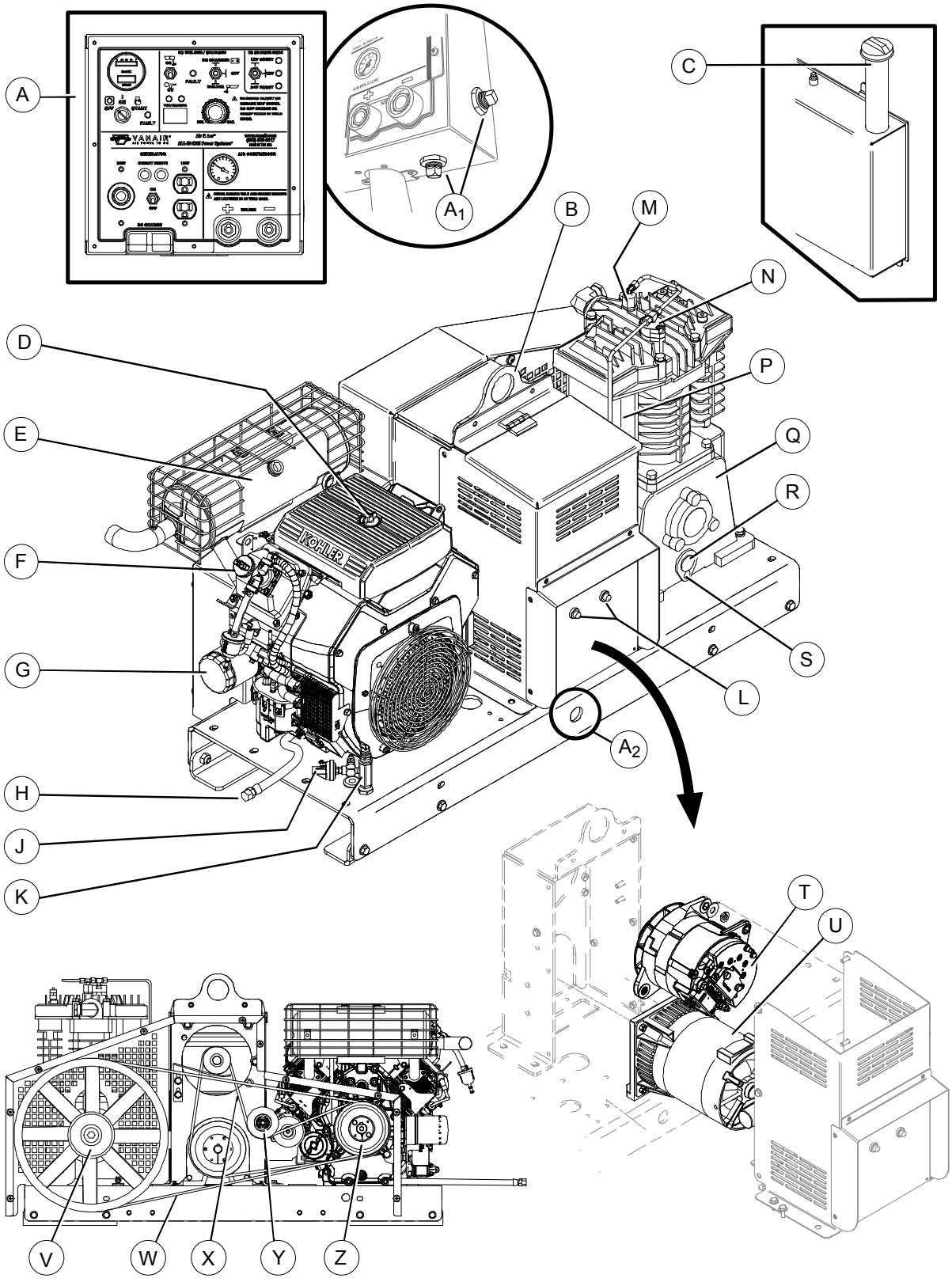


FIGURE 2-1: MAJOR MACHINE COMPONENTS LOCATIONS KEY	
KEY	**DESCRIPTION**
A	INSTRUMENT PANEL
A_1	SERVICE AIR OUTLETS[I]
B	LIFTING BAIL
C	FUEL FILL (Remote Mount)
D	ENGINE AIR FILTER
E	MUFFLER
F	ENGINE OIL FILL PORT
G	ENGINE OIL FILTER
H	ENGINE OIL DRAIN
J	PRESSURE SWITCH
K	PILOT VALVE
L	AC GENERATOR CIRCUIT BREAKERS (25 Amp)[II]
M	HIGH PRESSURE VALVE
N	LOW PRESSURE VALVE
P	COMPRESSOR AIR FILTER
Q	COMPRESSOR UNIT
R	OIL SIGHT GLASS
S	COMPRESSOR OIL DRAIN PORT (Plugged)
T	DC GENERATOR
U	AC GENERATOR
V	COMPRESSOR PULLEY/FLYWHEEL
W	COMPRESSOR BELT (x 2, Adjacent)
X	GENERATOR BELT
Y	GENERATOR IDLER/ADJUSTMENT SHEAVE
Z	ENGINE PULLEY

[I] These service valve locations are auxiliary; main service valve outlet may also be located at base access [**A_2**], or as per customer installation.

[II] For additional locations of other system fuses or circuit breakers, consult **Section 6.6, Servicing the System Fuses and Circuit Breakers**.

NOTE

Refer to *Section 9, Illustrations and Parts List*, for assembly details and corresponding part numbers.

SECTION 2: DESCRIPTION

NOTE

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

This manual should be read in conjunction with other appropriate supplied manuals, such as the Engine Operator's manual, or Generator Operator's manual.

NOTE

Refer to the Engine Operator's Manual for service and maintenance recommendations that are not provided in this manual.

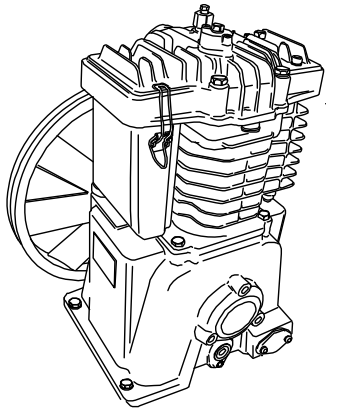


Figure 2-2: Compressor Unit

2.1 GENERAL DESCRIPTION

Vanair® Manufacturing, Inc.'s Air N Arc 200 Series All-In-One Power System offers superior performance and reliability, as well as limited maintenance requirements.

The Power System package is designed to provide compressed air, DC welding output, AC power, and battery boosting/charging in one easy to use interface.

This section of the manual provides brief descriptions of the components and systems on the Air N Arc 200 Series All-In-One Power System package. See ***Figure 2-1*** for a quick visual guide to the Power System's main component locations.

NOTE

Refer to the Maintenance Section of this manual for adjustment and replacement procedures.

2.2 COMPRESSED AIR SYSTEM

System Component or Component Group	Manual Section	Location
COMPRESSED AIR SYSTEM	**2.2**	**page 22**
Compressor Unit	2.2.1	page 22
Air Intake / Air Filter	2.2.2	page 23
Pressure Relief Valve	2.2.3	page 24
Pilot Valve	2.2.4	page 24

2.2.1 COMPRESSOR UNIT

See ***Figure 2-2***. The compressor is a reciprocating, two-stage, cast iron unit built for long-lasting durability, and designed to operate in a harsh industrial environment. With proper maintenance it should provide years of reliable service.

The air compressor is constantly in operation when the machine is on. Therefore, it provides a constant supply of

high pressure air as an automatic feature of the 200 Series machine package. Whenever the pressure in the air tank drops below 150 psi, the engine will run at full throttle until the pressure in the 30 gallon capacity standard tank reaches 175 psi.

The compressor unit features:

• **Heavy Duty Stainless Steel Valves** - Lapped to optical flatness for high efficiency and extended wear. All valves are oversized and designed for high flow.

• **Cast Iron Cylinders** - precision bored for high performance and low oil carry-over.

• **Suction Valve Head Unloaders** - for continuous running air compressors, unloader lets unit idle load-free until air supply drops to cut-in pressure; automatically lets unit idle again after high pressure limit is reached.

• **Rings** - long-life industrial design compression and oil control rings for maximum performance.

• **Large Intake Filter Silencers** -for quiet operation and provides maximum particulate protection.

• **Deep Finned Cylinders and Heads** - ensure cool, vibration free operation and long life.

• **Cast Iron High Tensile Strength Rods** - with replaceable rod bearings and pin bushings. Machined to close tolerances for many years of service.

• **Large Main Roller Bearings** - precision fit to hold alignment of all rotating parts.

• **Cast Iron Crackcase** - for strength and durability.

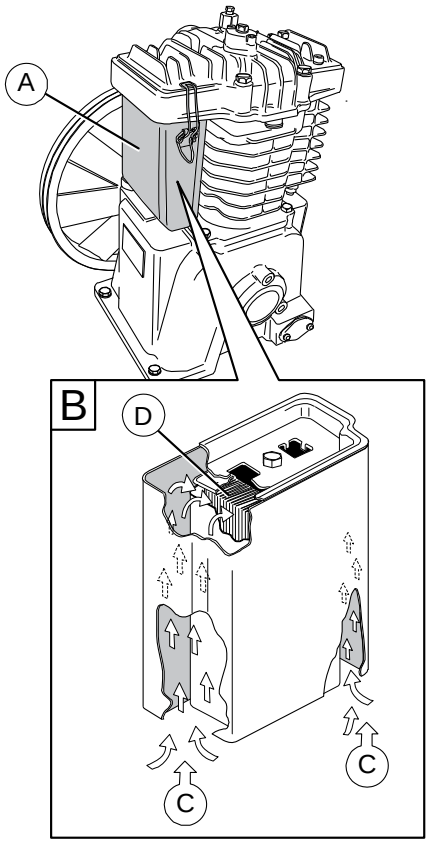
• **Oil Sightglass** - conveniently located for reading of oil level in crankcase.

• **Ductile Iron Crankshaft** - dynamically balanced, precision-machined, and ground. Assures extended running life for all internal bearings and wearing surfaces.

• **Balanced Flywheel** - for smooth operation with high volume airflow to cool heads and cylinders.

2.2.2 AIR INTAKE / AIR FILTER

See ***Figure 2-3***. The air inlet filter is integrated into the compressor assembly. The air filter element is a dry type replaceable assembly that drops into the air inlet canister body, which clamps to the compressor cylinder head. Air is introduced into the unit via intake vents located on each side of the bottom of the filter body. For routine maintenance of the air filter, consult ***Sections 6.2*** and ***6.3***



KEY	DESCRIPTION
A	AIR INLET FILTER
B	INLET FLOW CUTAWAY VIEW
C	AIR INTAKE VENTS
D	AIR FILTER ELEMENT

Figure 2-3: Compressor Air Intake

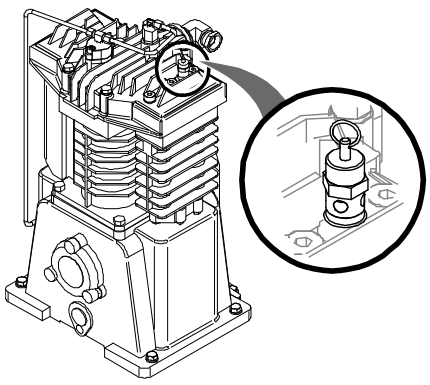


Figure 2-4: Pressure Relief Valve

for maintenance schedules, and ***Section 6.5.1*** for specific air filter maintenance procedures.

2.2.3 PRESSURE RELIEF VALVE

See ***Figure 2-4***. The pressure relief valve is the last safety device that will be activated. It is a spring-backed normally closed valve that will vent excess pressures to the atmosphere when excessive pressures are reached. The Air N Arc 200 Series Power System is equipped with a 200 psig relief valve. As the pressure begins to approach 200 psig, it will crack open to slowly relieve pressure. If pressure continues building through this venting, it will be fully open at 200 psig. Both air and oil will be expelled from this valve.

2.2.4 PILOT VALVE

See ***Figure 2-5***. The pilot valve senses the air pressure in the air tank receptacle. When the tank's pressure rises to the preset "unload" valve setting, the valve's ball opens, passing high pressure air to the compressor unloading device. When the tank pressure drops to the preset "load" valve setting, the ball closes, venting the compressor-unloading device to atmosphere.

Since the compressor operation is constant when the machine is on, the system is always building a supply of high pressure air. Whenever the pressure in the air tank drops below 150 psi, the engine will run at full throttle until the pressure in the tank reaches 175 psi, which will be indicated on the pressure gauge of the instrument panel.

If the compressor is not needed due to:

- The operator wants the engine to start at idle speed when the system air pressure is below 150 psi.

NOTE

There must be a minimum of 10 psi in the air tank to allow for an idle start. Otherwise the regulator valve will bypass the manual switch until the tank reaches this minimum (10 psi) pressure.

- The engine needs to be freed up to accommodate for demand elsewhere.

The pilot valve allows the operator to manually bypass the compressor startup or turn off the compressor during operation, which in turn cancels its draw on the engine.

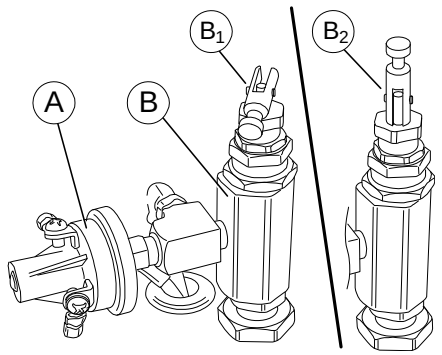
The pressure in the air tank may override the manual shutdown condition of the pilot valve: The regulator valve, which is set to 10 psi, will signal the compressor to operate, running the engine at full throttle (regardless of the position of the pilot valve switch) if the pressure in the tank is below 10 psi. This action builds the pressure in the tank until it is enough to satisfy the regulator valve (with a signal of at least 10 psi), and then the compressor will shut down.

NOTE

It is recommended that the operator shut the air valve off when a project is completed. This will prevent the pressure in the tank from leaking down, and causing unnecessary engine speed.

For a visual aid to understanding the operation of the pilot valve, refer also to ***Section A.8*** in the ***Appendix***.

Although the pressure cut-in and cut-out pressures are pre-set at the factory, they may be manually adjusted. For procedure on pressure control switch adjustment, see ***Section 6.5.5***.



KEY	DESCRIPTION
A	PRESSURE SWITCH (10 psi)
B	PILOT VALVE
B_1	MANUAL SWITCH - OFF Position
B_2	MANUAL SWITCH - ON Position: Compressor is manually turned off and automatic start-up is bypassed so long as the pressure signal from the air tank is at 10 psi or above

Figure 2-5: Pilot Valve

2.3 ENGINE

See ***Figure 2-6***. The 200 Series All-In-One Power System utilizes the 25 HP EFI Kohler® gasoline engine, which features electronic fuel-injection, air-cooled, electric start with a fuel economy improvement up to 27%. It powers both the compressor unit and generators simultaneously. The engine has a full flow oil filter, while also offering re-borable and replaceable cylinders, grindable crankshaft, replaceable valve guides and seats, and heavy-duty engine bearings.

The engine is preset to a fixed speed. For information on speed control setting, consult ***Section 6.5.6, Adjusting the 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 these engines is 3600 RPM.

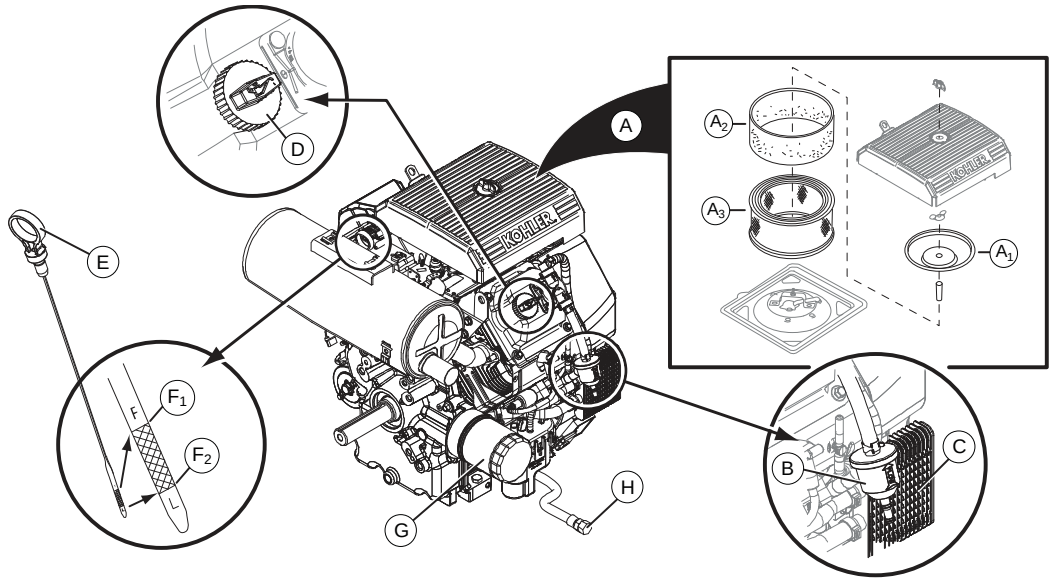
The compressor and generator are driven by the engine via the use of two drive belt types. The compressor

NOTE

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.

NOTE

Refer to the Engine Operator's Manual for service and maintenance recommendations that are not provided in this manual.



KEY	DESCRIPTION	KEY	DESCRIPTION
A	ENGINE AIR FILTER	**E**	ENGINE DIPSTICK HANDLE
A_1	INNER AIR FILTER COVER	**F**	Acceptable range for engine oil level between: **F_1** (FULL), and **F_2** (LOW) - DO NOT OVERFILL
A_2	PRE-FILTER ELEMENT		
A_3	AIR FILTER ELEMENT	**G**	ENGINE OIL FILTER
B	ENGINE FUEL FILTER (Primary - 70 micron)	**H**	ENGINE OIL DRAIN
C	ENGINE OIL COOLER	**J**	FUEL TANK
D	ENGINE OIL FILL PORT	**K**	ENGINE FUEL FILTER (Secondary - 10 micron)

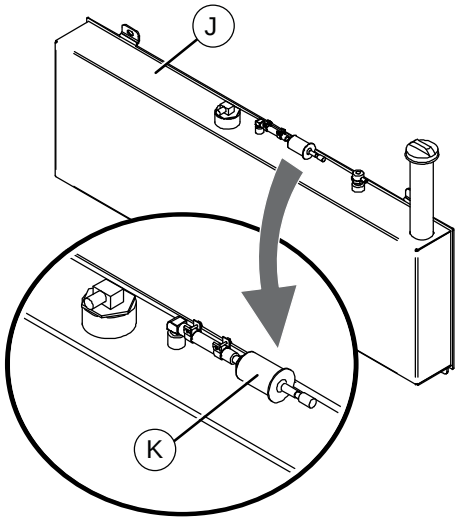


Figure 2-6: Engine Components

utilizes two (2) poly-link, chain-type belts, whereas the generator uses a serpentine v-belt. Both of these belt types have provisions for belt tensioning, should the belts become stretched out over time.

The fuel tank provided in the 200 Series Power System has a capacity of eleven (11) gallons (41.6 L), and is accessed via a conveniently-located port for ease of refill.

The fuel system has a fuel supply and return connection on the top of the fuel tank. Fuel level can be checked on the fuel level gauge that is located on the instrument panel. The fuel level gauge receives its level signal from the fuel sender that is located in the fuel tank. The fuel system also contains a fuel filter.

2.4 AC GENERATOR

See ***Figure 2-7***. The AC generator utilized on the 200 Series package is a 2-pole, single phase, 2-bearing, brushless style. These units should not require

maintenance since they do not have slip rings, nor slipping contacts. The end brackets are die-cast in a high resistance aluminum alloy, the shaft is C45 steel, and is fitted with a keyed fan. A 20 and 25 amp, in-series circuit breaker protection is also included.

⚠ WARNING

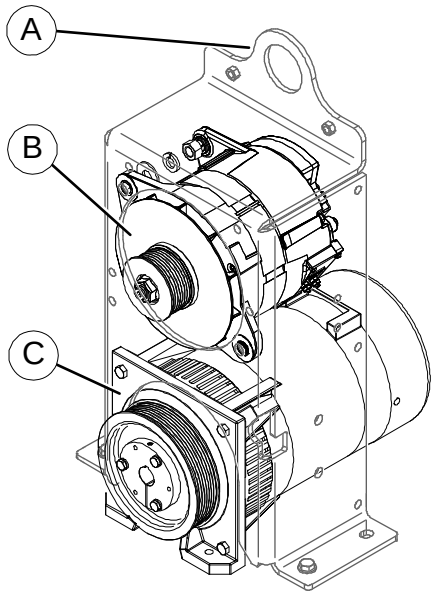
DO NOT rely on breakers for overload protection.

These breakers are temperature and time dependant, and cannot be relied upon for overload protection.

2.5 INSTRUMENTATION

This section describes the basic functions of the controls located on the instrument panel. To insure that the controls are engaged correctly, Consult the various operating procedures as described in ***Section 5, Operation***, and ***Appendix B***.

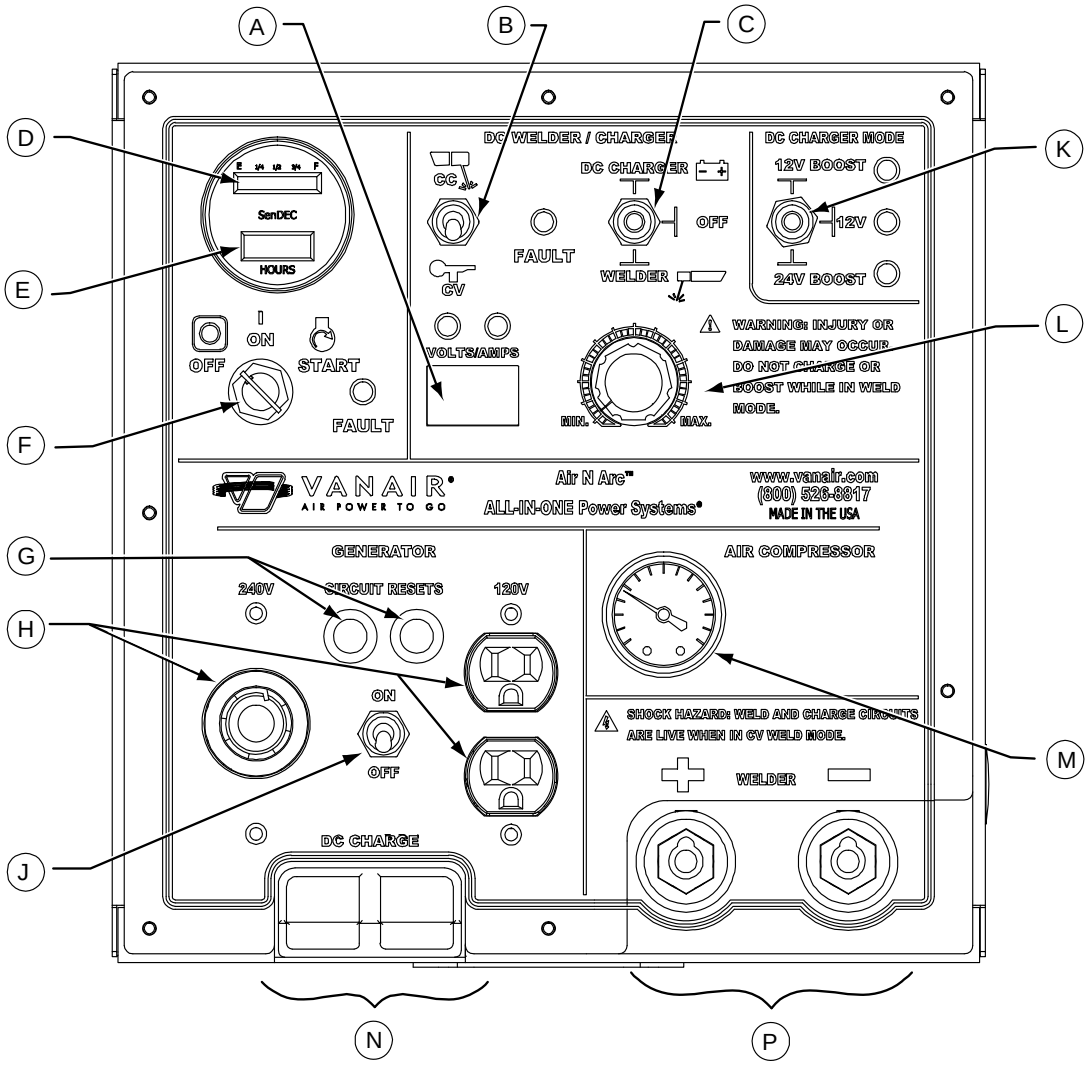
System Component or Component Group	Manual Section	Location
INSTRUMENTATION	**2.5**	**page 27**
Volts/Amps Display	2.5.1	page 29
Welder Function Switches	2.5.2	page 29
Fuel Gauge/Hour Meter	2.5.3	page 29
Engine Control (ON/OFF/START) Switch	2.5.4	page 29
Circuit Breaker Overload Trip/Reset Buttons	2.5.5	page 29
AC Voltage Outlets	2.5.6	page 30
Generator Control ON/OFF Toggle Switch	2.5.7	page 30
DC Charger Mode Toggle Switch	2.5.8	page 30
Volts/Amps Manual Adjustment Dial	2.5.9	page 30
Compressor Air Pressure Switch/ Gauge	2.5.10	page 30
Battery Cable Receptacle	2.5.11	page 30
Weld Lead Connection	2.5.12	page 30



KEY	DESCRIPTION
A	LIFTING BAIL (reference)
B	DC GENERATOR
C	AC GENERATOR

Figure 2-7: Generator Assembly

See ***Figure 2-8***. The standard instrument panel for the Air N Arc 200 Series contains a volts/amps display, welder function switches (welder CC/CV toggle switch, and DC charger/welder toggle switch), welder DC charge



KEY	DESCRIPTION	KEY	DESCRIPTION
A	VOLTS/AMPS DISPLAY ***(2.5.1)***	**H**	AC VOLTAGE OUTLETS ***(2.5.6)***
B	WELDER CC/CV TOGGLE SWITCH ***(2.5.2)***	**J**	GENERATOR CONTROL ON/OFF SWITCH ***(2.5.7)***
C	DC CHARGER/WELDER TOGGLE SWITCH ***(2.5.2)***	**K**	DC CHARGER 12V / 24V TOGGLE SWITCH ***(2.5.8)***
D	FUEL GAUGE ***(2.5.3)***	**L**	VOLTS/AMPS MANUAL ADJUSTMENT DIAL ***(2.5.9)***
E	HOUR METER ***(2.5.3)***	**M**	COMPRESSOR AIR GAUGE ***(2.5.10)***
F	ENGINE CONTROL (ON/OFF/START SWITCH) ***(2.5.4)***	**N**	BATTERY CABLE RECEPTACLE ***(2.5.11)***
G	CIRCUIT BREAKER TRIP/RESET BUTTONS ***(2.5.5)***	**P**	WELDER LEAD CONNECTION ***(2.5.12)***

Figure 2-8: Remote Instrument Panel

switch, volt/amp manual adjustment dial, air pressure gauge, fuel gauge/hour meter, weld lead terminals, battery cable receptacle, generator control ON/OFF switch, AC voltage outlets, and AC overload trip/reset buttons. In addition, the panel contains function indicator lamps that light to show various machine operation conditions.

2.5.1 VOLTS/AMPS DISPLAY

The **volts/amps display** shows the amount of volts and/or amp level while welding or boosting. Range is:

30 - 205 Amps

15 - 40 Volts

2.5.2 WELDER FUNCTION SWITCHES

The constant current (CC) or constant voltage (CV) toggle switch lets the operator choose the type of power supply desired.

- CC Mode = Constant Amperage
- CV Mode = Constant Voltage

The three-position **DC charger/welder toggle switch** serves as the battery charge enabling switch, power-enabling switch for welding, or the disabling (OFF) switch for the DC generator function.

2.5.3 FUEL GAUGE/HOUR METER

The **fuel gauge/hour meter** contains two separate system indications: the fuel gauge shows the amount of fuel, and the hour meter records the total accumulated hours that the package is operated. The hour meter can be used to assist in scheduled maintenance planning.

NOTE

Any time the engine control switch is on the hour meter is running.

2.5.4 ENGINE CONTROL (ON/OFF/START) SWITCH

The **engine control switch** engages the phases of the engine, which is integral to all the functions of the 200 Series Power System. Consult the various operating procedures as found in ***Section 5, Operation,*** to determine the integration of the engine with each separate system function.

2.5.5 CIRCUIT BREAKER OVERLOAD TRIP/ RESET BUTTONS

The **reset-capable circuit breakers** are used to protect the generator circuits from damage if an extended overload or short circuit situation occurs. The circuit breaker will trip and can be easily reset by pushing the button.

⚠ 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.

Do not force the reset buttons if they remain fixed in their inset positions—if the buttons are tripping frequently, or do not reset, this is an indication of a system problem. Whenever a circuit breaker trips, always check the complete system for any possible faulty conditions before resetting the system. If trouble persists, consult ***Section 7, Troubleshooting***, or the Vanair® Service Department.

2.5.6 AC VOLTAGE OUTLETS

The **AC voltage outlets** allow for AC generator power access via one 120V duplex, and one 240V receptacles.

2.5.7 GENERATOR CONTROL ON/OFF TOGGLE SWITCH

The **generator control ON/OFF switch** engages the AC generator. When off, the outlets are de-energized.

2.5.8 DC CHARGER MODE TOGGLE SWITCH

The three-position **DC charger mode toggle switch** lets the operator choose the type of charge needed from 12V center (default), 12V boost or 24V boost options. This is a momentary switch; the lights will indicate the mode selected.

2.5.9 VOLTS/AMPS MANUAL ADJUSTMENT DIAL

The **volts/amps manual adjustment dial** allows the operate to manually increase or decrease the amount of amperage or voltage, in variable increments, for the desired weld heat. Range is: 30-205 amps / 15-40 volts.

2.5.10 COMPRESSOR AIR GAUGE

The **compressor air gauge** indicates the discharge air pressure.

2.5.11 BATTERY CABLE RECEPTACLE

The **battery cable receptacle** junction contains the interface connections for the battery cables when charging the battery from the DC charger. The battery cable receptacle contains a weather-resistant cap.

2.5.12 WELDER LEAD CONNECTION

The **welder lead connection** contains the positive and negative interface connections for the standard welding lead cable.

SECTION 3: SPECIFICATIONS

TABLE 3A: WELDER, GENERATOR, AND ENGINE SPECIFICATIONS	
SYSTEM INFORMATION	**SPECIFICATION**
Rated Welder Output	200A High Frequency DC/CC, DC/CV; 100% Duty Cycle @ 200 Amps
Welding Leads	25 or 50 Ft. Optional (Refer to **Section A.5** for Optional Parts Listing)
AC Generator	5,000 Watts Continuous Duty
AC Generator 120V Power Rating	60 Hz 1 PH, 2-20 Amp Circuits
AC Generator 240V Power Rating	60 Hz 1 PH, 20 Amp
Battery Charger Capacity	12V Charge, 12V Boost, 24V Boost
Engine	25 EFI[I]
Engine Oil Capacity	Two (2) Quarts 10W30 (Refer to Engine Operator's Manual for Extreme Conditions)
Fuel Consumption	1.27 GPH at Full Engine Speed/Load (Approx. 8.6 Hour Runtime w/ 11Gal. Tank)
Fuel Tank Capacity	11 Gallons (41.6 L)
Fuel Type	87 Octane or Higher Unleaded Gasoline[II]
Operating Temperature Limits	-20°F to 110°F (-29° to 43°C): Consult **Section 5.8, Extreme Condition Operation**
[I] For in-depth specifications and requirements regarding the Kohler® 25 EFI engine, refer to the Engine Operator's Manual.	
[II] Ethanol blended fuels, such as E85, are prohibited for use with the Kohler 25 EFI engine. **DO NOT** use ethanol-based fuels.	

TABLE 3B: AIR COMPRESSOR SPECIFICATIONS	
COMPRESSOR INFORMATION	**SPECIFICATION**
Compressor Type	Reciprocating, Dual-Stage
Air Compressor Capacity	24 CFM @ 175 PSI
Air Filter	Pleated Paper, Dry Type
Oil Capacity/Type	**Service:** 1.75 Quarts ISO68 Premium Non-Detergent Lubricant
Air Tank Capacity	Thirty (30) Gallons or Remote Tank
Tank Pressure Rating	200 PSI
Safety Relief Valve Setting	200 PSI
Operating Range (ambient)	-20°F to 110°F (-29° to 43°C): Consult **Section 5.8, Extreme Condition Operation**
Electrical System	12 VDC
Cooling System	Air to Oil Heat Exchanger
Instrument Gauges	Pressure and Hour Meter
Adjustable Air Pressure Control Settings	Factory Preset Pressure: 150 PSI (Cut-In) / 175 PSI (Maximum Cut-Out)
Air Service Outlets	Two (2) on Control Panel (remote panel version), One (1) on Machine

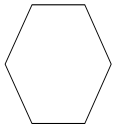
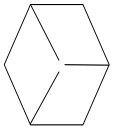
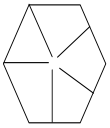
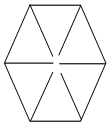
TABLE 3C: UNIT WEIGHT AND DIMENSIONS SPECIFICATIONS[I]

Dimensions (Overall Package)	Length (in)	Width (in)	Height (in)	Weight (lbs) (wet)[II]	Weight (lbs) (dry)[II]
Skid-Mount	50	23.2	27	546	536
With 30 Gallon Air Tank	50.5	23.7	43	740	730

[I] See ***Diagram 4.5*** (**parts 1 and 2**) for full dimension drawing, and ***Figure 4-1*** for location space requirements.

[II] Dimensions and weights listed do not include remote-mounted fuel tank or instrument panel (add 25 lbs for instrument panel to above-listed weights).

TABLE 3D: BOLT AND TORQUE SPECIFICATIONS

	 2	 5	 7	 8	**SOCKET HEAD CAP SCREW**
I.D. Marks	No markings	3 lines	5 lines	6 lines	Allen head
Material	Low carbon	Medium -carbon, tempered	Medium - carbon, quenched & tempered	Medium carbon, quenched & tempered	High-carbon, quenched & tempered
Tensile Strength (minimum)	74,000 PSI	120,000 PSI	133,000 PSI	150,000 PSI	160,000 PSI

US BOLT TORQUE SPECIFICATIONS (Torque in foot-pounds)

		2	2	5	5	7	7	8	8	Socket head cap screw	Socket head cap screw
Bolt Diameter	**Thread per inch**	**Dry**	**Oiled**	**Dry**	**Oiled**	**Dry**	**Oiled**	**Dry**	**Oiled**	**Dry**	**Oiled**
1/4	20	4	3	8	6	10	8	12	9	14	11
1/4	28	6	4	10	17	12	9	14	10	16	13
5/16	18	9	7	17	13	21	16	25	18	29	23
5/16	24	12	9	19	14	24	18	29	20	33	26
3/8	16	16	12	30	23	40	30	45	35	49	39
3/8	24	22	16	35	25	45	35	50	40	54	44
7/16	14	24	17	50	35	60	45	70	55	76	61
7/16	20	34	26	55	40	70	50	80	60	85	68
1/2	13	38	31	75	55	95	70	110	80	113	90
1/2	20	52	42	90	65	100	80	120	90	126	100
9/16	12	52	42	110	80	135	100	150	110	163	130
9/16	18	71	57	120	90	150	110	170	130	181	144
5/8	11	98	78	150	110	140	140	220	170	230	184
3/4	10	157	121	260	200	320	240	380	280	400	320
3/4	16	180	133	300	220	360	280	420	320	440	350
7/8	9	210	160	430	320	520	400	600	460	640	510
7/8	14	230	177	470	360	580	440	660	500	700	560
1	8	320	240	640	480	800	600	900	680	980	780
1	12	350	265	710	530	860	666	990	740	1060	845

TABLE 3E: VARIOUS FUNCTION ACCEPTABLE TESTING OUTPUT RANGES	
FUNCTION	**ACCEPTABLE RANGE**
Engine No-Load Hi RPM	3660 +/-10
Engine Idle RPM	2000 +/-10
Air Cut-in Pressure	150 +/-10
Air Cut-out Pressure	175 +/-10
AC Generator Hz (no load)	61+/-1
AC Generator 240 Plug	243 +/-3
AC Generator 120 Plug	122 +/-2
AC Generator 120 Plug	122 +/-2
Welder Max Voltage	70 +/-10
Welder Max Amperage	300 +/-5
Welder Max CV Voltage	40 +/-2
Welder Min CV Voltage	14 +/-2
12V Charge Voltage	14 +/-1
12V Boost Voltage	16 +/-1
24V Boost Voltage	29 +/-1

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SECTION 4: INSTALLATION

4.1 MACHINE PACKAGE RECEIPT/ INSPECTION

Upon receipt of the machine package, inspect the exterior of the shipping crate for signs of shipping/transit damage. Any damage should be reported immediately to the shipping company. Open the lid and inspect the component parts and supports to ensure that there has been no internal movements of assemblies or components which may have caused damage. To install the 200 Series All-In-One Power System, refer to the following sections:

System Component or Part Group Task	Manual Section	Location
Machine Package Prep	**4.2**	page 35
Service Body Prep	**4.3**	page 35
Machine Package Mounting	**4.4**	page 36
Installation and Dimensions Diagram	**4.5 (Part 1)**	page 39
Installation and Dimensions Diagram	**4.5 (Part 2)**	page 40

4.2 MACHINE PACKAGE PREP

Refer to ***Section 4.5, Installation and Dimensions Diagram, Part 1 and Part 2***, and the following instructions.

