

AIR N ARC[®]

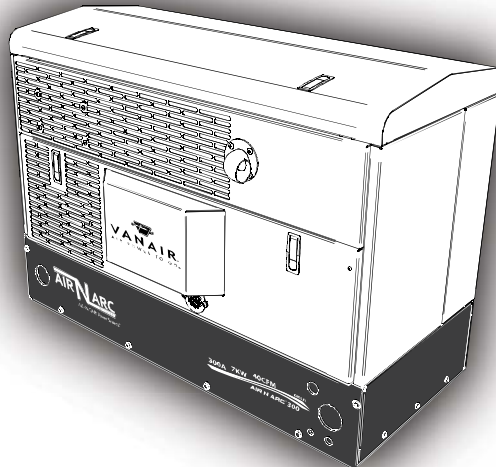
BY VANAIR[®]

ALL-IN-ONE Power Systems[®]

AIR N ARC[®] 300 DIESEL

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.

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.

Vanair Manufacturing, Inc.

10896 West 300 North
Michigan City, IN 46360

Phone: (219) 879-5100
(800) 526-8817

Service Fax: (219) 879-5335

Parts Fax: (219) 879-5340

Sales Fax: (219) 879-5800

www.vanair.com

NOTE

Use only Vanair Vanguard™ Premium Synthetic Oil and Genuine Vanair Parts. Inspect and replace damaged components before operation. Substituting non-Vanguard™ Oil or non-genuine Vanair filter components WILL VOID THE COMPRESSOR WARRANTY!



VANAIR[®]
AIR POWER TO GO[™]

090012-OP_r0

Effective Date:

04-12

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**AIR N ARC®
ALL-IN-ONE POWER-SYSTEMS®**

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(844) VAN - SERV

SERVICE@VANAIR.COM

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**10896 W. 300 N.
MICHIGAN CITY, IN 46360**

(800) 526-8817

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EFFECTIVE: JAN 8, 2016

090088_r1

VANAIR VANTAGE WARRANTY

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

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

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

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

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

1. Lifetime Warranty Parts – 3 Years Labor
 - Rotary Screw Air Compressor Air End
2. 6 Years Parts – 3 Years Labor
 - Vanair Super Capacitor (VSC)
3. 3 Years Parts – 1 Year Labor
 - Reciprocating Compressor Air End
 - Generators
 - Welders
4. 2 Years Parts – 1 Year Labor
 - Hydraulic Motors
 - Hydraulic Pumps
5. 1 Year Parts – 1 Year Labor
 - All electronics including, but not limited to:
 - (i) I/O Boards
 - (ii) Modules
 - (iii) Panel Boxes
 - (iv) Instrumentation
 - (v) Clutches
 - (vi) Solenoids
 - (vii) Running Gear/Trailers
 - (viii) Compressor/Hydraulic Coolers, including Fan and Radiator Core

This Limited Warranty shall not apply to:

1. Consumable components, such as shaft seals, valves, belts, filters, capacitors, contactors, relays, brushes or parts that fail due to normal wear and use.
2. Items furnished by Vanair, but manufactured by others, such as engines and trade accessories (these items are covered by the manufacturer's warranty, if any).
3. Equipment that has been modified by any party other than Vanair or equipment which has not been used and maintained in accordance with Vanair's specifications.
4. Equipment which has been improperly installed and/or improperly operated, based upon Vanair's specifications for the equipment or industry standards.
5. Equipment installed by non-authorized or third party personnel.

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

In the event of a warranty claim covered by this Limited Warranty, the exclusive remedies shall be, at Vanair's sole discretion: (i) repair; or (ii) replacement; (iii) where authorized in writing by Vanair in appropriate cases, the reasonable cost of repair or replacement at an authorized Vanair service facility; or (iv) payment of (or credit for) the purchase price (less reasonable depreciation based upon actual use) upon return of the equipment at the warranty claimant's risk and expense. Vanair will pay standard ground freight for any warranty item shipped to and from Vanair or (Vanair designated facility) within the first year of the applicable warranty period. Any additional expedited freight cost is the responsibility of the purchaser.

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

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

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



VANAIR®
MOBILE POWER SOLUTIONS™

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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 demand increases.

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 is 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.

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

PSIG - pounds per square inch gauge

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.

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WARRANTY CLAIMS PROCEDURE

CLAIMS PROCESS FOR WARRANTED VANAIR PARTS

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

PROCEDURE:

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

1. Locate the machine's serial number:

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

The engine and the compressor also have individual serial numbers respectively (see *Figure W-2*). For engine warranty issues, consult the Engine Operator's Manual for the engine's limited warranty details. For particular compressor unit issues, the compressor serial number may be needed. In any case, engine and/or compressor issues can be confirmed using the machine serial number as found in *Figure W-1*.

2. Fill out the Return Material Authorization (RMA) Form's required information:

Locate the form on *page XVI* of this Section. Follow the instructions given on the form to fill in the information needed. This form is used for the purpose of soliciting a warranty case. All of the field information **except** for the bottom section block fields, which include *Disposition of Goods*, *Notifications* and *Additional Notes*, will be required.

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

NOTE

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.

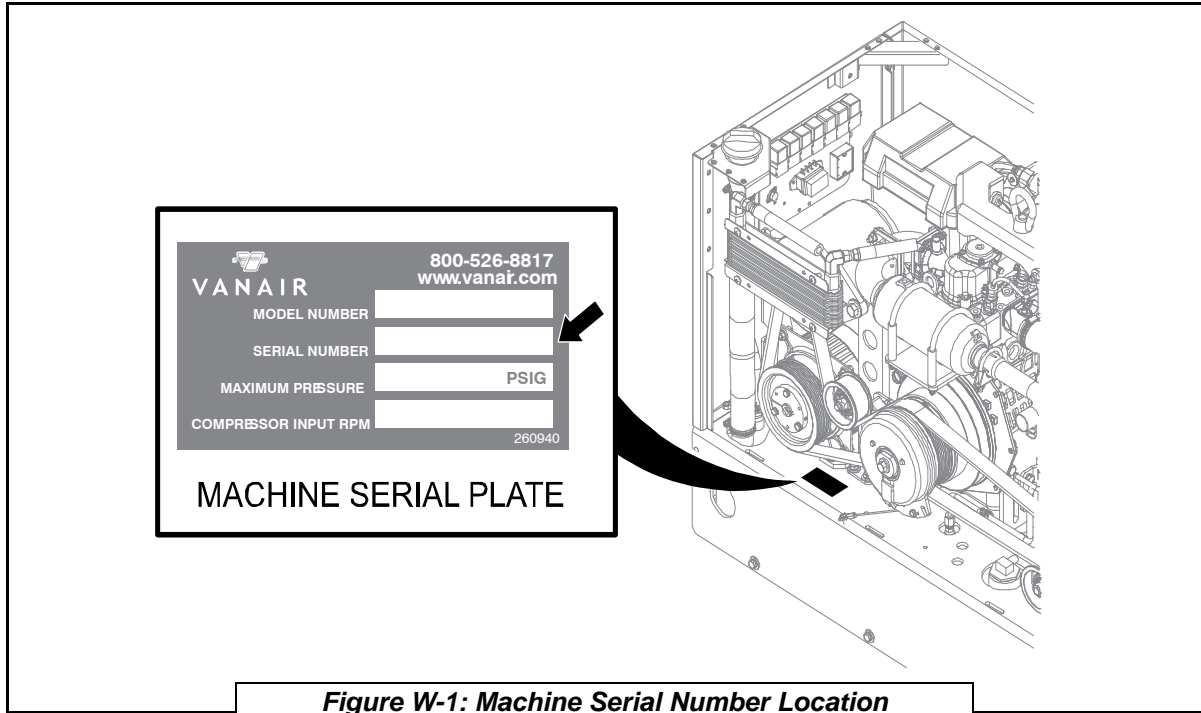


Figure W-1: Machine Serial Number Location

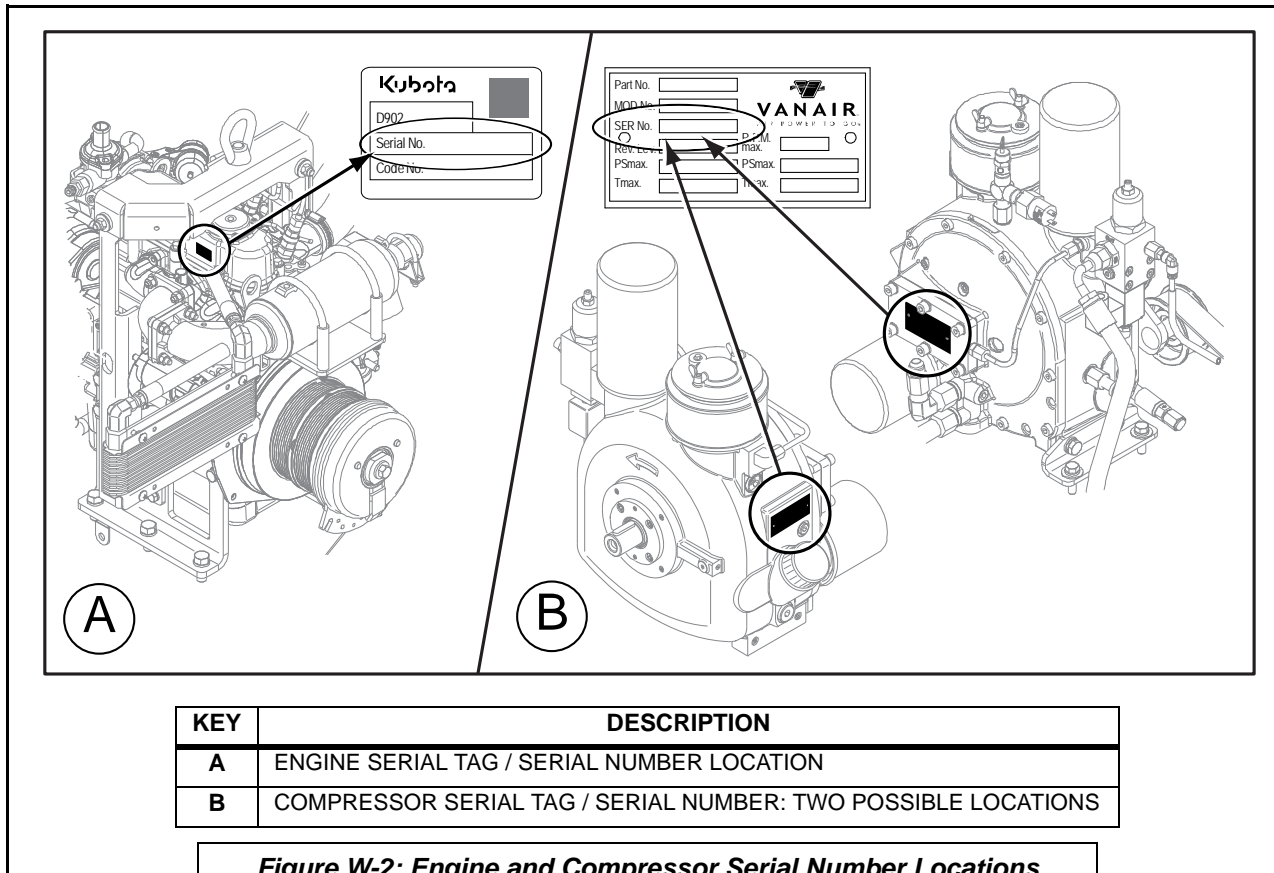


Figure W-2: Engine and Compressor Serial Number Locations

The above information is needed in addition to the information from Step #2.

4. **Contact the Vanair® Service Department by phone (1-219-879-5100) to speak with a Service Technician.**
5. **Vanair Service will troubleshoot the problem based on the information provided by the customer, and attempt to return the unit to service as quickly as possible.**
6. **If the unit cannot be returned to service, and Vanair determines this matter is a warranty issue, the Service Technician will assign an RMA (Return Material Authorization) number that will provide for the return of the item to Vanair for analysis and a final determination as to the item's warranty status.**

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.

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

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

VANAIR WILL NEVER ACCEPT ANY INVOICES FOR PARTS RETURNED: ANY PARTS RETURNED VIA INVOICE WILL BE RETURNED FREIGHT COLLECT: NO PARTS ARE TO BE RETURNED FREIGHT COLLECT!

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

RETURN MATERIAL AUTHORIZATION FORM



Ph. 219-879-5100
 Fax. 219-879-5335
 service@vanair.com

Return Material Authorization

10896 W. 300 N.
 Michigan City, IN 46360

S / N: 30 _____	Customer: _____	Date: _____
AnA S/N: _____	RMA#: _____	Contact: _____
Email: _____		Phone: _____
Fax: _____	Address: _____	
Tech: _____	Dealer: _____	PO#: _____

GENERAL INFORMATION

All returns are sent back for warranty consideration and are subject to factory inspection and analysis. Vanair® is not responsible for shipping damage due to insufficient or improper packaging methods. Failure to identify returned goods with the assigned RMA number on the outside of the shipping package will delay processing or result in the shipment being returned, freight collect. To receive warranty parts, a credit card or Purchase Order must be given to the service technician. Once the disposition of the part is determined, (I.E. manufacturing defect or other) Vanair will credit your account if covered by warranty. You can also contact the Service Department by email at service@vanair.com if you have any questions.

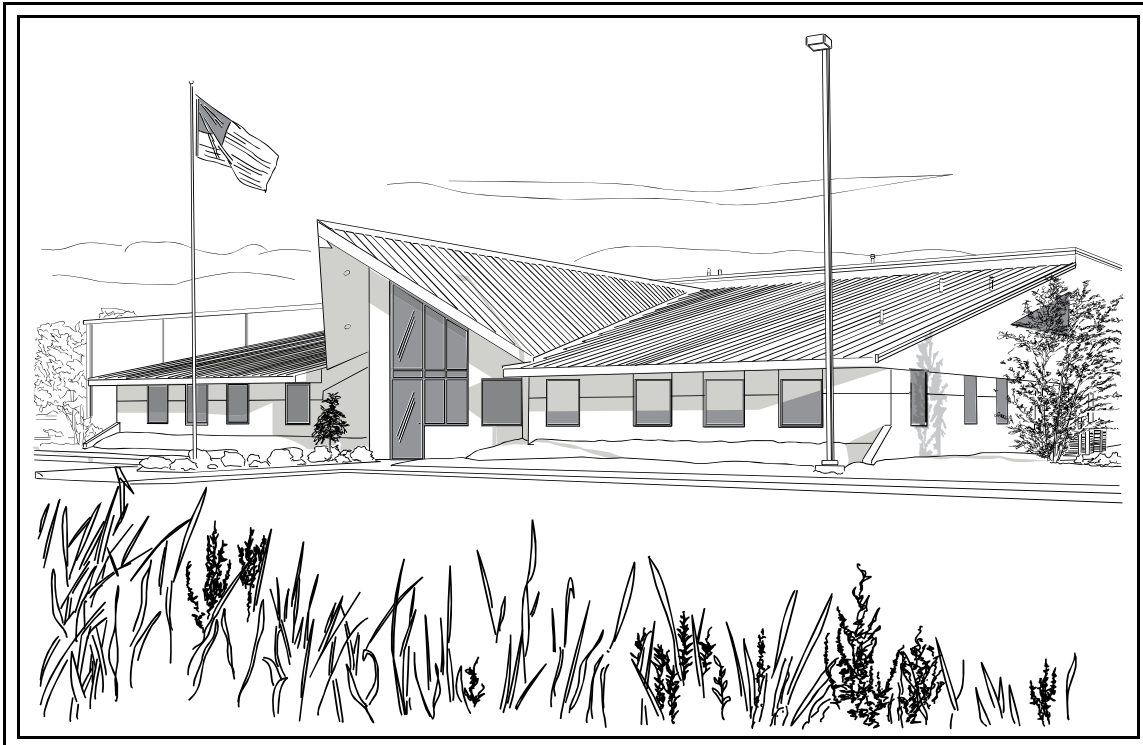
Return parts to the address listed above.

INSTRUCTIONS TO CUSTOMERS

- | | |
|---|---|
| 1 | Product must be returned within 30 days from the day the RMA is issued. The RMA is void thereafter and any parts received after this time frame will be returned freight collect or not accepted. |
| 2 | The RMA number must be placed on the outside of the shipping package. Do not write the RMA number on the component with permanent marker, this damages the component. Please use a tag. |
| 3 | Components (including generators) must be returned completely assembled with no loose parts or they will not be accepted. |
| 4 | A copy of the form must be included with all paperwork. |
| 5 | No product will be accepted freight collect. |
| 6 | We will not accept any parts returned on an invoice. They will be returned freight collect. |
| 7 | Any invoice issued for labor claims must include the RMA number assigned on this form, the 30-XXXXX number for the unit, and be invoiced for any labor claims within 30 days of the work completion. The allowable Vanair labor rate is \$65.00 per hour for all authorized work done in the United States. |
| 8 | All warranty claims must be pre-approved by Vanair or they will not be accepted. |

Qty.	Part #	Description	Reason for return

Final Disposition of Goods		Notifications	Additional Notes
No Credit	Return to Customer	Quality Control	
Return to Stock	Issue Credit for Parts	Operations	
Scrap Goods	Issue Credit for Freight	Purchasing	
Ret to Vendor		Accounting	
Part Invoice #:		Shipping	



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-proof and able to operate in temperature extremes ranging from 0°F to 110°F (-18°C to 43°C); with available cold weather kit, operation further extends from below 0° to -40°F (-18°C to -40°C). Refer to **Section 5.8, Extreme Condition Operation**.

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

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.

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 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 insure 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.

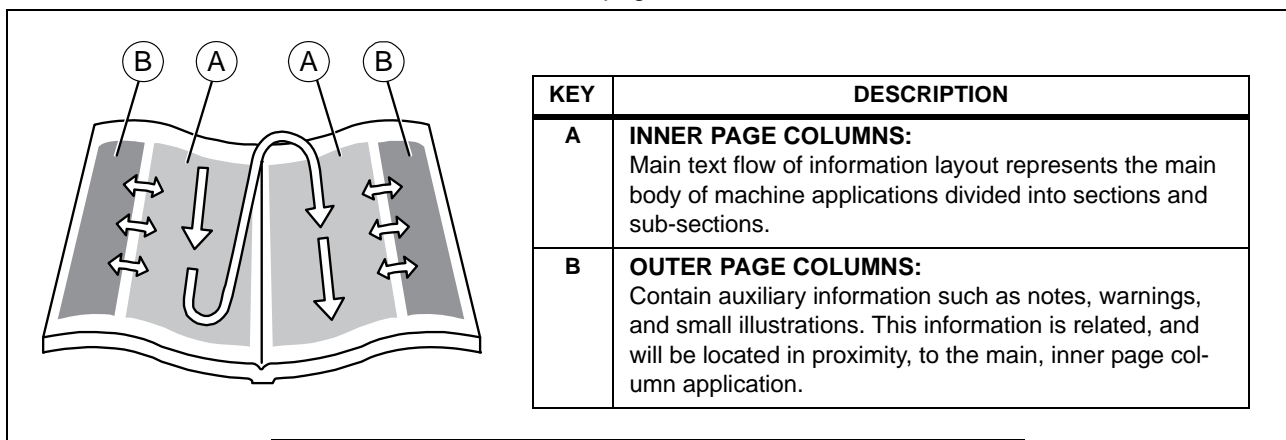



Figure M-1: Manual Layout Navigation


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.

1.2 DANGERS, WARNINGS, CAUTIONS, AND NOTES

	DANGER
Identifies actions or conditions which will cause death, severe injury, equipment damage or destructive malfunctions.	

	WARNING
Identifies actions or conditions which may cause death, severe injury, equipment damage or destructive malfunctions.	

	CAUTION
Identifies actions or conditions which will or can cause injuries, equipment damage or malfunctions.	

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



IMPORTANT



It is mandatory that all operators read this manual before operating or servicing the Air N Arc 300 Series All-In-One Power System. Failure to do so could result in death, bodily injury or damage to equipment.

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.

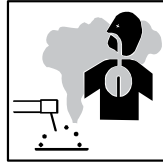
Keep all panels and covers securely in place.

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.

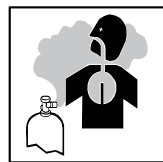
Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.

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.

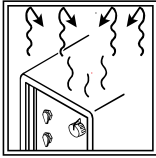
1.4.3 *BUILD UP OF GAS CAN INJURE OR KILL*



Shut off shielding gas supply when not in use.

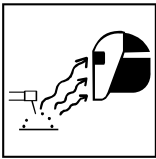
Always ventilate confined spaces or use approved air-supplied respirator.

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.

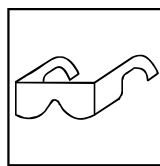
Remove stick electrode from holder or cut off welding wire at contact tip when not in use.

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**



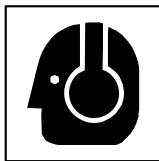
Sparks and flying metal can be caused by welding, chipping, wire brushing, and grinding. As welds cool, they can throw off slag.

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.

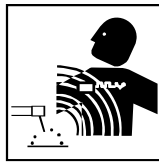
Allow cooling period before working on equipment.

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.

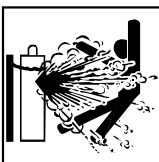
Wear approved ear protection if noise level is high.

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.

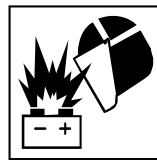
Read and follow instructions on compressed gas cylinders, associated equipment, and Compressed Gas Association (CGA) publication P-1 listed in Safety Standards.

1.5 ENGINE HAZARDS

 IMPORTANT

<p>Operator must be familiar with all safety precautions listed in the Engine Operator's Manual, in addition to the safety issues listed in this section.</p>

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.

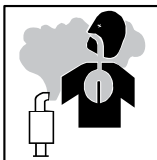
Before working on generator, remove spark plugs or injectors to keep engine from kicking back or starting.

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

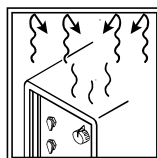
1.5.4 ⚠ HOT PARTS CAN CAUSE SEVERE BURNS

Do not touch hot parts bare handed.

Allow cooling period before working on equipment.

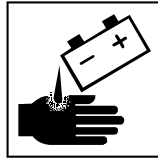
1.5.5 ⚠ ENGINE EXHAUST GASES CAN KILL

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.

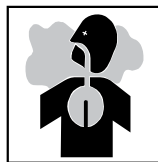
1.5.9 ⚠ EXHAUST SPARKS CAN CAUSE FIRE



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

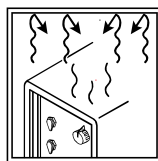
1.6 COMPRESSED AIR HAZARDS

1.6.1 ⚠ BREATHING COMPRESSED AIR CAN CAUSE SERIOUS INJURY OR DEATH

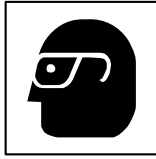


Do not use compressed air for breathing.
Use only for cutting, gouging, and tools.

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

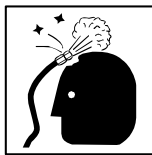


Do not use in enclosed spaces where deadly exhaust gases can build up and machine can overheat, causing fire.

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

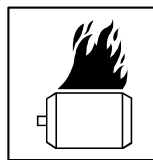


Use lifting bail to lift unit and properly installed accessories only.

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.

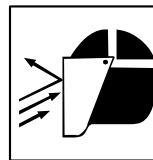
1.7.2 OVERHEATING CAN DAMAGE MOTORS



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

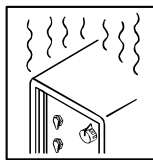


Wear a face shield to protect eyes and face.

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

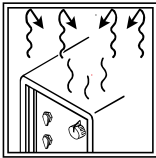


Allow cooling period; follow rated duty cycle.

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

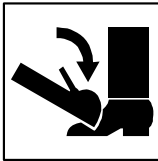
Do not block or filter airflow to unit.

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.

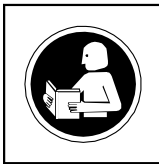
1.7.6 **⚠** TILTING OF TRAILER CAN CAUSE INJURY



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.

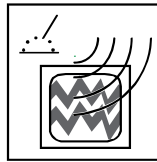
If notified by the FCC about interference, stop using the equipment at once.

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

Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 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 MACHINE CANOPY ACCESS SAFETY SWITCHES

Consult *Figure 1-1*. The Air N Arc 300 Series machine package is equipped with two safety switches, which will either shut down, or not allow the machine to start, if access doors are bridged. The **hood safety switch** will not allow the machine to start if the hood is open; the hood must be closed in order to start the machine. However if the engine is running, the switch is bypassed, and the hood may be raised without detriment to the operating state of the machine.

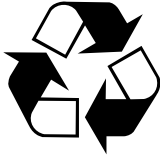


CAUTION

The machine is not designed to run with the hood open as standard operating procedure. The safety switch bypass is designed to allow for observing machine components in operating condition.

The rear door safety switch will not allow the machine to run if an attempt to remove the door panel occurs. Under condition of the machine running, if the switch is triggered, the machine will shut down.

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 :	2.4 Engine ^I
	Figure 2-10
COMPRESSOR OIL:	6.6.5 Changing the Compressor Oil
	Figure 6-8 (drain location)
ENGINE COOLANT:	6.6.11 Inspecting the System Coolers
	Figure 6-15 (drain location)
^I In addition to this section, also consult the Engine Operator's Manual when performing maintenance.	