1. Remove packing and inspect the machine and control panel for shipping damage.
2. Check fluid levels, if needed. Refer to ***Section 6.5.2*** for compressor oil maintenance, and ***Sections 6.5.10.2*** and ***6.5.10.3*** for engine oil.

4.3 SERVICE BODY PREP

Consult **Section 3, Specifications**, for dimensional requirements; **Section 4.5** (**Part 1** and **Part 2**), for measurements; and the following instructions.

⚠ DANGER

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

⚠ DANGER

DO NOT install in enclosed spaces.

⚠ WARNING

ELECTRICAL HAZARD! Be sure the battery is disconnected before starting the installation.

NOTE

Contact Vanair at
(219) 879-5100 / (800) 526-8817
Service Fax: (219) 879-5335
www.vanair.com
to report missing items, incorrect part numbers, or other discrepancies.

NOTE

Install electrical components (circuit breakers, pressure switches, toggle switches, etc.) in locations where exposure to water or moisture will be most minimized.

NOTE

In order to prevent accidental damage to vehicle components (fuel tanks, lines, brake lines, wiring harnesses), note their location before drilling any holes.

⚠ WARNING

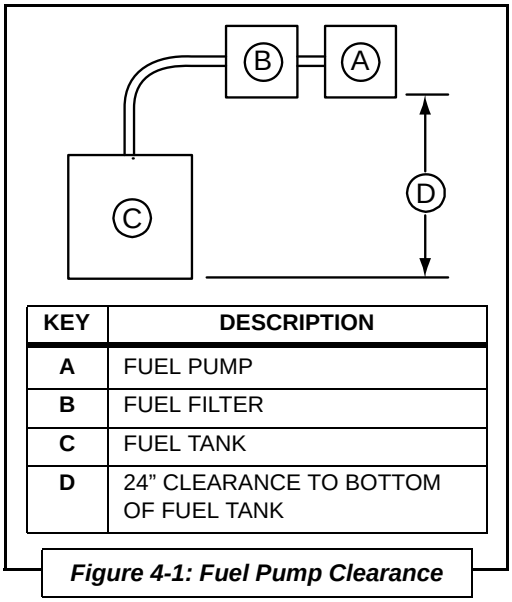
Installation must adhere to the safety precautions listed in the Safety Section of this manual for cooling and noxious fume ventilation.

If mounting footprint is tighter than the recommended minimum requirements, consult the Vanair Service Department for application installation recommendations.

NOTE

For set up without a fuel tank, where an additional fuel pump is required, order the following kit:

•Kit no. MA57870



KEY	DESCRIPTION
A	FUEL PUMP
B	FUEL FILTER
C	FUEL TANK
D	24” CLEARANCE TO BOTTOM OF FUEL TANK

Figure 4-1: Fuel Pump Clearance

NOTE

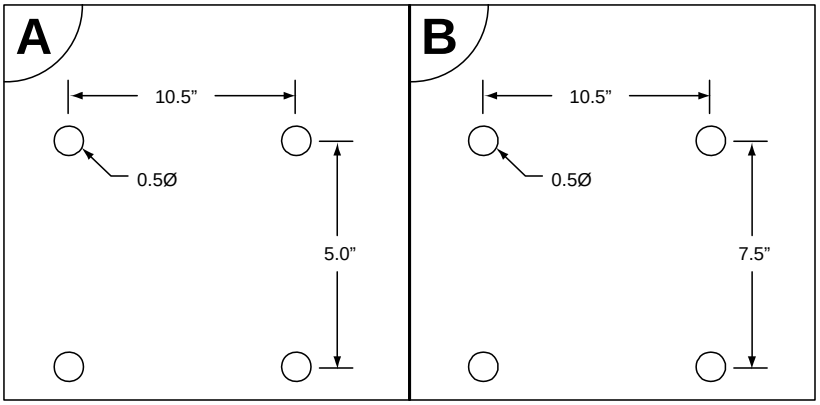
Mounting brackets are available to space panel off from truck body (*Figure 4-2*). Contact Vanair®.

1. Drill four (4) 9/16” mounting holes in the service body floor on a 12.75” by 34.88” square pattern at the desired mounting location. Ensure that all proper machine clearances will be maintained.
2. For units without a fuel tank, follow these steps:
   - Mount the electric fuel pump at the desired location on the service body keeping it as close to the truck fuel tank as possible. Mount the electric fuel pump a maximum distance of 24 inches from the bottom of the tank (***Figure 4-1***).
   - Install 1/4” fuel line from the vehicle tank to the 1/4” fuel filter under the hood of the machine.
   - Ensure that the lines do not make contact with sharp edges, moving parts or exhaust heat (consult ***Appendix A, Section A.6, Hose Installation Guide*** for assistance in running hose lines).
   - Units must have a 70 micron fuel filter in line before the pump.
3. Install the remote control panel (Optional) at the desired location on the service body and route the control trunk line to the location where the unit will mount. Ensure that all sharp edges that the trunk-line contacts are shielded or grommeted, and that there are no excessively sharp bends in the trunk-line. Ensure the trunk line does not come in contact with exhaust parts.

4.4 MACHINE PACKAGE MOUNTING

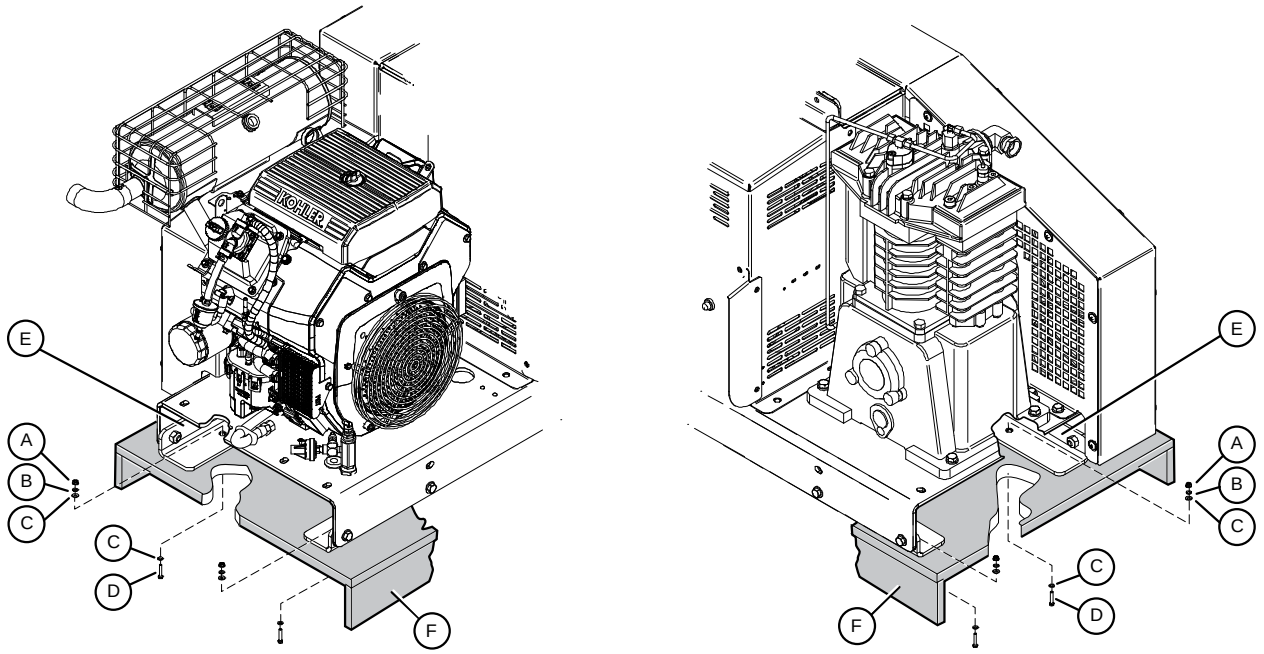
When determining package position on vehicle, be aware of the minimum space requirements needed for cooling and circulation, and also package access for performing maintenance (see ***Section 4.5, Installation and Dimensions Diagram, Part 1 and Part 2***). To prepare the machine for mounting, refer to ***Figure 4-3*** and the following procedure:

1. To unbolt the unit from the skid, remove the mounting nuts [**A**], lock washers [**B**], washers [**C**] and mounting bolts [**D**] securing the machine to the shipping crate.



KEY	DESCRIPTION	PART NUMBER
A	MOUNTING PATTERN WITH SPACER	(SPACER) A16738P
B	MOUNTING PATTERN WITHOUT SPACER	_

Figure 4-2: Remote Panel Mounting Pattern (with and without Spacer)



KEY	DESCRIPTION	KEY	DESCRIPTION
A	MOUNTING NUT 1/2 (x 4)	**D**	MOUNTING BOLT 1/2 (x 4)
B	LOCK WASHER 1/2 (x 4)	**E**	SKID MOUNT BRACKET (x 4)
C	WASHER 1/2 (x 8)	**F**	SHIPPING CRATE SKID PLATFORM

Figure 4-3: Removing Package from Crate Mounting

⚠ CAUTION

Lift the machine package in accordance within the safety guidelines given in *Section 1.7.1, Falling Unit Can Cause Injury*.

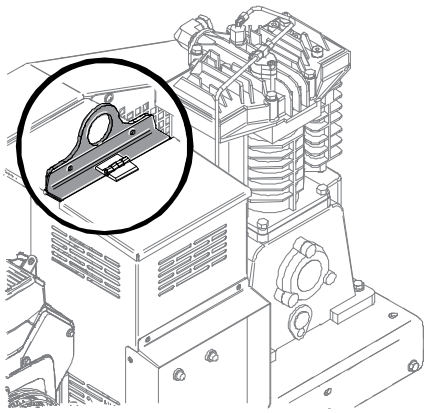


Figure 4-4: Lifting Bail Location

NOTE

For guidance on machine start-up procedure and control panel functions, consult *Section 5, Operation*.

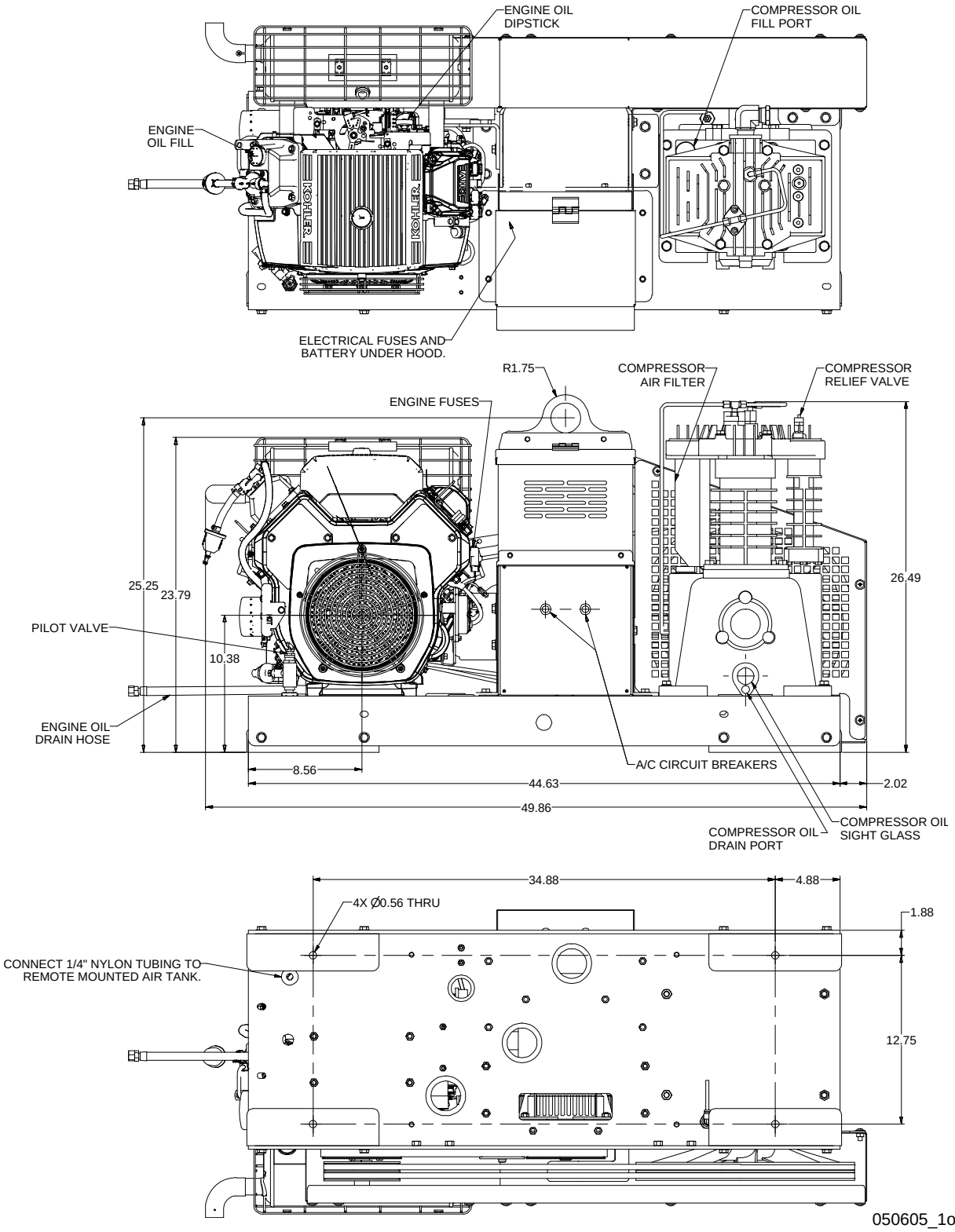
NOTE

It is recommended that the machine be mounted on a vibration isolating material such as 1/4" neoprene rubber pads.

Isolating Dampeners (Part Number PR93969) are available by calling the Vanair® Customer Service Department.

2. Using a proper hoist, lift and place the unit in a preliminary position on the service body of the vehicle so that access is easily attained, the control trunk line and all other connections will reach the unit, and there is enough space surrounding the mounting area for cooling purposes. Refer to ***Figure 4-4*** for lifting bail location.
3. Route the control trunk-line through the grommeted opening. Connect the ½" air line via the JIC fitting on the end of the air tank, and connect and secure the weather proof connectors. The plugs are all differentiated to ensure that they cannot be mis-connected.
4. Connect and clamp the fuel line to the in-line fuel filter located on the engine near the left valve cover as you are looking at the motor, if using truck tank.
5. Leaving the unit in the preliminary position, connect the ground cable to the unit battery, and check all fluid levels (**NOTE:** vehicle should be on a level surface in order to get accurate fluid level checks).
6. Turn the Ignition switch on the control panel to "**ON**". While the ON sequence is initiated, check that the fuel pump is energized. Wait 3-5 seconds for the fuel pump to prime the fuel system. The unit will start more quickly if the fuel pump is manually pre-energized to prime the fuel system. Start and run the unit for a few minutes, then turn the machine off. Check fuel connections for leaks, verify all connections, and replace access panel and close hood.
7. Move the unit into its final location for mounting, while positioning the control trunk line and all other connections.
8. Bolt the machine down with four ½" bolts inserted up from the bottom through the four mounting bolt holes of the base frame. See ***Section 4.5, Installation and Dimensions Diagram, Part 1*** and ***Part 2***.
9. Start the unit and fully test all functions. Warm the unit to full operating temperature. After the unit has cooled, check all fluid levels and add as needed.

4.5 INSTALLATION AND DIMENSIONS DIAGRAM (PART 1 OF 2)



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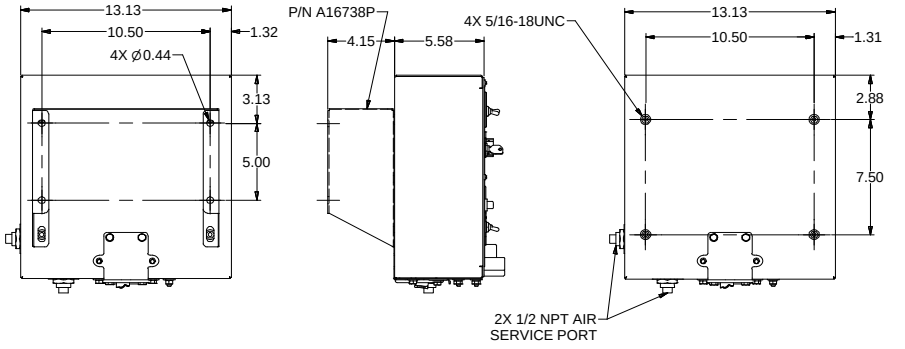
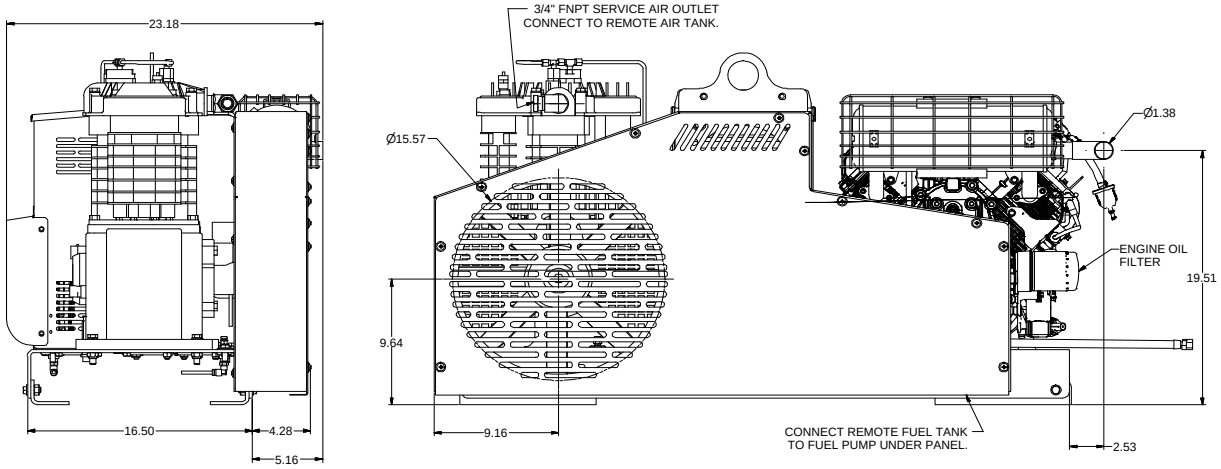
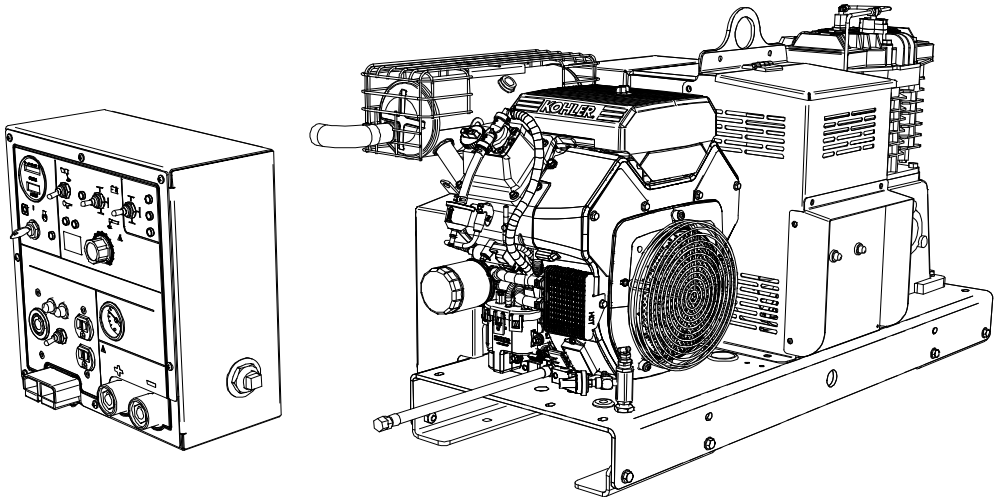
4.5 INSTALLATION AND DIMENSIONS DIAGRAM (PART 2 OF 2)



REMOTE PANEL WITH OPTIONAL SPACER

REMOTE PANEL WITHOUT SPACER





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SECTION 5: OPERATION

5.1 GENERAL INFORMATION

The Air N Arc 200 All-In-One Power System has a comprehensive array of controls and indicators for each function of the power system. Understanding the correct operation of the 200 Series system will help you to understand and recognize when the system is operating optimally. The information in the Operation Section will help the operator to recognize and interpret the readings, which will call for service or indicate the beginning of a malfunction.

NOTE

Before starting the Vanair® Air N Arc 200 All-In-One Power System, 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 truck 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.

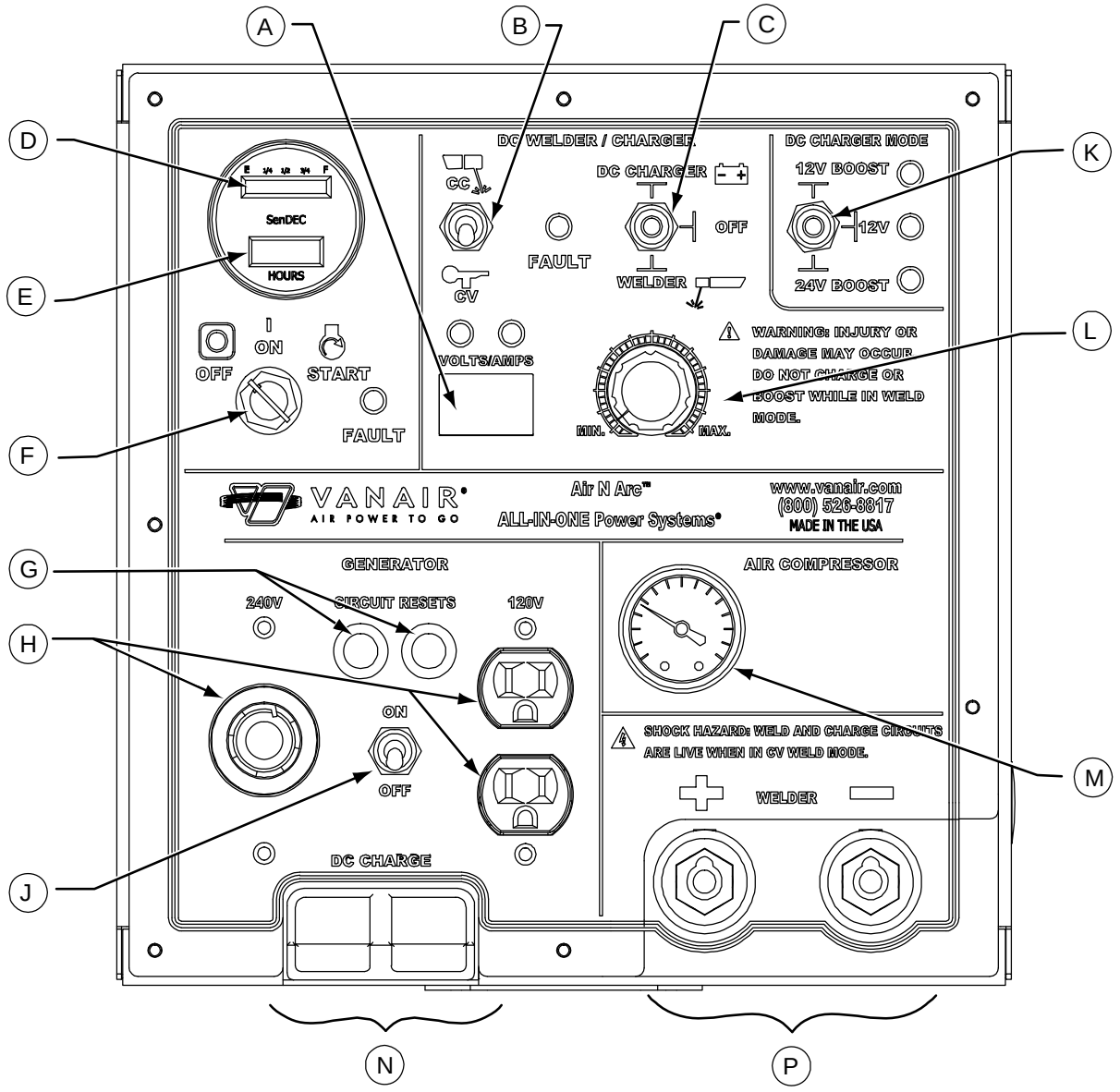
NOTE

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

NOTE

If any of 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.

Continued on page 43



KEY	DESCRIPTION	KEY	DESCRIPTION
A	VOLTS/AMPS DISPLAY	**H**	AC VOLTAGE OUTLETS
B	WELDER CC/CV TOGGLE SWITCH	**J**	GENERATOR CONTROL ON / OFF SWITCH
C	DC CHARGER/WELDER TOGGLE SWITCH	**K**	DC CHARGER 12V / 24V TOGGLE SWITCH
D	FUEL GAUGE	**L**	VOLTS/AMPS MANUAL ADJUSTMENT DIAL
E	HOUR METER	**M**	AIR PRESSURE GAUGE
F	ENGINE CONTROL(ON/OFF/START SWITCH)	**N**	BATTERY CABLE RECEPTACLE
G	CIRCUIT BREAKER TRIP/RESET BUTTONS	**P**	WELDER LEAD CONNECTIONS

NOTE: For details concerning the functional operation purpose of each component of the instrument panel, consult **Section 2.5, Instrumentation**.

Figure 5-1: Instrument Panel Functions

5.2 ENGINE START-UP AND SHUTDOWN PROCEDURE

Consult ***Figure 5-1: Instrument Panel Functions*** for 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.

5.2.1 ENGINE START-UP

Consult ***Figure 5-2***, and the following steps:

1. Check to make sure all switches [**A**] (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 [**B**]; wait 3-5 seconds for the fuel pump to prime the system.
3. Continue turning control switch to the **START** position [**C**] 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.

NOTE

Air compressor will start automatically with machine start-up.

NOTE

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

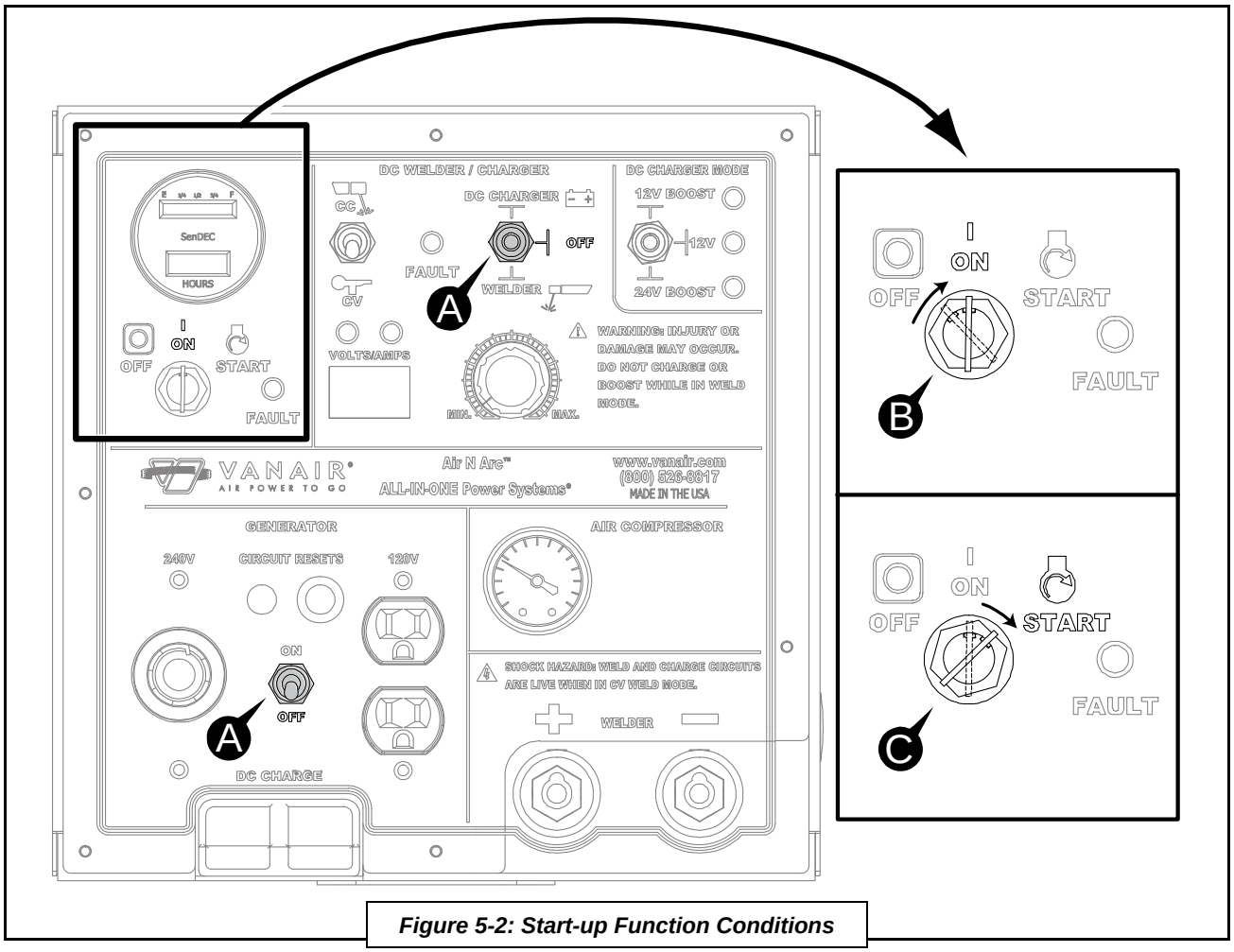


Figure 5-2: Start-up Function Conditions

5.2.2 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 5-1***. To shut the engine off at any time, turn the engine control switch 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 (***Figure 5-2***, [**A**]) 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.

5.3 ENGINE THROTTLE CONTROL FUNCTIONS

The engine speed is controlled by three factors:

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

Consult Table 5A: Engine Throttle Control Function Conditions to understand how the engine speed relates to the demand(s) of the machine system's output functions.

5.4 OPERATING THE WELDER

⚠ WARNING

Before attempting any welding procedure, the operator must be aware of general safety practices, and particularly those pertaining to welding, as found in *Section 1.4* of this manual.

Consult ***Figure 5-3***. The **variable power dial** adjusts the welder amperage (30 to 205 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.

NOTE

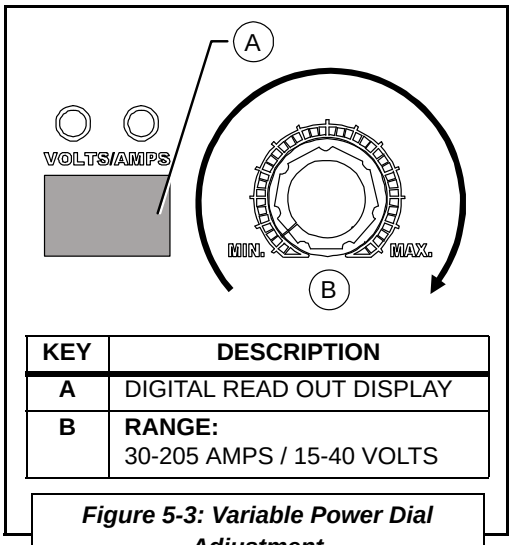
The amps/volts display will read the set value for five (5) seconds when the dial is adjusted, and then return to the actual output value five (5) seconds after the dial has been adjusted.

TABLE 5A: ENGINE THROTTLE CONTROL FUNCTION CONDITIONS[I]			
Air Pressure	**Generator Switch**	**Welder Switch**	**Engine Speed Condition Result**
Tank Pressure Below (<) 150 PSI or Set Pressure[II]	OFF	OFF	Engine runs at full throttle (3600 RPM).
Tank Pressure Above (≥) 150 PSI or Set Pressure[II]	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[III].
	ON	ON	Full speed and all items available for use.

[I] Any combination of the 200 Power System output functions (compressor, generator, welder) used simultaneously at capacity will have an adverse affect on engine running at full throttle.

[II] Factory set pressure: 150 PSI = ON / 175 PSI = OFF

[III] Consult **Appendix A, Section A.3, Wattage Requirements for Common Receptacle Units** for a listing of wattage requirements of various implements.



KEY	DESCRIPTION
A	DIGITAL READ OUT DISPLAY
B	**RANGE:** 30-205 AMPS / 15-40 VOLTS

Figure 5-3: Variable Power Dial Adjustment

5.4.1 WELDER OPERATING PROCEDURE

5.4.1.1 CC (CONSTANT CURRENT) MODE

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

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 5B** 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 5.2, 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 5B** 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.
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.

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.

NOTE

For electrode striking technique, consult *Section A.7, Electrode Ignition Procedure* in Appendix A.

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 5C**.

5.4.1.2 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

TABLE 5B: ELECTRODE SPECIFICATIONS

METAL THICKNESS	ELECTRODE SIZE	WELDING AMPERES
1/16-1/8	3/32	50-90
1/8-1/4	1/8	90-140
¼-3/8	5/32	120-180
3/8-1/2	3/16	150-230

TABLE 5C: 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+

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 200 on the work piece.
3. Start the engine (**See Section 5.2, 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 200 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 dial may be adjusted to the desired voltage level.

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

NOTE

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

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 spool gun adapter into the positive (+) welder connection port on the control panel.

2. Place the ground clamp from the Air N Arc 200 on the work piece.
3. Start the engine (**See Section 5.2, 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 200 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.

5.5 OPERATING THE AC GENERATOR

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 5-4***).

⚠ 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.

5.6 OPERATING THE AIR COMPRESSOR

The air compressor on the Air N Arc 200 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

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.

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.

⚠ 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.

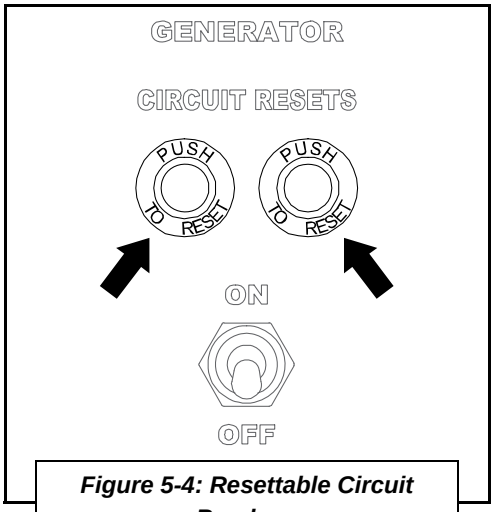


Figure 5-4: Resettable Circuit Breakers

NOTE

The Air N Arc 200 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 6.5.5, Adjusting Compressor Cut-In/Cut-Out Pressure*).