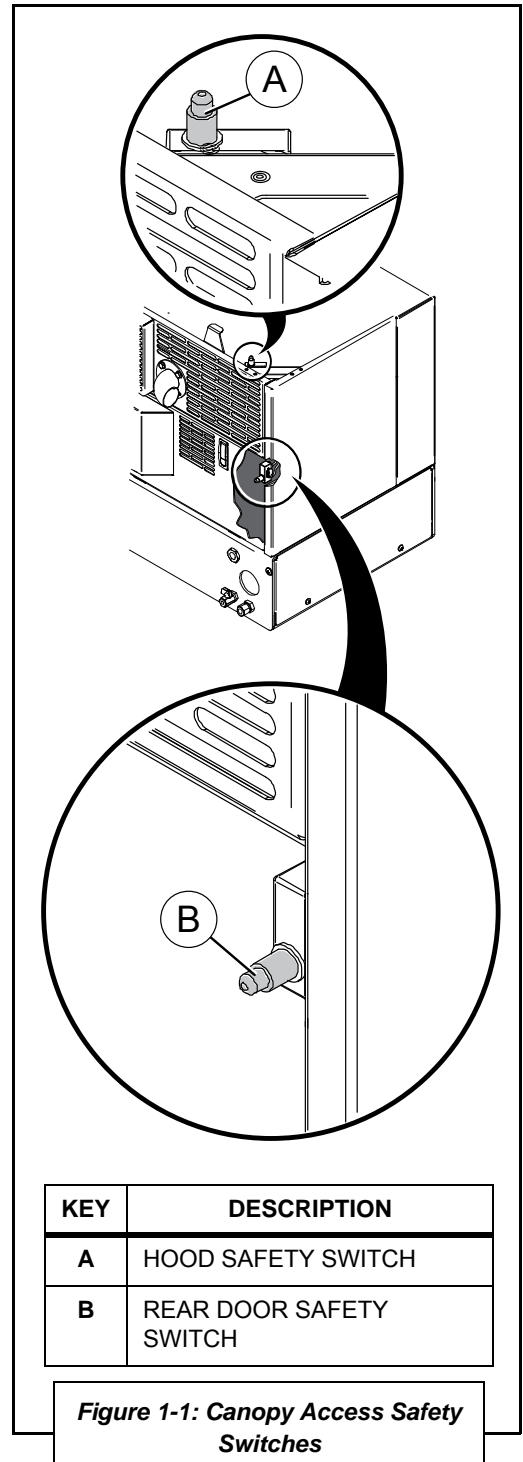
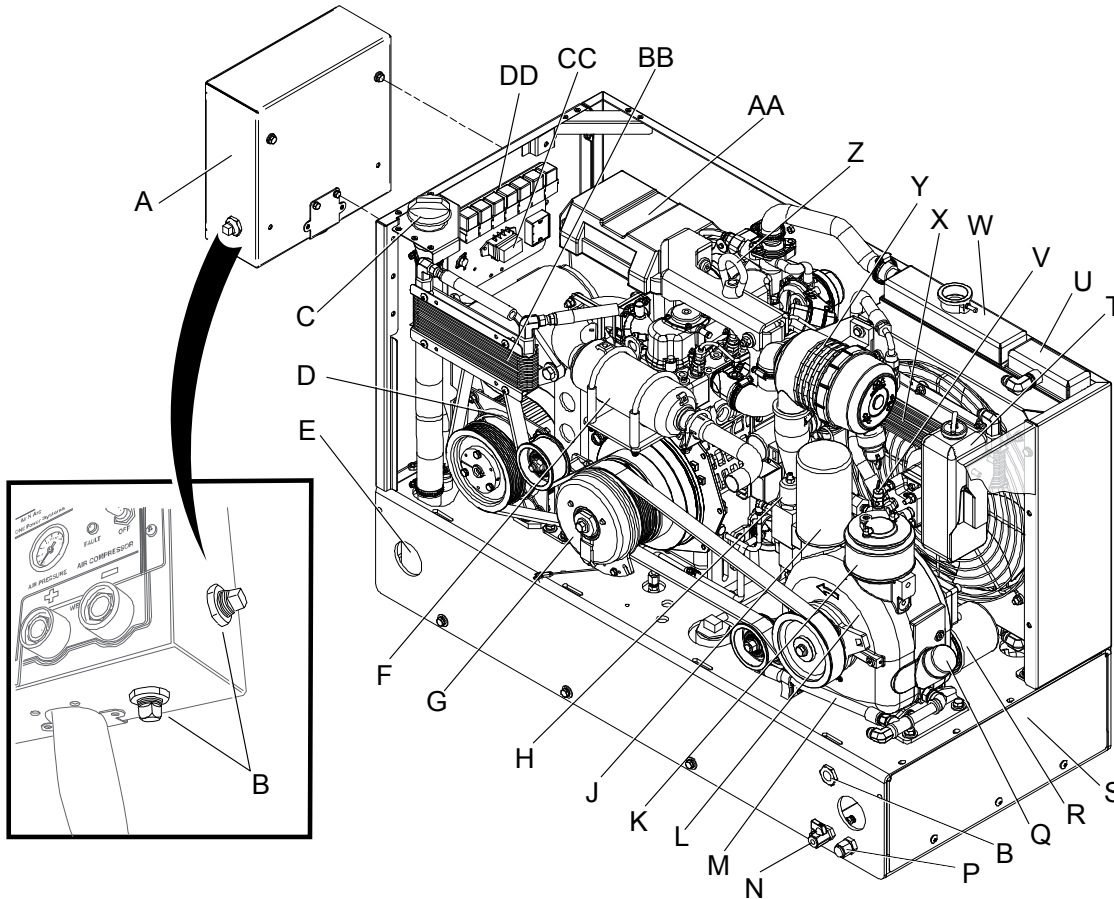


Figure 2-1: MAJOR MACHINE COMPONENTS LOCATIONS¹



KEY	DESCRIPTION	KEY	DESCRIPTION
A	INSTRUMENT PANEL (MAY BE REMOTELY MOUNTED)	Q	COMPRESSOR FLUID FILL PORT
B	AIR OUTLET SERVICE PORTS	R	COMPRESSOR OIL FILTER
C	FUEL FILL	S	AIR TANK RESERVOIR (4 GAL.) (located under frame)
D	AC GENERATOR	T	ENGINE COOLANT RECOVERY TANK
E	FUEL TANK (12 GAL)	U	COMPRESSOR OIL COOLER AND FAN ASSEMBLY
F	MUFFLER	V	PRESSURE RELIEF VALVE (200 PSI)
G	CLUTCH	W	ENGINE RADIATOR
H	MINIMUM PRESSURE VALVE	X	HYDRAULIC FLUID COOLER
J	AIR/OIL COASLESCER	Y	ENGINE AIR FILTER
K	COMPRESSOR AIR FILTER	Z	LIFTING BAIL
L	COMPRESSOR UNIT	AA	BATTERY
M	COMPRESSOR OIL DRAIN TUBE	BB	OIL COOLER
N	AIR TANK (MOISTURE) DRAIN	CC	FUSES (NOT ALL FUSES ARE SHOWN)
P	ENGINE OIL DRAIN	DD	RELAYS (NOT ALL RELAYS ARE SHOWN)

¹Refer to **Section 9** for part description details and part numbers.

NOTE: The above figure is an "at-a-glance" view of the 300 package. Component detail is covered in-depth in **Section 2**.

NOTE: For information on engine components, refer to **Section 2.4**, or the Engine Operator's Manual.

SECTION 2: DESCRIPTION

2.1 GENERAL DESCRIPTION

Vanair® Manufacturing, Inc.'s Air N Arc 300 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 300 Series All-In-One Power System package. See **Figure 2-1** for a quick visual guide to the Power System's main component locations.

2.2 COMPRESSED AIR SYSTEM

System Component or Component Group	Manual Section	Location
COMPRESSED AIR SYSTEM	2.2	page 21
Compressor Unit	2.2.1	page 21
Electronic Air Inlet Valve	2.2.2	page 22
Air Inlet Filter	2.2.3	page 23
Secondary Spin-on Air/Oil Coalescer	2.2.4	page 23
Minimum Pressure/Check Valve	2.2.5	page 23
Pressure Relief Valve	2.2.6	page 23
Adjustable Pressure Switch	2.2.7	page 24
Oil Reservoir and Primary Air/Oil Separator	2.2.8	page 24

2.2.1 COMPRESSOR UNIT

See **Figure 2-2**. The compressor is a single-stage, positive-displacement, oil-flooded, rotary screw type compressor. Rotary screw compressors function by injecting oil into the compressor unit and mixing it directly with the air as both air and oil are forced through the rotating screws in the compression chamber. Because of this concept, compressed air is generated on demand

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 Maintenance Section of this manual for adjustment and replacement procedures.

NOTE

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

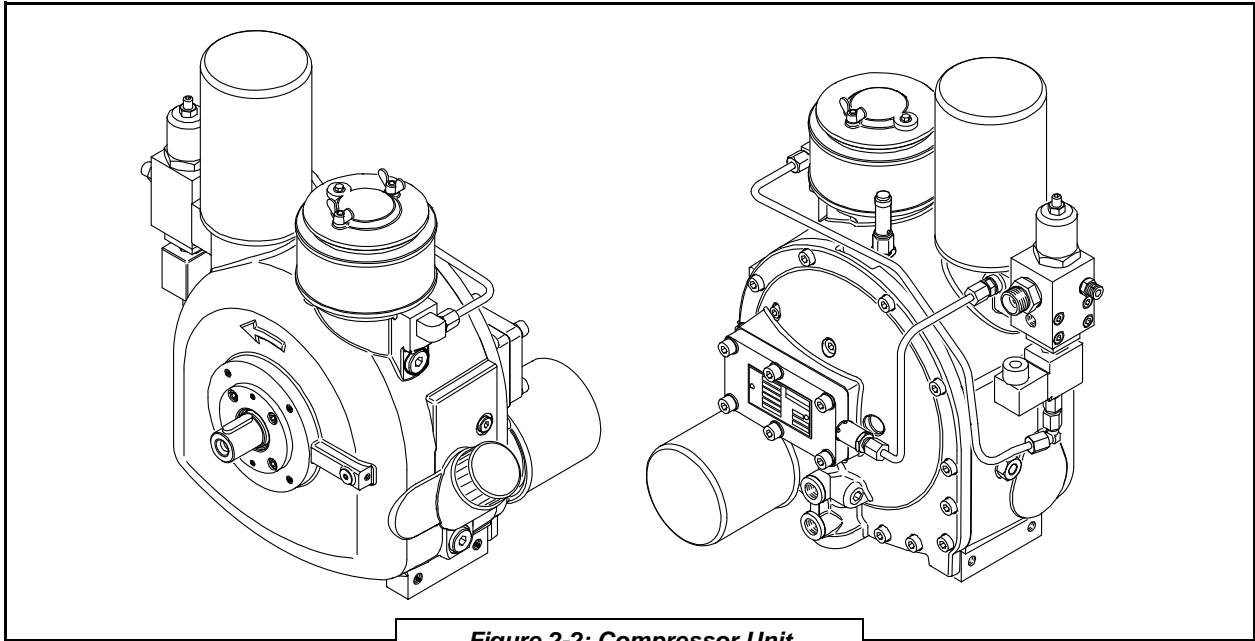


Figure 2-2: Compressor Unit

and eliminates the need for a separate air reservoir. Internal porting also lubricates the bearings and seals by using pressure differentials.

The oil has three primary functions: coolant, sealant, lubricant. The oil carries the heat associated with compressing air to an air-to-oil heat exchanger. It also seals the clearances between the rotors and the stator housing, as well as between the rotors themselves. Lastly, the oil lubricates the rotors and the bearings and seal, allowing one rotor to drive the other, which is an idler.

The rotors are mounted inside the main casting and consist of a male and female rotor supported with low-friction bearings sized for a long, useful life.

2.2.2 ELECTRONIC AIR INLET VALVE

See **Figure 2-3**. The electronically-actuated air inlet valve is a piston-type valve located directly on top of the compressor assembly, beneath the air inlet filter. On initial start-up, the solenoid is energized and the inlet valve opens due to pilot air being passed through the solenoid actuated valve. When operating pressure is reached, the pressure switch (**Figure 2-6**) de-activates the solenoid and the inlet valve closes. At the same time, the compressor pressure will unload to a lower pressure (typically about 40 psig). Only the compressed air within the compressor unit will reduce due to the operation of the minimum pressure/check valve. This reduction in

internal air pressure reduces the power requirement considerably during this unloaded state. The pressure switch will re-activate the solenoid valve allowing the inlet valve to open upon sensing an air demand (reduced pressure). This will allow the compressor to start producing air again.

2.2.3 AIR INLET FILTER

See **Figure 2-3**. The air inlet filter, which is integrated into the compressor assembly, is a dry type replaceable element that drops in directly on top of the inlet valve assembly. It is accessible by removing the cover from the top of the filter assembly. For routine maintenance of the air filter, consult **Sections 6.2** and **6.3** for maintenance schedules, and **Section 6.6.1** for specific air filter maintenance procedures.

2.2.4 SECONDARY SPIN-ON AIR/OIL COALESCER

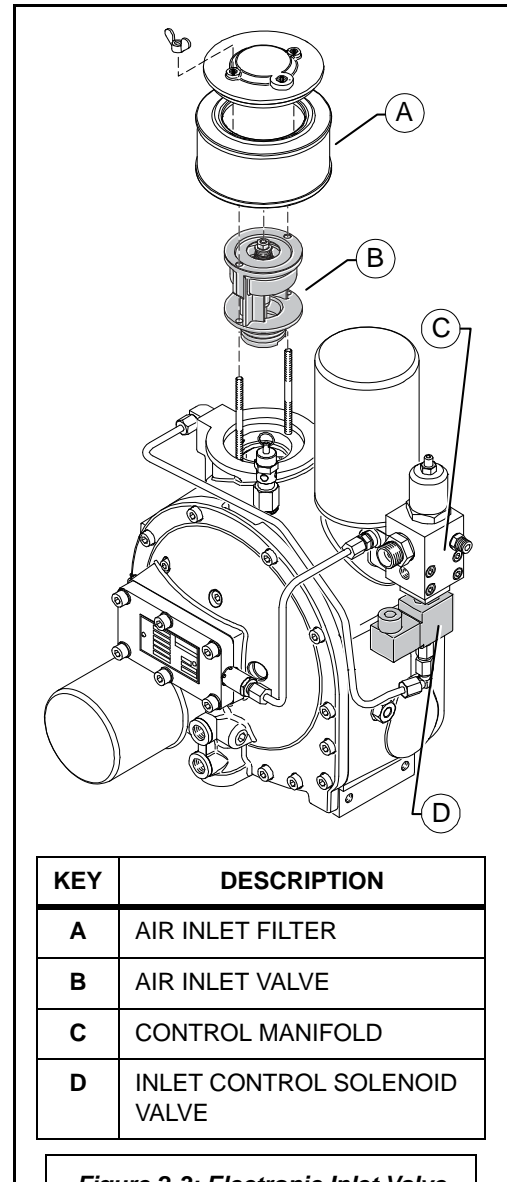
See **Figure 2-4**. The compressor assembly is fitted with a secondary spin-on air/oil coalescer. The coalescer element recovers the finer particles of residual oil that remain in the air after primary separation occurs. The oil that is collected in this element is “scavenged” back to the compressor unit for re-use. This element will need to be replaced from time to time as part of normal maintenance. For routine maintenance of the spin-on air/oil coalescer consult **Sections 6.2** and **6.3** for schedule intervals, and **Section 6.6.6** for the specific coalescer maintenance procedure.

2.2.5 MINIMUM PRESSURE/CHECK VALVE

See **Figure 2-4**. This combination valve, located on the control manifold, serves two functions. First, the minimum pressure valve maintains a pressure of approximately 65 psig in the compressor to ensure oil injection during load conditions and also to maintain effective oil separation. Once this internal pressure is exceeded, it will allow air to pass downstream to the service outlet. The discharge check valve prevents air in the service line from venting down through the compressor during unload.

2.2.6 PRESSURE RELIEF VALVE

See **Figure 2-5**. 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 300 Series Power System is equipped with a 200 psig relief valve. As the pressure begins to



KEY	DESCRIPTION
A	AIR INLET FILTER
B	AIR INLET VALVE
C	CONTROL MANIFOLD
D	INLET CONTROL SOLENOID VALVE

Figure 2-3: Electronic Inlet Valve

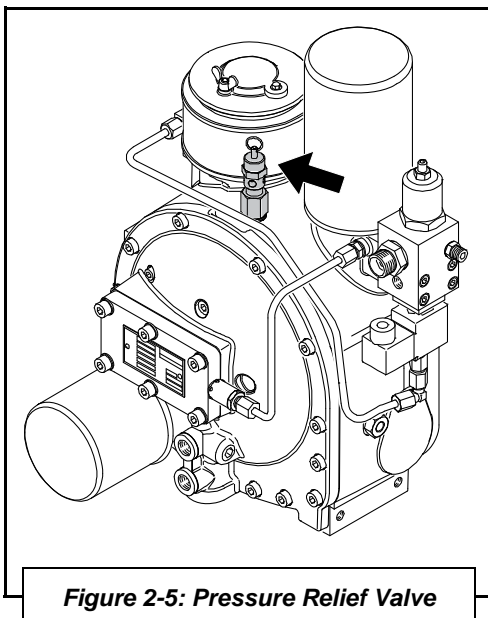
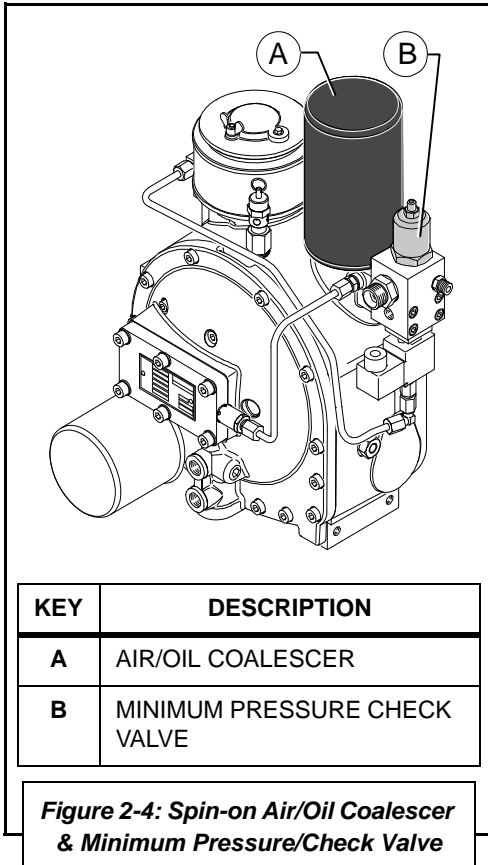


WARNING

Compressor oil can ignite if it comes in contact with very hot surfaces, like a muffler or exhaust manifold on the engine.

NOTE

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



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.

2.2.7 ADJUSTABLE PRESSURE SWITCH

See **Figure 2-6**. The adjustable pressure switch is mounted off of the generator support bracket, and is plumbed into pressure on the upstream side of the minimum pressure valve. The purpose of the switch is to provide a control for the inlet valve control solenoid, much like a pneumatic regulator valve. When the pressure in the service line drops below the set limit, it reactivates the inlet valve control solenoid, allowing the inlet valve to suck in more air. The pressure switch has both a high and low pressure setting.

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 6.6.14**.

2.2.8 OIL RESERVOIR AND PRIMARY AIR/OIL SEPARATOR

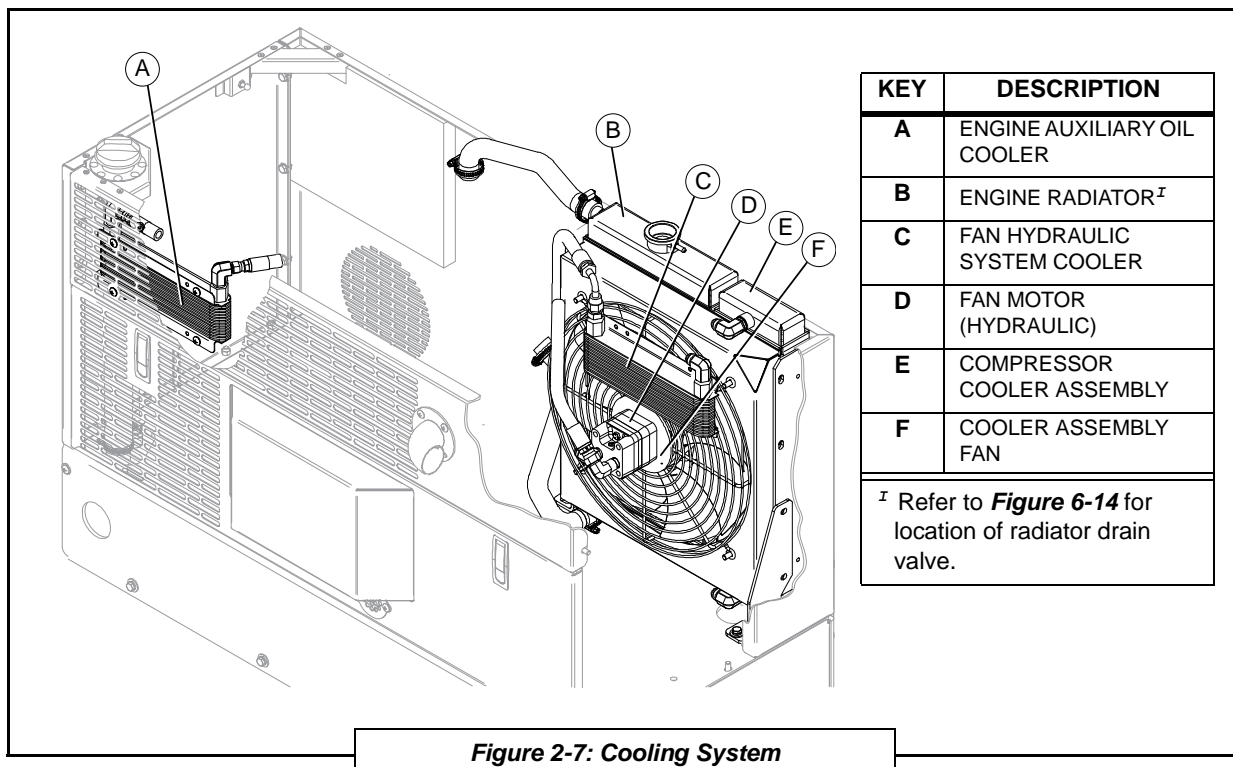
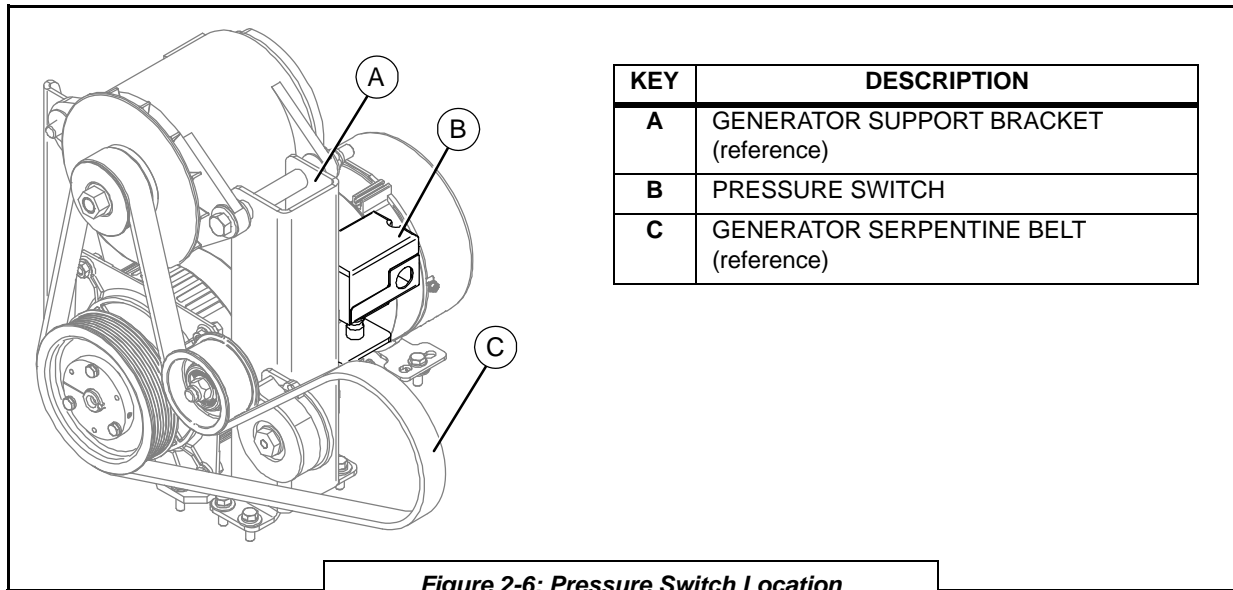
The main casting of the compressor unit, which contains the screw compressor, is also the oil reservoir and primary oil separation unit. The initial (primary) oil separation is caused by both changes in velocity and direction. The main casting also contains the oil fill tube and drain hose assembly. A separate oil reservoir is not required.

2.3 OIL COOLING SYSTEM

System Component or Component Group	Manual Section	Location
OIL COOLING SYSTEM	2.3	page 24
Compressor Temperature and Pressure Switches	2.3.1	page 26
Compressor Spin-on Oil Filter	2.3.2	page 26

See **Figure 2-7**. The machine package cooling system consists of four (4) main heat exchange units identified in **Figure 2-7**, and the following explanation.

The compressor system lubricant is air-cooled via the compressor-cooler portion [E] of the cooler assembly. The assembly fan [F], which draws air through the cooler, is driven by a hydraulic motor [D], whose fluid is cooled by the fan motor's cooler [C].



The engine is liquid-cooled via the engine radiator section [B] of the cooler assembly. There is also an auxiliary engine oil cooler [A], which assists in cooling the engine.

The compressor cooling system allows for the compressor lubricant temperature to be maintained to a

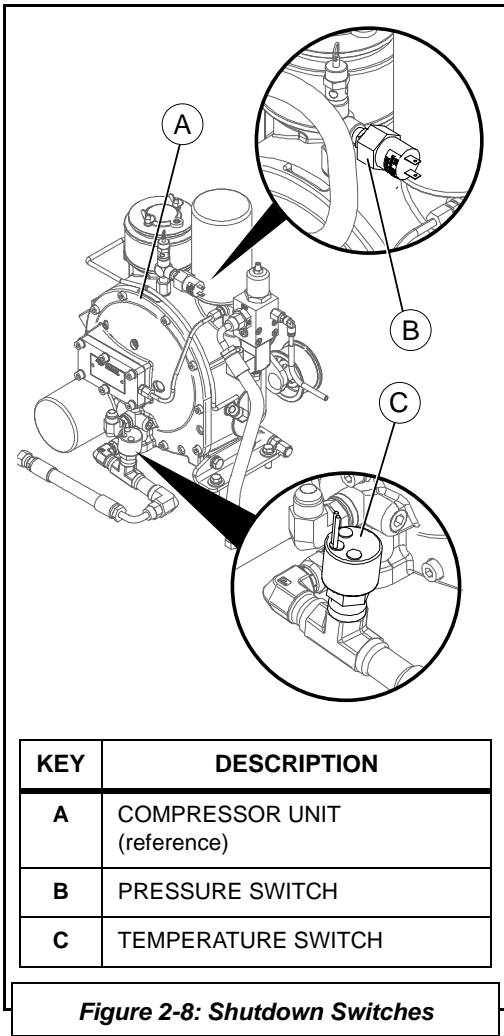


Figure 2-8: Shutdown Switches

minimum of approximately 160°F (71°C). The elevated temperature forces the moisture, which may be ingested into the compressor system due to atmospheric humidity, to stay in a state of vapor. This prevents the moisture from condensing out in the system and contaminating the lubricant.

The cooler core for the 300 Series Power System relies on the cooling fan to draw fresh air from outside the package across the core to cool the compressor lubricant. The maximum lubricant temperature is maintained by using an integral compressor thermal valve.

The oil cooling system is composed of the following main components:

2.3.1 COMPRESSOR TEMPERATURE AND PRESSURE SWITCHES

See **Figure 2-8**. The compressor is equipped with two switches that can shut down the unit should over-limit conditions occur. The temperature switch de-energizes the clutch at 240°F (116°C). The pressure switch disengages the clutch at 185 psi.

2.3.2 COMPRESSOR SPIN-ON OIL FILTER

See **Figure 2-9**. The compressor system is also supplied with a spin-on oil filter, positioned off the lower corner of the compressor. This element requires regular replacement to prolong the life of the compressor system. For routine maintenance of the spin-on filter, consult **Sections 6.2** and **6.3** for maintenance schedules, and **Section 6.6.4** for specific compressor oil filter maintenance procedures.

2.4 ENGINE

NOTE

Do not tamper with the governor setting to increase the maximum engine speed. Overspeed is hazardous and will void the engine warranty.