⚠ CAUTION

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

NOTE

The pressurized air system requires routine maintenance. See *Section 6.3, Maintenance Schedule Table*, for important maintenance procedures.

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 5-5***). 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 2.2.4, Pilot Valve***, and **Section A.8, Pressure System Control - Function Sequences**.

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.

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 *Section 6.3, Maintenance Schedule Table*, for important maintenance procedures.

5.7 OPERATING THE BATTERY BOOSTER/CHARGER

System Operation Group	Manual Section	Location
Operating the Battery/Boost Charger	**5.7**	page 51
Connection - Disconnection Sequence and Operation	5.7.1	page 51

The Vanair state-of-the-art battery charging module and the optional battery charging cables add further versatility to the 200 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.

Consult **Table 5D** for factory preset ranges. 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.

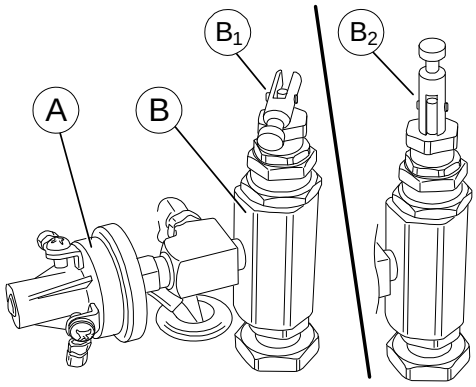
During charging, if the machine begins to cycle between high and low idle, then the battery is fully charged.

5.7.1 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.

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



KEY	DESCRIPTION
A	PRESSURE REGULATOR (ref.)
B	PILOT VALVE
B_1	MANUAL SWITCH 'OFF' POSITION
B_2	MANUAL SWITCH 'ON' POSITION

Figure 5-5: Pilot Valve

⚠ 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.

IMPORTANT

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

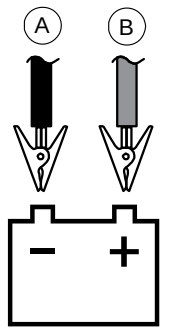
TABLE 5D: FACTORY PRESETS		
	FACTORY ADJUSTMENT RANGE	**FACTORY PRE-SET**
12V CHARGER	12V - 15V	14V
12 V BOOST	14V - 17V	16V
24V BOOST	26V - 35V	30V

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.



KEY	DESCRIPTION
A	BLACK
B	RED

Figure 5-6: DC Generator Cable Connections

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 5-6***).
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.

5.8 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 6.3, Maintenance Schedule 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.

5.8.1 COLD WEATHER OPERATION

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.

NOTE

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

5.8.1.1 ENGINE OPERATION

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.

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.

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.

NOTE

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

5.8.2 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.

5.8.3 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.

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SECTION 6: MAINTENANCE

6.1 GENERAL INFORMATION

A strict maintenance program is the key to long life for the Air N Arc 200 Series All-In-One Power System package. Below is a program that, when adhered to, should keep the package in top operating condition. Refer to **Section 6.5, 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:

System Component or Component Group	Manual Section	Location
Routine Maintenance Schedule	**6.2**	page 55
Maintenance Schedule Table	**6.3**	page 57
Replacement Parts	**6.4**	page 64
Parts Replacement and Adjustment Procedures	**6.5**	page 61
Servicing the System Fuses and Circuit Breakers	**6.6**	page 96
Storage and Intermittent Use	**6.7**	page 98

⚠ 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.

⚠ WARNING

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

6.2 ROUTINE MAINTENANCE SCHEDULE

Vanair® Manufacturing, Inc. considers the maintenance schedule given in ***Section 6.3, Maintenance Schedule Table***, 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 Manufacturing, Inc. especially requires that a consistent service regimen be established for engine oil changes, and engine and compressor air filter servicing. The following schedule 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.

NOTE

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

NOTE

Follow the prescribed periodic maintenance (PM) schedule as recommended. Perform the required PM schedule at recommended intervals. Failure to follow this prescribed periodic 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.

Please take a moment to acquaint yourself with the following service schedule. There is also a corresponding service log (**Appendix B, Maintenance & Service Log**) to assist the customer in establishing a maintenance routine log.

For assistance in obtaining routine maintenance or replacement parts, consult ***Section 9.1, Parts Ordering Procedure***, and **Table 9A: Recommended Spare Parts List.**

6.3 MAINTENANCE SCHEDULE TABLE

		INTERVALS							
		BREAK-IN PERIOD	MAINTENANCE SCHEDULE Hourly or Calendar Period - whichever comes first						NOTE
		First 20 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	If working in dusty or dirty conditions, reduce the recommended time intervals between servicing by half for engine and compressor oil change, and engine and compressor filter servicing.
KEY	**TASK DESCRIPTION**								**ACTION TO TAKE**
1	Check tension of both compressor poly-link drive belts	●	●		●	●	●	●	Tighten belts if necessary. Consult ***Section 6.5.7, Replacing and Re-tensioning the Compressor and/ or Generator Drive Belts***, and its sub-sections that concern the compressor drive belts.
2	Change engine oil and engine filter	●			●	●	●	●	Consult ***Section 6.5.9.2, Checking the Engine Oil***, and if necessary, to change the oil and oil filter refer to ***Section 6.5.9.3, Replacing the Engine Oil***.
3	Wash engine air pre-cleaner	●	●	●	●	●	●	●	Remove and wash engine air filter precleaner: Consult ***Section 6.5.9.1, Engine Air Filter Maintenance***.
4	Change compressor oil	●			●	●	●	●	Consult the following ***Sections 6.5.2, Compressor Oil Maintenance***.
5	Check engine oil level		●	●	●	●	●	●	Consult ***Section 6.5.9.2, Checking the Engine Oil***, and if necessary, to change the oil and oil filter refer to ***Section 6.5.9.3, Replacing the Engine Oil***.
6	Check and maintain oil level at proper amount shown in the compressor sight glass		●	●	●	●	●	●	Compressor must operate at oil levels within the parameters of the sight glass, per ***Section 6.5.2***, ***Compressor Oil Maintenance***. Do not overfill, or operate at low levels.
7	Check air tank for water accumulation		●	●	●	●	●	●	Drain any water from the air tank, per procedure in ***Section 6.5.8, Draining the Air Tank***.

6.3 MAINTENANCE SCHEDULE TABLE

KEY	TASK DESCRIPTION	INTERVALS: BREAK-IN PERIOD: First 20 Hours of Operation	MAINTENANCE SCHEDULE Hourly or Calendar Period - whichever comes first: 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	ACTION TO TAKE
8	Inspect unit for oil leaks or damage		•	•	•	•	•	•	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.
9	Inspect cooler fins (both engine and compressor) for contamination)		•	•	•	•	•	•	Clean or clear as necessary. Refer to Section ***6.5.9.5, Engine Cooler Maintenance*** for engine cooler procedure.
10	Inspect ventilation areas and surroundings		•	•	•	•	•	•	Ensure ventilation areas and surroundings are not blocked or clogged with debris. Clean or clear as necessary.
11	Clean and inspect engine air filter			•	•	•	•	•	Consult ***Section 6.5.9.1, Engine Air Filter Maintenance***.
12	Clean and inspect compressor air filter			•	•	•	•	•	Consult ***Section 6.5.1, Compressor Air Filter***.
13	Check/clean all external parts of compressor and engine		•	•	•	•	•	•	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.
14	Inspect serpentine welder generator drive belt for wear, damage or excessive cracking				•	•	•	•	Ensure that drive belts are in satisfactory operating condition, and are tensioned adequately. Should a belt need to be replaced, consult ***Sections 6.5.7.8*** through ***6.5.7.10*** for generator drive belt procedures.
15	Check battery cables and connections					•	•	•	Clean and tighten as necessary. Replace any worn cables.

NOTE

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

Continued on next page

6.3 MAINTENANCE SCHEDULE TABLE

		INTERVALS							
		BREAK-IN PERIOD	MAINTENANCE SCHEDULE Hourly or Calendar Period - whichever comes first						NOTE
		First 20 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	**If working in dusty or dirty conditions, reduce the recommended time intervals between servicing by half for engine and compressor oil change, and engine and compressor filter servicing.**
KEY	**TASK DESCRIPTION**								**ACTION TO TAKE**
16	Inspect unit mounting bolts					●	●	●	Tighten any loose mounting bolts as necessary.
17	Blow out the DC welding generator and AC generator					●	●	●	Use compressed air to clear out generators (NOTE: carry out every 100 hours if operating in dirty environmental conditions.)
18	Replace engine fuel filter(s)				●	●	●	●	Consult ***Section 6.5.9.4, Replacing the In-line Fuel Filters***.
19	Check compressor cut-in and cut-out pressures						●	●	Ensure that the cut-in and cut-out pressure settings are correct. Adjust if necessary, per ***Section 6.5.5, Adjusting Compressor Cut-In/Cut-Out Pressure***.
20	Replace engine spark plugs (*Check at 200 hours*)						●	●	Consult the procedure in the Engine Operator's Manual on how to change the spark plugs.
21	Replace engine air filter				●	●	●	●	Consult ***Section 6.5.9.1, Engine Air Filter Maintenance***, on how to change the air filter.
22	Check the engine speed						●	●	Ensure that the engine speed is running at correct interval. Adjust if necessary, per ***Section 6.5.6, Adjusting the Engine Speed***.
23	Inspect the welding leads and battery charging cables						●	●	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

6.3 MAINTENANCE SCHEDULE TABLE

		INTERVALS							
		BREAK-IN PERIOD	MAINTENANCE SCHEDULE Hourly or Calendar Period - whichever comes first						NOTE
		First 20 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	**If working in dusty or dirty conditions, reduce the recommended time intervals between servicing by half for engine and compressor oil change, and engine and compressor filter servicing.**
KEY	**TASK DESCRIPTION**								**ACTION TO TAKE**
24	Inspect welding electrode clamp and ground clamp						●	●	Ensure that welding electrode and ground clamps are in satisfactory for operation (no cracks or advanced wear). Repair or replace as necessary.
25	Replace the air compressor and generator drive belts						●	●	Consult ***Section 6.5.7 and applicable sub-sections*** on how to replace and re-tension the drive belts.
26	Inspect the generators and the automatic belt tensioner						●	●	Ensure that the automatic belt tensioner is free of rough, noisy or worn bearings. Consult ***Section 6.5.7.8, Replacing and Re-tensioning the Generator Belt***.
27	Inspect compressor head valves. Clean the carbon from valves and head if necessary							●	Refer to ***Sections 6.5.4, Compressor Head Valve Assembly Inspection and Maintenance*** for compressor head valve maintenance procedures.
28	Check and tighten all bolts, nuts, etc., if necessary							●	Check all bolt and nut fastenings to assure tightness, and/or correct torque values where applicable. Check more frequently under heavy use conditions.
29	Check compressor unloader valve(s) operation							●	Refer to ***Sections 6.5.3, Unloader Valve Maintenance***, for unloader valve maintenance procedures.

Consult ***Section 9.1 and Table 9A*** for replacement part order numbers.

NOTE: Consult *Section 6, Maintenance* for additional, non-routine maintenance procedures.

6.4 REPLACEMENT PARTS

Replacement parts should be purchased through your local Vanair® representative or where the 200 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.

VANAIR MANUFACTURING, INC.
10896 West 300 N.
Michigan City, IN 46360
Telephone: (800) 526-8817
(219) 879-5100
Service Fax: (219) 879-5335
Parts Fax: (219) 879-5340
Sales Fax: (219) 879-5800

www.vanair.com

NOTE

For assistance when ordering new replacement parts, consult *Section 9.1, Parts Ordering Procedure*, and Table 9A: Recommended Spare Parts List.

NOTE

If additional spare parts are being stored for future use, make certain 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 6.7.2, Long Term Storage*.

6.5 PARTS REPLACEMENT AND ADJUSTMENT PROCEDURES

Continued on next page

⚠ WARNING

Relieve pressure from the compressor system before removing any components. The compressor and engine oil levels should be checked with the unit shut down and the oil allowed to properly settle.

⚠ 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.

⚠ CAUTION

Always wear personal protective equipment such as gloves, safety shoes or boots, eye, and hearing protection as required for the task at hand.

⚠ CAUTION

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

NOTE

It may be necessary to change the compressor oil and oil filter at earlier intervals if the compressor oil has water contamination or if the compressor system is operated in a dirty environment.

NOTE

Inspect and replace damaged components before operation with Genuine Vanair® Replacement Parts. Using replacement parts other than Genuine Vanair Replacement Parts will void the warranty.

NOTE

Refer to the Engine Operator's Manual for detailed and additional maintenance and replacement procedures for the engine.

6.5.1 COMPRESSOR AIR FILTER

System Operation Group	Manual Section	Location
Compressor Air Filter	**6.5.1**	**page 63**
Compressor Air Filter Replacement	6.5.1.1	page 63

⚠ 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.

The compressor oil is the key to a long useful life of the air compressor system. Dirt and other foreign matter can be introduced into the compressor system through the air intake. A clean air filter will ensure that the compressor is protected. Consult ***Section 6.3, Maintenance Schedule Table*** for routine compressor air filter inspection intervals.

⚠ WARNING

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

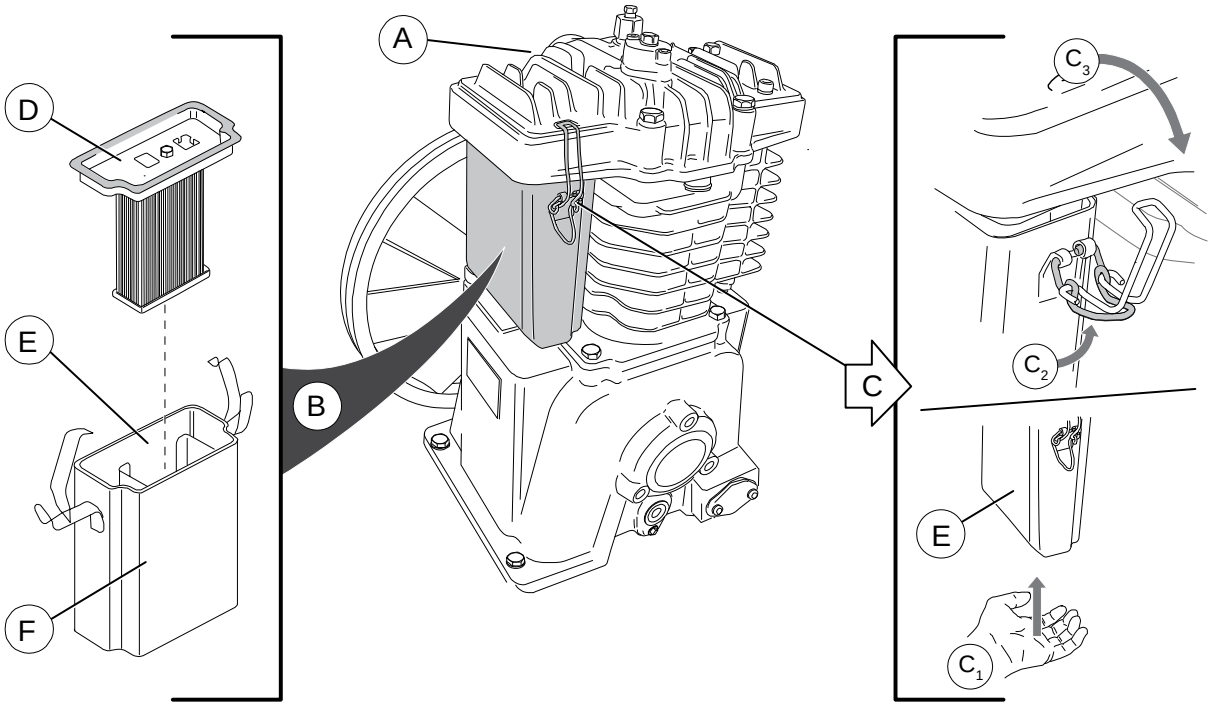
6.5.1.1 COMPRESSOR AIR FILTER REPLACEMENT

TOOLS/ITEMS NEEDED	REPLACEMENT PART(S)
Container large enough to accommodate filter	**Air Filter Replacement Kit No. RC99245**

The air filter element uses a pleated paper-type filter to carefully remove accumulated dirt before being compression can begin. **DO NOT** clean the compressor air filter element.

Refer to ***Figure 6-1***, and the following procedure:

1. With the machine off and the ignition key removed, locate the air filter assembly [**B**] on the compressor unit [**A**].
2. Grasp the base of the filter assembly for support [$\mathbf{C_1}$].
3. Unfasten one of the two (2) spring clamps [**C**] securing the air filter body [**F**] to the compressor by lifting upwards on the lower end of the spring clamp [$\mathbf{C_2}$], which relieves tension on the upper part of the spring clamp.
4. Unhook the upper part of the spring clamp [$\mathbf{C_3}$] to release the clamp from the compressor.
5. Repeat Steps #2 through #4 above for the other spring spring clamp [**C**] to release the air filter body [**F**] from the compressor.
6. Remove the worn filter assembly [**D**] from the air filter housing [**E**]; entire assembly lifts out.



KEY	DESCRIPTION	KEY	DESCRIPTION
A	COMPRESSOR UNIT	**C_3**	Release upper edge of spring clamp
B	COMPRESSOR AIR FILTER	**D**	AIR FILTER ASSEMBLY[I]
C	RELEASING AIR FILTER BODY	**E**	AIR FILTER BODY
C_1	Grasp body at base for support	**F**	COMPRESSOR-SIDE OF BODY (faces compressor)
C_2	Lift lower edge of spring clamp		

[I]Order Air Filter Assembly Replacement Kit no. RC99245.

Figure 6-1: Air Inlet Filter Replacement Kit

7. With the new air filter assembly in place within the body, position the body below its seating on the compressor unit. **NOTE:** Compressor-side of body [**F**] faces in toward the compressor unit.
8. Swing the upper edge of spring clamp [**C**] so that its end fits into the groove on the compressor.
9. Push down on the lower end tab of the spring clamp to lock the spring clamp into place.
10. Repeat Steps #8 and #9 for the clamp on the other side of the air filter body to secure the filter into place.

11. Dispose of worn air filter assembly within the guidelines of all applicable local, regional and/or federal laws.

6.5.2 COMPRESSOR OIL MAINTENANCE

System Operation Group	Manual Section	Location
Compressor Oil Maintenance	**6.5.2**	**page 65**
Compressor Oil Change	6.5.2.1	page 65

TOOLS/ITEMS NEEDED	REPLACEMENT PART(S)
Compressor Oil (if necessary)	**ISO68, Non-Detergent Oil**

⚠ WARNING

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

⚠ WARNING

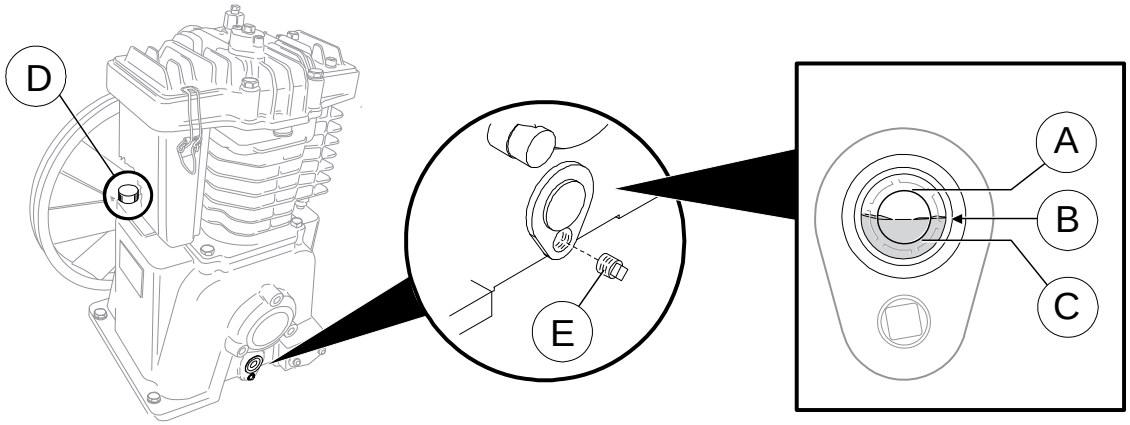
Before performing maintenance or repair operations on the machine, ensure that all power has been removed and locked out to prevent accidental start-up.

NOTE

The compressor is factory-filled to full level (1.75 quarts) of high quality, non-detergent ISO68 oil.

Consult **Section 6.3, Maintenance Schedule Table** for compressor oil maintenance schedule, and refer to ***Figure 6-2*** and the following procedure to check the compressor oil.

1. With the machine off, check the level of the oil in the sight glass as indicated in ***Figure 6-2***.
2. Locate the fill port [**D**]; unscrew and remove the compressor oil fill cap.



KEY	DESCRIPTION	KEY	DESCRIPTION
A	HIGH OIL LEVEL - Do not fill above the top of the red circle	**D**	COMPRESSOR OIL FILL PORT
B	CORRECT COMPRESSOR OIL LEVEL - Midway of the sight glass	**E**	CRANK CASE DRAIN PLUG (1/4" NPT)
C	LOW OIL LEVEL - Do not let level drop below bottom of the red circle		

Figure 6-2: Compressor Oil Maintenance

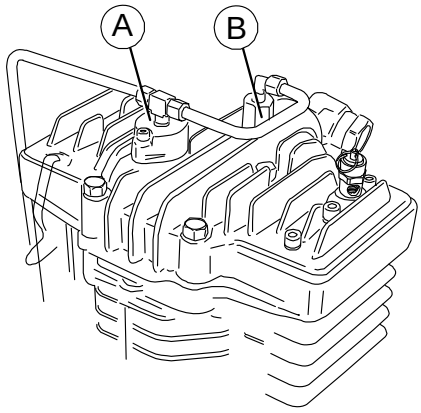
3. When filling or replenishing the compressor oil, be aware of the quantity via the sight glass indications: The red circle indicates both high and low levels. **Do not** overfill the compressor unit, and **do not** operate the compressor when the oil level drops below the LOW indication.

6.5.2.1 COMPRESSOR OIL CHANGE

NOTE
Scheduled intervals may change under extreme condition environments. Consult *Section 5.8, Extreme Condition Operation* to help determine a proper routine for maintenance under adverse operation conditions.

TOOLS/ITEMS NEEDED	REPLACEMENT PART(S)
Compressor Oil	**ISO68, Non-Detergent Oil (1.75 Quarts)**
Container to Collect Drained Oil	
Wrench (1/4”) for Drain Plug	

1. With the machine off, locate the crank case drain plug [**E**] as indicated in ***Figure 6-2***.
2. Place container below plug outlet.
3. Remove the cap on the oil fill port [**D**].
4. Remove the 1/4” drain plug [**E**], and let the oil drain from the crank case.
5. After oil has drained, replace the drain plug and tighten.
6. Add oil as needed, but **DO NOT** overfill.
7. Replace oil fill cap [**D**] and tighten.
8. Dispose of discarded oil within the guidelines of all applicable local, regional and/or federal laws.



KEY	DESCRIPTION
A	LOW PRESSURE VALVE
B	HIGH PRESSURE VALVE

Figure 6-3: Unloader Valve Locations

6.5.3 UNLOADER VALVE MAINTENANCE

The unloader valves for low pressure and high pressure are located on the top of the compressor cylinder head, as shown in ***Figure 6-3***. These valves are susceptible to contamination from moisture and lack of lubrication, which may cause them to stick. For routine maintenance

of the unloader valves, consult **Section 6.3, Maintenance Schedule Table**.

6.5.3.1 LOW PRESSURE VALVE MAINTENANCE

TOOLS/ITEMS NEEDED
Hex Head Key (5mm)
Screw Driver (Small)
ISO68 Compressor Oil (to lubricate the gaskets)
Pipe Sealant

REPLACEMENT PART(S)
Low Pressure Valve Assembly Replacement Kit No. RC46552 (if applicable)

Refer to ***Figure 6-4*** for low pressure valve assembly.

1. Locate the low pressure unloader valve [**A**] as indicated in ***Figure 6-3***.
2. Remove the copper tubing [**A**] connected to the tee on the top of the low pressure unloader valve [**C**].
3. Remove the tee [**B**] connected to the upper cover [**F**].
4. Remove the two (2) 5mm capscrews [**D**] and spring washers [**E**] securing the upper cover [**F**] in place.
5. Remove the valve assembly, which consists of:
   - Upper cover gasket [**G**]
   - Unloading piston [**H**]
   - Viton o-ring [**J**]
   - Unloading spring [**K**]
   - Unloading cylinder [**L**]
   - Lower unloader gasket [**M**]
   - Unloading fork [**N**]
   - Washer [**P**]
   - Bolt [**Q**]
6. Remove viton o-ring [**J**] from piston shaft.
7. Clean the piston [**H**], bore (inner cylinder chamber of [**L**]) and spring [**K**] with soap and water.
8. Dry the assembly parts.
9. Apply a small amount of o-ring lubricant to viton o-ring [**J**], and reset onto the piston shaft [**H**].
10. Reassemble the parts in order, taking care to:

⚠ WARNING

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

⚠ WARNING

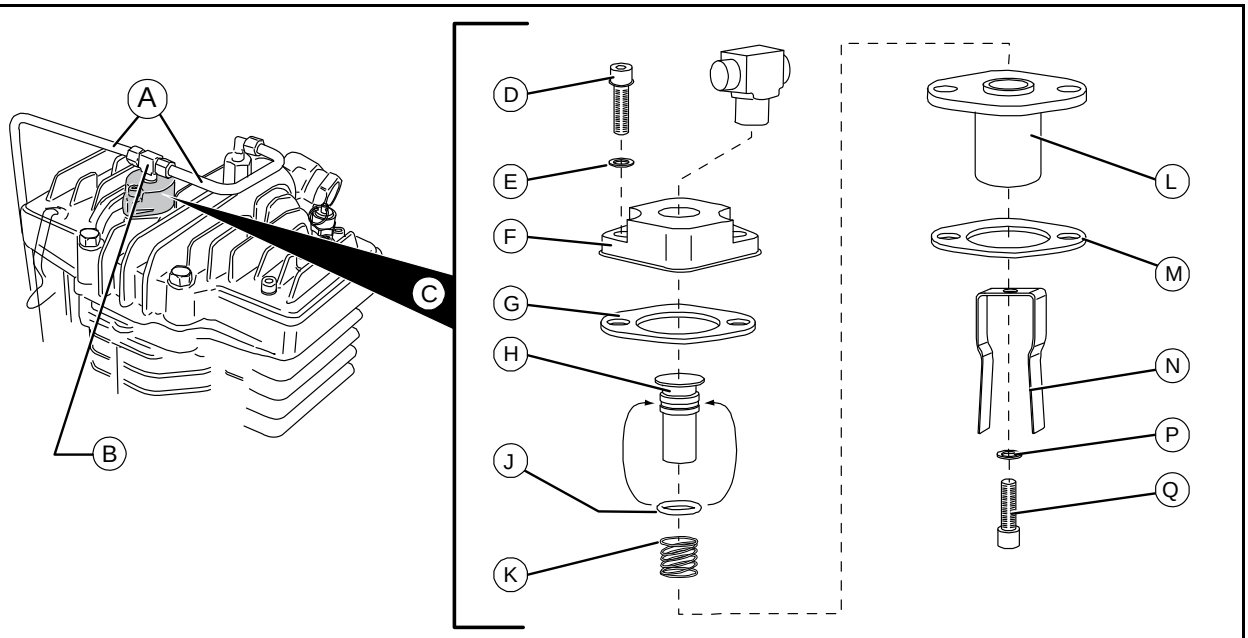
Before performing maintenance or repair operations on the machine, ensure that all power has been removed and locked out to prevent accidental start-up.

⚠ CAUTION

The piston springs of the valves are under tension: when unscrewing the valve body use a wrench to loosen enough to move by hand. Then relieve tension gradually the rest of the way.

NOTE

After disassembling the valve, if the parts appear to be too worn or damaged, order the Low Pressure Valve Assembly Replacement Kit no. RC46552, and consult Section 6.5.3.2, Low Pressure Valve Replacement.



KEY	DESCRIPTION	KEY	DESCRIPTION
A	VALVE TUBING (COPPER)	**J**	VITON O-RING
B	TEE	**K**	UNLOADING SPRING
C	LOW PRESSURE VALVE[I]	**L**	UNLOADING CYLINDER
D	CAPSCREW	**M**	LOWER UNLOADER GASKET
E	SPRING WASHER	**N**	UNLOADING FORK
F	UPPER COVER	**P**	WASHER
G	UPPER COVER GASKET	**Q**	BOLT
H	UNLOADING PISTON		

[I]Order Low Pressure Valve Assembly Replacement Kit no. RC46552.

Figure 6-4: Low Pressure Unloader Valve Replacement Kit

- Spread the top and bottom sealing surfaces of lower unloader gasket [**M**] with a light coating of ISO68 oil (for a complete seal).
- Spread the top and bottom sealing surfaces of upper cover gasket [**G**] with a light coating of ISO68 oil (for a complete seal).

11. Place upper cover into position and secure with the two (2) spring washers [**E**] and capscrews [**D**]. Consult **Table 6A: Bolt Torques for Compressor** for proper torque specification.
12. Test to confirm that the valve functions freely by depressing the piston with a small screw driver through the top air port. The valve

should depress with little force and spring back.

13. Replace the tee: coat the threads with pipe sealant.
14. Replace the copper valve tubing [**A**] into position on the tee [**B**] and tighten.

⚠ WARNING

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

6.5.3.2 LOW PRESSURE VALVE REPLACEMENT

TOOLS/ITEMS NEEDED	REPLACEMENT PART(S)
Hex Head Key (5mm)	Low Pressure Valve Assembly Replacement Kit No. RC46552
Screw Driver (Small)	
ISO68 Compressor Oil (To lubricate the gaskets)	
Pipe Sealant	

⚠ 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 6-4*** for low pressure valve assembly.

1. Locate the low pressure unloader valve [**A**] as indicated in ***Figure 6-3***.
2. Remove the copper tubing [**A**] connected to the tee on the top of the low pressure unloader valve [**C**].
3. Remove the tee [**B**] connected to the upper cover
4. Remove the two (2) 5mm capscrews [**D**] and spring washers [**E**] securing the upper cover [**F**] in place.
5. Remove the valve assembly, which consist of:
   - Upper cover gasket [**G**]
   - Unloading piston [**H**]
   - Viton o-ring [**J**]
   - Unloading spring [**K**]
   - Unloading cylinder [**L**]
   - Lower unloader gasket [**M**]
   - Unloading fork [**N**]
   - Washer [**P**]
   - Bolt [**Q**]

TABLE 6A: BOLT TORQUES FOR COMPRESSOR

HEAD BOLTS		CYLINDER-CASE		ROD BOLTS		FRONT COVER		REAR COVER	
SIZE BOLT	TORQUE CM-FT	SIZE BOLT	TORQUE CM-FT	SIZE BOLT	TORQUE CM-FT	SIZE BOLT	TORQUE CM-FT	SIZE BOLT	TORQUE CM-FT
M10-1.5	320-23.1	M10-1.5	280-20.25	M8-1.25	280-20.25	M10-1.5	300-21.7	M8-1.25	300-21.7

6. Replace the worn assembly with the complete new replacement assembly, no. RC46522. Reassemble the parts in order, taking care to:
   - Spread the top and bottom sealing surfaces of lower unloader gasket [**M**] with a light coating of ISO68 oil (for a complete seal).
   - Spread the top and bottom sealing surfaces of upper cover gasket [**G**] with a light coating of ISO68 oil (for a complete seal).
7. Place upper cover into position and secure with the two (2) spring washers [**E**] and capscrews [**D**]. Consult **Table 6A: Bolt Torques for Compressor** for proper torque specification.
8. Test to confirm that the valve functions freely by depressing the piston with a small screw driver through the top air port. The valve should depress with little force and spring back.
9. Replace the tee: coat the threads with pipe sealant.
10. Replace the copper valve tubing [**A**] into position on the tee [**B**] and tighten.
11. Dispose of discarded valve assembly within the guidelines of all applicable local, regional and/or federal laws.

⚠ 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.

6.5.3.3 HIGH PRESSURE VALVE MAINTENANCE

TOOLS/ITEMS NEEDED	REPLACEMENT PART(S)
Wrench	High Pressure Valve Assembly Replacement Kit No. RC21654 (if applicable)
Screw Driver (Small)	
ISO68 Compressor Oil (To lubricate the gaskets)	
Pipe Sealant	

Refer to ***Figure 6-5*** for high pressure valve assembly.

1. Locate the high pressure unloader valve [**C**].
2. Remove the copper tubing [**A**] connected to the elbow [**B**] on the top of the high pressure unloader valve [**C**].
3. Unscrew the valve body [**D**].
4. Remove the valve assembly, which consist of:
   - Valve body [**D**]
   - O-ring [**E**]
   - Piston [**F**]
   - Spring [**G**]

- Retaining nut [**H**]

NOTE

After disassembling the valve, if the parts appear to be too worn or damaged, order the High Pressure Valve Assembly Replacement Kit no. RC21654, and consult Section 6.5.3.4, High Pressure Valve Replacement.

5. Remove o-ring [**E**] from piston shaft.
6. Clean the piston [**F**], bore (inside of valve body [**D**]) and spring [**G**] with soap and water.
7. Dry the assembly parts.
8. Apply a small amount of o-ring lubricant to o-ring [**E**], and reset onto the piston shaft [**F**].
9. Reset and tighten the valve body [**D**].
10. Test to confirm that the valve functions freely by depressing the piston with a small screw driver through the top air port. The valve should depress with little force and spring back.
11. Replace the elbow: coat the threads with pipe sealant.
12. Replace the copper valve tubing [**A**] into position on the elbow [**B**] and tighten.

6.5.3.4 HIGH PRESSURE VALVE REPLACEMENT

TOOLS/ITEMS NEEDED
Wrench
Screw Driver (Small)
ISO68 Compressor Oil (To lubricate the gaskets)
Pipe Sealant

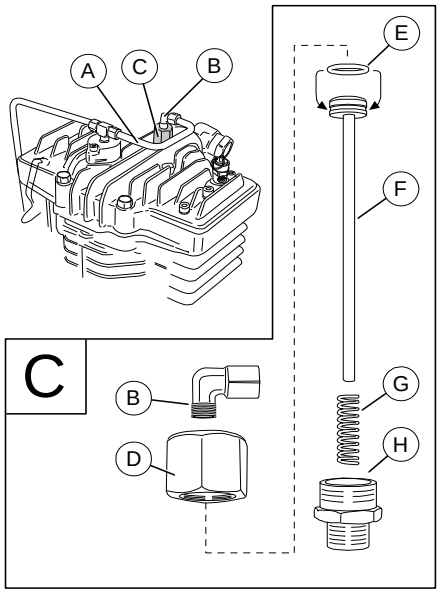
REPLACEMENT PART(S)
High Pressure Valve Assembly Replacement Kit No. RC21654

WARNING

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

Refer to ***Figure 6-5*** for high pressure valve assembly.