NOTE

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

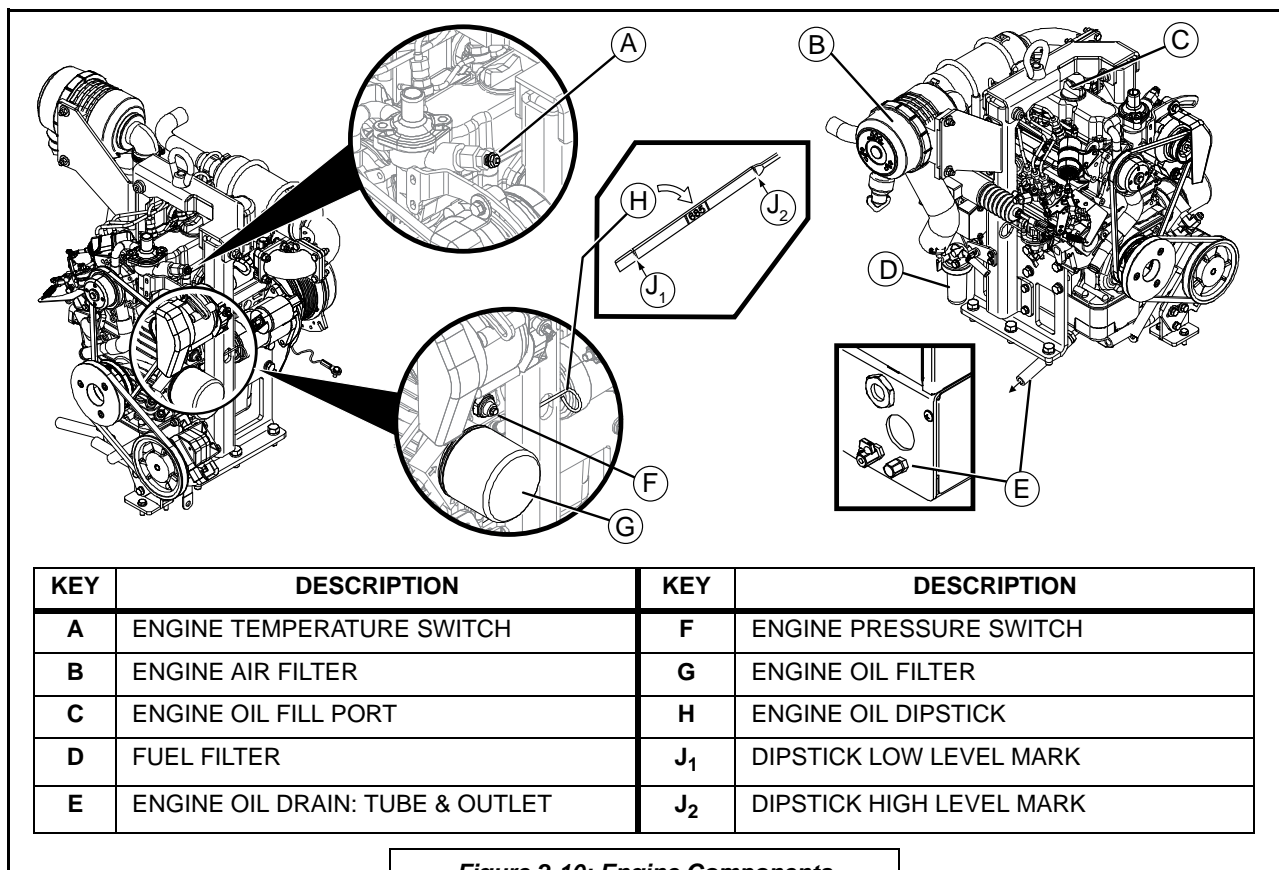
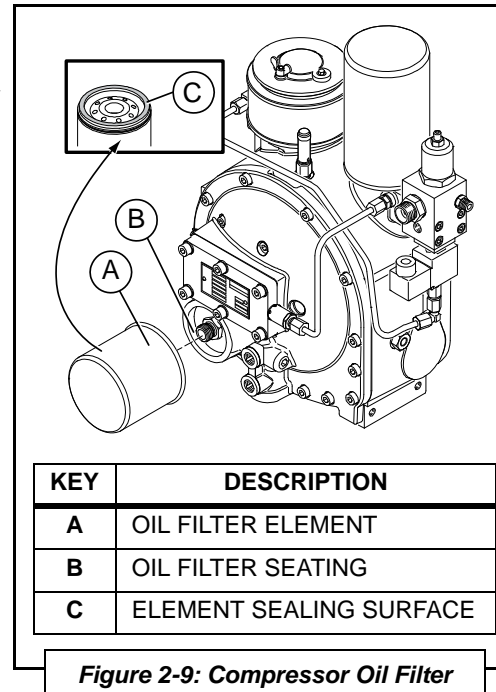
See **Figure 2-10**. The 300 All-In-One Power System features the Kubota Super Mini Series 25HP industrial engine, which offers multi-cylinder, liquid-cooled operation, with superior endurance and reliable characteristics while being compliant with stringent Tier 4 emissions regulations. It powers both 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. The adjustment for the engine can be attained by setting the speed adjustment screws. For procedure on setting the engine speed control, consult **Section 6.6.13**.

The drive systems from the engine to both the compressor and generator are accomplished with two micro V-belt systems. Both of these systems have provisions for belt tensioning, should the belts become stretched out over time (refer to **Section 6.6.15**).

The fuel tank provided in the 300 Series Power System has a capacity of twelve (12) gallons (45.4 L), and is accessed via a conveniently-located port for ease of refill. The filler cap is accessed on the generator side of the package from the left front corner, under the hood (**Figure 2-11**). 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



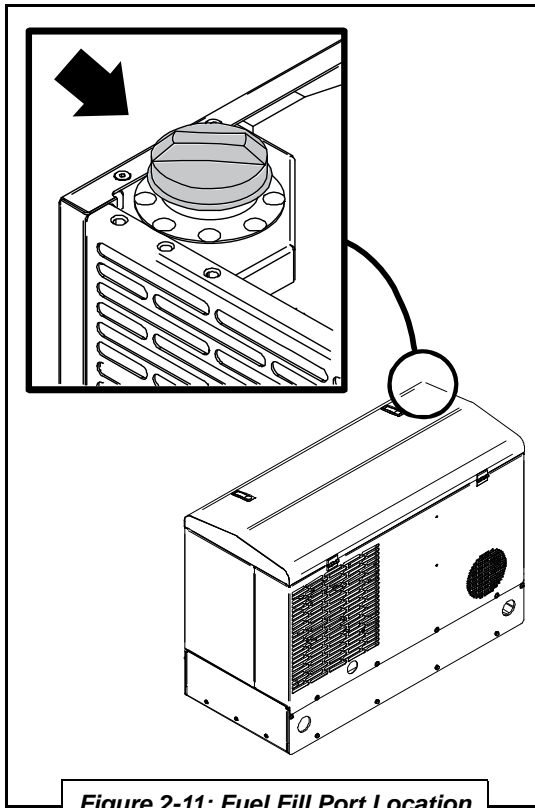



Figure 2-11: Fuel Fill Port Location

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 contains a filter, which is located at the lower right when facing the muffler side of the engine (*Figure 2-10, [D]*). For information on fuel filter maintenance, consult the Engine Operator's Manual.

2.5 AC GENERATOR

See *Figure 2-12*. The AC generator utilized on the 300 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 30 amp, in series circuit breaker protection is also included.

	WARNING
<p>DO NOT rely on breakers for overload protection.</p> <p>These breakers are temperature and time dependant, and cannot be relied upon for overload protection.</p>	

2.6 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*.

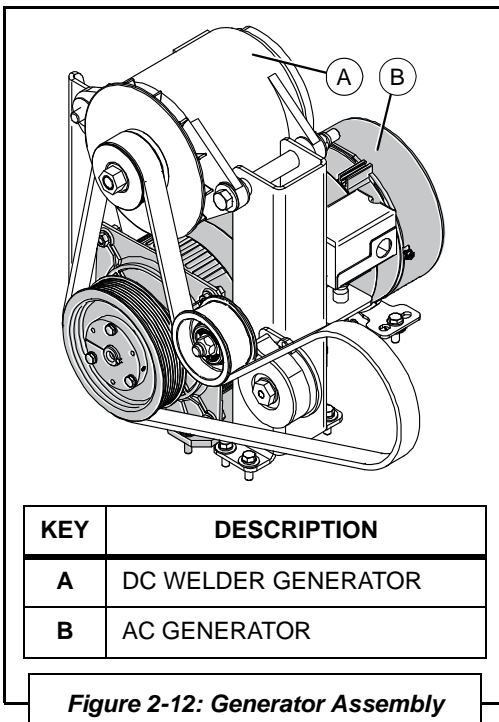


Figure 2-12: Generator Assembly

System Component or Component Group	Manual Section	Location
INSTRUMENTATION	2.6	page 28
Volts/Amps Meter	2.6.1	page 29
Welder Function Switches	2.6.2	page 29
DC Charger Mode Toggle Switch	2.6.3	page 31
Volts/Amps Manual Adjustment Dial	2.6.4	page 31
Compressor ON/OFF Toggle Switch	2.6.5	page 31
Compressor Air Pressure Gauge	2.6.6	page 31
Welder Lead Junction	2.6.7	page 31
Battery Cable Receptacle	2.6.8	page 31

Continued on next page

System Component or Component Group	Manual Section	Location
Generator Control ON/OFF Toggle Switch	2.6.9	page 31
AC Voltage Outlets	2.6.10	page 31
Circuit Breaker Overload Trip/Reset Buttons	2.6.11	page 31
Door Open Indicator Lamp	2.6.12	page 32
Alternator Fail Indicator Lamp	2.6.13	page 32
Engine Control (ON/OFF/START) Switch	2.6.14	page 32
High Temperature Indicator Lamp	2.6.15	page 32
Low Oil Pressure Indicator Lamp	2.6.16	page 32
Preheat / Start Condition Indicator Lamp	2.6.17	page 32
Fuel Gauge/Hour Meter	2.6.18	page 32

IMPORTANT

DO NOT OPEN the instrument panel box. Opening the instrument panel box will void the warranty.

See **Figure 2-13**. The standard instrument panel for the Air N Arc 300 Series contains a volts/amps meter, welder function switches, DC charger mode toggle switch, volts/amps manual adjustment dial, compressor ON/OFF toggle switch, compressor air pressure gauge, welder lead junction and battery cable receptacle, generator control ON/OFF switch, AC voltage outlets, circuit breaker overload trip/reset buttons, engine control (ON/OFF/START) switch and fuel gauge/hour meter.

In addition the panel contains function indicator lamps that light to show various machine operation conditions. These include: the door open indicator lamp, high temperature indicator lamp, low oil pressure indicator lamp and preheat/start condition indicator lamp.

2.6.1 VOLTS/AMPS METER

The **volts/amps meter** shows the amount of volts and/or amp level while welding or boosting.

2.6.2 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 welding function.

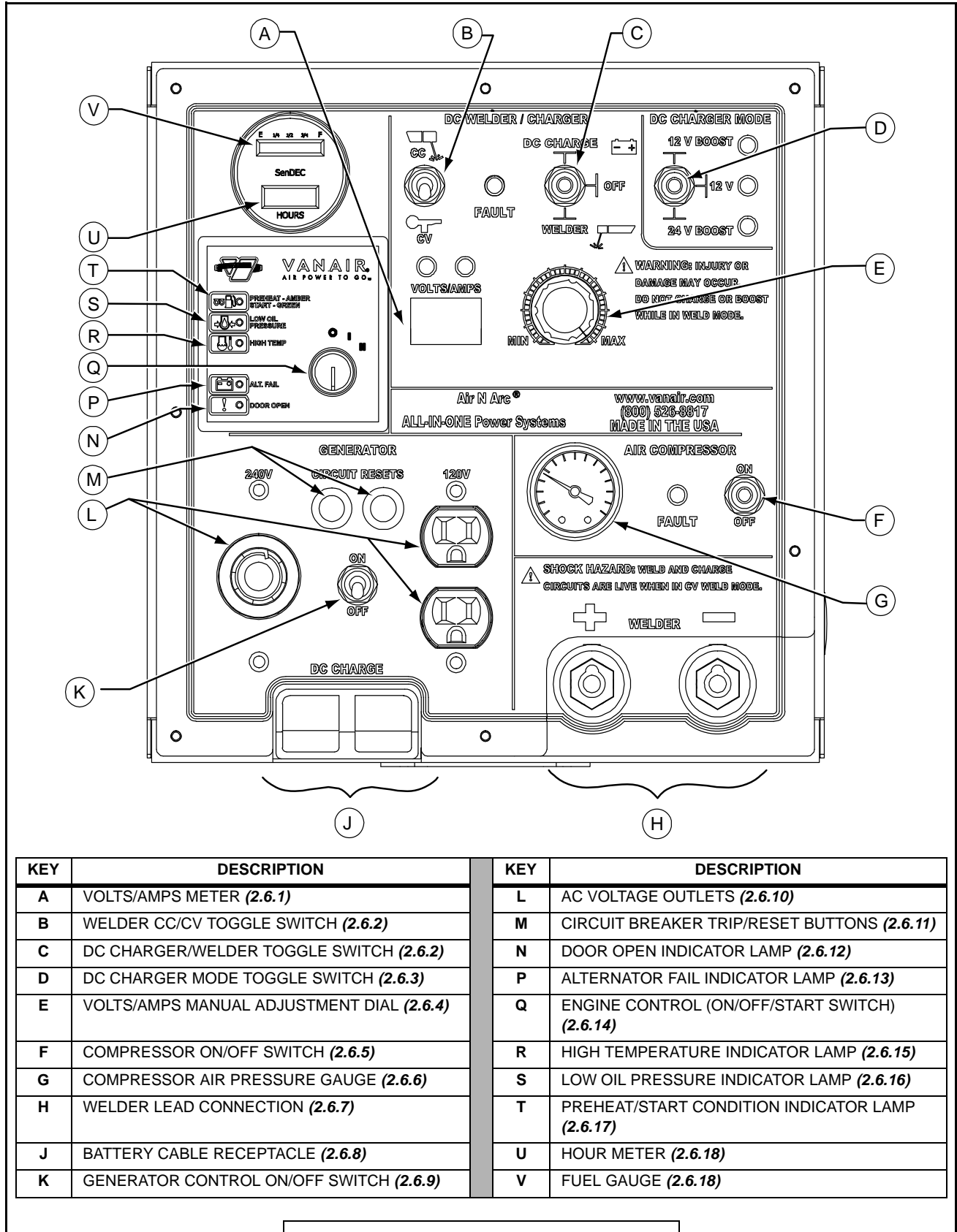


Figure 2-13: Instrument Panel

KEY	DESCRIPTION	KEY	DESCRIPTION
A	VOLTS/AMPS METER (2.6.1)	L	AC VOLTAGE OUTLETS (2.6.10)
B	WELDER CC/CV TOGGLE SWITCH (2.6.2)	M	CIRCUIT BREAKER TRIP/RESET BUTTONS (2.6.11)
C	DC CHARGER/WELDER TOGGLE SWITCH (2.6.2)	N	DOOR OPEN INDICATOR LAMP (2.6.12)
D	DC CHARGER MODE TOGGLE SWITCH (2.6.3)	P	ALTERNATOR FAIL INDICATOR LAMP (2.6.13)
E	VOLTS/AMPS MANUAL ADJUSTMENT DIAL (2.6.4)	Q	ENGINE CONTROL (ON/OFF/START SWITCH) (2.6.14)
F	COMPRESSOR ON/OFF SWITCH (2.6.5)	R	HIGH TEMPERATURE INDICATOR LAMP (2.6.15)
G	COMPRESSOR AIR PRESSURE GAUGE (2.6.6)	S	LOW OIL PRESSURE INDICATOR LAMP (2.6.16)
H	WELDER LEAD CONNECTION (2.6.7)	T	PREHEAT/START CONDITION INDICATOR LAMP (2.6.17)
J	BATTERY CABLE RECEPTACLE (2.6.8)	U	HOUR METER (2.6.18)
K	GENERATOR CONTROL ON/OFF SWITCH (2.6.9)	V	FUEL GAUGE (2.6.18)

2.6.3 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.

2.6.4 VOLTS/AMPS MANUAL ADJUSTMENT DIAL

The **volts/amps manual adjustment dial** allows the operator to manually increase or decrease the amount of amperage or voltage, in variable increments, for the desired weld heat.

2.6.5 COMPRESSOR ON/OFF TOGGLE SWITCH

The **compressor ON/OFF toggle switch** engages the air compressor system. This machine utilizes an electronic clutch to engage the compressor.

2.6.6 COMPRESSOR AIR PRESSURE GAUGE

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

2.6.7 WELDER LEAD JUNCTION

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

2.6.8 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.

2.6.9 GENERATOR CONTROL ON/OFF TOGGLE SWITCH

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

2.6.10 AC VOLTAGE OUTLETS

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

2.6.11 CIRCUIT BREAKER OVERLOAD TRIP/RESET BUTTONS

The **reset-capable circuit breakers** are used to protect the generator circuits from damage if an overload or short

IMPORTANT

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.

circuit situation occurs. The circuit breaker will trip and can be easily reset by pushing the button.

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.

2.6.12 DOOR OPEN INDICATOR LAMP

The **door open indicator lamp** signals that the front panel is not in place, or not fastened properly; machine package will not start if the door panel is open.

2.6.13 ALTERNATOR FAIL INDICATOR LAMP

When lit steady (not blinking), the **alternator fail indicator lamp** denotes a malfunction of the charging system.

2.6.14 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 300 Series Power System. Consult the various operating procedures as found in **Section 4, Operation**, to determine the integration of the engine with each separate system function.

NOTE

All shut downs are bypassed for ten (10) seconds to allow for cranking.

2.6.15 HIGH TEMPERATURE INDICATOR LAMP

The **high temperature indicator lamp** signifies that the engine has shut down due to excessive coolant temperature.

2.6.16 LOW OIL PRESSURE INDICATOR LAMP

The **low oil pressure indicator lamp** signifies that the engine has shut down due to insufficient oil pressure.

2.6.17 PREHEAT/START CONDITION INDICATOR LAMP

The **preheat/start condition indicator lamp** is useful in cold condition operating temperatures. This indicator signifies glow plug operation.

NOTE

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

2.6.18 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.

SECTION 3: SPECIFICATIONS

TABLE 3A: WELDER, GENERATOR, AND ENGINE SPECIFICATIONS

SYSTEM INFORMATION	SPECIFICATION
Rated Welder Output	300A High Frequency DC/CC, DC/CV; 100% Duty Cycle @ 280 Amps
Welding Leads	25 or 50 Ft Optional (Refer to Section A.5 for Optional Parts Listing)
AC Generator	6800 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, 28 Amp
Battery Charger Capacity	12V Charge, 12V Boost, 24V Boost
Engine	Diesel 25HP ^I
Engine Oil Capacity	Four (4) Quarts 10W30 (Refer to Engine Operator's Manual for Extreme Conditions)
Fuel Consumption	1.25 GPH at Full Engine Speed/Load 9.6 Hour Runtime w/ 12 Gallon Tank
Fuel Tank Capacity	12 Gallons
Fuel Type	Diesel Fuel ^{II}
Operating Temperature Limits	0°F to 110°F (-18°C to 43°C); Cold Weather Kit extends temperature range from 0°F to -40°F (-18°C to -40°C)

^IFor specification and requirements regarding the Kubota® 25 HP Diesel Engine, refer to the Engine Operator's Manual.

^{II}Diesel Fuel Specification Type and Sulfur Content % (ppm) used must be compliant with all applicable emission regulations for the area in which the engine is operated.

Engine manufacturer recommends a fuel sulfur content of less than 0.10% (1000 ppm). For fuels with a high sulfur content 0.50% (5000 ppm) to 1.0% (10000 ppm) a more frequent engine oil and oil filter change schedule is needed (approximately half). **DO NOT USE** fuels with a sulfur content greater than 1.0% (10000 ppm). For additional information on fuel for this engine, consult **Section 5.8 (Extreme Conditions)**, and the Engine Operator's Manual.

Not recommended for bio-diesel blends over 5%.

TABLE 3B: SPECIFICATIONS — AIR COMPRESSOR

COMPRESSOR INFORMATION	SPECIFICATION
Compressor Type	Single Stage, Oil Injected Rotary Screw
Air Compressor Capacity	40 CFM @ 175 PSI
Inlet Control	Zero (0) No Load / 100% Load
Air Filter	Pleated Paper, Dry Type
Oil Filter	Spin-on Type
Oil Capacity/Type	New: 3.5 Quarts / Service: 2.5 Quarts [Vanguard™ Premium Synthetic Oil]
Air Tank Capacity	Four (4) Gallons
Tank Pressure Rating	200 PSI
Safety Relief Valve Setting	200 PSI
Operating Range (ambient)	0° to 110°F (-18°C to 43°C); Cold Weather Kit needed for operating below 0°F(-18°C)
Electrical System	12 VDC
Cooling System	Air to Oil Heat Exchanger
Instrument Gauges	Pressure and Hour Meter
Adjustable Air Pressure Control Settings	Cut-in Pressure: 100 PSI / Cut-out Pressure: 125 PSI (Factory Preset); 150/175 PSI (Maximum Cut-out)
Air Service Outlets	Two (2) on Control Panel, One (1) on Machine





TABLE 3C: SPECIFICATIONS — UNIT WEIGHT AND DIMENSIONS^I

Dimensions	Length	Width	Height	Weight ^{II} (wet)	Weight ^{II} (dry)
Overall Package	47.5"	21"	33"	980 lbs.	870 lbs.

^ISee **Diagram 4.5** (parts 1 and 2) for full dimension drawing, and **Figure 4-1** for location space requirements.

^{II}Weight listed includes battery and fuel tank, but not instrument panel: Add 25 lbs. to weights above for instrument panel.

TABLE 3D: BOLT AND TORQUE SPECIFICATIONS

	 SAE 2	 SAE 5	 SAE 7	 SAE 8	
	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)

Bolt Diameter	Thread per inch	2		5		7		8		Socket head cap screw	
		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 FACTORY SETTING RANGES

FUNCTION	FACTORY SETTING
Engine No-Load Hi RPM	3660
Engine Idle RPM	2000
Air Cut-in pressure	100
Air Cut-out pressure	125
AC generator Hz (no load)	61
AC generator 240 plug	243
AC generator 120 plug	122
AC generator 120 plug	122
Welder Max Voltage	70
Welder Min Voltage	20
Welder Max Amperage	300
Welder Max CV Voltage	40
Welder Min CV Voltage	14
Welder 12V charge voltage	14
Welder 12V boost voltage	16
Welder 24V boost voltage	29

TABLE 3F: GENUINE VANGUARD™ OIL CHARACTERISTICS

Viscosity	178 SUS at 100°F (38°C)
Flashpoint	495°F (257°C)
Pour point	-49°F (-45°C)
Contains	Rust and Oxidation Inhibitors
Contains	Detergents

TABLE 3G: MACHINE PACKAGE DIMENSIONS

For complete machine package dimensions, consult *Section 4.5 Installation and Dimensions Diagram (Part 1 of 2)*, and *Section 4.6 Installation and Dimensions Diagram (Part 2 of 2)*.

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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 Vac-Tron ADBD Compressor System, refer to the following sections:

System Component or Part Group Task	Manual Section	Location
Machine Package Prep	4.2	page 37
Service Body Prep	4.3	page 37
Machine Package Mounting	4.4	page 39
Installation and Dimensions Diagram (Part 1 of 2)	4.5	page 42
Installation and Dimensions Diagram (Part 2 of 2)	4.6	page 43

4.2 MACHINE PACKAGE PREP

Refer to *Figure 4-1, Installation and Dimensions Diagram*, and the following instructions.

1. Remove packing and inspect the machine for shipping damage.
2. Check fluid levels, if needed. Refer to **Section 6.6.3** for compressor oil, and **Section 6.6.12** for engine oil.

4.3 SERVICE BODY PREP

Consult **Section 3, Specifications** for dimension requirements, 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.

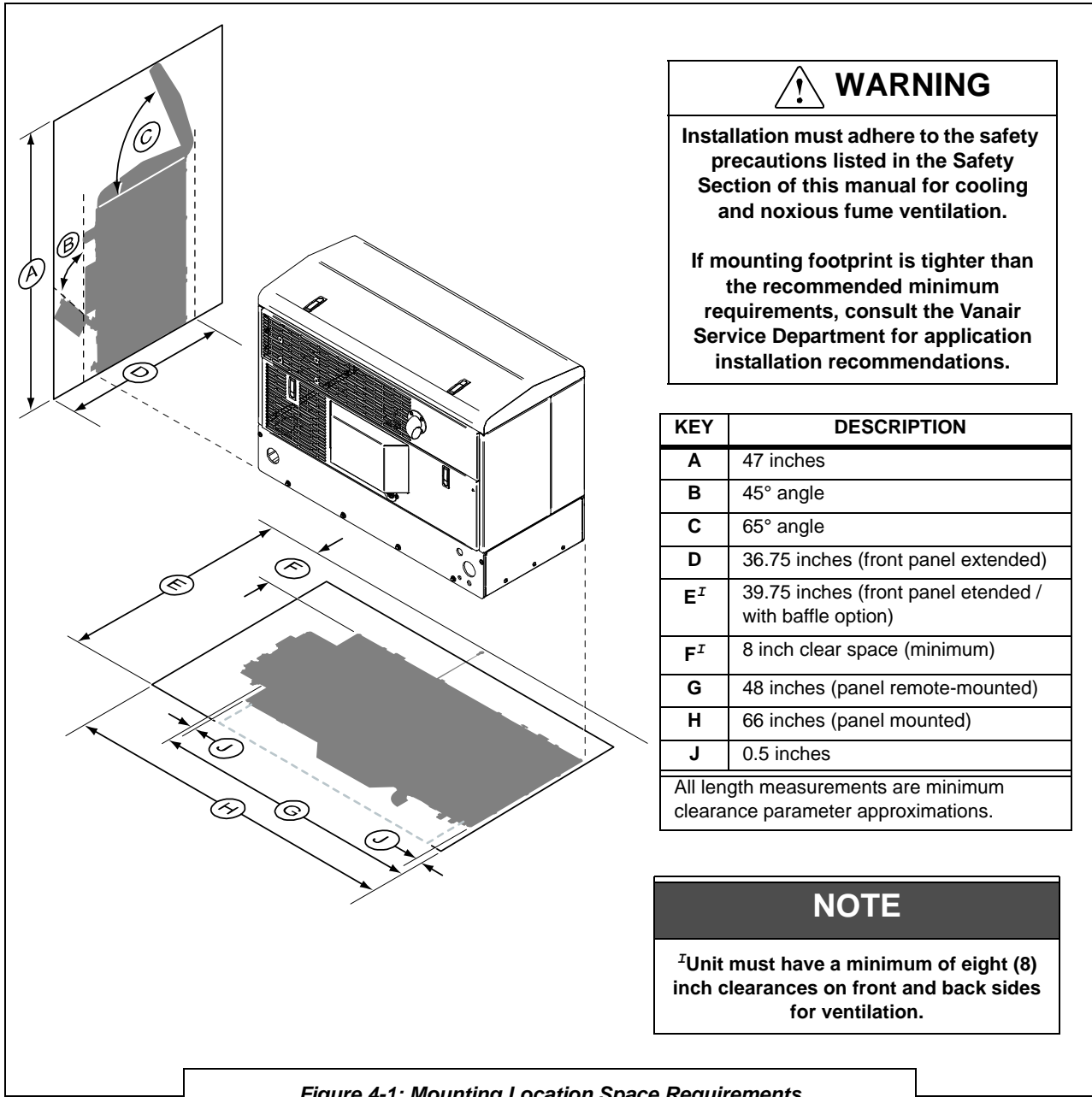


Figure 4-1: Mounting Location Space Requirements

NOTE

For wet ups without a fuel tank where an additional fuel pump is required, order either of the following kits:

- Kit no. 032744 - Option for remote fuel pump short run
- Kit no. 32745 - Option for remote fuel pump long run

1. Drill four (4) 9/16" mounting holes in the service body floor on a 19.25" by 44.375" 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 4-2**).