1. Locate the high pressure unloader valve [**A**].



KEY	DESCRIPTION
A	VALVE TUBING (COPPER)
B	ELBOW
C	HIGH PRESSURE VALVE[I]
D	VALVE BODY
E	O-RING
F	PISTON
G	SPRING
H	RETAINING NUT

[I] **Order High Pressure Valve Assembly Replacement Kit no. RC21654.**

Figure 6-5: High Pressure Unloader Valve Replacement Kit

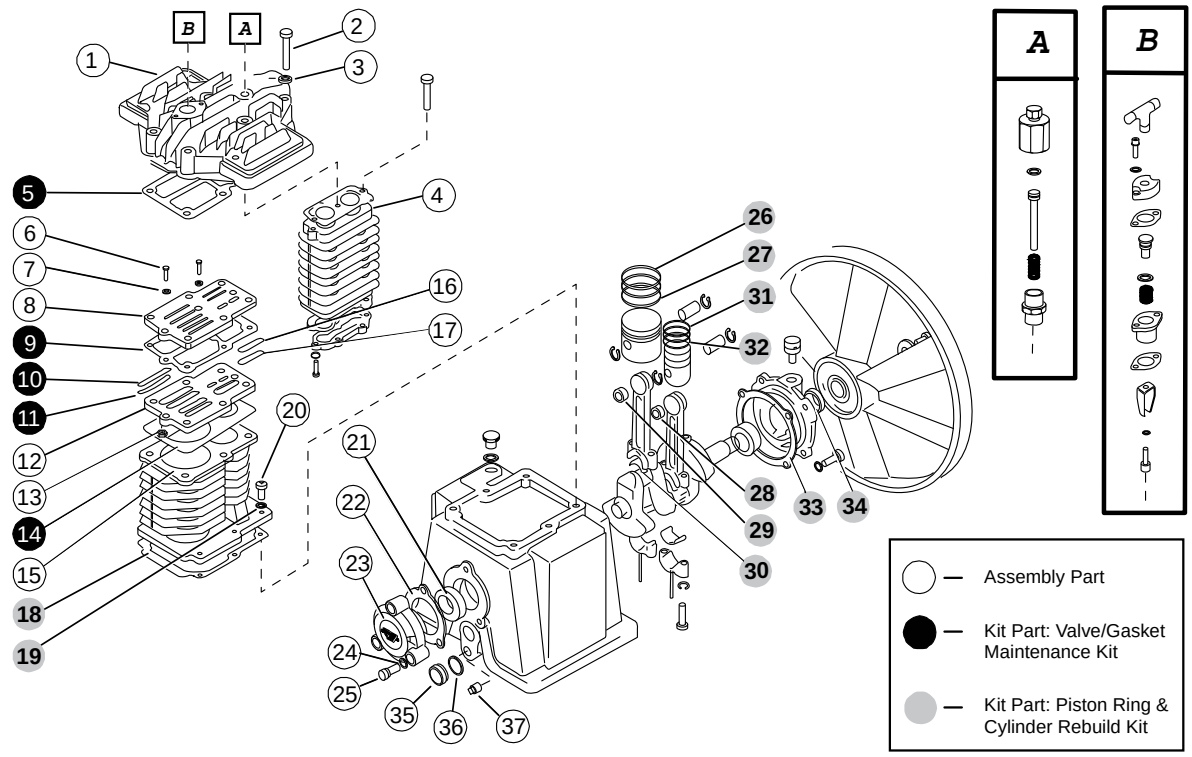
WARNING

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

2. Remove the copper tubing [**A**] connected to the elbow [**B**] on the top of the high pressure unloader valve [**C**].
3. Unscrew the valve body [**D**].
4. Remove the valve assembly, which consist of:
   - Valve body [**D**]
   - O-ring [**E**]
   - Spring [**G**]
   - Piston [**F**]
   - Retaining nut [**H**]
5. Replace the worn assembly parts with the new replacement parts from kit.
6. Reset and tighten the valve body [**D**].
7. Test to confirm that the valve functions freely by depressing the piston with a small screw driver through the top air port. The valve should depress with little force and spring back.
8. Replace the elbow: coat the threads with pipe sealant.
9. Replace the copper valve tubing [**A**] into position on the elbow [**B**] and tighten.
10. Dispose of discarded valve assembly parts within the guidelines of all applicable local, regional and/or federal laws.

6.5.4 COMPRESSOR HEAD VALVE ASSEMBLY INSPECTION AND MAINTENANCE

Consult ***Figures 6-6*** and ***6-7***. The head valve assemblies should be inspected every 1000 hours of operation, or as necessary (ergo, more frequently in dirty atmosphere, heavy usage, etc.) in order to maintain efficient operation. Follow the steps given below to inspect and perform maintenance on the valve(s).

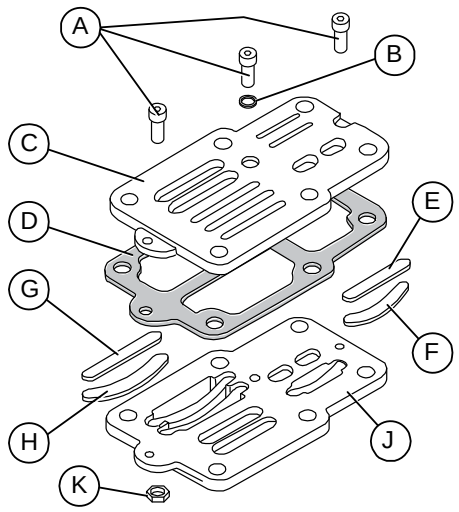


KEY	DESCRIPTION	KEY	DESCRIPTION	KEY	DESCRIPTION
1	CYLINDER HEAD	14	CYLINDER - VALVE SEAT GASKET	27	OIL CONTROL RING
2	CLINDER HEAD BOLT	15	CYLINDER	28	PISTON PIN BUSH
3	SPRING WASHER	16	VALVE PLATE	29	PISTON PIN BUSH
4	INTER-COOLER BODY	17	VALVE PLATE SPRING	30	CONNECTING ROD BEARNING (2 HALVES)
5	CYLINDER HEAD SEAT GASKET	18	CYLINDER CRANKCASE GASKET	31	COMPRESSION RING
6	VALVE SEAT BOLT	19	COPPER WASHER	32	OIL CONTROL RING
7	VALVE SEAT SPRING WASHER	20	CYLINDER CRANKCASE BOLT	33	FRONT COVER GASKET
8	VALVE SEAT (UPPER)	21	BEARING (FRONT & REAR)	34	FRONT OIL SEAL
9	VALVE SEAT GASKET	22	REAR COVER GASKET	35	OIL LEVEL GAUGE & GAUGE COVER
10	VALVE PLATE	23	REAR COVER	36	GAUGE COVER SEAL
11	VALVE PLATE SPRING	24	COPPER WASHER	37	CRANKCASE OIL PLUG
12	VALVE SEAT (BOTTOM)	25	REAR COVER BOLT	A	HIGH PRESSURE VALVE ASSEMBLY (***6.5.3.3***)
13	NUT	26	COMPRESSION RING	B	LOW PRESSURE VALVE ASSEMBLY (***6.5.3.1***)

● - Order compressor gasket/valve kit no. KIT1120.

● - Order piston ring and cylinder rebuild kit no. KIT1121. Consult Vanair for additional information on piston/cylinder maintenance procedure.

Figure 6-6: Compressor Valve Assembly Package



KEY	DESCRIPTION
A	VALVE SEAT BOLT
B	VALEV SEAT BOLT SPRING WASHER
C	VALVE SEAT (UPPER)
D	CYLINDER - VALVE SEAT GAS-KET
E	VALVE PLATE (2nd)
F	VALVE PLATE SPRING (2nd)
G	VALVE PLATE (1st)
H	VALVE PLATE SPRING (1st)
J	VALVE SEAT (BOTTOM)
K	NUT

Figure 6-7: Compressor Valve Detail

⚠ 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.

6.5.4.1 REMOVE VALVE PACKAGE

TOOLS/ITEMS NEEDED
Socket Wrench
Screw Driver (Small)
Hex Head Key
Pipe Sealant (for air tubing)
Clean Shop Cloths
ISO68 Compressor Oil (To lubricate the gaskets)
Non-flammable Cleaning Fluid
Tag Wire or String

REPLACEMENT PART(S)
Compressor Gasket/ Valve Kit No. KIT1120

1. Turn off machine power and disconnect battery lead to assure that the machine is not accidentally started during maintenance procedure.
2. Relieve all air pressure from system before starting work.
3. Disconnect air tubing from head.
4. Loosen and remove head bolts.
5. Remove upper tubing from unloader cylinder.
6. Remove cylinder head to expose valve assembly.
7. Remove valve assembly, head to valve package gasket and valve package to cylinder gasket. Use new gaskets in re-assembly.

   Note conditions of cylinders: Clean out any foreign material and cover with clean shop cloth while open. Refer to parts breakdown for description of valve package.
8. Secure valve assembly package, loosen and remove socket head bolts to separate the upper and lower valve seats. This will expose the valve springs and valve plates.

NOTE

Do not interchange upper and lower valve seats.

9. Thoroughly clean and wash all valve seats and parts with a suitable non-flammable cleaning fluid.

NOTE

Use care to not scratch or deform valve parts in the cleaning.

10. Carefully inspect the valve seats, plates and springs for dents, cracks, wear, and any reason to prevent proper and efficient operation.
11. Replace all parts not in proper condition.

⚠ 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.

6.5.4.2 ASSEMBLE VALVE ASSEMBLY PACKAGE

Refer to ***Figures 6-6*** and ***6-7***.

1. Secure lower valve plate in flat position with spring slots “up”.
2. Refer to breakdown list in ***Figure 6-7*** for valve package parts breakdown.
3. Place valve springs and valve plates in proper positions over slots in seat. Use tag wire or string for tie to hold in position for completing assembly.
4. Secure upper valve seat in flat position with spring slots up. Use new valve seat gasket.
5. Place valve seat gasket in position on lower valve plate.
6. Place upper valve seat with valve springs and plates tied in position on top of lower valve seat with new valve eat gasket in place between the two seats.
7. Start center and then two end valve plates socket head bolts, tighten finger tight being careful not to damage seat gasket, use socket head wrench to torque the three bolts uniformly to secure the top valve seat to the lower valve seat using care to avoid damage to the gasket, and valve springs and plates from moving out of position.
8. Remove ties to free valve springs and plates.
9. Check to be sure valve springs and valve plates are in proper position and the plates are free to flex when manually touched with blunt instrument.

⚠ 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.

6.5.4.3 ASSEMBLE VALVE ASSEMBLY PACKAGE INTO COMPRESSOR

Refer to ***Figures 6-6*** and ***6-7***.

1. Use new gaskets, valve package to cylinder and cylinder head to valve package. Select gaskets by part numbers from parts breakdown.
2. Remove shop cloth to expose open cylinder bores. Remove any foreign matter from cylinder bores and top of cylinder.
3. Place gasket on top of cylinder, place and align valve package, place gasket on top of valve package and align holes for head bolts.
4. Place clean head on top of valve package with gasket and align with cylinder bolt holes.
5. Insert cylinder head bolts using care to avoid damage to the gaskets, start each bolt threading evenly to contact head surfaces.
6. Torque head bolts equally; follow torque specifications in **Table 6A, Bolt Torques for Compressor**.
7. Attach and tighten copper tubing of constant running compressors.
8. Assemble and tighten discharge tubing.
9. Check oil level in crankcase.
10. Close and tighten valve or the connections used to relieve air pressure from system.
11. Reconnect battery lead cable to battery.
12. Remove all tools and make area safe to start compressor.
13. Turn on power at main switch and inspect to see that unit is operating properly.
14. Observe unit operation from normal pump up to cut out pressure to assure that it is running properly.
15. If unit has performed satisfactorily through a running cycle, put on line for duties.
16. Make entry in equipment maintenance log.

IMPORTANT

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

6.5.5 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 the following procedure.

Refer to ***Figure 6-8***. Locate the pilot valve left on the base frame, near the engine, and use the following procedure to make adjustments.

1. With a marker or scoring object, make a corresponding mark [**F**] on the pressure adjustment screw [**B**], pressure differential adjustment nut [**D**], and the valve body [**E**] for referential purposes.
2. With the machine off, loosen the locknut [**C**], and adjust the pressure adjustment nut clockwise (in) to raise the cut-in/cut-out pressure, and counter-clockwise (out) to lower the cut-in/cut-out pressure. Using the reference mark made in Step #1, adjust the pressure adjustment nut by a 1/4 - 1/2 turn interval, and tighten the locknut.
3. Start the engine and check the air pressure gauge reading after the engine has returned to idle speed.
4. Repeat Steps #2 and #3 if further adjustment is needed.

NOTE

DO NOT adjust the factory set pressure differential adjustment nut. Reference the mark made on the pressure variation adjustment nut, and the valve body to insure that it has not changed position.

6.5.6 ADJUSTING THE ENGINE SPEED

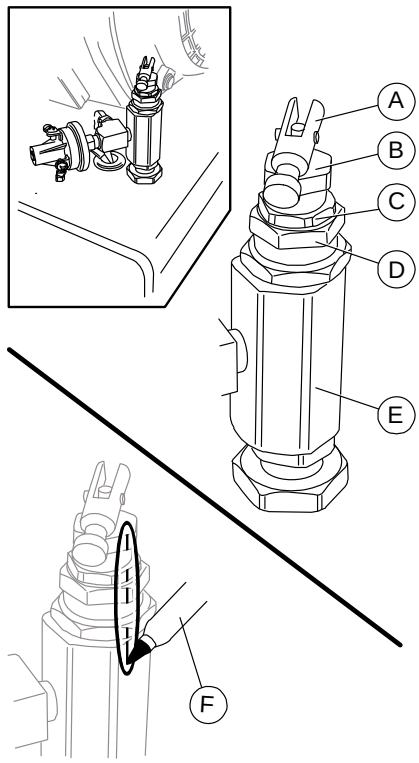
Consult the Vanair® Service Department for issues relating to adjustment of engine speed.

IMPORTANT

The pressure setting is pre-set to the *maximum* capability of the machine at the factory.

⚠ WARNING

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



KEY	DESCRIPTION
A	MANUAL ADJUSTMENT VALVE
B	CUT-IN / CUT-OUT PRESSURE ADJUSTMENT SCREW
C	LOCKNUT
D	PRESSURE DIFFERENTIAL NUT
E	VALVE BODY
F	Marking a reference line

Figure 6-8: Pilot Valve Adjustment

NOTE

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

6.5.7 REPLACING OR 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.

⚠ 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.

The compressor and generator are driven by the engine via the use of two drive belt types. The compressor utilizes two (2) poly-link, chain-type belts, 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 6.5.7.3** for instruction on how to check the compressor belt(s) tension.

6.5.7.1 ACCESSING THE DRIVE BELTS - REMOVING THE BELT GUARD SHIELD

TOOLS/ITEMS NEEDED	REPLACEMENT PART(S)
Large Phillips Head Screw Driver or Drill Bit & Drill	Not Applicable

⚠ WARNING

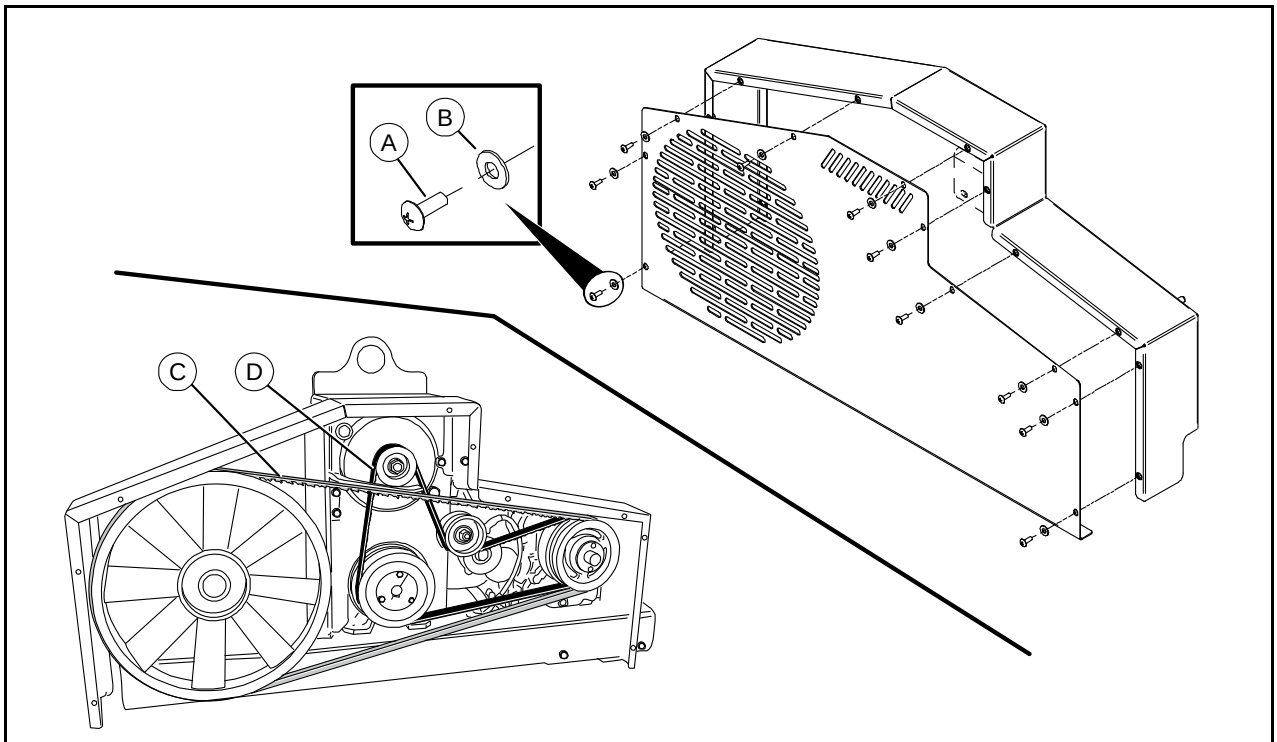
Relieve pressure from the compressor system before performing maintenance on any components.

⚠ 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.

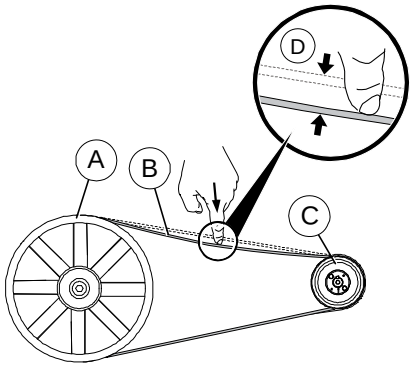
The belt guard must be removed to access the drive belts. The Air N Arc 200 Series All-In-One Power System utilizes two poly-link series v-belts to drive the compressor unit, and a single serpentine v-belt to drive the generator system. Consult ***Figure 6-9***, and the following procedure to access the drive belts:

1. Disconnect the battery ground cable.



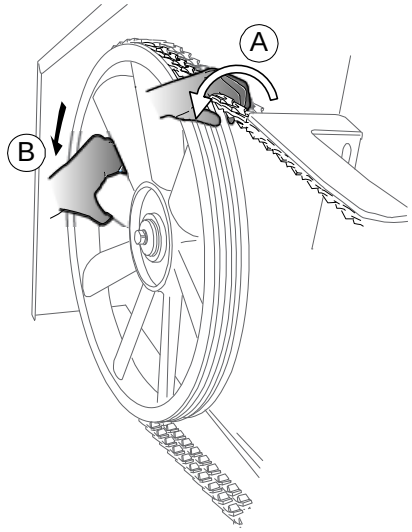
KEY	DESCRIPTION	KEY	DESCRIPTION
A	TRUSS HEAD SCREW (x 10)	C	COMPRESSOR V-BELT: POLY-LINK (x 2) / Outside track on engine drive sheave
B	NYLON WASHER (x 10)	D	GENERATOR V-BELT: SERPENTINE / Inside track on engine drive sheave

Figure 6-9: Drive Belt Access — Belt Guard Shield Removal



KEY	DESCRIPTION
A	COMPRESSOR PULLEY
B	DRIVE V-BELT
C	ENGINE PULLEY
D	BELT DEFLECTION RANGE: 3/8 to 1/2 inch

Figure 6-10: Belt Deflection



KEY	DESCRIPTION
A	COMPRESSOR PULLEY
B	BELT DEFLECTION RANGE: 3/8 to 1/2 inch
C	ENGINE PULLEY

Figure 6-11: Removing the Compressor Belt(s)

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.

6.5.7.2 REPLACING THE BELT GUARD SHIELD

TOOLS/ITEMS NEEDED	REPLACEMENT PART(S)
Large Phillips Head Screw Driver or Drill Bit & Drill	**Not Applicable**

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 6-9***, 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**.

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

TOOLS/ITEMS NEEDED	REPLACEMENT PART(S)
Optional Long-Nosed Pliers	**Compressor Drive Belt No. DR270814 (2)**

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" give (see ***Figure 6-10***). Consult ***Figures 6-9***, ***6-10***, ***6-11***, and the following procedure:

1. With the machine off and the ground wire disconnected from the battery, remove the belt guard shield per ***Section 6.5.7.1***.

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 6-10***. 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 6-11***: For belt removal, grip the outer belt with the right hand.
4. While twisting the belt outward [**A**], manually rotate the compressor pulley with the left hand [**B**]. The belt will slide free.
5. Repeat steps #3 and #4 to remove the inner belt.
6. If belt is too loose, then it will need to be resized. Consult **Section 6.5.7.4** to re-size a poly-link belt.

NOTE

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

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

6.5.7.4 COMPRESSOR BELT SIZING

TOOLS/ITEMS NEEDED	REPLACEMENT PART(S)
Marking Tool Such as a Black or Blue Felt Marker	**Compressor Drive Belt No. DR270814 (2)**

When sizing a new compressor drive belt, first remove the worn belt as explained in **Section 6.5.7.3**, Step #3 through Step # 5. Then consult ***Figures 6-12*** 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**].

1. Wrap new belt as shown in ***Figure 6-12***, 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 procedures given in **Sections 6.5.7.5 and 6.5.7.6** to remove excess belt links.

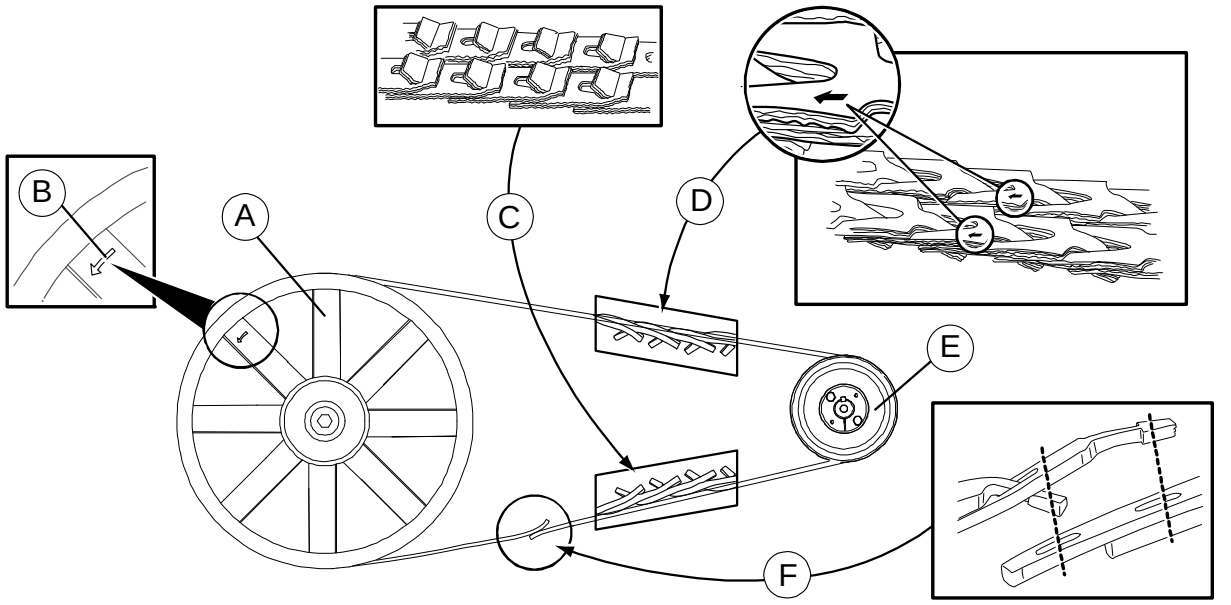
NOTE

Every tenth link in a poly-link belt is designated with an arrow ([D] in Figure 6-12).

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.



KEY	DESCRIPTION	KEY	DESCRIPTION
A	COMPRESSOR PULLEY	**D**	OUTER SIDE OF BELT TRACK - Arrows printed on links point in the same direction as compressor pulley direction of rotation arrow [B]
B	COMPRESSOR PULLEY DIRECT OF ROTATION ARROW	**E**	ENGINE PULLEY
C	BELT PLACEMENT - Tabs face inside, toward pulleys	**F**	OVERLAP: Align last two tabs with two holes

Figure 6-12: Compressor Drive V-Belt - Determining Sizing and/or Link Removal

6.5.7.5 COMPRESSOR BELT LINK DISENGAGEMENT

⚠ WARNING

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

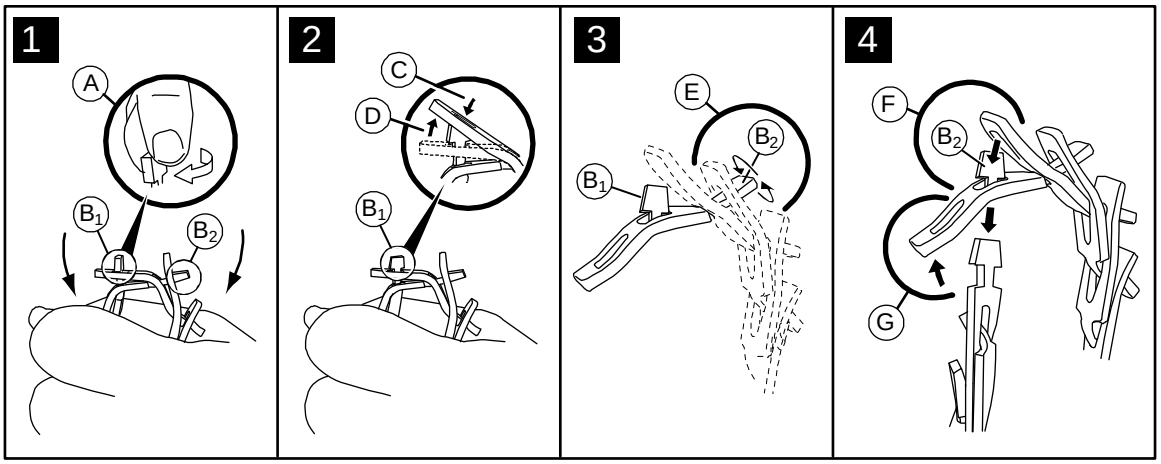
⚠ WARNING

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

TOOLS NEEDED	REPLACEMENT PART(S)
Optional Long-Nosed Pliers	**Compressor Drive Belt No. DR270814 (2)**

Refer to ***Figure 6-13***, and the following procedure:

1. Hold belt tab-side up with one hand; bend back as far as possible to expose tab [$\mathbf{B_1}$].
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 [$\mathbf{B_2}$] so that the tab is turned parallel to the slot.



KEY	DESCRIPTION	KEY	DESCRIPTION
A	Rotate tab [B_1] 90° so that the tab's end is parallel to the slot it is linked to	**D**	Pull up on link end while pushing down on [C]
B_1	First tab to unlink	**E**	Rotate belt end with tab [B2] 90° so that the tab's end is parallel to the slot it is linked to
B_2	Second tab to unlink	**F**	Push down on the tab [B_2], while pulling up on [G]
C	Push down on the tab [B_1], while pulling up on [D]	**G**	Pull up on link end while pushing down on [C]

Figure 6-13: Compressor Drive V-Belt - Link Removal

4. Push down on the tab [**F**], while pulling up on the link's end [**G**].

6.5.7.6 COMPRESSOR BELT ASSEMBLY

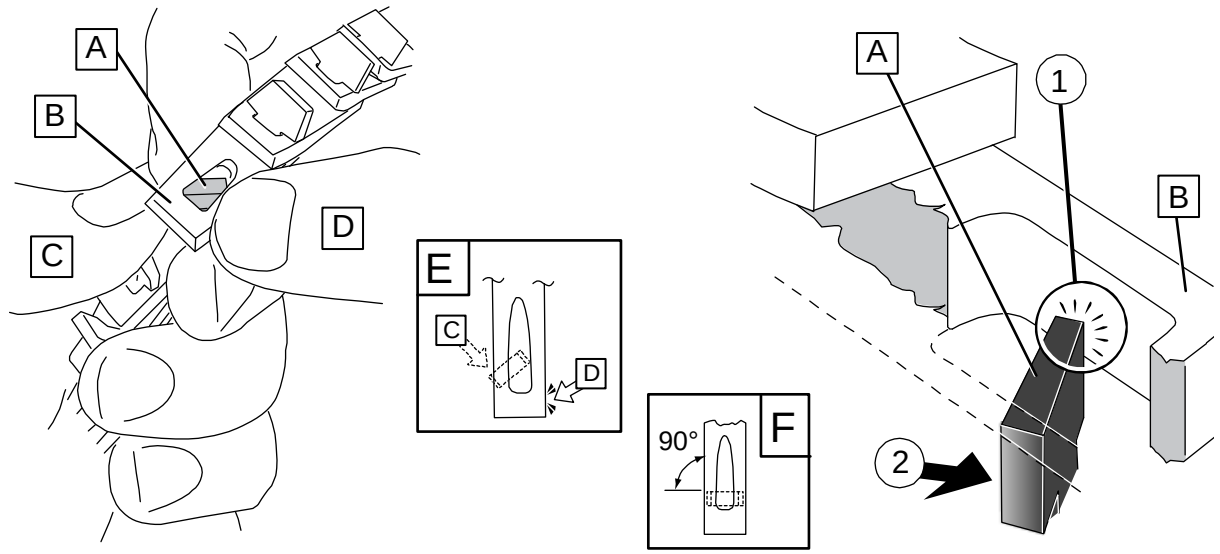
Once the proper length of the belt has been determined (refer to **Section 6.5.7.4**), and the belt is shortened to its proper fitted length (refer to **Section 6.5.7.5**), then the belt's ends are linked together to form the completed belt. Refer to ***Figure 6-14***, and the following procedure:

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.

NOTE

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

In *Figure 6-13*, Tab [B_1] represents the first tab, and Tab [B_2] represents the second tab.



KEY	DESCRIPTION	KEY	DESCRIPTION
A	TAB	**D**	THUMB (pushing on link end)
B	LINK END	**E**	TOP VIEW: tab pivoting into link slot
C	THUMB (pushing on tab)	**F**	TOP VIEW: twist tab to lock the link in place

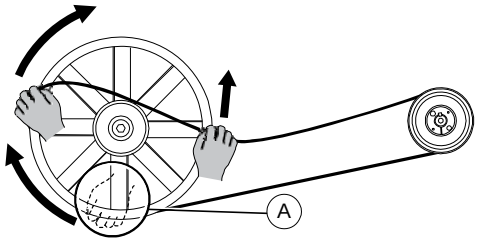
Figure 6-14: Attaching Compressor Belt Link

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.

6.5.7.7 ROUTING COMPRESSOR BELTS ONTO PULLEY GROOVES

Refer to ***Figures 6-15*** and ***6-16***, and the following procedure to mount the compressor link drive belts onto the compressor and engine pulleys.

1. Make certain that the belt is sized correctly before setting it into place on the pulleys. Consult ***Sections 6.5.7.4*** through ***6.5.7.6*** 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 6-12***, [**B**] and [**D**]).



KEY	DESCRIPTION
A	Start at bottom edge of compressor pulley

Figure 6-15: Setting Compressor Belt into Place

3. Start at the bottom edge of the pulley as per ***Figure 6-15***. Continue to set the belt into the proper groove on the compressor pulley (inside belt to inside track; outside belt to outside track as in ***Figure 6-16***).
4. After the belt is seated into the compressor pulley groove, hold the belt and the pulley with the left hand (***Figure 6-15***), 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.

6.5.7.8 RE-TENSIONING OR REPLACING 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.

NOTE

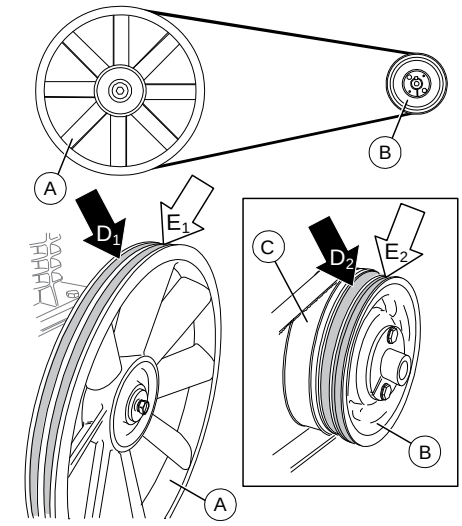
Proper alignment of all pulleys on the serpentine belt is crucial. A chirping or squeaking sound after replacing the belts may indicate an alignment problem. Always inspect and replace the belts as recommended in the maintenance section of this manual.

The belt guard must be removed to access the drive belt. The Air N Arc 200 Series All-In-One Power System® utilizes a single serpentine v-belt to drive the generator system. **Consult Section 6.5.7.1, Accessing the Drive Belts**, for instructions on how to remove the belt guard.

NOTE

Every tenth link is designated with an arrow ([D] in Figure 6-16).

For multiple belt drives, ensure that each belt has the same number of links.



KEY	DESCRIPTION
A	COMPRESSOR PULLEY
B	ENGINE PULLEY
C	GENERATOR PULLEY
D_1	COMPRESSOR DRIVE BELT - **Inside** track on compressor pulley
D_2	COMPRESSOR DRIVE BELT - **Inside** track on engine pulley
E_1	COMPRESSOR DRIVE BELT - **Outside** track on compressor pulley
E_2	COMPRESSOR DRIVE BELT - **Outside** track on engine pulley

Figure 6-16: Compressor Drive Belt Pulley Tracks

6.5.7.9 RE-TENSIONING THE GENERATOR SERPENTINE DRIVE BELT

TOOLS/ITEMS NEEDED
Wrench - Size 3/8”
Tension Tester

REPLACEMENT PART(S)
Not Applicable

⚠ WARNING

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

⚠ WARNING

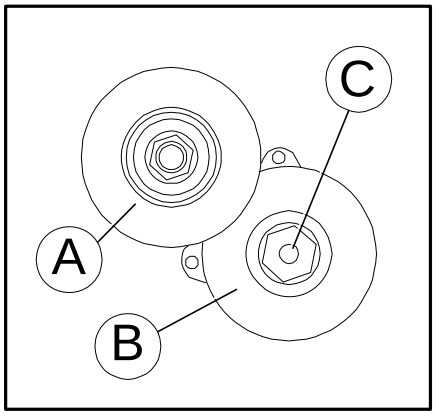
Before performing maintenance or repair operations on the machine, ensure that all power has been removed and locked out to prevent accidental start-up.

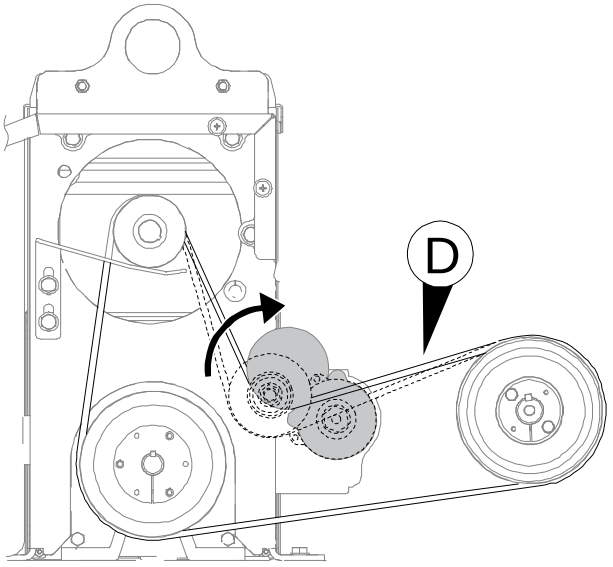
To re-tension the generator serpentine belt, consult ***Figure 6-17*** and the following procedure:

1. With the machine off and the ignition key removed, Locate the generator belt idler sheave [**A**] on the generator tensioner palatable].
2. Loosen, but do not remove, the tensioner plate mounting and adjustment bolt [**C**]; Loosen enough to allow the tensioner plate to pivot while still retaining belt path position.
3. As the tensioner plate is manually pivoted about the loosened, but anchored, mounting bolt, use a tension tester on the belt, at various increments, to determine the correct position of the plate. Consult **Table 6B: Measuring Belt Deflection** for the proper tension measurement.
4. Once a position is achieved that accounts for a satisfactory tension in the belt, torque the bolt [**C**] to 12 ft-lbs (16.3 Nm) to secure the tensioner plate [**B**] into position.

NOTE

If a new generator belt is installed, recheck the tension after 10-20 hours of operation, and re-tension if necessary.