- Install the pick-up and return fuel lines.
 - 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.

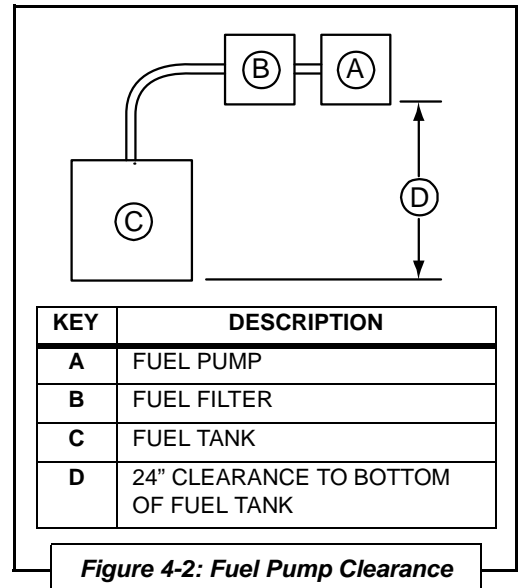


Figure 4-2: Fuel Pump Clearance

4.4 MACHINE PACKAGE MOUNTING

When determining package position on vehicle, be aware of the minimum space requirements needed for cooling

NOTE	
A mounting bracket option (no. A16738P) is available to space panel off truck body (Figure 4-3).	

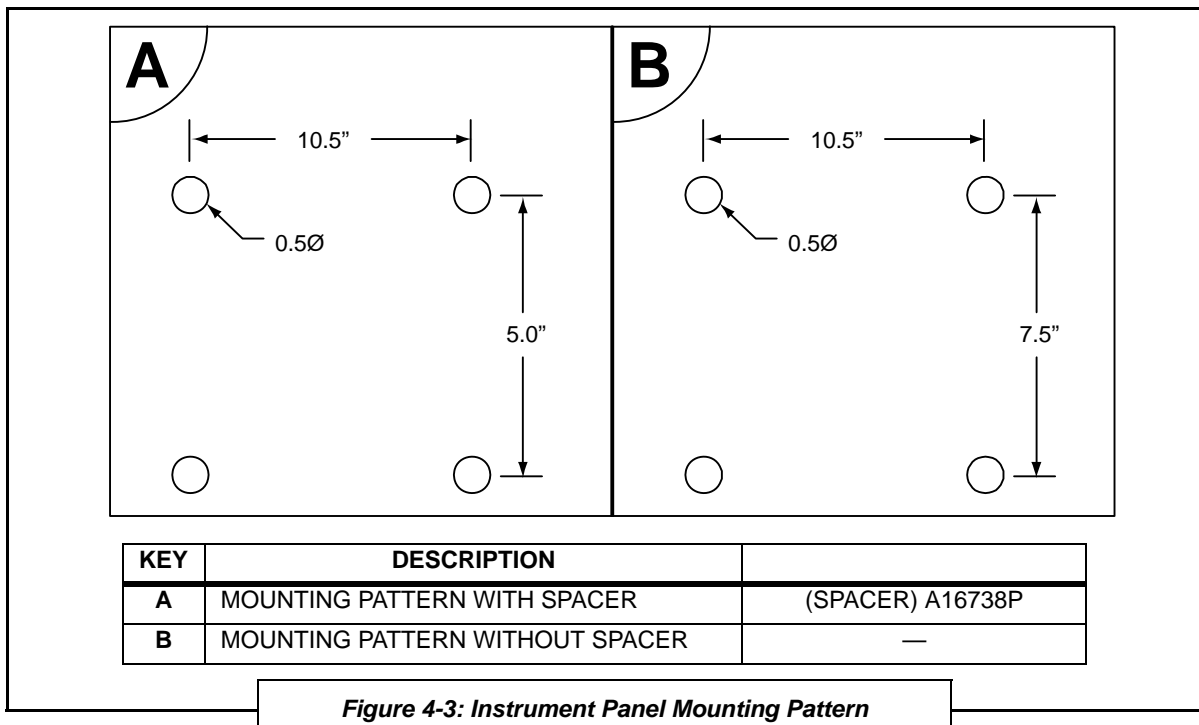


Figure 4-3: Instrument Panel Mounting Pattern

NOTE

For safety reasons the front access panel contains a shut-off switch. The front access panel will not allow the machine to start if it is not in place, and will shut down the machine if it is removed while running. Consult *Section 1.11, Machine Canopy Access Safety Switch* for further information on the machine safety switches.

and circulation, and also package access for performing maintenance (see *Figure 4-1*).

1. Refer to *Figure 4-4*. Remove the truss screws [B], nylon flat washers [C] in order to remove access panel covers ([A] and [K]) found on both side ends of the unit.
2. To unbolt the unit from the skid, remove the mounting nuts [D], lock washers [E], washers [F] and mounting bolts [G] securing the package unit [J] to the shipping crate.
3. Place the unit in a preliminary position on the service body so that the front panel access and hood opening (front) side is easily accessible, and the control trunk line and all other connections will reach the unit. Refer to *Figure 4-5* for lifting bail location.

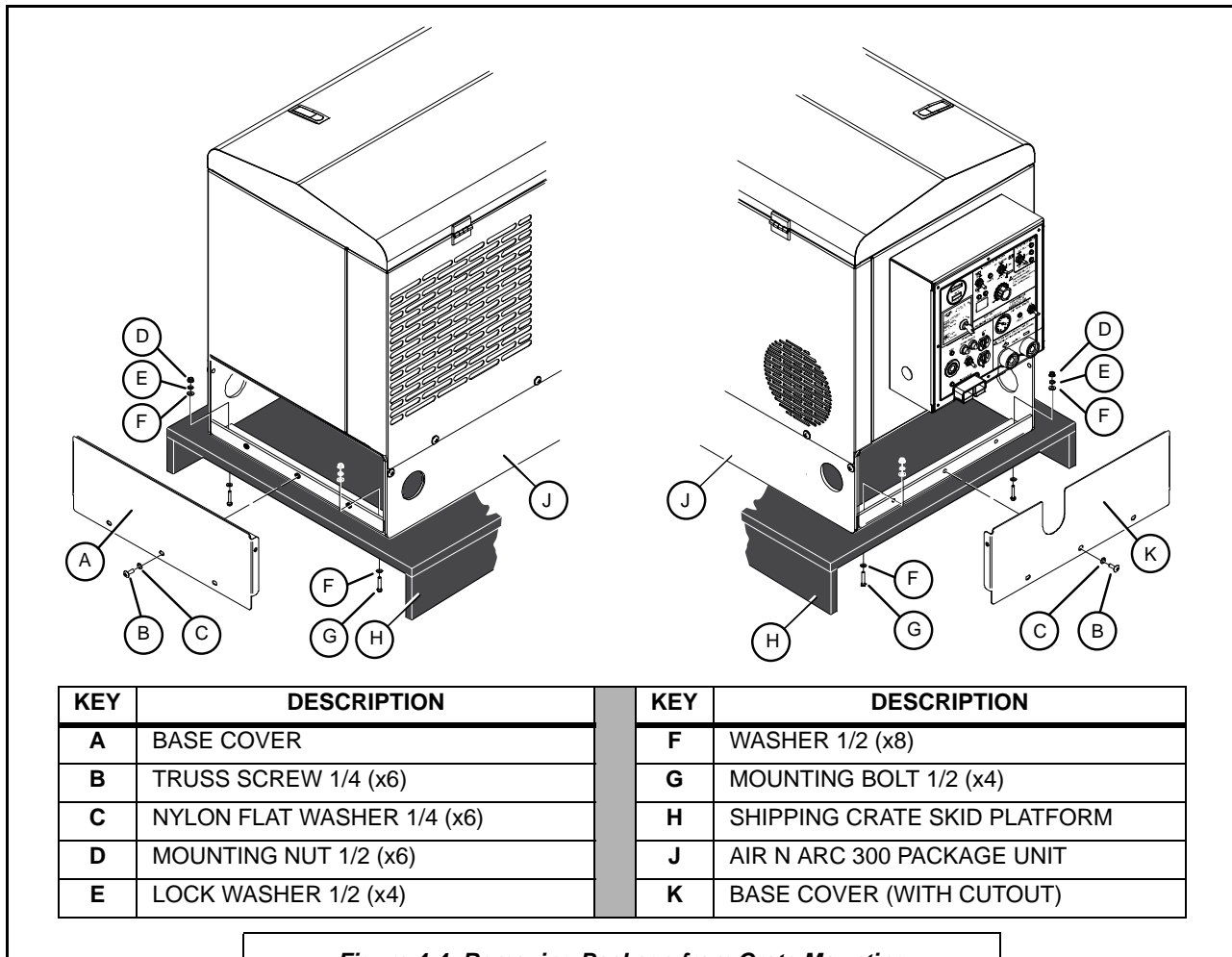


Figure 4-4: Removing Package from Crate Mounting

4. 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.
5. Leaving the unit in the preliminary position, connect the ground cable to the unit battery, check all fluid levels. Replace the front access panel and close the unit hood.
6. Refer to **Figure 4-6** for remote-mounted fuel pump: Open the bleed nut shown to siphon off any air in the line. Turn on the pump, allow air to escape, and tighten the nut when all air is out of the system (fuel begins to leak out).
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 from the bottom. Note: See **Figure 4-1** for location space requirements.
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.

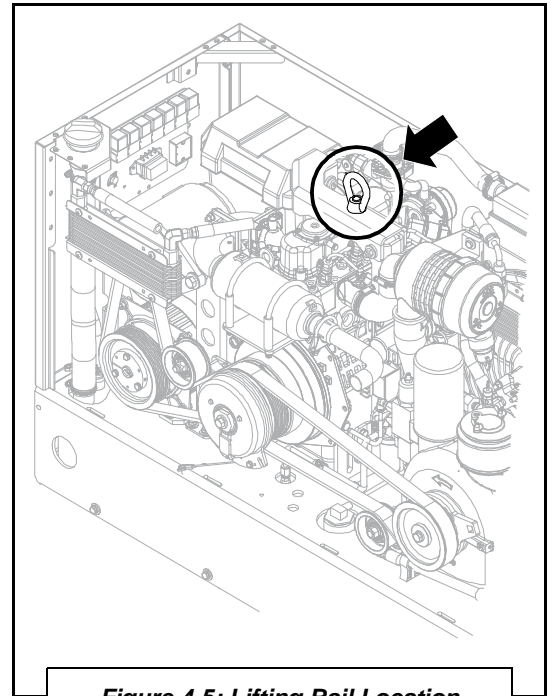


Figure 4-5: Lifting Bail Location

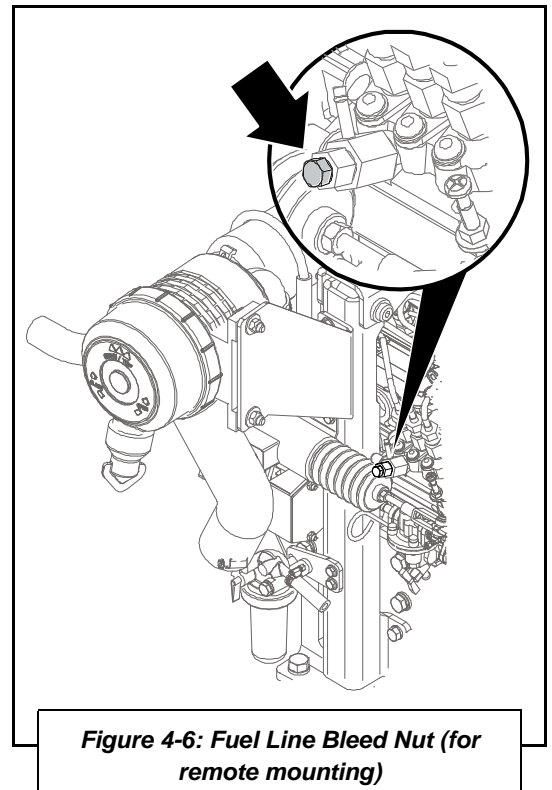
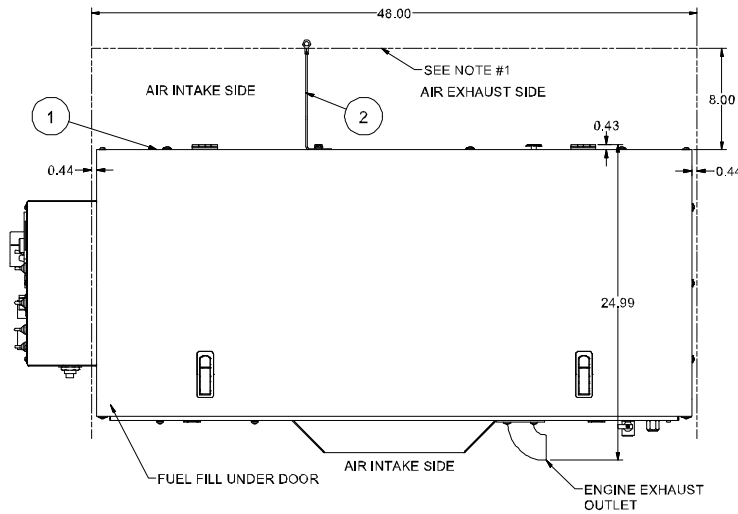