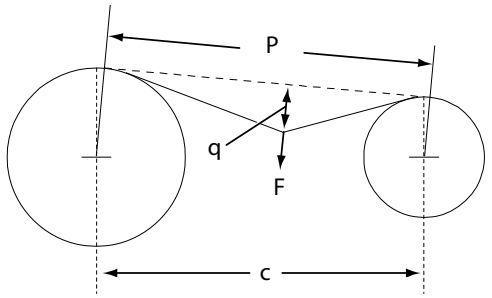




KEY	DESCRIPTION	KEY	DESCRIPTION
A	IDLER SHEAVE	**C**	TENSIONER PLATE MOUNTING AND ADJUSTMENT BOLT: Loosen bolt to allow tensioner plate to pivot manually to achieve new belt-tensioned position.
B	TENSIONER PLATE	**D**	Belt tension adjustment should be verified using a tension tester

Figure 6-17: Adjusting the Generator Drive V-Belt

TABLE 6B: MEASURING BELT DEFLECTION



P - Span Length

c - Center Distance

F - Deflection Force

q - Deflection Distance

SPAN LENGTH (in)	DEFLECTION DISTANCE (in)	DEFLECTION FORCE (lbs)			
		ALL RIBS		TORQUE TO IN-LB TENSION	
		RE-TENSION	NEW INSTALL	RE-TENSION	NEW INSTALL
14.286	0.223	10.725	17.074	51	79

6.5.7.10 REPLACING THE GENERATOR SERPENTINE DRIVE BELT

TOOLS/ITEMS NEEDED
Wrench - Size 3/8”
Tension Tester

REPLACEMENT PART(S)
Serpentine Belt No. DR62184

⚠ 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.

In order to replace the generator serpentine belt, the compressor belts will need to be removed. Consult **Section 6.5.7.3**, Steps #3 and #4 to remove the compressor belts.

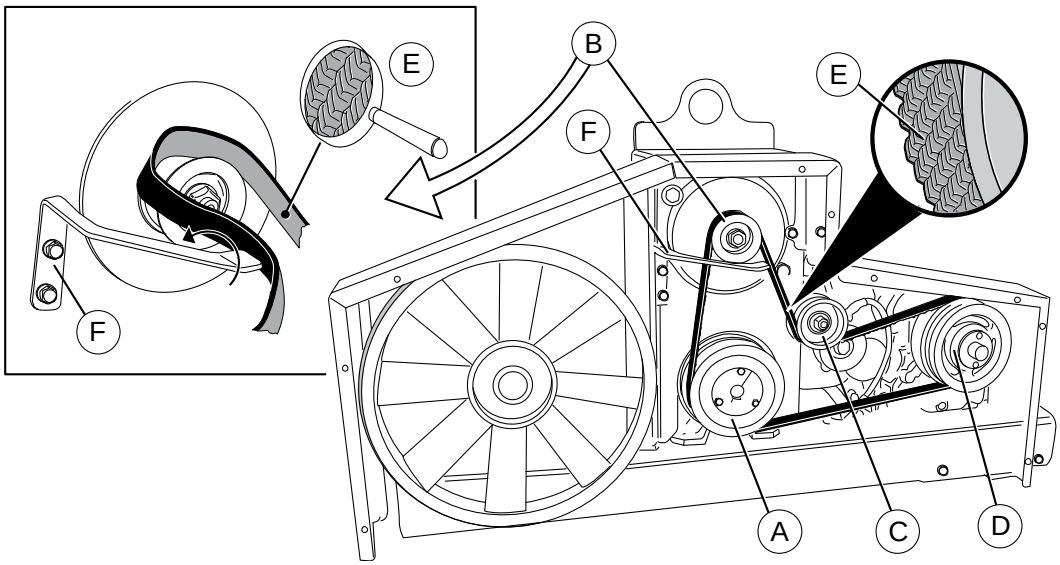
To replace the generator serpentine belt, refer to ***Figures 6-17*** and ***6-18***, and the following procedure:

1. With the machine off, the ignition key removed, and the compressor v-belts removed, the worn generator serpentine belt can now be replaced.
2. Loosen the generator belt by performing the procedure given in **Section 6.5.7.9, Re-Tensioning the Generator Serpentine Belt**.

   By loosening the tensioner plate bolt (item [**C**] in ***Figure 6-17***), and pivoting the generator idler sheave (item [**A**] in ***Figure 6-17***) to its maximum position, the generator belt will be loose enough to remove from the generator and engine drive pulleys.

3. Run a new serpentine belt into place about the generator, engine and idler pulleys as shown in ***Figure 6-18***. Keep in mind when routing the belt that:
   - Belt treads face the inside of the main pulleys, as shown in item [**E**].
   - Begin the belt routing by first wedging the belt between the compressor belt dampener [**F**] and the DC pulley, as shown in the inset view of ***Figure 6-18***. Once the belt is beyond the dampener, it can be placed over the DC pulley, and then continued from there.
4. When the belt has been situated onto each track groove on the drive pulleys and the idler, the tension will need to be reset via the position of the idler sheave [**B**], and checked.

   To reset and check the generator belt tension, refer to **Section 6.5.7.9, Re-tensioning the Generator Serpentine Belt**.
5. After the generator serpentine belt has been set and checked, the compressor drive belts need to be repositioned. Consult **Section**



KEY	DESCRIPTION	KEY	DESCRIPTION
A	AC GENERATOR PULLEY	**D**	ENGINE PULLEY (generator belt to inside pulley track)
B	DC (WELDER) GENERATOR PULLEY	**E**	BELT TREAD - Faces inward (inside) of belt track
C	IDLER SHEAVE	**F**	COMPRESSOR BELT DAMPENER

Figure 6-18: Generator Drive V-Belt - Routing Onto Track

6.5.7.7, Routing Compressor Belts Onto Pulley Grooves to reset the compressor drive belts. Refer to **Section 6.5.7.3, Re-tensioning the Compressor Drive Belts** to assure that the compressor belts are properly tensioned.

6. After the compressor belts have been reset and their tensions confirmed, replace the belt guard shield as per **Section 6.5.7.2, Replacing the Belt Guard Shield**.

NOTE

If a new generator belt is installed, recheck the tension after 10-20 hours of operation, and re-tension if necessary.

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 6.5.7.3).

6.5.8 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.

6.5.9 ENGINE MAINTENANCE

System Operation Group	Manual Section	Location
Engine Maintenance	**6.5.9**	**page 89**
Engine Air Filter Maintenance	6.5.9.1	page 90
Checking the Engine Oil	6.5.9.2	page 91
Replacing the Engine Oil	6.5.9.3	page 93
Replacing the In-line Fuel Filter	6.5.9.4	page 94
Checking the Engine Cooler	6.5.9.5	page 95

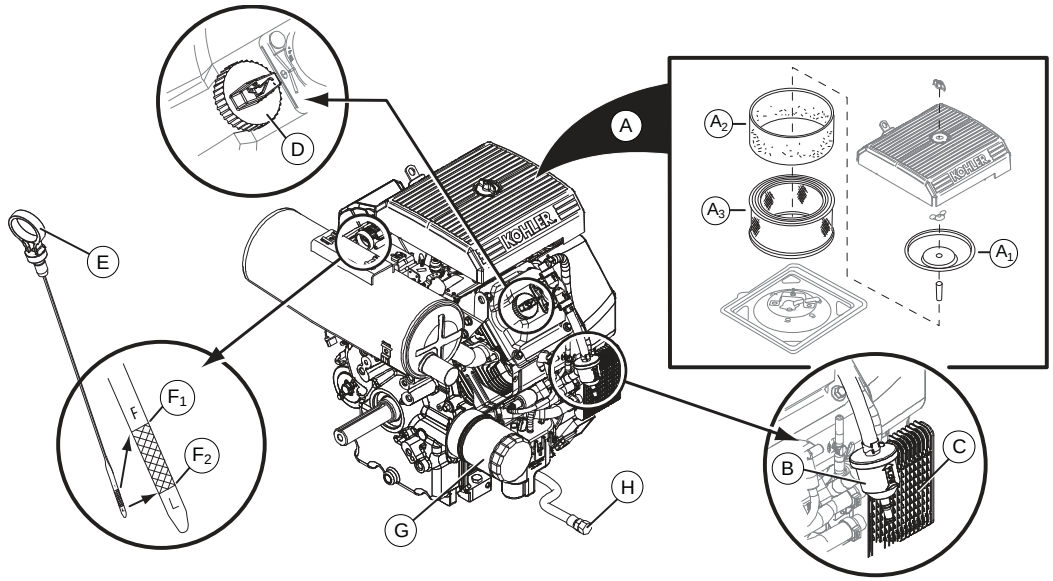
⚠ WARNING

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.

Although engine routine maintenance is covered in this operation manual, maintenance personnel should also refer to the Engine Operator's Manual when addressing any engine issues on the Air N Arc 200 Series All-In-One Power System. Refer to ***Figure 6-19*** for a location overview of routine maintenance items for the engine.



KEY	DESCRIPTION	KEY	DESCRIPTION
A	ENGINE AIR FILTER	**E**	ENGINE DIPSTICK HANDLE
A_1	INNER AIR FILTER COVER	**F**	Acceptable range for engine oil level between: **F_1** (FULL), and **F_2** (LOW) - DO NOT OVERFILL
A_2	PRE-FILTER ELEMENT		
A_3	AIR FILTER ELEMENT	**G**	ENGINE OIL FILTER
B	ENGINE FUEL FILTER (Primary - 70 micron)	**H**	ENGINE OIL DRAIN
C	ENGINE OIL COOLER	**J**	FUEL TANK
D	ENGINE OIL FILL PORT	**K**	ENGINE FUEL FILTER (Secondary - 10 micron)

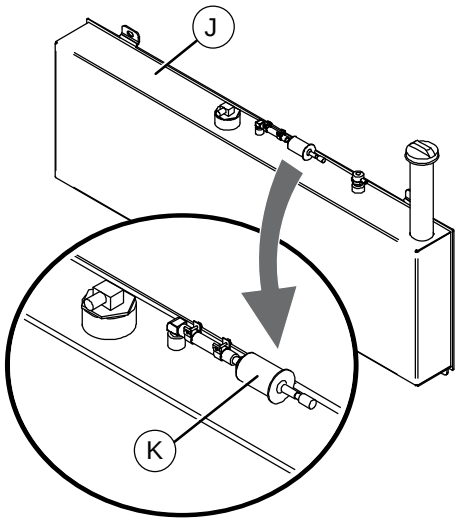


Figure 6-19: Engine Components

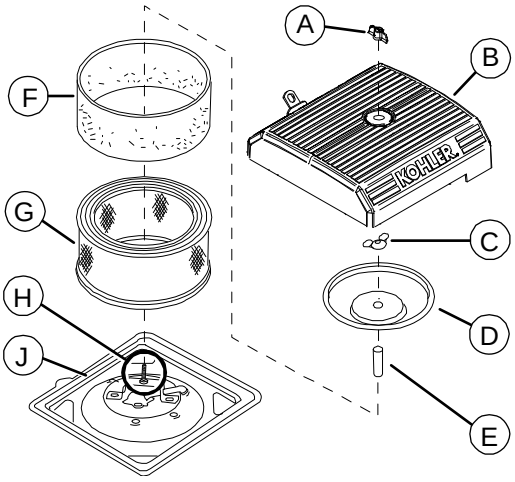
6.5.9.1 ENGINE AIR FILTER MAINTENANCE

TOOLS NEEDED	REPLACEMENT PART(S)
Clean Cloth	**Air Filter Replacement Element No. 262722**

Refer to ***Figure 6-20***. The maintenance parts of the engine air filter consist of the precleaner [**F**], which is reusable, and the air filter element [**G**], which will need to be replaced if damaged, worn or dirty.

Handle the new air cleaner element carefully; do not use if the sealing surfaces are bent or damaged. If ordering additional replacement filters to have on hand, consult **Section 6.7, Storage and Intermittent Use**.

NOTE
DO NOT clean the air filter element.



KEY	DESCRIPTION
A	COVER RETAINING KNOB
B	COVER
C	COVER WING NUT
D	ELEMENT COVER
E	RUBBER SEAL
F	PRECLEANER
G	AIR FILTER ELEMENT[I]
H	AIR FILTER STUD
J	BODY

[I] **Order Air Filter Replacement Element no. 262722.**

Figure 6-20: Engine Air Filter Maintenance

PRECLEANER MAINTENANCE

Wash the precleaner element with warm water and detergent. Rinse thoroughly and squeeze out excess water (do not wring). Allow to dry before replacing.

⚠ WARNING

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

AIR FILTER ELEMENT REPLACEMENT

1. Loosen the cover retaining knob [**A**] and remove cover [**B**].
2. Remove and inspect the precleaner [**F**]: wash or replace as necessary.
3. Clean area around the air cleaner element [**G**] to prevent dirt and debris from entering the engine.
4. Remove the element cover wing nut [**C**] and element cover [**D**].
5. Remove the air filter element [**G**], and inspect: replace as necessary.
6. Check the condition of the rubber seal [**E**] on the air filter stud [**H**]. Replace if the seal is worn, damaged, or questionable.
7. Reinstall the components in reverse order of removal.

⚠ 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.

6.5.9.2 CHECKING THE ENGINE OIL

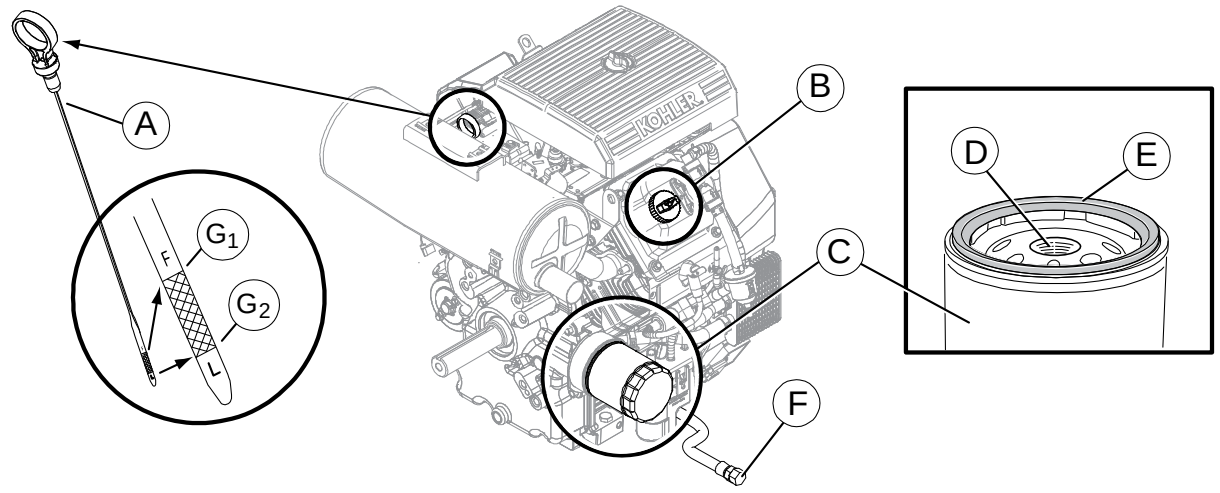
Refer to ***Figure 6-21***. The engine oil level is checked often and periodically as per the maintenance schedule intervals suggested in **Section 6.3, MAINTENANCE**

SCHEDULE TABLE. Check the engine oil level when the engine is off, and the oil allowed to settle.

TOOLS NEEDED	REPLACEMENT PART(S)
Clean Cloth	**Engine Oil[I] (if necessary)**
Funnel (to add oil if necessary)	

[I] Engine may need additional amount of oil if low. Consult Engine Operator's Manual for oil grade used, amount needed, and oil change intervals. Consult **Section 6.5.9.3, Replacing the Engine Oil**, to change the engine system oil.

1. Locate the engine dipstick handle [**A**] and remove.
2. Wipe off the excess oil on the dipstick blade, and replace the dipstick back into the engine tube in order to get a clear level reading.
3. Remove the stick again, and observe where the oil level shows at the gauge-end of the stick [**G**]. Acceptable level should be within



KEY	DESCRIPTION	KEY	DESCRIPTION
A	ENGINE OIL DIPSTICK HANDLE	**E**	RUBBER GASKET
B	ENGINE OIL FILL PORT	**F**	ENGINE OIL DRAIN PLUG
C	ENGINE OIL FILTER[I]	**G**	Acceptable range for engine oil level between: **G_1** (FULL), and **G_2** (LOW) - DO NOT OVERFILL
D	THREADED CENTER HOLE		

[I] **Order Replacement Engine Oil Filter No. EN38480**

Figure 6-21: Engine Oil Maintenance

range between F (full) and L (low) on the gauge [G_1 and G_2].

If the level shows low, replenish with the same type of engine oil currently being used to achieve a satisfactory level, by adding oil at engine oil fill port [**B**].

If the engine is due for an oil change, or if operating conditions require more frequent change intervals than the normal routine maintenance schedule given in this section, consult the Engine Operator's Manual for oil change scheduling, and the procedure on how to change the engine oil.

⚠ 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.

6.5.9.3 REPLACING THE ENGINE OIL

TOOLS NEEDED	REPLACEMENT PART(S)
Clean Cloth	Engine Oil[I]
Funnel	Engine Oil Filter Replacement Element No. 270757
Drain Pan	
Catch Pan	
Disposable Container	
Oil Filter Strap Wrench	

[I] Consult Engine Operator's Manual for oil grade used, amount needed, and oil change intervals. Engine Capacity is two (2) quarts (system), 1.75 (service).

Refer to ***Figure 6-21***. Replace the oil filter **at least every other oil change (every 200 hours of operation).** Always use a genuine Kohler® oil filter. Replace the oil filter as follows:

1. To keep dirt, debris, etc., out of the engine, clean the area around the dipstick [**A**]; remove the dipstick.
2. Remove the oil drain plug [**F**], and let the oil drain into a receptacle container such as an automotive oil pan. Allow ample time for complete drainage.
3. Reinstall the drain plug [**F**] and torque to 13.6 Nm (10 ft-lb.).
4. To keep dirt, debris, etc., out of the engine, clean the area around the oil filter [**C**]; remove the oil filter.
5. Wipe the surface with a clean cloth where the oil filter mounts.

6. Place a new replacement filter in a shallow pan with the open end facing upward, as shown in the figure. Pour new oil, of the proper type, in through the threaded center hole [**E**]. Stop pouring when the oil reaches the bottom of the threads. Allow a minute or two for the oil to be absorbed by the filter material.
7. Apply a thin film of clean oil to the rubber gasket [**D**] on the new filter.
8. Install the new oil filter onto the engine oil filter adapter. Install the oil filter until the rubber gasket contacts the filter adapter or oil cooler, then tighten the filter an additional 3/4 to one full turn.
9. Remove the fill cap [**B**] or use the dipstick fill tube [**A**] to fill the crankcase with new oil of the proper type to the [G_1] or **FULL** mark on the dipstick (see [G_1] in ***Figure 6-21***). Recheck oil level before adding more oil. (Refer to **Section 6.5.9.2, Checking the Engine Oil**).
10. Reinstall the oil fill cap and dipstick securely.
11. Test run the engine to check for leaks. Stop the engine, allow a minute for the oil to drain down, and recheck the level on the dipstick. Verify the oil level is up to but not over the [G_1] or **FULL** mark on the dipstick.

6.5.9.4 REPLACING THE IN-LINE FUEL FILTERS

⚠ WARNING

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

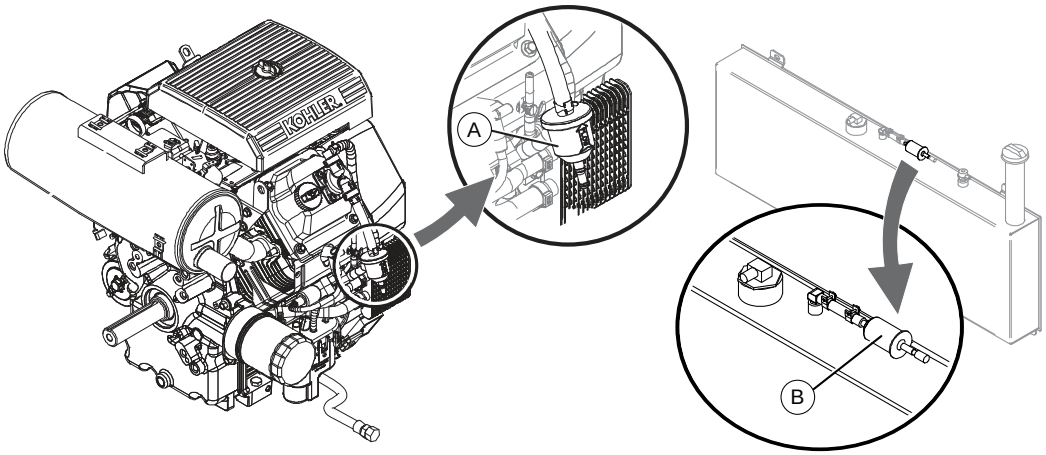
⚠ WARNING

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

TOOLS/ITEMS NEEDED	REPLACEMENT PART(S)
Pliers	Fuel Filter Replacement No. RC81465 (70 micron)
	Fuel Filter Replacement No. EN269654 (10 micron)

IMPORTANT

The components inside the fuel pump module are not serviceable; DO NOT attempt to open the fuel pump module. Damage to the precision components will result, and the warranty will be void.



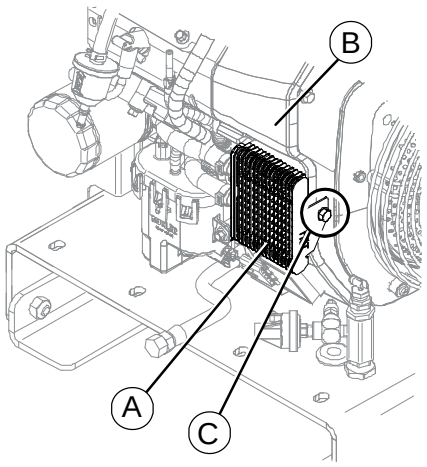
KEY	DESCRIPTION		ORDER REPLACEMENT NUMBER:
A	IN-LINE FUEL FILTER (Primary - 70 micron)		70 micron replacement filter element no. RC81465
B	IN-LINE FUEL FILTER (Secondary - 10 micron)		10 micron replacement filter element no. EN269654

Figure 6-22: Engine Fuel Filters

To service the fuel system the engines have been provided with two in-line fuel filters (***Figure 6-22***) to prevent harmful contamination from entering the module. Be sure to use approved 70 micron (primary) and 10 micron (secondary) filter replacements respectively. Install according to the directional arrows appearing on the fuel filter containments (Refer to the Engine Operator's Manual for specific procedure).

IMPORTANT

Failure to use the proper replacement filters can result in engine damage, and void the warranty.



KEY	DESCRIPTION
A	ENGINE OIL COOLER
B	ENGINE BLOWER HOUSING
C	COOLER MOUNTING BOLT (x 2)

Figure 6-23: Engine Cooler Maintenance

6.5.9.5 ENGINE COOLER MAINTENANCE

TOOLS/ITEMS NEEDED	REPLACEMENT PART(S)
Wrench	**None**
Brush	
Compressed Air Source (External)	

Refer to ***Figure 6-23***. Periodically as per **Section 6.3,**

⚠ WARNING

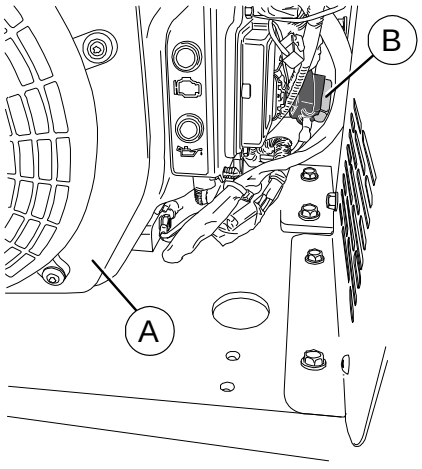
Relieve pressure from the compressor system before performing maintenance on any components.

⚠ 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.

⚠ DANGER

Fuses will need to be replaced if they are blown when tripped. 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*.
ALWAYS turn off the machine and disconnect the battery cables when performing any maintenance on the electrical system.



KEY	DESCRIPTION
A	ENGINE HOUSING (reference)
B	40 AMP CIRCUIT BREAKER (Auto-reset)

Figure 6-24: Engine Circuit Breaker

Maintenance Schedule Table, inspect the cooler fins of the engine for any residual dirt or contamination. Should any residue or build-up appear during inspection, clear with the use of air blown across the surface of the cooler fins. Should build-up be excessive, do the following:

1. Remove the mounting bolts [**C**] securing the oil cooler [**A**] to the engine blower housing [**B**].
2. Clean the inside of the cooler with a brush.
3. Reinstall the oil cooler [**A**] to the blower housing [**B**] securing in place with the mounting bolts [**C**].

6.6 SERVICING THE SYSTEM FUSES AND CIRCUIT BREAKERS

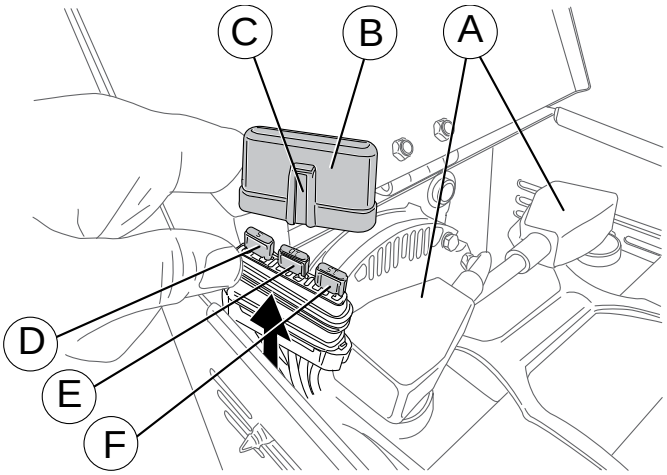
Consult ***Figure 6-24*** for the location of the engine breaker; ***Figure 6-25*** for the location of the system fuses, and ***Figure 6-26*** for location of the AC generator breakers and relays.

TOOLS/ITEMS NEEDED	REPLACEMENT PART(S)	FIG / KEY#
Fuse Removal Tool (recommended), or Pliers	**40 Amp Auto-Reset Breaker No. 270492**	**6-24 / A**
	5 Amp Fuse No. EL270936	**6-25 / D**
	10 Amp Fuse No. EL41538	**6-25 / E**
	15 Amp Fuse No. EL59018	**6-25 / F**
	25 Amp Breaker (AC Generator) No. CO270157 (x 2)	**6-26 / B**
	Relays No. 270501 (x 3)	**6-26 / E (E_1, E_2 & E_3)**
	20 Amp Breaker No. CO62617 (x 2)	**Section 9.5 #28**

NOTE: Machines with remote instrument panel will have an additional 25A breaker at the machine.

The engine 40 amp breaker is located between the engine and the generator canopy, as shown in ***Figure 6-24***. For additional information on engine electronics, consult the Engine Operator's Manual.

The fuse holder is mounted on the inside of the canopy, at the left of the battery, per ***Figure 6-25***. The fuse holder is situated via a groove [**C**] on the mounting-side of the

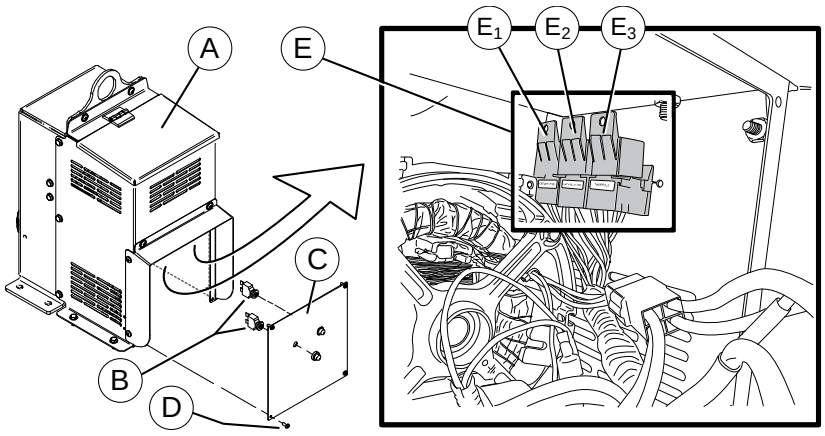


NOTE

Replacement fuses can sometimes be found at local vendor carriers, such as automobile supply stores, hardware stores, etc.

KEY	DESCRIPTION	KEY	DESCRIPTION
A	BATTERY CABLE CONNECTIONS (reference)	**D**	5 AMP FUSE - Generator Switch
B	FUSE HOLDER LID	**E**	10 AMP FUSE - Start
C	FUSE HOLDER LID MOUNTING GROOVE	**F**	15 AMP FUSE - DC Welder Generator

Figure 6-25: Power System Fuses



IMPORTANT

The instrument panel internal wiring is snugly fit and ordered within the box. If the panel has to be accessed to replace the breakers, pull the face plate away from the box *very carefully*, and only as far as needed to access the breakers.

KEY	DESCRIPTION	KEY	DESCRIPTION
A	CANOPY - Generator(s) and Battery Housing	**E**	RELAYS
B	CIRCUIT BREAKERS	**E1**	AC GENERATOR
C	FACEPLATE	**E2**	SWITCHED POWER
D	PHILLIPS PAN HEAD SCREW (x 4)	**E3**	POWER

Figure 6-26: AC Generator - Breaker and Relay Locations

cap. To disengage the holder, grasp and lift upwards. Once it is free, remove the cap to access the fuses.

The 25 amp generator breakers are located behind the face plate at the lower portion of the canopy. To access these breakers, the face plate must be removed. Refer to ***Figure 6-26*** for aid in replacing the DC generator breakers.

The two 20 amp receptacle breakers are located inside the instrument panel box (***Figure 6-26*** [**B**]).

6.7 STORAGE AND INTERMITTENT USE

6.7.1 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.

⚠ CAUTION

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

6.7.2 LONG TERM STORAGE

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

Depressurize the air tank and open the drain valve on the tank.

Cover the unit with a tarp or plastic to prevent the accumulation of dust, but leave the bottom open for air circulation.

Fill gas tank with fuel and fuel stabilizer to prevent moisture build-up in the tank.

SECTION 7: TROUBLESHOOTING

7.1 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. Adherence to a routine maintenance regimen will minimize the occurrence of many common problems. Refer to **Section 6.3, Maintenance Schedule Table** for a typical maintenance regimen program.

Although Vanair® strives to anticipate situations that may occur during the operation life of the machine package, the **Troubleshooting Guide** (**Section 7.3**) may not cover all possible situations. Be aware that additional troubleshooting information may be found in other sources such as the Engine Operator's Manual. Should the situation remain unresolved after exhausting available sources, contact the Vanair® Service Department at:

Phone: 800-526-8817 (toll free)

Phone: 219-879-5100, ext. 400

Fax: 219-879-5335

www.vanair.com

NOTE

When contacting the Vanair Service Department, please have machine serial number on hand to quickly expedite service. See *Figure 7-1* for machine serial plate location.

⚠ WARNING

DO NOT operate any of the Air N Arc 200 Series All-In-One Power System's 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 valve, which will vent all pressure to the atmosphere.

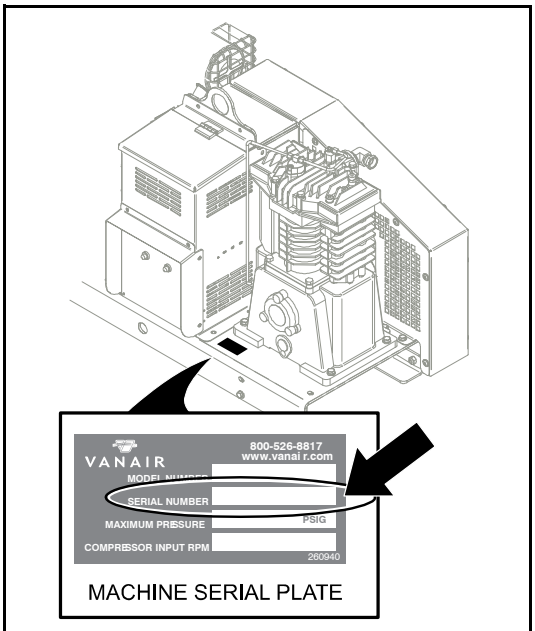


Figure 7-1: Machine Serial Plate Location

7.2 A NOTE ON CONDENSATION DUE TO COMPRESSION

Liquid water occurs naturally in air lines as a result of compression. Moisture vapor in ambient air is concentrated when pressurized, and condenses when cooled in downstream air piping.

Compressed air dryers reduce water vapor concentration and prevent liquid water formation in compressed air lines. Dryers are necessary companion to air filters, aftercoolers, and automatic tank drains for improving the productivity of compressed air systems.

Water and water vapor removal increases the efficiency of air operated equipment, reduces contamination and rusting, increases service life of pneumatic equipment and tools, and prevents air line freeze ups. For assistance in dealing with water and water vapor removal, consult Vanair.®

7.3 TROUBLESHOOTING GUIDE

Fault/Malfunction	Possible Cause	Corrective Action
ENGINE[I]		
For additional information concerning the engine, consult the Engine Operator's Manual		
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 6.6, Servicing the System Fuses and Circuit Breakers**, and/or consult the Engine Operator's 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 **Section 6.5.9.2, Checking the Engine Oil**. Replenish as necessary. Consult the Engine Operator's Manual for additional information.

Continued on next page

[I] Do not attempt to service or replace major engine components, or any items that require special timing or adjustment procedures. Contact the Engine manufacturer.

7.3 TROUBLESHOOTING GUIDE

Fault/Malfunction	Possible Cause	Corrective Action
ENGINE (CONTINUED)		
Engine will crank, but not start (continued)	Wrong fuel type fill	Use only clean, automotive grade gasoline—do not use E85, etc. Refer to Engine Operator's 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 **Section 6.5.9.4, Replacing the In-line Fuel Filters**, and the Engine Operator's Manual.
	Low battery voltage	Recharge or replace if necessary.
		Loose connections; tighten connections.
		Dirty connections; clean connections.
	Restricted engine air filter	Check that the air cleaner element and precleaner are clean and all components are properly secured (**Section 6.5.9.1, Air Filter Maintenance**). Clean or replace as necessary.
	Defective oil pressure switch	Check continuity, and replace Kohler® Oil Sentry Protection switch, if necessary (refer to Engine Operator's Manaul).
		Remove wire—if it runs, the switch is faulty.
	Blown fuse	Check continuity, and replace if necessary. See **Section 6.6, Servicing the System Fuses and Circuit Breakers**, and/or consult the Engine Operator's Manual.
	Poor ground connection	Check and clean/renew connection.
	Fouled spark plug	Check spark plug and replace if necessary. Refer to Engine Operator's Manual.
	Engine choke not operating properly	Check engine choke position. Refer to Engine Operator's Manual.
	Broken or faulty wiring	Check harness connections and wiring condition.

Continued on next page

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7.3 TROUBLESHOOTING GUIDE

Fault/Malfunction	Possible Cause	Corrective Action
ENGINE (CONTINUED)		
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 6.6, 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 6.6, Servicing the System Fuses and Circuit Breakers**.
	Governor stuck	Free governor and lubricate if necessary.
	Fuel filter(s) and/or fuel lines partly plugged	Replace fuel filter or lines. Refer to **Section 6.5.9.4, Replacing the In-line Fuel Filters**, and the Engine Operator's Manual.
	Unloader valve(s) sticking or faulty	Refer to ***Section 6.5.3, Unloader Valve Maintenance***, to clean or rebuild/replace.
	Blown system fuse	Check system fuse; replace if necessary. Refer to **Section 6.6, Servicing the System Fuses and Circuit Breakers**.
	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 6.5.5, Adjusting the Cut-in / Cut-out Pressure***.
	Unloader valve(s) sticking or faulty	Refer to ***Section 6.5.3, Unloader Valve Maintenance***, to clean or rebuild/replace.
	Defective oil pressure switch	Check continuity, and replace Kohler® Oil Sentry Protection switch, if necessary (refer to Engine Operator's Manaul).
	Throttle solenoid stuck	Check throttle solenoid. Replace if necessary.

Continued on next page

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7.3 TROUBLESHOOTING GUIDE

Fault/Malfunction	Possible Cause	Corrective Action
ENGINE (CONTINUED)		
Improper Control Operation: Engine does not slow down (continued)	Throttle solenoid stuck (continued)	Check throttle relay; replace if necessary. Refer to **Section 6.6, Servicing the System Fuses and Circuit Breakers**.
	Broken or faulty wiring	Check harness connections and wiring condition.
Engine overheats	Located too close to obstruction	Move further from obstruction, or move obstructing obstacle(s).
	Restricted engine oil filter	Replace engine oil filter. Refer to **Section 6.5.9.3, Replacing the Engine Oil**. Also refer to the Engine Operator's Manual.
	Low oil level	Check engine oil level; refer to ***Section 6.5.9.2, Checking the Engine Oil***. Replenish as necessary. Also refer to the Engine Operator's Manual.
	Restricted engine air filter	Check that the air cleaner element and precleaner are clean and all components are properly secured. Clean or replace as necessary. Refer to Engine Operator's Manual.
	Restricted cooling air in or out	Clean engine intake grill. refer to **Section 6.5.9.5, Engine Cooler Maintenance**.
	Engine oil cooler plugged	Clear debris/dirt from cooler core/flush shroud. Refer to **Section 6.5.9.5, Engine Cooler Maintenance**, and the Engine Operator's Manual.
Engine stops during operation	Low oil level	Check engine oil level; refer to ***Section 6.5.9.2, Checking the Engine Oil***. Replenish as necessary. Consult the Engine Operator's 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 **Section 6.5.9.4, Replacing the In-line Fuel Filters**, and the Engine Operator's Manual.

Continued on next page

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7.3 TROUBLESHOOTING GUIDE

Fault/Malfunction	Possible Cause	Corrective Action
ENGINE (CONTINUED)		
Engine stops during operation (continued)	Wrong fuel type fill	Use only clean, automotive grade gasoline—do not use E85, etc. Refer to Engine Operator's Manual for information on engine fuel type to use.
	Restricted engine air filter	Replace.
	Restricted cooling air in or out	Clean engine intake grill. refer to **Section 6.5.9.5, Engine Cooler Maintenance**.
	Fouled spark plug	Check spark plug and replace if necessary. Refer to Engine Operator's 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 Operator's Manual for information on engine fuel type to use.
	Engine air filter contaminated	Check air filter. Replace if necessary (refer to the Engine Operator's Manual).
	Fuel filter(s) and/or fuel lines partly plugged	Replace fuel filter or lines. Refer to **Section 6.5.9.4, Replacing the In-line Fuel Filters**, and the Engine Operator's Manual.
	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 Operator's Manaul).
	Fouled spark plug	Check spark plug and replace if necessary. See Engine Operator's Manual.
	Engine choke not operating properly.	Check engine choke position.
COMPRESSOR		
Flywheel rotation slows down	Belt(s) slipping	Re-tension or replace belts.
Severe vibration	Bent crankshaft	Remove and replace. Contact Vanair for details.

Continued on next page

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7.3 TROUBLESHOOTING GUIDE

Fault/Malfunction	Possible Cause	Corrective Action
COMPRESSOR (CONTINUED)		
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 ***Section 6.5.2, Compressor Oil Maintenance***. **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 ***Section 6.5.1, Compressor Air Filter***.
	Unloader valve(s) sticking or faulty	Refer to ***Section 6.5.3, Unloader Valve Maintenance***, to clean or rebuild/replace.
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.
	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 6.5.5, Adjusting the Cut-in / Cut-out Pressure***.

Continued on next page

7.3 TROUBLESHOOTING GUIDE

Fault/Malfunction	Possible Cause	Corrective Action
	COMPRESSOR (CONTINUED)	
Compressor will not build up pressure (continued)	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 ***Section 6.5.1, Compressor Air Filter***.
	Belt(s) slipping	Re-situate and adjust belt tension, or replace belt if necessary. Consult ***Section 6.5.7, 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 Operator's Manual.
	Unloader valve(s) sticking or faulty	Refer to ***Section 6.5.3, Unloader Valve Maintenance***, to clean or rebuild/replace.
	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 6.6, 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.
	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.
Slipping of belts	Working pressure too high	Lower working pressure.
	Improper belt tension.	Adjust belt tension. Consult ***Section 6.5.7, Replacing and Re-tensioning the Compressor and/or Generator Drive Belts***, and its sub-sections.

Continued on next page

7.3 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 6.5.8, 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 (refer to ***Appendix A, Hose Installation Guide*** for assistance in running or checking hose lines).
	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 6.5.5, Adjusting the 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 6.5.7, 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.

Continued on next page

7.3 TROUBLESHOOTING GUIDE

Fault/Malfunction	Possible Cause	Corrective Action
COMPRESSOR (CONTINUED)		
System operating pressure below specified minimum (continued)	Pressure control out of adjustment or malfunctioning	Pressure settings may need to be reset. Consult ***Section 6.5.5, Adjusting the Cut-in / Cut-out Pressure***.
System operating pressure below specified minimum (continued)	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	Adjust pressure switch setting. Refer to ***Section 6.5.5, Adjusting the Cut-in / Cut-out Pressure***. Replace if switch continues to deviate from setting.
	Input rpm too low	Adjust to proper setting.
	Clogged compressor air filter	Check air filter. Replace if necessary; refer to ***Section 6.5.1, Compressor Air Filter***.
	Incorrect engine speed	Reduce load. Refer to ***Section 6.5.6***.
	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 ***Section 6.5.2, Compressor Oil Maintenance***.
Excessive oil consumption	Worn piston ring	Replace; consult Vanair® Service Department for pison ring and cylinder maintenance procedures.
	Worn piston	Replace; consult Vanair Service Department for pison ring and cylinder maintenance procedures.
	Worn cylinder	Replace; consult Vanair Service Department for pison 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.

Continued on next page

7.3 TROUBLESHOOTING GUIDE

Fault/Malfunction	Possible Cause	Corrective Action
DC GENERATOR (CONTINUED)		
Welder and/or battery charger behave erratically (continued)	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 6.6, 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 6.5.7, 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 6.6, Servicing the System Fuses and Circuit Breakers**.
Low AC voltage	Engine speed too low for demand	Adjust speed control. Consult ***Section 6.5.6, Adjusting the Engine Speed***, and the Engine Operator's Manual.
High AC voltage	Engine speed too high for demand	Adjust speed control. Consult ***Section 6.5.6, Adjusting the Engine Speed***, and the Engine Operator's Manual.

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SECTION 8: DIAGRAMS

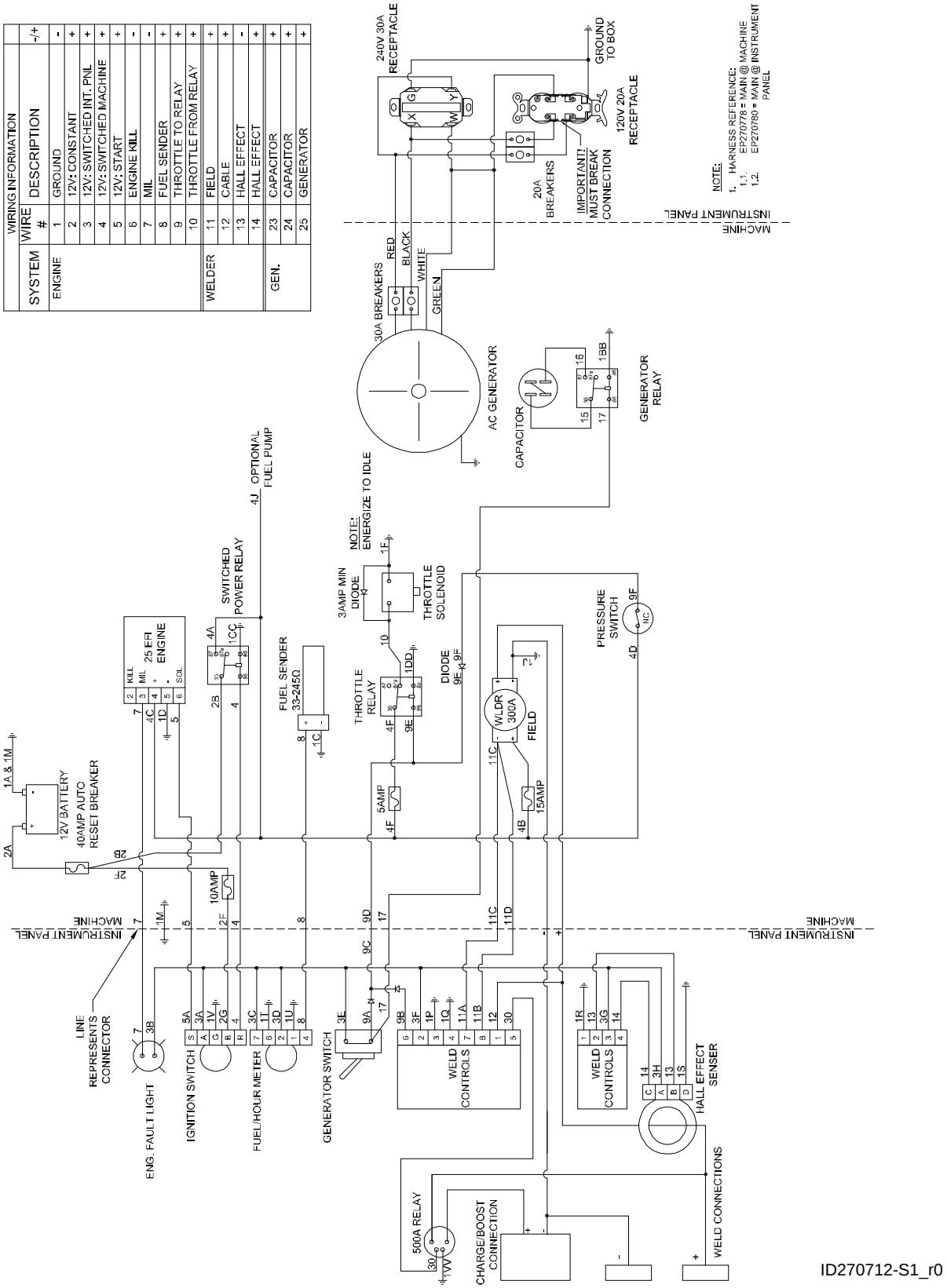
8.1 GENERAL INFORMATION

The diagrams located in this section of the manual are designed to assist the service technician with troubleshooting any problems that may arise while operating the All-In-One Power System within its intended use.

The flow schematic and wiring diagram should be used together when identifying any potential problems. They are laid out in a format that is designed to be easy to read for the end user or a service technician.

NOTE
For machine measurement specifications refer to *Section 4-5, Installation and Dimensions Diagram* (parts 1 and 2).

8.2 WIRING DIAGRAM - AIR N ARC 200 SERIES



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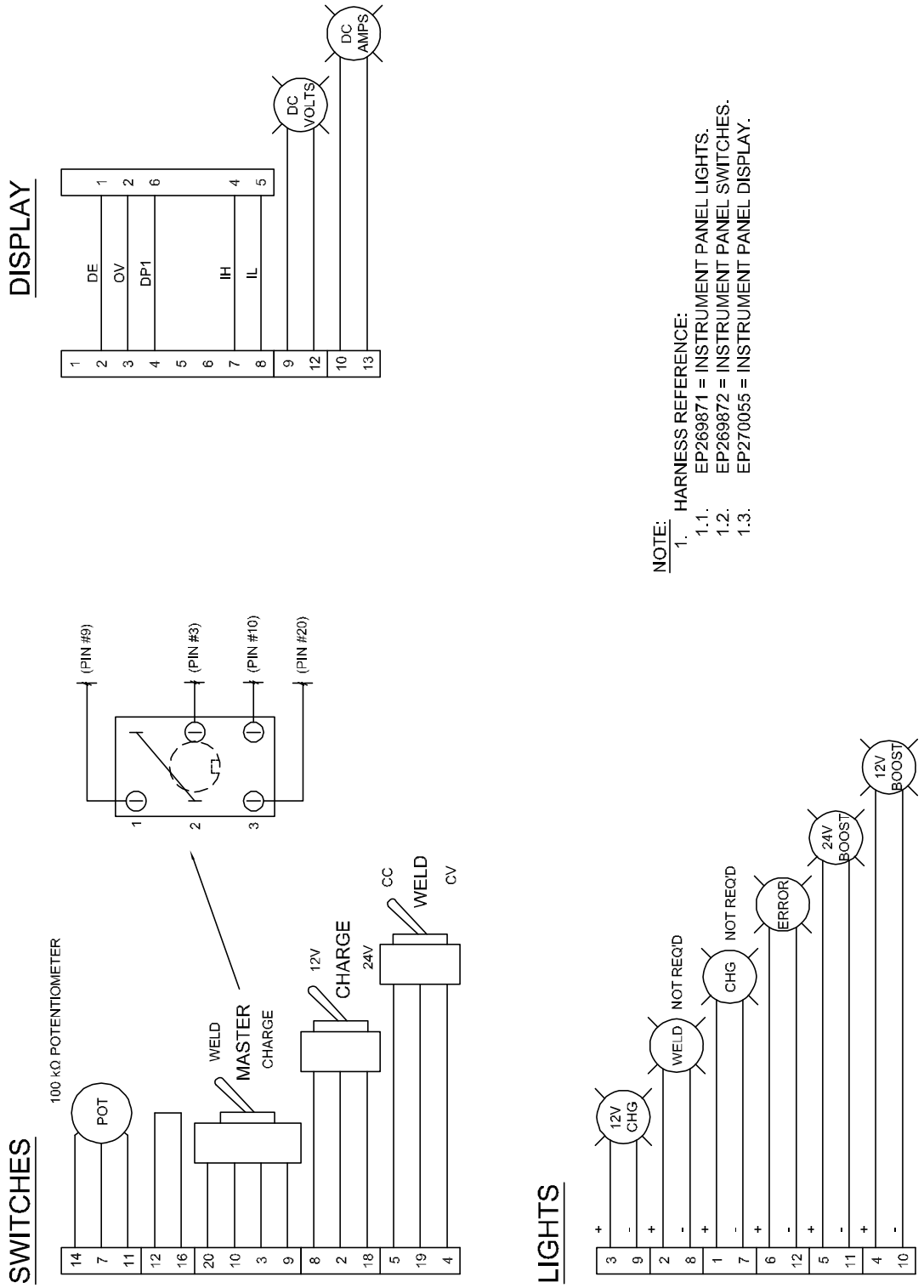
8.3 WIRING DIAGRAM - SWITCHES & LIGHTS



NOTE:
1. HARNESS REFERENCE:
   1.1. EP269871 = INSTRUMENT PANEL LIGHTS.
   1.2. EP269872 = INSTRUMENT PANEL SWITCHES.
   1.3. EP270055 = INSTRUMENT PANEL DISPLAY.

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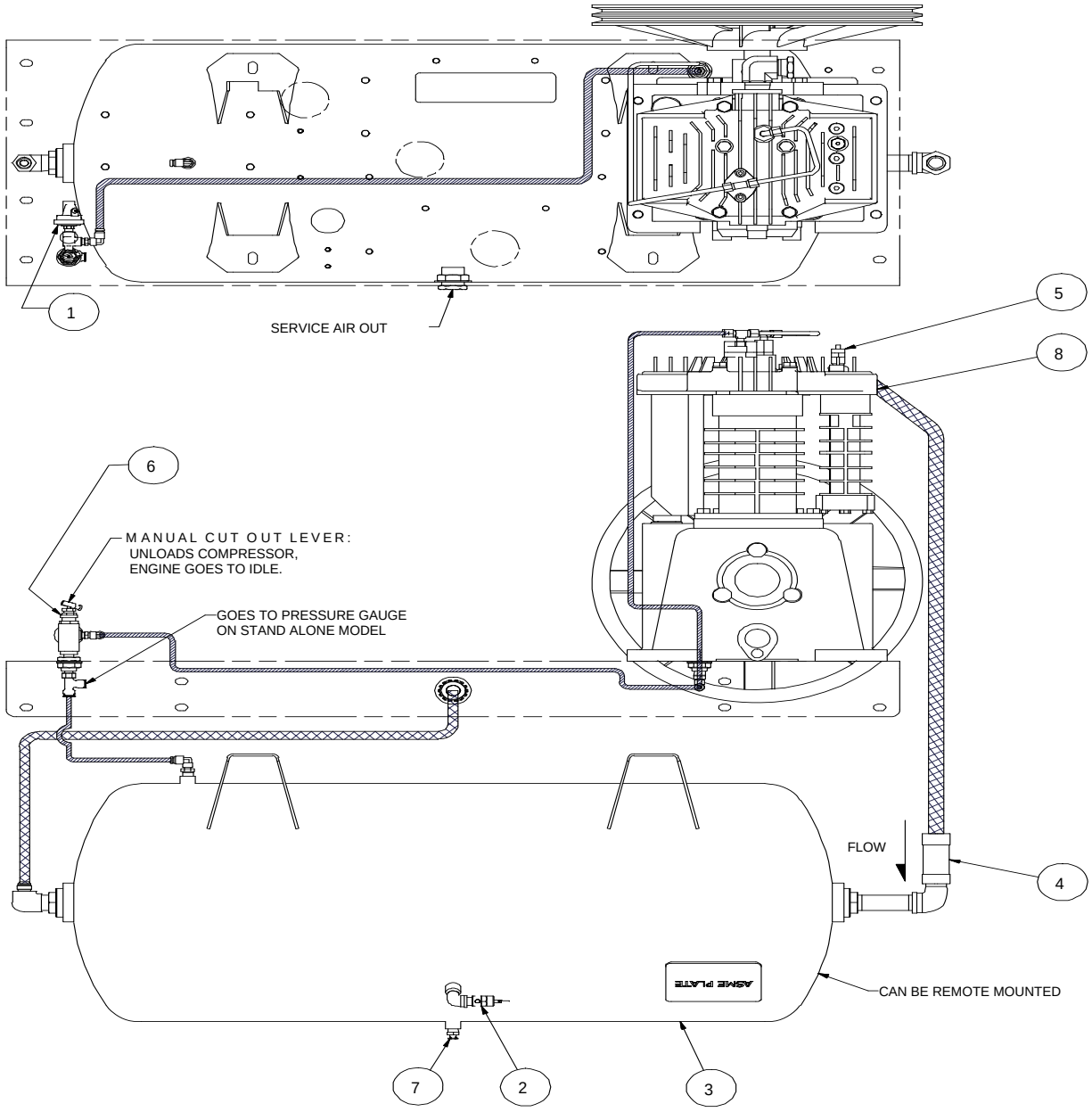
8.4 COMPRESSOR FLOW SCHEMATIC DIAGRAM



PARTS LIST			
ITEM	PART NUMBER	DESCRIPTION	QTY
1	260818	SWITCH, PRESSURE N.C. 10 PSI HOBBS	1
2	264232	VALVE, RELIEF 200 PSI 1/4 NPT MALE	1
3	A18096P	TANK, 30 GAL	1
4	CO59774	VALVE, CHECK VALVE 3/4" FNPT	1
5	CO62609	VALVE, POP-OFF VALVE, 70 PSI	1
6	CO67609	VALVE, PILOT VALVE, 150-175 PSI	1
7	FI74953	VALVE, PETCOCK VALVE, 1/4 NPT	1
8	PA35509	ID, COMPRESSOR E57, 24 CFM	1

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SECTION 9: ILLUSTRATED PARTS LIST

9.1 PARTS ORDERING PROCEDURE

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 compressor unit serial number plate. See ***Figure 9-1*** for location of machine package serial plate. Consult **Table 9A: Recommended Spare Parts List** on the next page for a listing of replacement parts.

VANAIR® MANUFACTURING, INC.
10896 West 300 N.
Michigan City, IN 46360
Telephone: (800) 526-8817
(219) 879-5100
Service Fax: (219) 879-5335
Parts Fax: (219) 879-5340
Sales Fax: (219) 879-5800
www.vanair.com

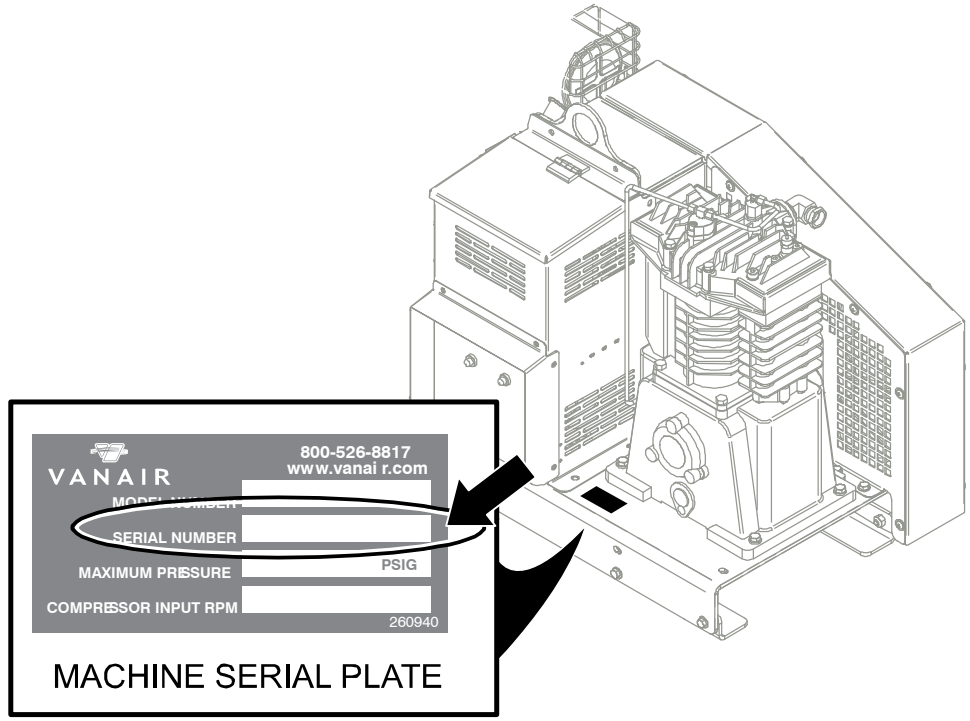


Figure 9-1: Machine Package Serial Number Plate Location

TABLE 9A: RECOMMENDED SPARE PARTS LIST

KEY NO.	PART NUMBER	DESCRIPTION	QTY	IDENTIFICATION REFERENCE	
				FIGURE or SECTION	KEY NO.
ROUTINE/SCHEDULED MAINTENANCE ITEMS					
1	RC99245	Element, Compressor Air Filter Assembly	1	Figure 6-1	B
2	262722	Element, Engine Air Filter[I]	1	Figure 6-20	G
3	270757	Filter, Engine Oil[I]	1	Figure 6-21	C
4	RC81465	Filter, In-line Fuel (70 micron)[I]	1	Figure 6-22	A
5	EN269654	Filter, In-line Fuel (10 micron)[I]	1	Figure 6-22	B
NON-ROUTINE MAINTENANCE ITEMS					
6	CO89649	Gauge, Air, Dry	1	9.5	#30
7	PR270548	Boot, Breaker Panel Mount	2	9.5	#49
8	263532	Fuse, 5 Amp	1	Figure 6-24	C
9	EL270936	Fuse, 5 Amp	1	Figure 6-25	D
10	EL41538	Fuse, 10 Amp	1	Figure 6-25	E
11	EL59018	Fuse, 15 Amp	1	Figure 6-25	F
12	270492	Breaker, 40 Amp Auto-Reset	1	Figure 6-24	A
13	CO269748	Gauge, Fuel / Hour Meter	1	9.5	#23
14	EL270483	Relay, 500 Amp (control panel)	1	9.5	#36
15	CO270157	Breaker, Circuit 240V/25A	2	Figure 6-26	B
16	270501	Relay, 40 Amp	3	Figure 6-26	E (E_1,E_2,E_3)
17	CO62617	Breaker, Circuit 20A	2	9.5	#28
18	RC46552	Valve Kit, Compressor Unloader - Low Pressure	1	Figure 6-4	C
19	RC21654	Valve Kit, Compressor Unloader - High Pressure	1	Figure 6-5	C
20	KIT1120	Valve Kit, Compressor Head (Valve & Gasket)	1	Figure 6-6	●
21	KIT1121	Rebuild Kit, Piston Ring and Cylinder[II]	1	Figure 6-6	●
22	260818	Switch, Pressure (N.C. 10 psi)	1	9.10	#1
23	CO67609	Valve, Pilot	1	9.10	#5
24	DR270814	Belt, Poly-Link Compressor	2	9.2	#4
25	DR62184	Belt, Serpentine Generator	1	9.2	#5

[I] Consult the Engine Operator's Manual for additional information.

[II] Consult Vanair® Service Department for maintenance on piston rings and cylinder procedures.

NOTE

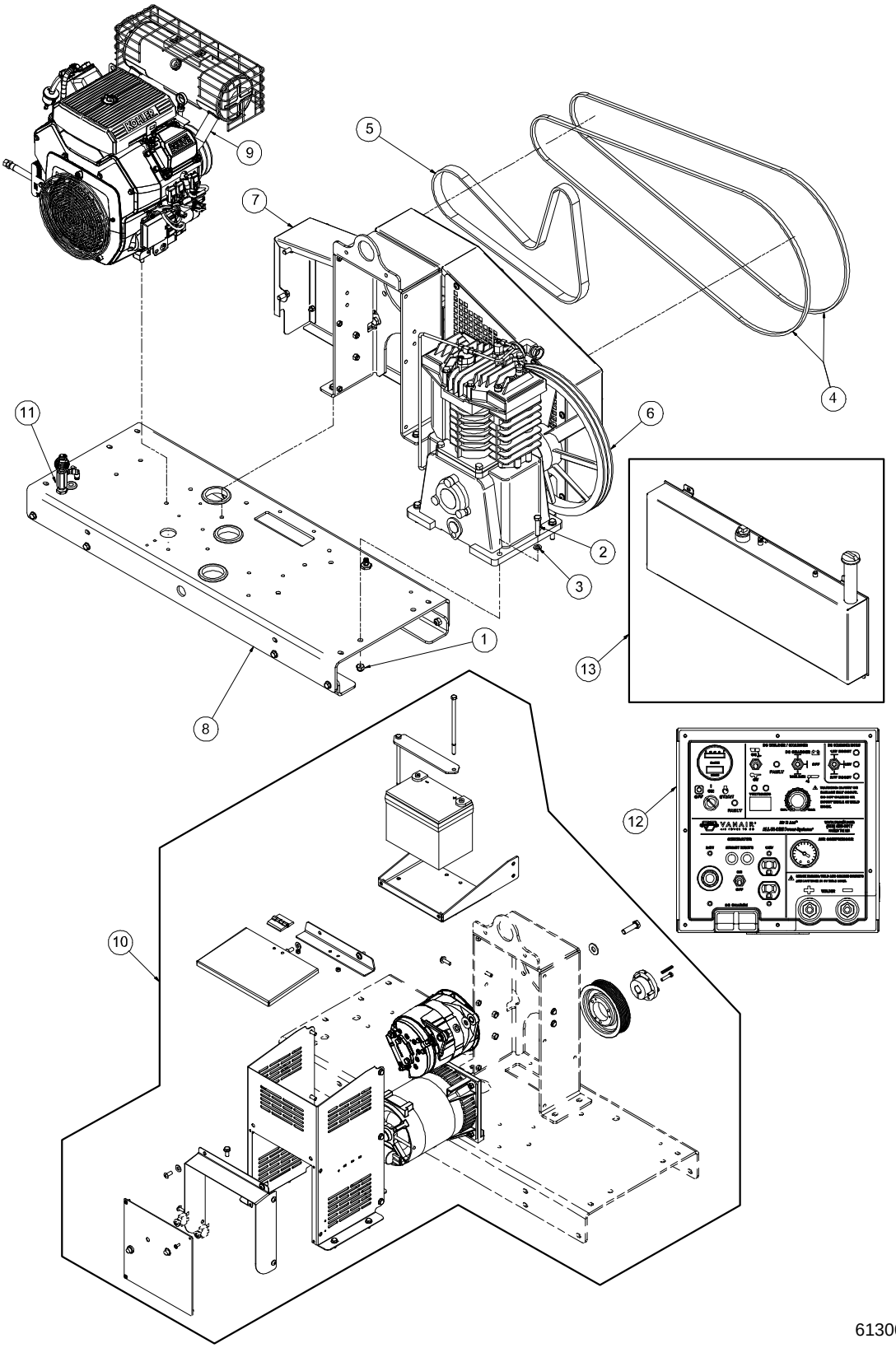
For a complete list of available options, see Appendix A, *Section A.5 Air N Arc 200 Series All-In-One Power System Available Options List*

NOTE

If additional spare parts are being stored for future use, make certain 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 6.7.2, Long Term Storage*.

NOTES

9.2 AIR N ARC 200 SYSTEMS ASSEMBLIES



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9.2 AIR N ARC 200 SYSTEMS ASSEMBLIES

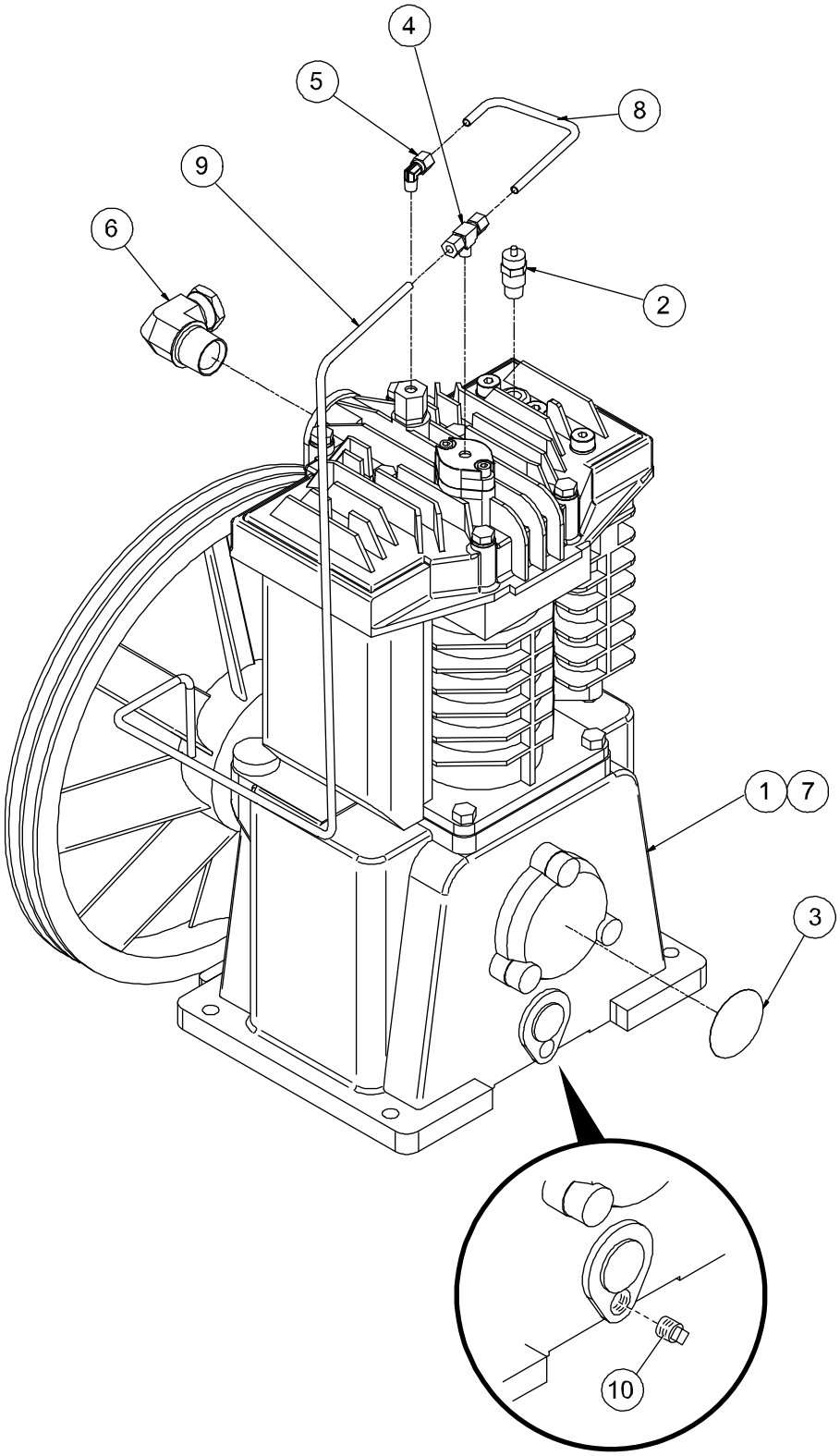
ITEM	DESCRIPTION	PART NUMBER	QTY	REFERENCE SECTION[I]
1	NUT, HEX LOCKING 7/16-14	825507-223	2	-
2	CAPSCREW, HEX GR5 7/16-14 x 2	829107-200	4	-
3	WASHER, LOCK 7/16	838507-109	4	-
4	BELT, POLY-LINK 122 LINKS	DR270814	2	-
5	BELT, SERPENTINE	DR62184	1	-
6	ID, COMPRESSOR E57, 24 CFM	—	1	*9.3*
7	ID, BELT GUARD ASSEMBLY	—	1	*9.7*
8	ID, FRAME ASSEMBLY SKID MOUNT	—	1	*9.4*
9	ID, ENGINE AND DRIVE PARTS	—	1	*9.6*
10	ID, ELECTRICAL SYSTEM, REMOTE	—	1	*9.8*
11	ID, CONTROL ASSEMBLY, SKID	—	1	*9.10*
12	ID, INSTRUMENT PANEL	—	1	*9.5*
13	ID, FUEL TANK ASSEMBLY	—	1	*9.9*
14	ID, DECAL AND PLATE LOCATIONS[II]	—	1	*9.11 (3 -Part Section)*

[I] For a detailed breakdown of the item number assembly, refer to the section listing in this column, for this manual.

[II] Not shown; refer to the section location listed under the Reference Section column.

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

9.3 COMPRESSOR AND PARTS ASSEMBLY



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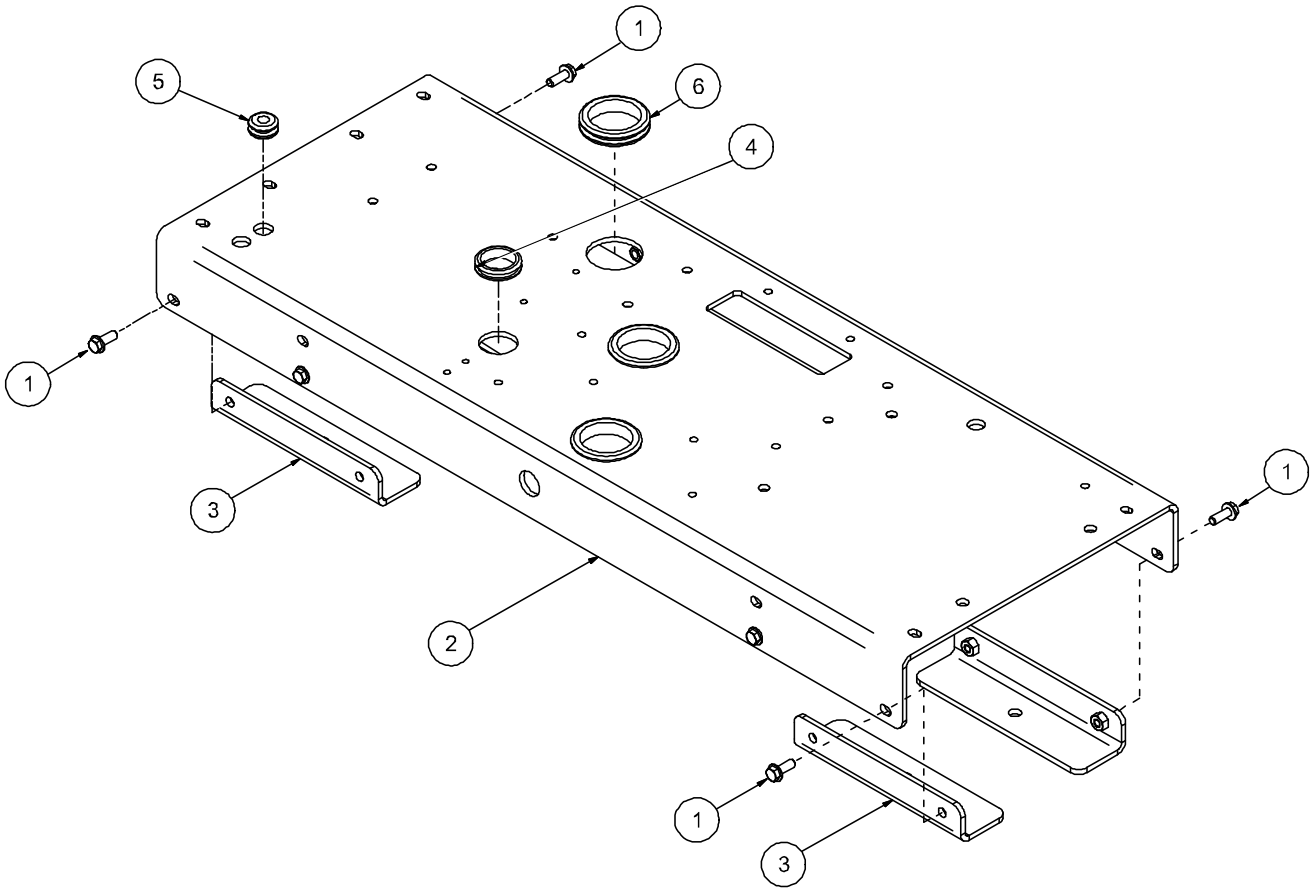
9.3 COMPRESSOR AND PARTS ASSEMBLY

ITEM	DESCRIPTION	PART NUMBER	QTY
1	COMPRESSOR, AIR, 24 CFM (E57)	CM37293PBK	1
2	VALVE, POP-OFF VALVE, 70 PSI	CO62609	1
3	DECAL, COMPRESSOR LOGO, ROUND	DL269684	1
4	TEE, BRANCH COMP 1/8MNPT x 1/4 COMP 90 DEG .	FI46707	1
5	ELBOW, COMP 1/8MNPT x 1/4 COMP 90 DEG.	FI64915	1
6	ADAPTER, 90 DEG. ELBOW, 1" MPT x 3/4" SWIVEL	HY83904	1
7	OIL, HYD ISO68	SE99966	2.0 QTS
8	TUBE, TIE-IN	TU270817	1
9	TUBE, COMPR TO BASE	TU270818	1
10	PLUG, DRAIN 1/4” NPT	-	1

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

9.4 FRAME



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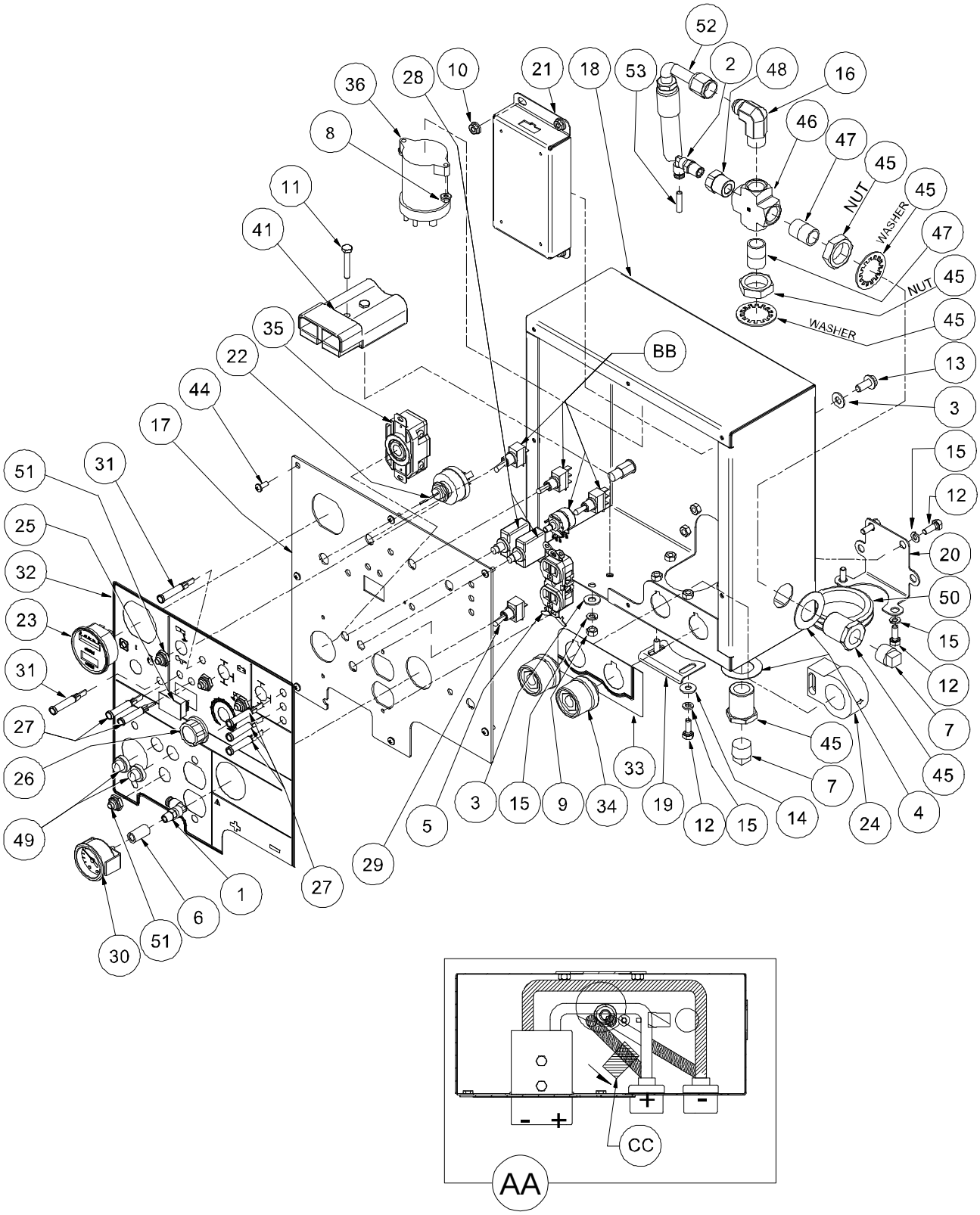
9.4 FRAME

ITEM	DESCRIPTION	PART NUMBER	QTY
1	SCREW, SER WASH 3/8-16 x 1	829706-100	8
2	PLATFORM, 200	A1270312	2
3	MOUNT SKID	A16581P	4
4	GROMMET, BLACK RUBBER, 1.75 ID	PR33078	1
5	GROMMET, BLACK RUBBER, 2.25 ID	PR52720	1
6	GROMMET, BLACK RUBBER, 2.25 ID	PR74492	3

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

9.5 INSTRUMENT PANEL



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9.5 INSTRUMENT PANEL

ITEM	DESCRIPTION	PART NUMBER	QTY
1	ELBOW, 1/4T x 1/8P PUSH-ON	261309	1
2	ELBOW, 90 DEG. PUSH ON 1/4T x 1/4P	261310	1
3	WASHER, NYLON 5/16-18	262943	4
4	WASHER, FLAT REDUCING 3/4 x 1 ELECT.	267994	2
5	RECEPTACLE, 120V/20A	270092	1
6	COUPLING, PIPE 1/8	806230-005	1
7	PLUG, PIPE 1/2	807800-020	2
8	NUT, HEX #10-24	825202-130	2
9	NUT, HEX 1/4-20	825204-226	2
10	NUT, HEX FLANGE 1/4-20	825304-236	4
11	CAPSCREW, HEX GR5 1/4-20 x 1 1/2 LG.	829104-150	2
12[I]	CAPSCREW, HEX GR8 1/4-20 x 3/4 LG	829404-075	6
13[I]	SCREW, SER WASH 5/16-18 x 0.75	829705-075	2
14	WASHER, FLAT 1/4	838204-071	2
15	WASHER, LOCK 1/4	838504-062	8
16	ELBOW, 37FL/90M #08 x 1/2	860208-050	1
17	FACEPLATE, CONTROL PANEL	A1269483	1
18	PANEL, CONTROL BACK	A1269489	1
19	CLAMP, CONTROL PANEL CABLE	A1269491	1
20	COVER, CONTROL PANEL CABLES	A1269492	1
21	MODULE, WELD CONTROL SYS ASSY	CO269598	1
22	SWITCH, IGNITION EFI ENGINES	CO269713	1
23	GAUGE, FUEL / HOUR METER	CO269748	1
24[II]	SENSOR, HALL EFFECT WELD CONTROLS	CO269900	1
25	PANELMETER, VOLTAGE, LED	CO270314	1
26	KNOB, PLASTIC, 1.3 DIA., 1/4 SHAFT	CO59489	1
27	LAMP, INDICATOR, LED, GREEN	CO59966	5
28	CIRCUIT BREAKER, 20 AMP	CO62617	2

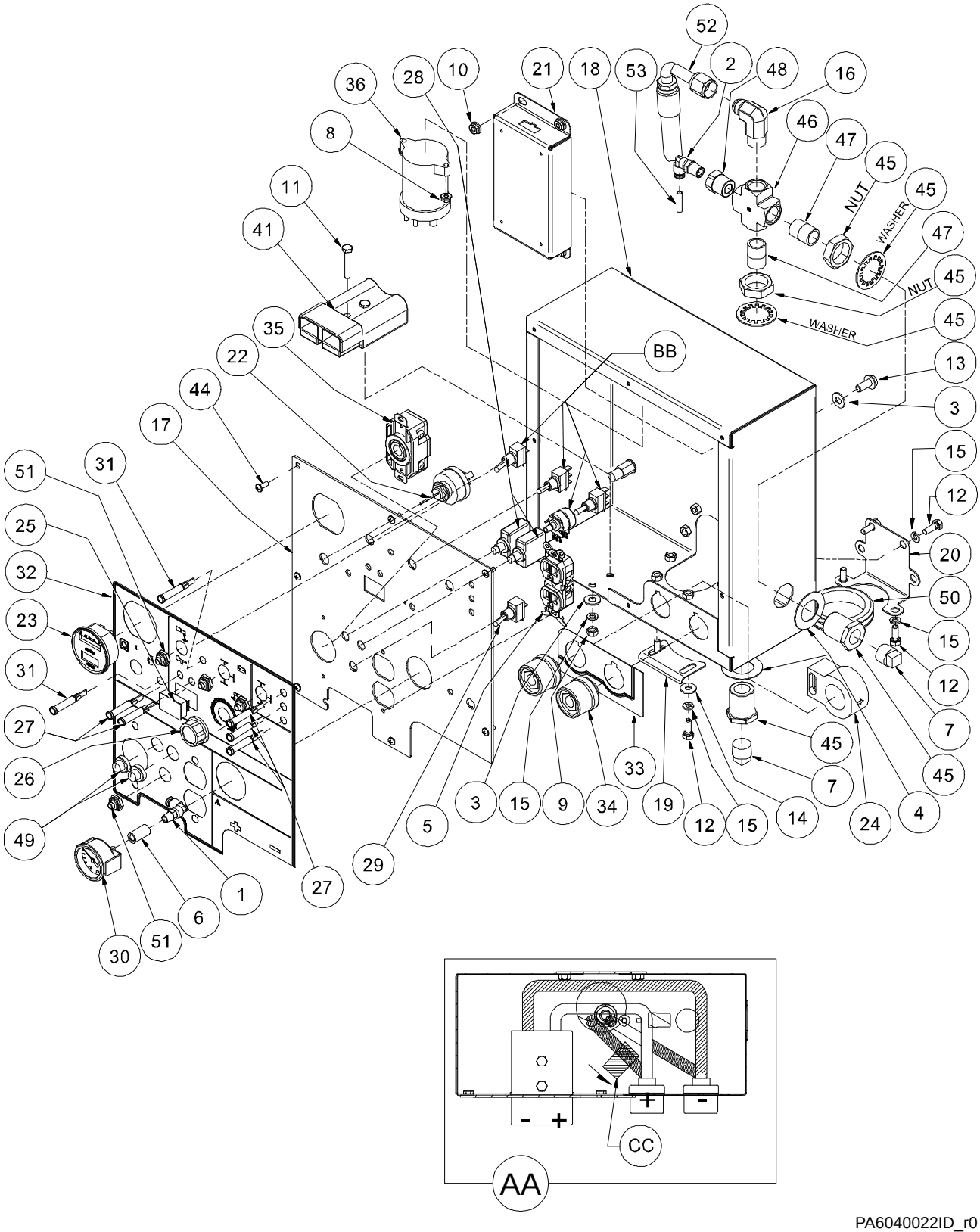
Continued on page 127

[I] Toggle switches and potentiometer are included with harness EP269872; wiring instrument panel switches.

[II] Refer to inset AA.

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

9.5 INSTRUMENT PANEL (CONTINUED)



PA6040022ID_r0

9.5 INSTRUMENT PANEL (CONTINUED)

ITEM	DESCRIPTION	PART NUMBER	QTY
29	SWITCH, TOGGLE, SPST, ON/OFF	CO78077	1
30	GAUGE, AIR, DRY, 0-200 PSI	CO89649	1
31	LAMP, INDICATOR, LED, RED	CO89659	2
32	DECAL, FACEPLATE	DL270755	1
33	DECAL, CONTROL PANEL, WELDER	DL270755-002	1
34	RECEPTACLE, PANEL 350 AMP	EL269932	2
35	RECEPTACLE, 240V/30A TURNLOC	EL270148	1
36*III*	RELAY, 500 AMP 12V COIL NO	EL270483	1
37	HARNESS, WIRE INST PNL LIGHTS	EP269871	1
38	HARNESS, WIRE INST PNL SWITCH	EP269872	1
39	HARNESS, WIRE INST. PNL DISPLAY	EP270055	1
40	HARNESS, WELD CABLE MACH TO PANEL	EP270170	1
41	HARNESS, WELD CABLE JUMPER	EP270171	1
42	HARNESS, A/C PANEL TO MACHINE	EP270230	1
43	HARNESS, WIRE INST PNL	EP270780	1
44	SCREW, PHILLIPS PAN HEAD #10-32 x 1/2" LG. SS	FA33542	7
45	PIPE BRASS, BULKHEAD 1/2 NPT	FI23542	2
46	PIPE BRASS, CROSS (BAR STOCK), 1/2 NPT.	FI25405	1
47	NIPPLE, PIPE XS CLOSE 1/2, BRASS	FI34220	2
48	BUSHING, PIPE BRASS 1/4 x 1/2	FI75068	1
49	BOOT, CIRCUIT BREAKER 3/8	PR270548	2
50	GROMMET, BLACK RUBBER, 2.25 ID	PR74492	1
51	SWITCH BOOT, TOGGLE, WEATHERPROOF	PR77230	4
52	HOSE, AIR TANK TO PANEL	TU270453-006	1
53*IV*	TUBING, 1/4 DIA., NYLON, 230 PSI x 1.25 FT	TU95945	1

AA - DETAIL: Welder lead connection

BB - Toggle switches and potentiometer are included with harness EP269872; wiring instrument panel switches.

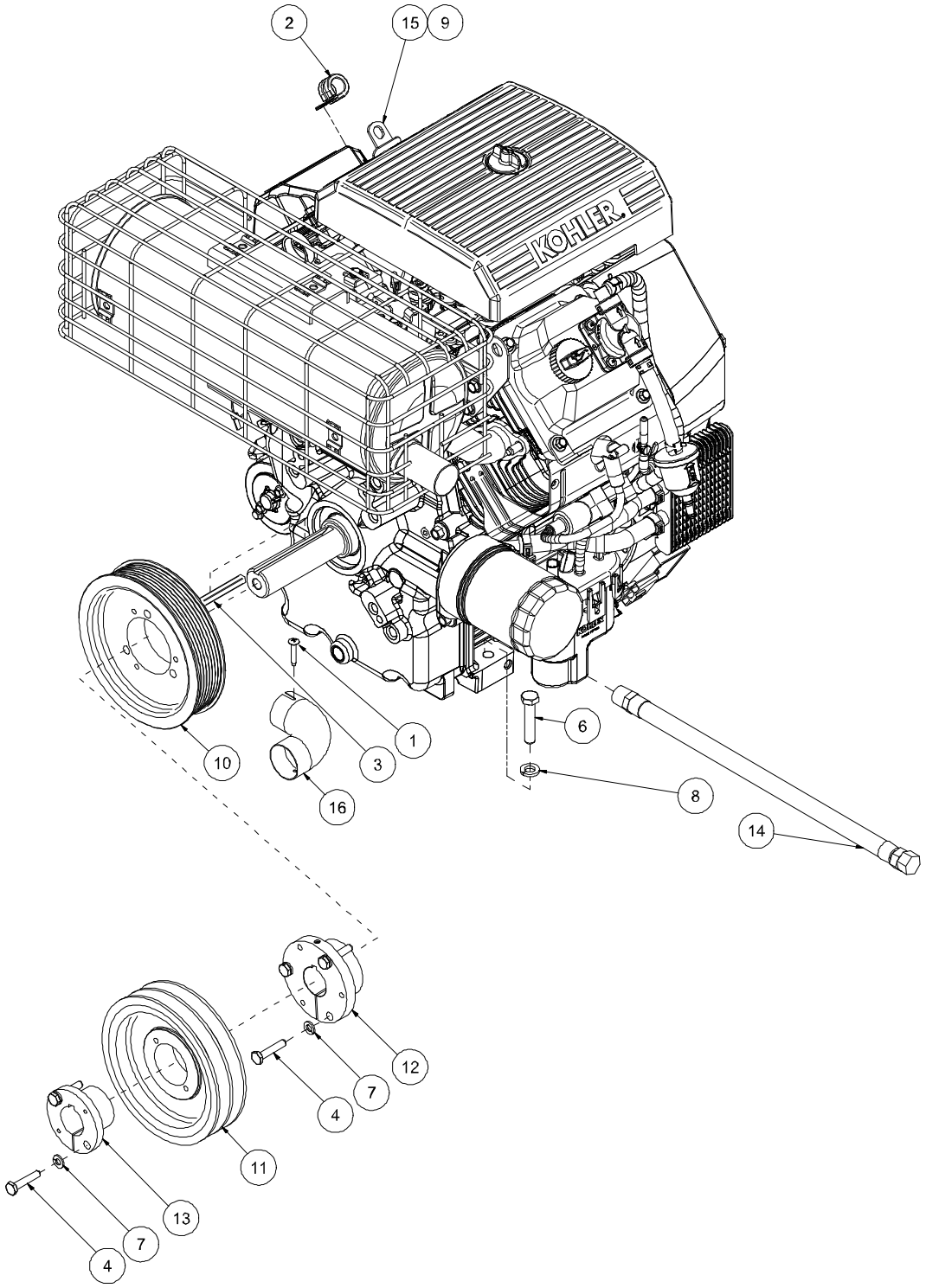
CC - Notice direction of arrow on item #24.

III Optional relay shown.

IV Connects to gauge.

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

9.6 ENGINE AND DRIVE PARTS



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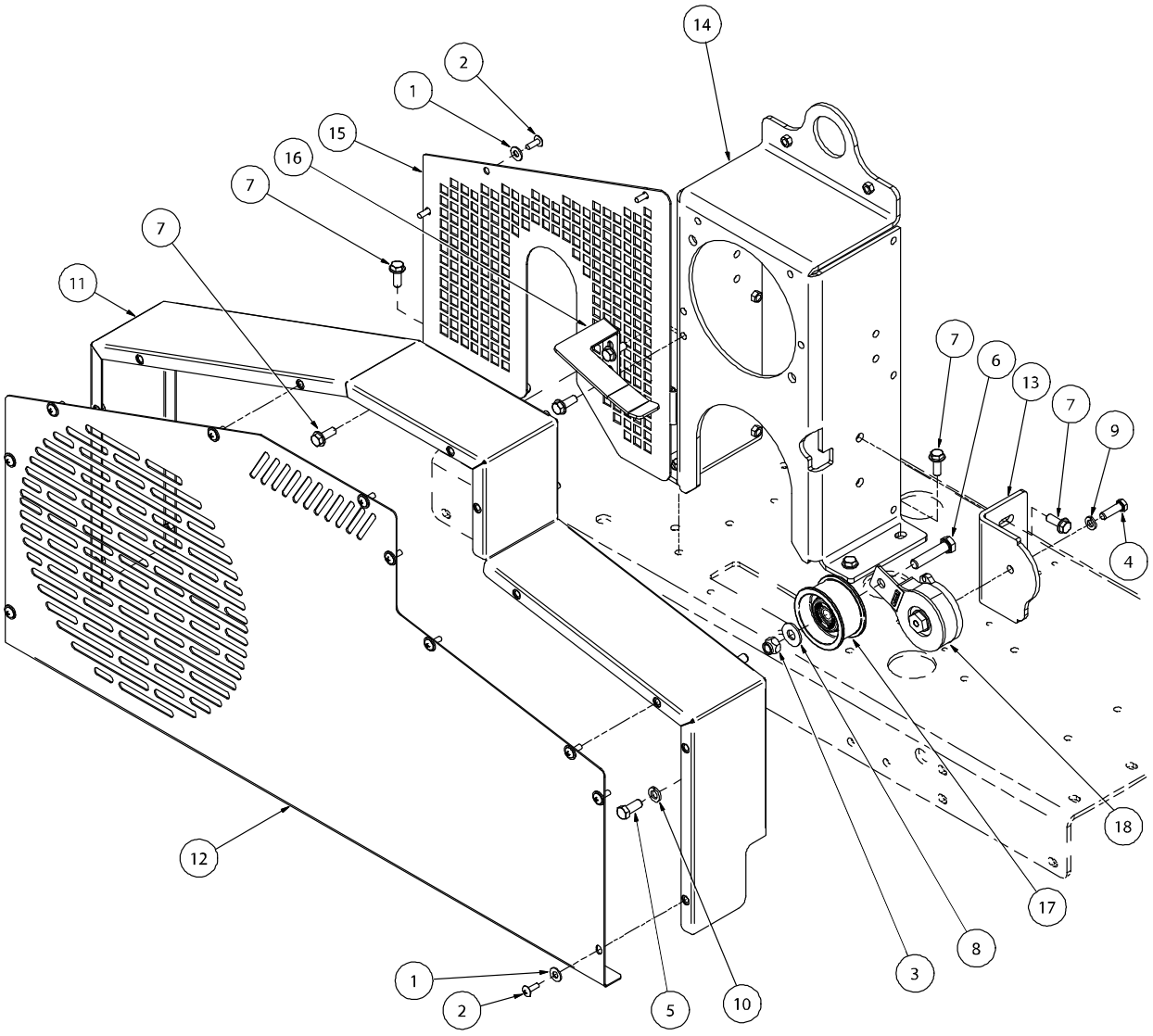
9.6 ENGINE AND DRIVE PARTS

ITEM	DESCRIPTION	PART NUMBER	QTY
1	SCREW, SHEET METAL PHIL. #8 x 1 LG.	265590	1
2	CLAMP, LOOM #010 5/8"	268503	1
3	KEY, SQUARE 1/4 x 1/4 x 3	821104-300	1
4	CAPSCREW, HEX GR5 1/4-20 x 1 1/4	829104-125	5
5	CAPSCREW, HEX GR5 3/8-16 x 1.50	829106-150	1
6	CAPSCREW, HEX GR5 3/8-16 x 1.75	829106-175	3
7	WASHER, LOCK 1/4	838504-062	5
8	WASHER, LOCK 3/8	838506-094	4
9	OIL, MOTOR 10W30, 2.5 QT	844300-001	1
10	SHEAVE, SERPENTINE, 8 GROOVE	A15891Z	1
11	SHEAVE, 2 GROOVE, 5.75 DOUBLE A, ZINC	DR76765Z	1
12	BUSHING, SDS, QD, 1 1/8 DIA.	DR85785Z	1
13	BUSHING, L, QD, 1 1/8 DIA., 2 BOLT	DR92958Z	1
14	HOSE, DRAIN 3/8 x 12"LG 3/8NPT	EN22698	1
15	ENGINE, GAS KOHLER 25HP EFI	EN270784	1
16	ELBOW, 90 DEG., EXHAUST	EN43384	1

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

9.7 BELT GUARD ASSEMBLY



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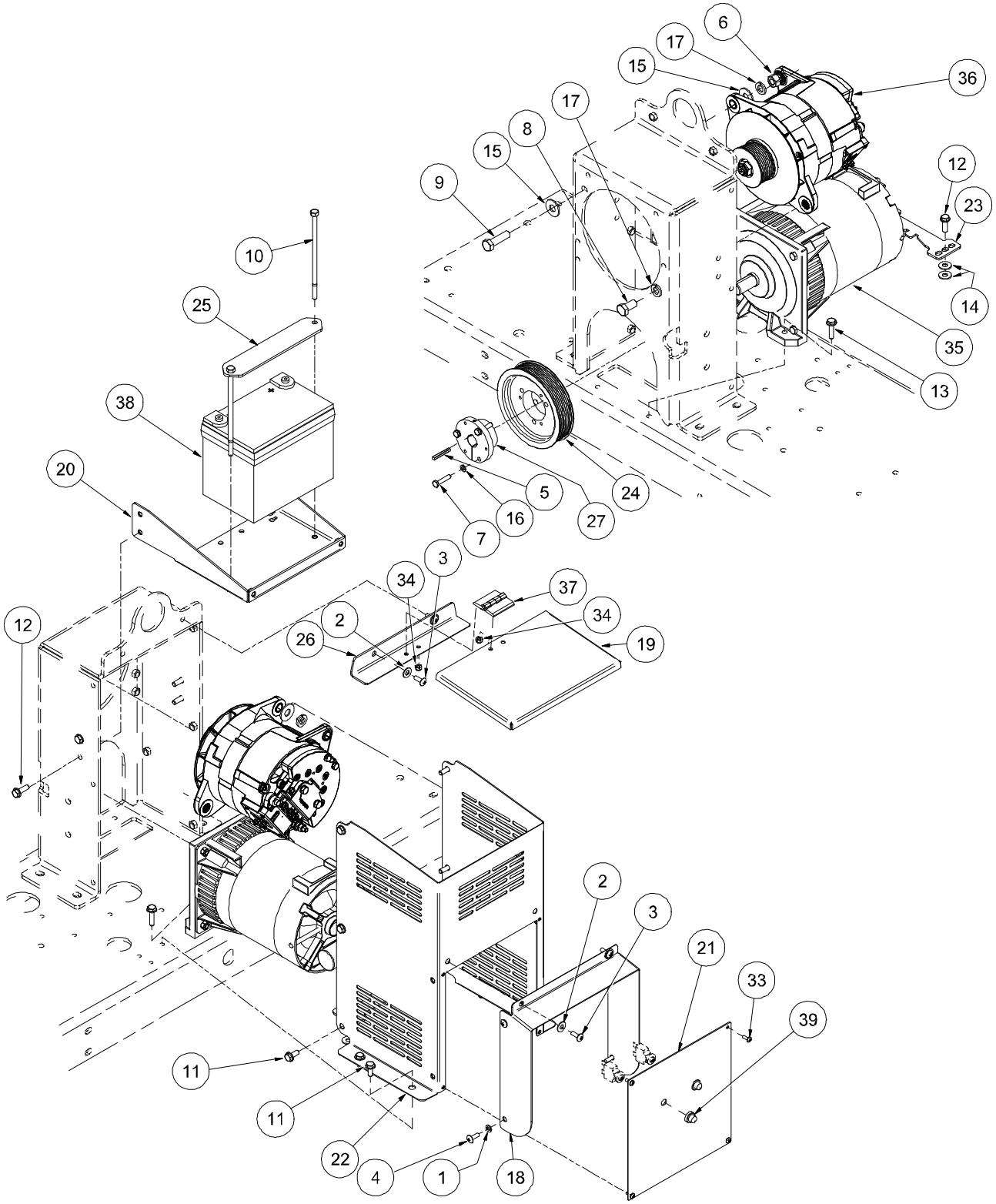
9.7 BELT GUARD ASSEMBLY

ITEM	DESCRIPTION	PART NUMBER	QTY
1	WASHER, NYLON 5/16-18	262943	14
2	SCREW, TRUSS HD 5/16-18 x 3/4 SS	262945	14
3	NUT, HEX LOCKING 1/2-13	825508-262	1
4	CAPSCREW, HEX GR5 3/8-16 x 1 1/4	829106-125	1
5	CAPSCREW, HEX GR5 7/16-14 x 1	829107-100	2
6	CAPSCREW, HEX GR5 1/2-13 x 2.25	829108-225	1
7	SCREW, SER WASH 3/8-16 x 1	829706-100	14
8	WASHER, FLAT 1/2	838208-112	1
9	WASHER, LOCK 3/8	838506-094	1
10	WASHER, LOCK 7/16	838507-109	2
11	SHIELD, BELT MAIN	A1270332	1
12	SHIELD, BELT REAR	A1270341	1
13	BRACKET, TENSIONER, ANA 200	A1270525	1
14	TOWER, WELDER ANA 200	A1270777	1
15	SHIELD, COMPRESSOR DRIVE	A15305P	1
16	DAMPENER, COMPRESSOR BELT IND	A17372P	1
17	IDLER, 1.375 WIDTH, 3 3/8 DIA.	DR46584	1
18	TENSIONER, ROTARY, LARGE, 42#	DR61391	1

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

9.8 ELECTRICAL SYSTEM



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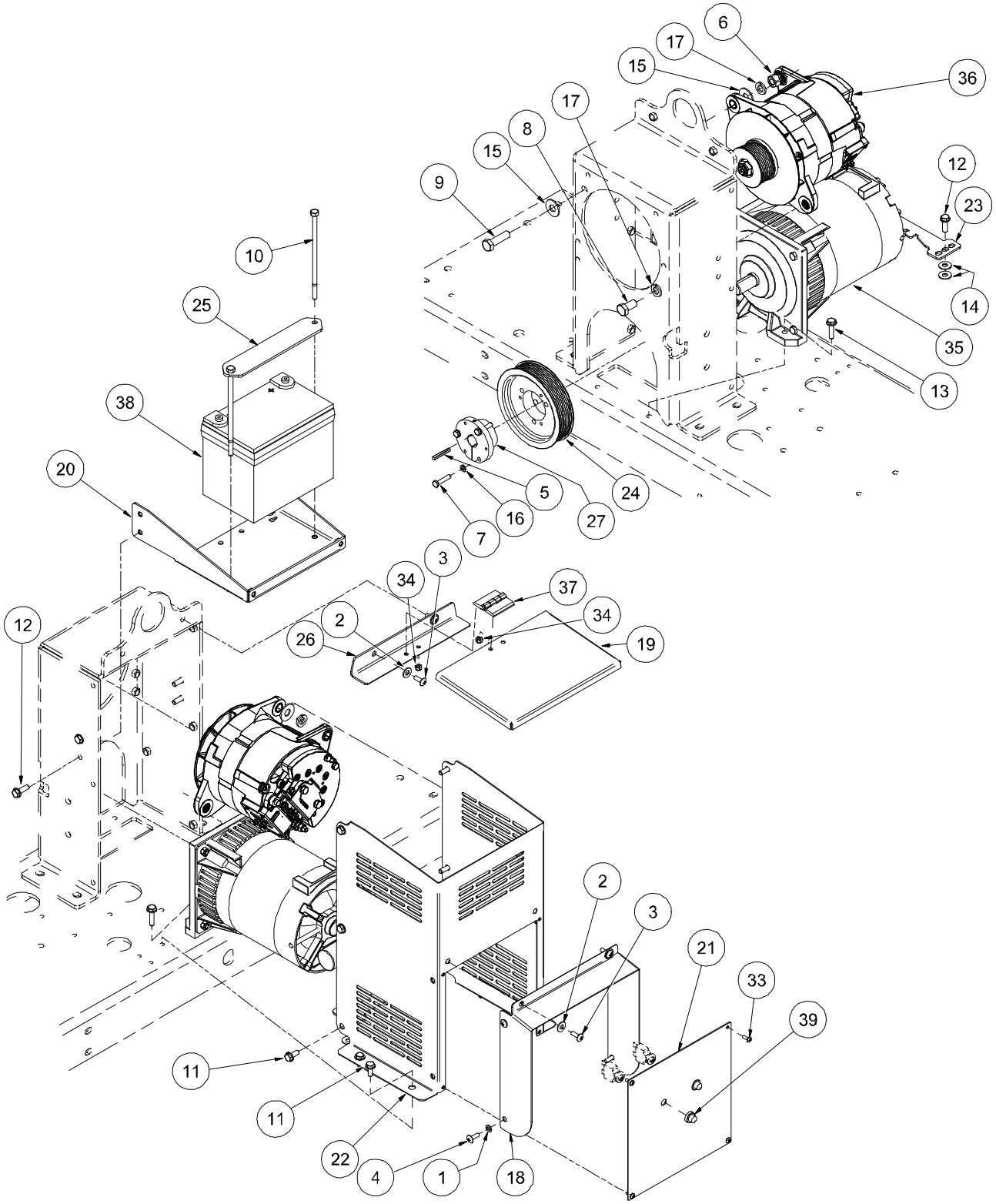
9.8 ELECTRICAL SYSTEM

ITEM	DESCRIPTION	PART NUMBER	QTY
1	WASHER, NYLON FLAT 1/4	262704	4
2	WASHER, NYLON 5/16-18	262943	4
3	SCREW, TRUSS HD 5/16-18 x 3/4 SS	262945	4
4	SCREW, TRUSS HD 1/4-20 x 3/4	262953	4
5	KEY, SQUARE 3/16 x 3/16 x 1.5	821103-150	1
6	NUT, HEX 1/2-13	825208-448	1
7	CAPSCREW, HEX GR5 1/4-20 x 1 1/4	829104-125	3
8	CAPSCREW, HEX GR5 1/2-13 x 1	829108-100	1
9	CAPSCREW, HEX GR5 1/2-13 x 1.75	829108-175	1
10	CAPSCREW, HEX GR8 5/16-18 x 7	829405-700	2
11	SCREW, SER WASH 5/16-18 x 0.75	829705-075	10
12	SCREW, SER WASH 5/16-18 x 1	829705-100	6
13	SCREW, SER WASH 5/16-18 x 1.25	829705-125	2
14	WASHER, FLAT 5/16	838205-071	4
15	WASHER, FLAT 1/2	838208-112	2
16	WASHER, LOCK 1/4	838504-062	3
17	WASHER, LOCK 1/2	838508-125	2
18	PANEL,SHIELD FACEPLATE	A10592P	1
19	COVER, BATTERY LID	A12524P	1
20	SUPPORT, BATTERY TRAY	A12634P	1
21	FACEPLATE, COVER BLANK	A12942P	1
22	SHIELD, CENTER ENCLOSURE	A13426P	1
23	MOUNT, REAR GENERATOR	A15865P	1
24	SHEAVE, SERPENTINE, 8 GROOVE	A15891Z	1
25	MOUNT, BATTERY INDUSTRIAL, PRO	A16270P	1
26	MOUNT BATTERY LID	A19244P	1
27	BUSHING, SDS, QD, 7/8 DIA.	DR41395Z	1
28	HARNESS, WIRE WELDER	EP269873	1

Continued on page 135

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

9.8 ELECTRICAL SYSTEM (CONTINUED)



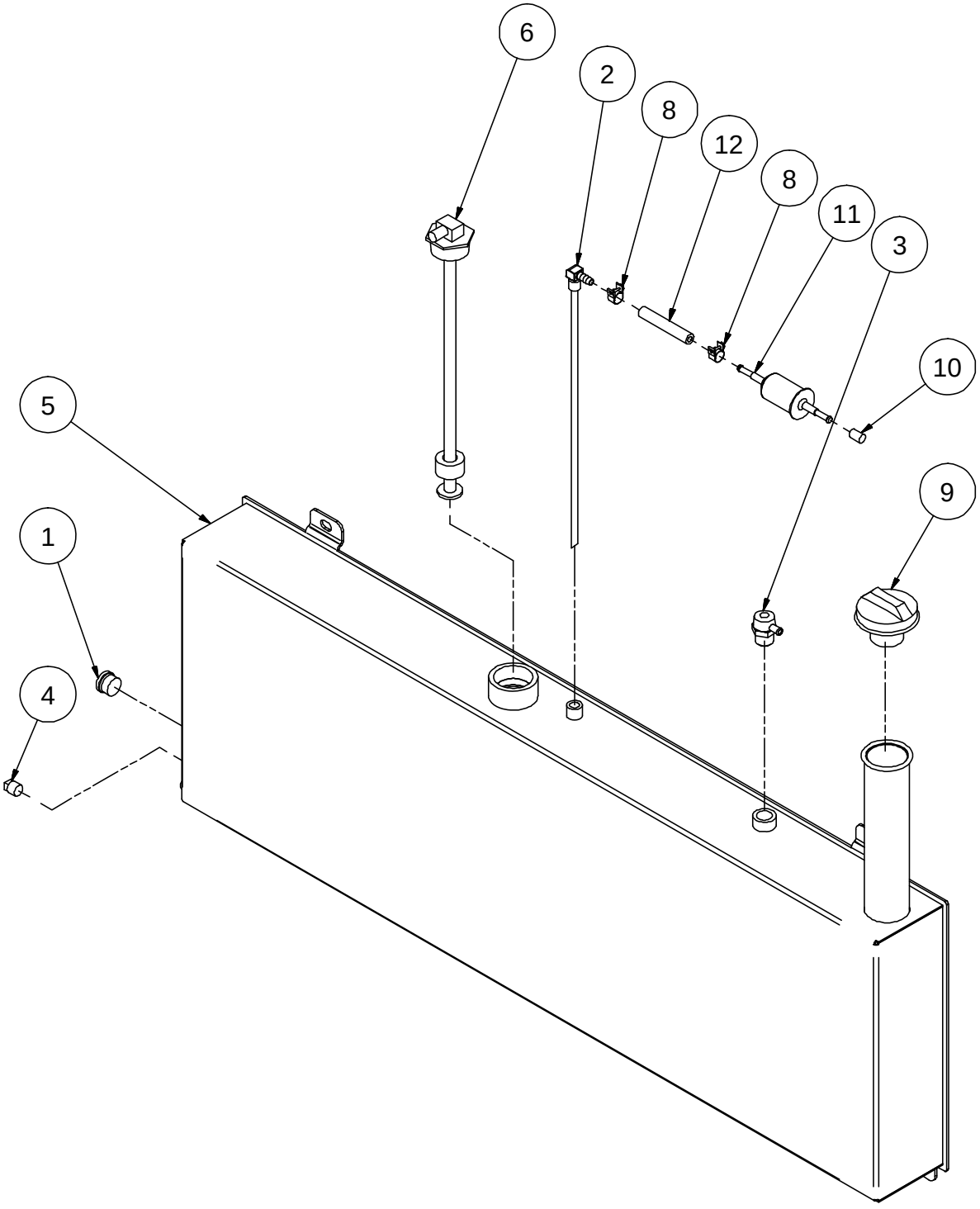
PA6120053ID_r0

9.8 ELECTRICAL SYSTEM (CONTINUED)

ITEM	DESCRIPTION	PART NUMBER	QTY
29	HARNESS, WIRING MAIN	EP270778	1
30	BATTERY CABLE, POSITIVE	EP41345	1
31	BATTERY CABLE, NEGATIVE	EP59646	1
32	HARNESS, REMOTE A/C, MACHINE	EP82587	1
33	SCREW, PHILLIPS PAN HEAD #10-32 x 1/2" LG. SS	FA33542	4
34	NUT, LOCK, M6 x 1.0 PITCH	FA55272	4
35	GENERATOR AC, W/OUT REAR COVER	GE269592	1
36	WELDER, GENERATOR	GE270045	1
37	HINGE, 2" x 2", BLACK	HA88014	1
38	BATTERY, 12 VOLT 35 AMP DEEP	MA31821	1
39	BOOT, CIRCUIT BREAKER 3/8	PR270548	2

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

9.9 FUEL TANK ASSEMBLY



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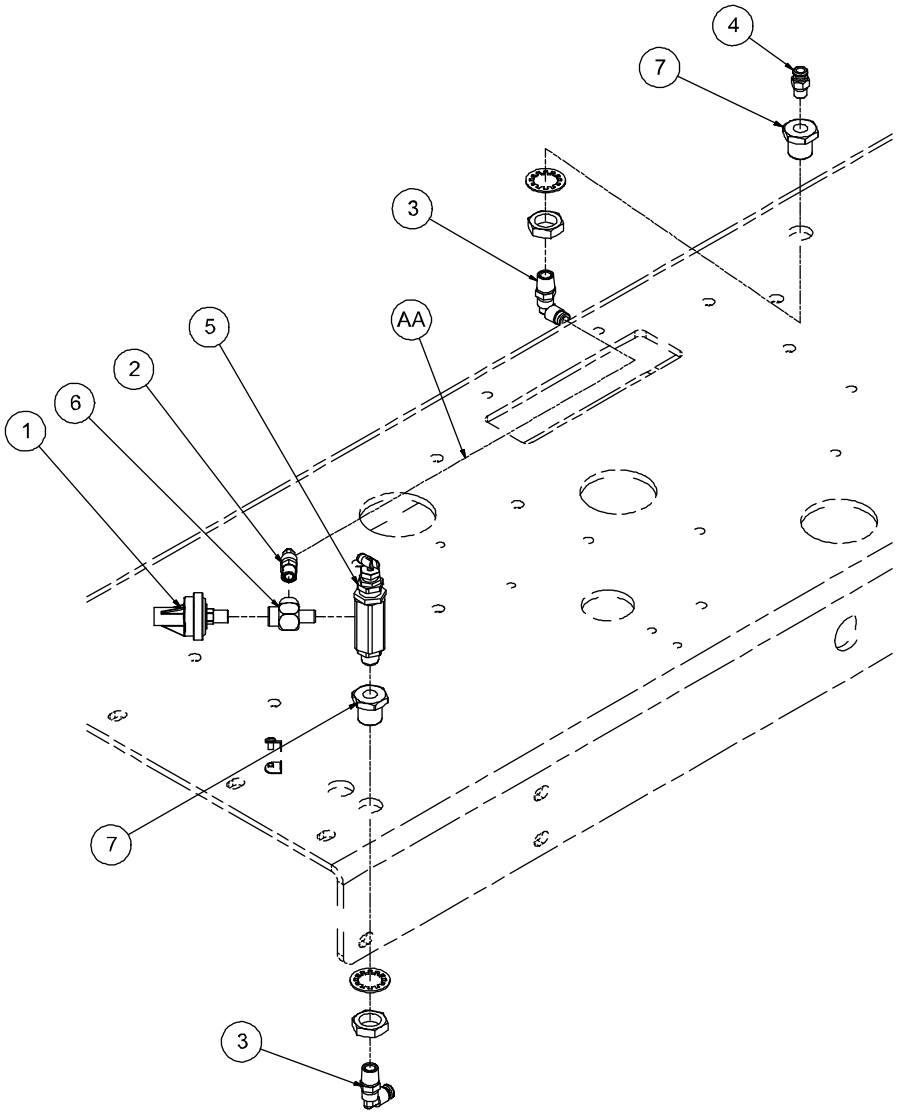
9.9 FUEL TANK ASSEMBLY

ITEM	DESCRIPTION	PART NUMBER	QTY
1	PLUG, SAE O-RING HOLLOW HEX #10	268081-007	1
2	TUBE, FUEL PICK-UP	269358	1
3	VALVE, ROLLOVER FUEL VENT 1/2 NPT	270956	1
4	PLUG, PIPE 1/4	807800-010	1
5	FUEL TANK, 11 GAL.	A1270787	1
6	SENDER UNIT, FUEL LEVEL, 14 LG	CO85672	1
7	HARNESS, FUEL SENDER EXTENSION, LONG	EP270788-2	1
8	CLAMP, HOSE, T-BOLT STYLE, 13mm SS	FA38355	2
9	CAP, UNLEADED GAS, VENTED	HA270038	1
10	CAP, VINYL, STRETCH, 1/4 DIA	PR62720	1
11	FILTER, INLINE FUEL 1/4-5/16"	RC81465	1
12	HOSE, FUEL 1/4" X 3" LG. SAE 30R9	TU269439	1

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

9.10 CONTROL ASSEMBLY



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9.10 CONTROL ASSEMBLY

ITEM	DESCRIPTION	PART NUMBER	QTY
1	SWITCH, PRESSURE N.C. 10 PSI	260818	1
2	ELBOW, 1/4T x 1/8P PUSH-ON	261309	1
3[I]	ELBOW, 90 DEG. PUSH-ON 1/4T x 1/4P	261310	2
4[II]	CONNECTOR, 1/4P x 1/4T	261317	1
5	VALVE, PILOT VALVE, 150-175 PSI	CO67609	1
6	TEE, MALE STREET 1/8 x 1/8 x 1/8	FI31152	1
7	PIPE BRASS, BULKHEAD 1/4 NPT	FI45068	2
8	TUBING, 1/4 DIA. NYLON, 230 PSI x 3.5 FT.	TU95945	1

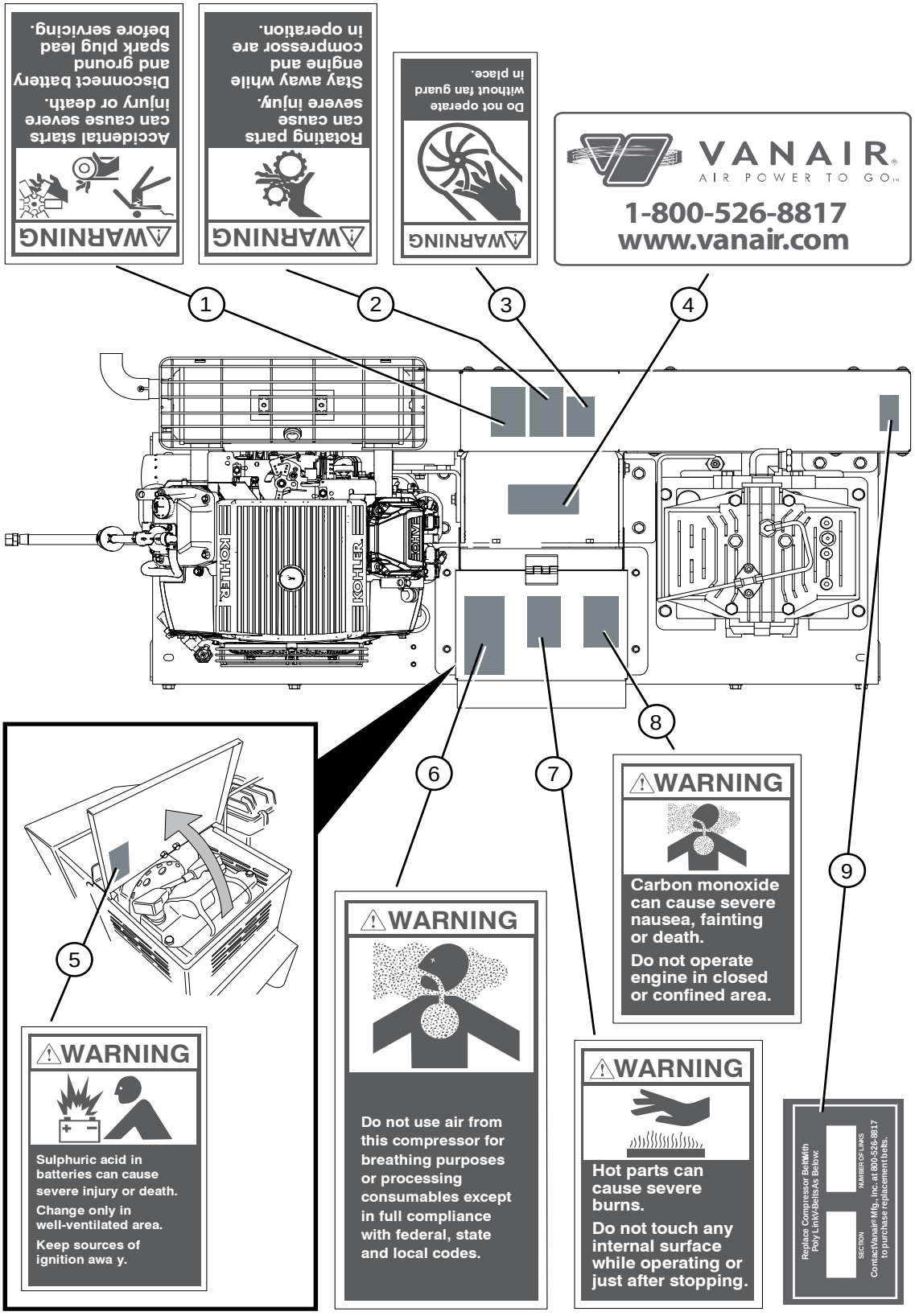
AA - Connect together with tube.

[I] To accumulator tank - provided by others.

[II] To compressor.

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

9.11 DECAL AND PLATE LOCATIONS (1 OF 3)



9.11 DECAL AND PLATE LOCATIONS (1 OF 3)

ITEM	DESCRIPTION	PART NUMBER	QTY
1	DECAL, ACCIDENTAL START-UP	I	1
2	DECAL, ROTATING PARTS	I	1
3	DECAL, FAN GUARD	I	1
4	DECAL, V-BELT LINK INFORMATION	I	1
5	DECAL, DO NOT BREATHE COMPRESSOR AIR	I	1
6	DECAL, SULFURIC ACID BATTERIES	I	1
7	DECAL, HOT PARTS	I	1
8	WARNING, CARBON MONOXIDE	I	1

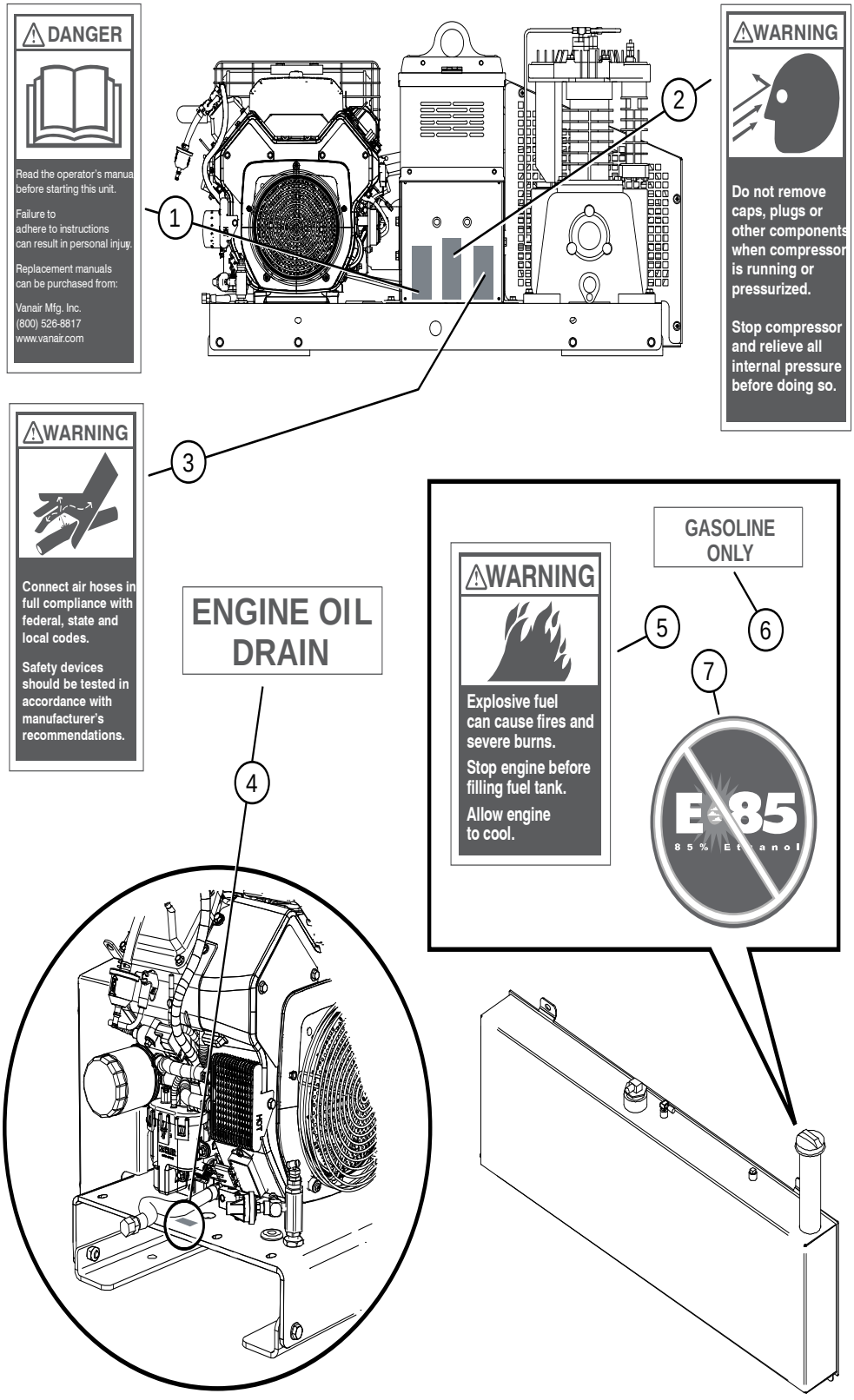
I This decal is included with decal sheet no. 263453.

WARNING

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

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

9.11 DECAL AND PLATE LOCATIONS (2 OF 3)



9.11 DECAL AND PLATE LOCATIONS (2 OF 3)

ITEM	DESCRIPTION	PART NUMBER	QTY
1	DECAL, READ MANUAL	*I*	1
2	DECAL, DO NOT REMOVE CAPS	*I*	1
3	DECAL, CONNECT AIR HOSES	*I*	1
4	DECAL, ENGINE OIL DRAIN	*I*	1
5*II*	DECAL, EXPLOSIVE FUEL	*I*	1
6*II*	DECAL, GASOLINE ONLY	*I*	1
7*II*	DECAL, DO NOT USE E-85	DL270183	1

I This decal is included with decal sheet no. 263453.

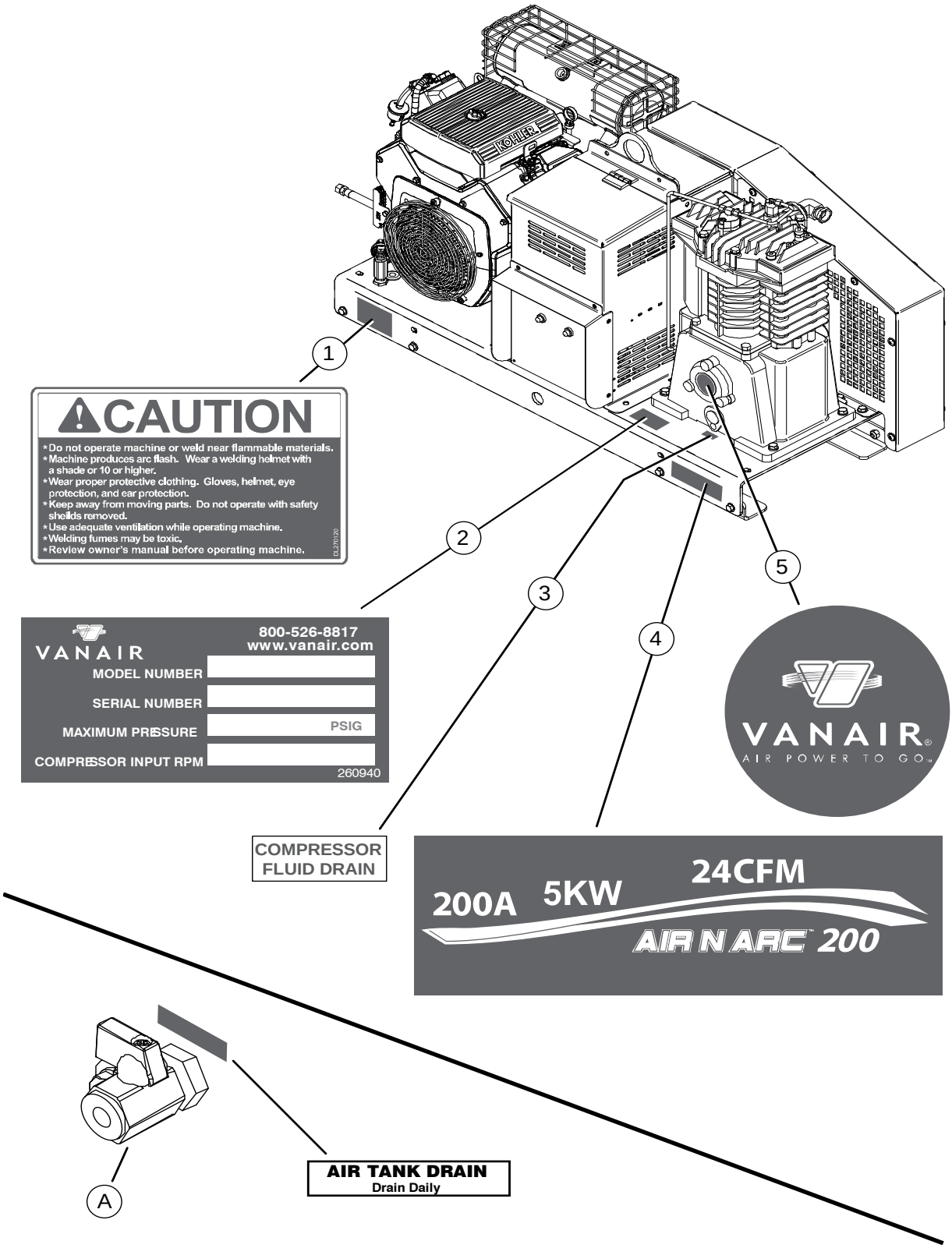
II If fuel fill related decals are not mounted on the machine, as in the case of remote-mount fuel suppliers, refer to this section to assure that these decals are placed visually close to the fuel fill port.

WARNING

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

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

9.11 DECAL AND PLATE LOCATIONS (3 OF 3)



9.11 DECAL AND PLATE LOCATIONS (3 OF 3)

ITEM	DESCRIPTION	PART NUMBER	QTY
1	DECAL, WARNING	DL270120	1
2	MACHINE SERIAL PLATE	260940	1
3	DECAL, COMPRESSOR FLUID DRAIN	I	1
4	DECAL, PERFORMANCE BADGE (AIR N ARC 200)	DL269665	1
5	DECAL, COMPRESSOR LOGO	DL269684	1

A - Air tank outlet valve (per customer installation): Decal should be placed near outlet valve of air tank.

I This decal is included with decal sheet no. 263453.

⚠ WARNING

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

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

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APPENDIX A: ADDITIONAL INFORMATION

A.1 ELECTRIC MOTOR CHART - STARTING WATTS[I]

NOTE

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

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

[I] Approximate current requirements.

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 f
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 RECEPTICAL 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 AIR 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 Ib Pavement Breaker	37 SCFM

Continued on next page

A.4 AIR TOOL AIR CONSUMPTION CHART (CONTINUED)

TOOL	AIR REQUIRED CFM @ 90 PSI
60 Ib Pavement Breaker	48 SCFM
90 Ib Pavement Breaker	68 - 85 SCFM
4" Piercing Tool	60 SCFM
60 Ib 1650 BPM Rock Drill	95 SCFM
50 Ib 1800 BPM Rock Drill	123 SCFM
Chipping Hammer	26 - 33 SCFM

A.5 AIR N ARC 200 SERIES ALL-IN-ONE POWER SYSTEM AVAILABLE OPTIONS LIST

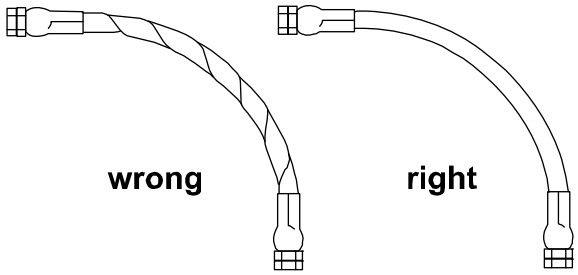
KEY NO.	OPTION ITEM	DESCRIPTION	PART ORDER NUMBER	QTY
1	REMOTE PANEL MOUNT	This bracket is used for remote panel installation to space panel off from truck body	A16738P	1
3	COLD WEATHER OPTION KIT	This kit (factory install) extends cold weather temperature operation range from 0°F to -40°F (-18° to -40°C)	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

Continued on next page

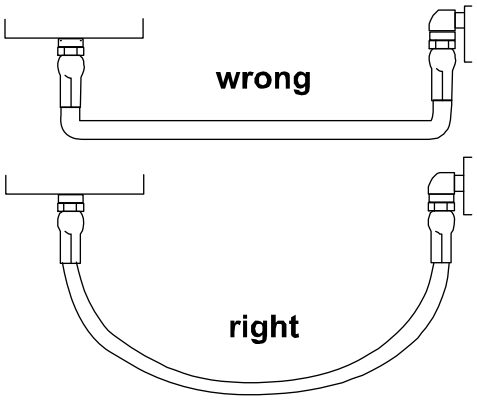
A.5 AIR N ARC 200 SERIES ALL-IN-ONE POWER SYSTEM AVAILABLE OPTIONS LIST (CONTINUED)

KEY NO.	OPTION ITEM	DESCRIPTION	PART ORDER NUMBER	QTY
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

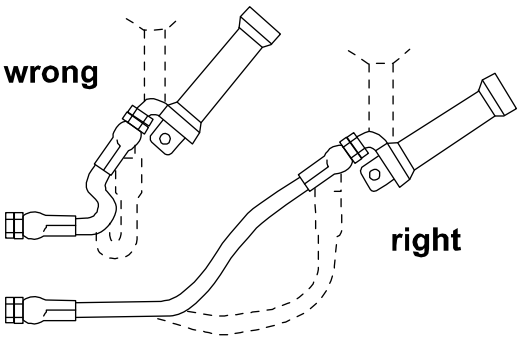
A.6 HOSE INSTALLATION GUIDE



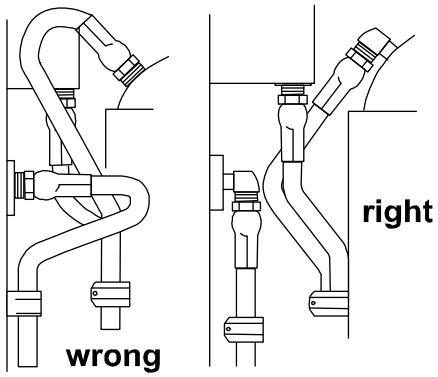
1. Hose is weakened when installed in twisted position. Pressure in twisted hose tends to loosen fitting connections. Design so that machine motion produces bending rather than twisting.



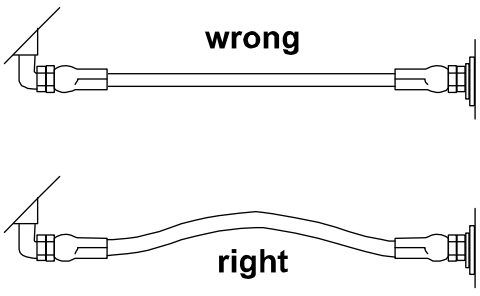
2. Ample bend radius should be provided to avoid collapsing of line and restriction of flow.



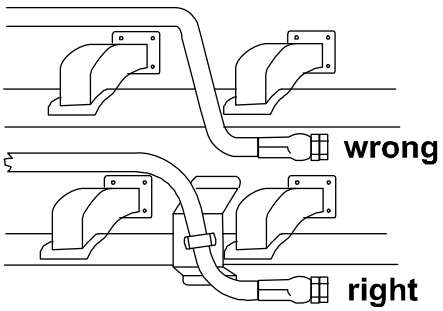
3. Exceeding minimum bend radius will greatly reduce hose assembly life.



4. Use elbows or other adapters as necessary to eliminate excess hose length and to insure neater installation for easier maintenance.

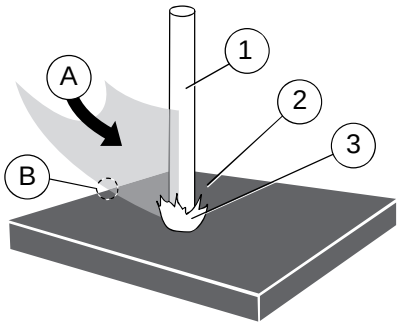


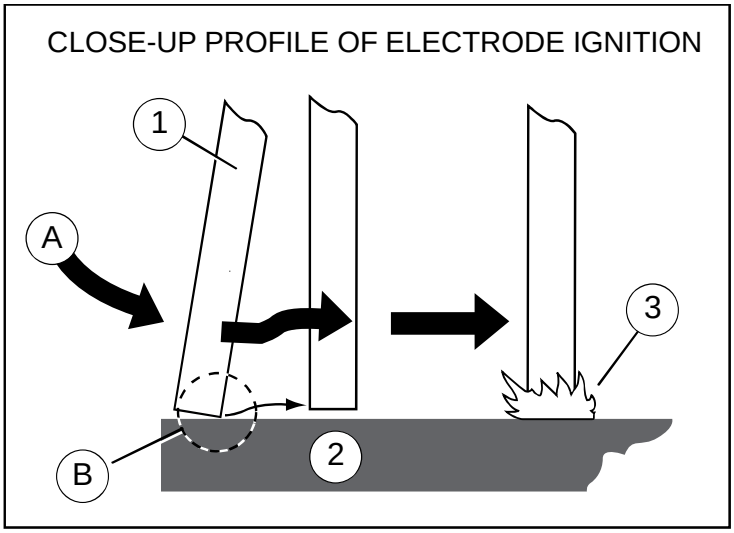
5. When hose assembly is installed in a flexing application, remember that metal hose fittings are not part of the flexible portion. Allow ample free length for flexing.



6. When properly routing, use clamps to secure the hose in its proper position.

A.7 ELECTRODE IGNITION PROCEDURE





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		

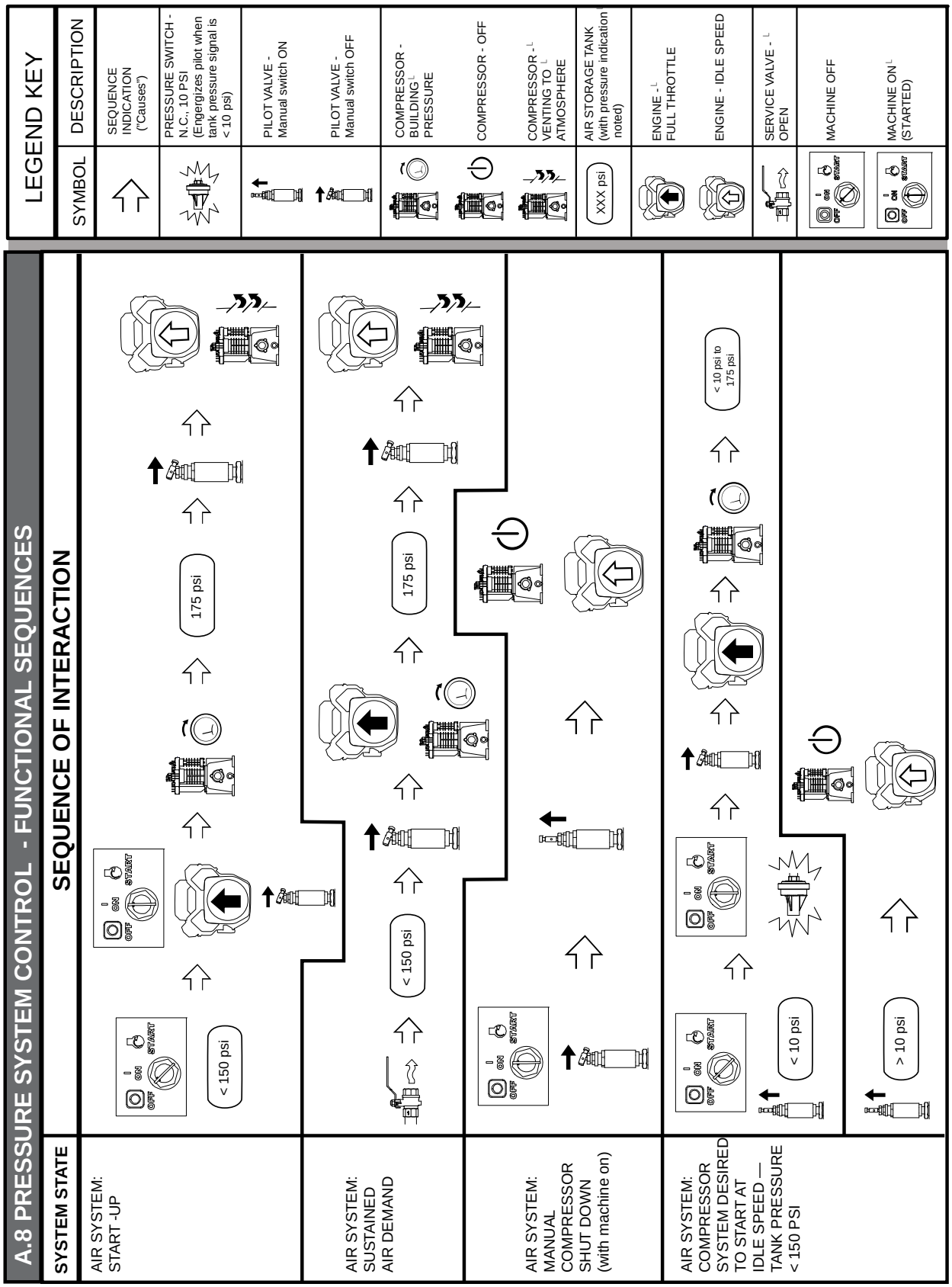
NOTES
If arc goes out, electrode was lifted too high; repeat with electrode closer to work piece surface
If electrode sticks to work piece surface, quickly twist the electrode to free it.

⚠ WARNING

Before attempting any welding procedure, the operator must be aware of general safety practices, and particularly those pertaining to welding, as found in *Section 1.4* of this manual.

TABLE A: 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



NOTE: The purpose of this chart is to show cause of how pressure conditions occur during the operational sequence of events of the compressor system cycles.

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APPENDIX B:
MAINTENANCE AND SERVICE LOG

B.1 GENERAL DESCRIPTION

The maintenance and service log given in this appendix can be used to track and keep a record of the maintenance intervals of the machine, as well an any non-routine repairs or changes made, throughout the productive life of the machine package.

The service log generally gives two types of login periods of operation—by hours, and by date intervals. Service should adhere to whichever occurs first between the two types.

Keeping such a record is extremely beneficial when considering a solution to any troubleshooting problem that might occur. For additional assistance in setting up a routine and orderly schedule to track machine maintenance and repair, refer to ***Section 6, Maintenance***, and particularly **Section 6.3, Maintenance Schedule Table**.

For procedure on ordering parts, consult ***Section 9, Parts Ordering Procedure***, ***Table 9A - Recommended Spare Parts List***, and ***Appendix A, Section A.5, Air N Arc 200 Series All-In-One Power System Available Options List***.

If a part needs to be replaced, but is not listed in any of the above sections, it can readily be identified visually by scanning through the various parts list sub-sections of ***Section 9, Illustrated Parts List***. The various parts list sections identify each part by its individual part number, which in turn can be used to order any part that needs to be replaced.

NOTE

When determining a service schedule, always take into account the type of environmental conditions where the machine will be operating. Extreme working conditions will usually mean lessening the intervals between service checks. For more information, consult *Section 5.8, Extreme Condition Operation*, and its sub-sections.

APPENDIX B: MAINTENANCE AND SERVICE LOG

Date of Purchase: _____

BREAK-IN PERIOD SERVICE POINTS
Date Completed: _____

100 HOURS OR ONE YEAR SERVICE POINTS
Dates Completed & Parts Replaced:

200 HOURS SERVICE POINTS
Dates Completed & Parts Replaced:

600 HOURS SERVICE POINTS
Dates Completed & Parts Replaced:

1000 HOURS SERVICE POINTS
Dates Completed & Parts Replaced:

OTHER SERVICE NOTES

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APPENDIX B: MAINTENANCE AND SERVICE LOG

Date of Purchase: _____

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OTHER SERVICE NOTES

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