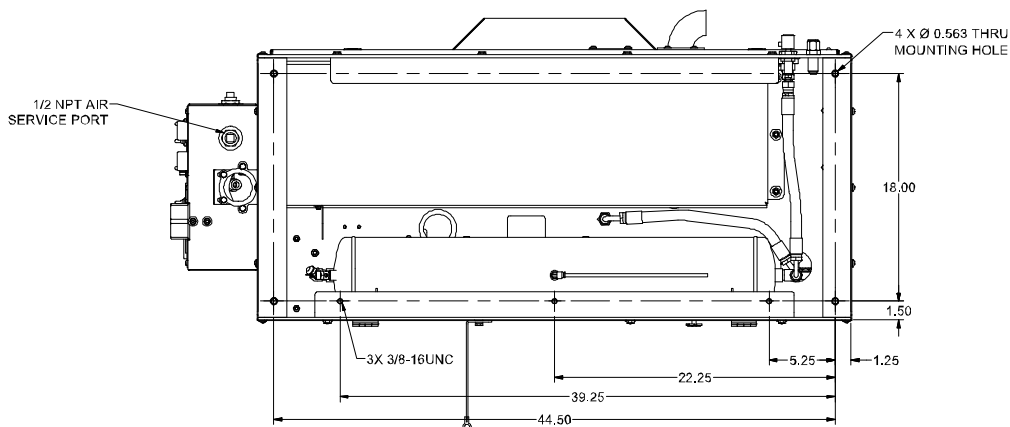
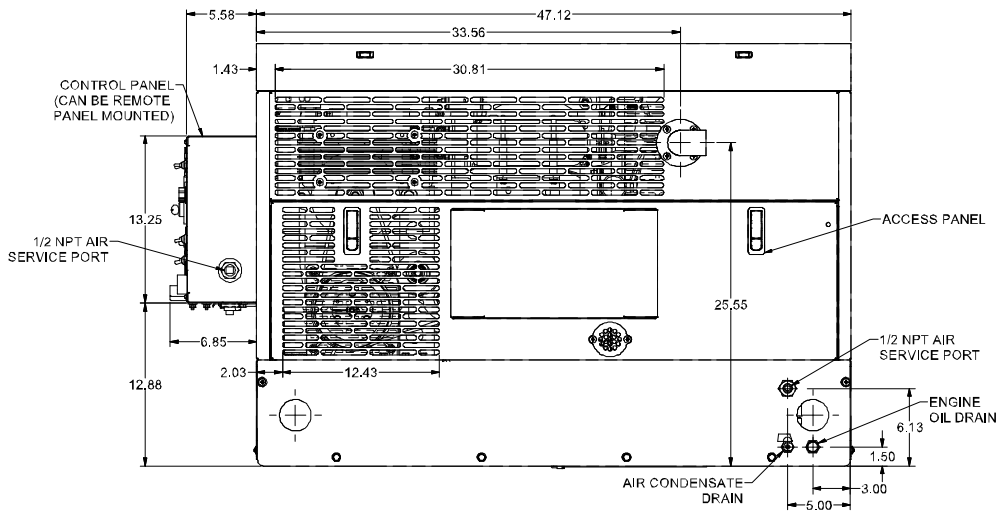
Figure 4-6: Fuel Line Bleed Nut (for remote mounting)

4.5 INSTALLATION AND DIMENSIONS DIAGRAM (PART 1 OF 2)



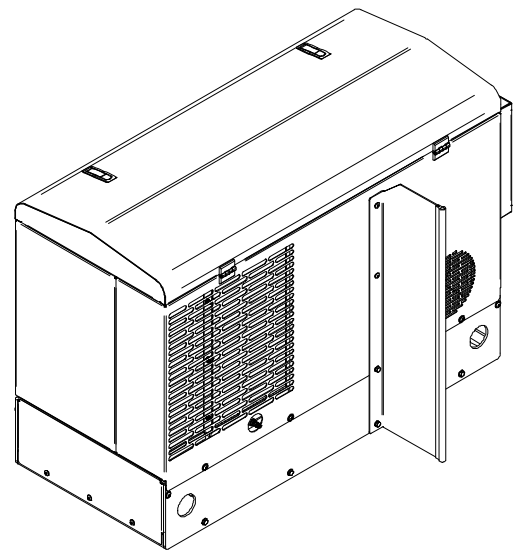
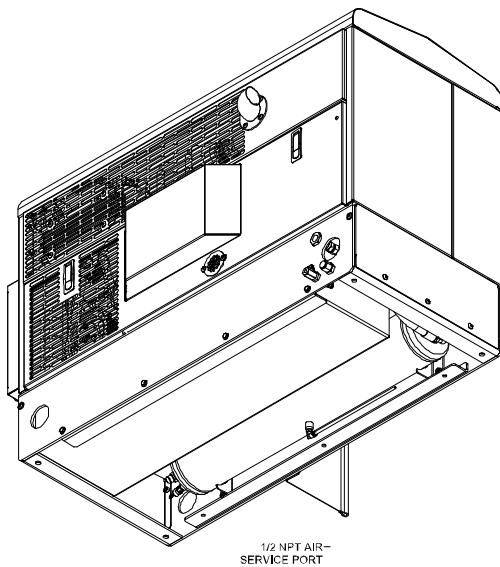
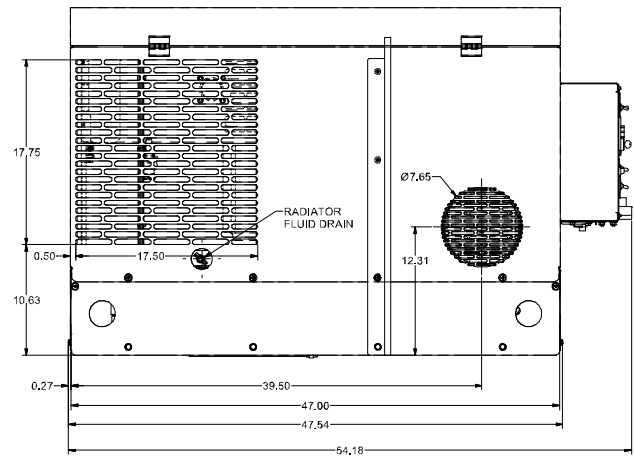
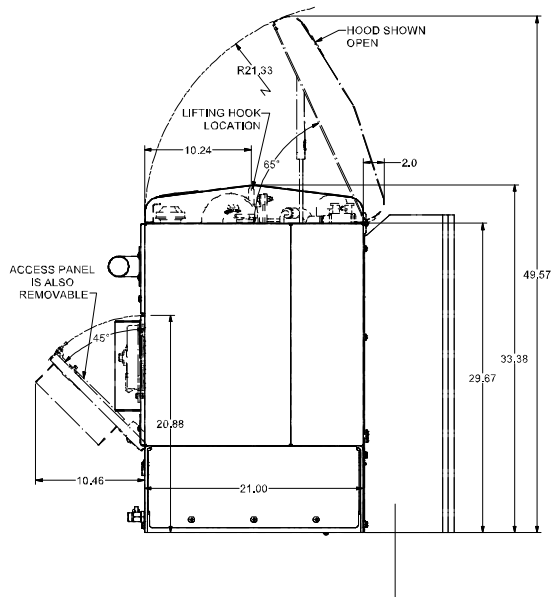
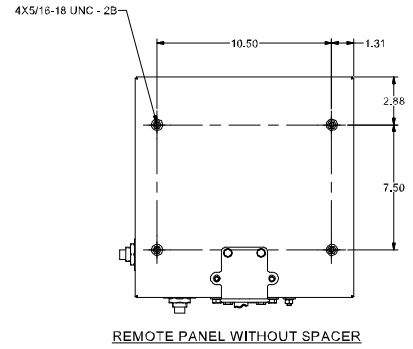
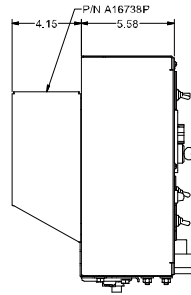
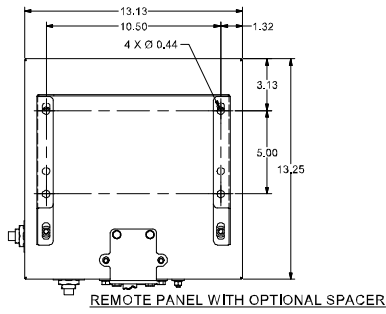
PARTS LIST			
ITEM	PART NUMBER	DESCRIPTION	QTY
1	PA6130014ID	AIR N ARC 300, DIESEL	1
2		OPT_BAFFLE PLATE	1

NOTE : MINIMUM DIMENSIONS FOR PROPER VENTING.



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4.6 INSTALLATION AND DIMENSIONS DIAGRAM (PART 2 OF 2)



050590 (2 of 2) _r1

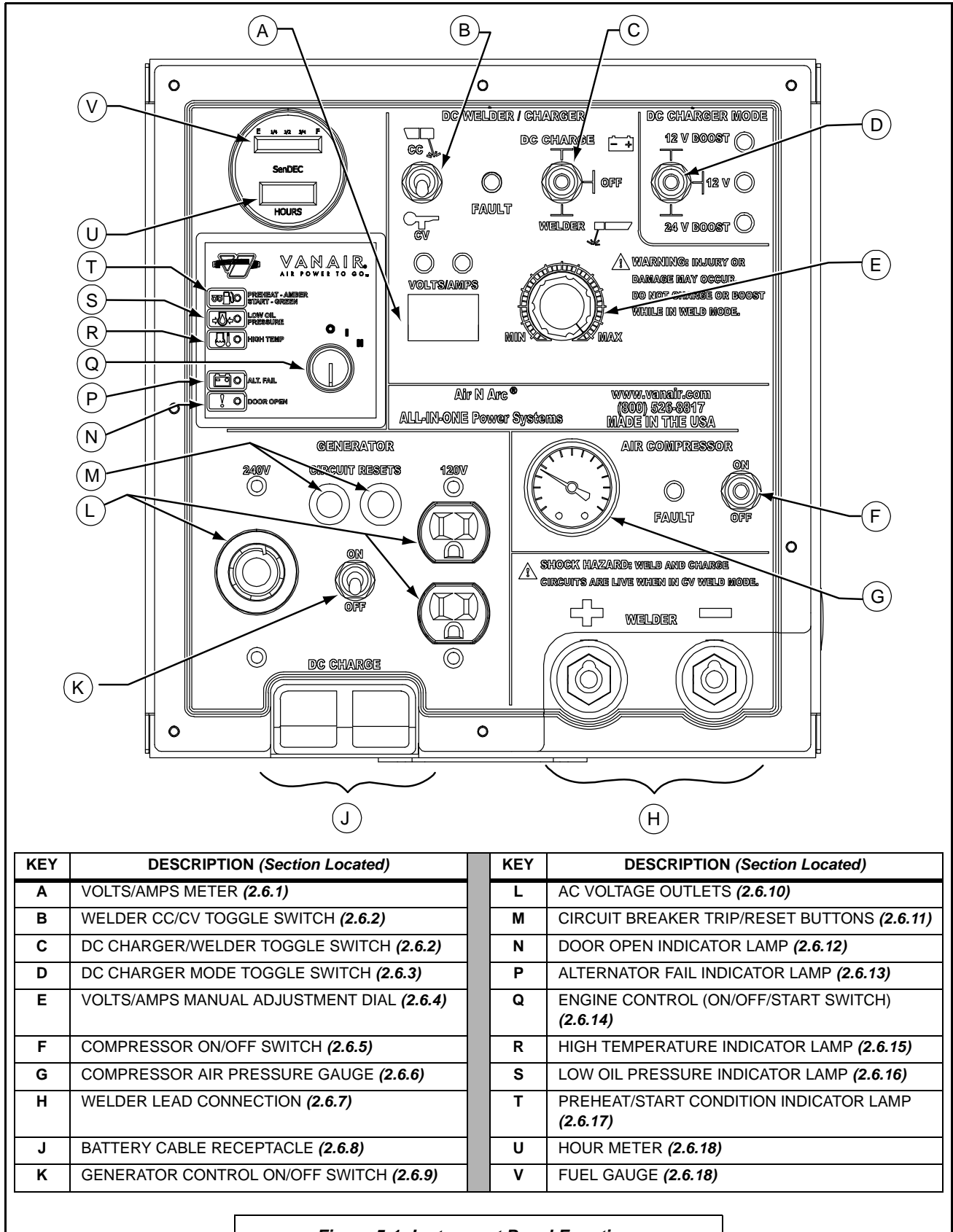



Figure 5-1: Instrument Panel Functions

KEY	DESCRIPTION (Section Located)	KEY	DESCRIPTION (Section Located)
A	VOLTS/AMPS METER (2.6.1)	L	AC VOLTAGE OUTLETS (2.6.10)
B	WELDER CC/CV TOGGLE SWITCH (2.6.2)	M	CIRCUIT BREAKER TRIP/RESET BUTTONS (2.6.11)
C	DC CHARGER/WELDER TOGGLE SWITCH (2.6.2)	N	DOOR OPEN INDICATOR LAMP (2.6.12)
D	DC CHARGER MODE TOGGLE SWITCH (2.6.3)	P	ALTERNATOR FAIL INDICATOR LAMP (2.6.13)
E	VOLTS/AMPS MANUAL ADJUSTMENT DIAL (2.6.4)	Q	ENGINE CONTROL (ON/OFF/START SWITCH) (2.6.14)
F	COMPRESSOR ON/OFF SWITCH (2.6.5)	R	HIGH TEMPERATURE INDICATOR LAMP (2.6.15)
G	COMPRESSOR AIR PRESSURE GAUGE (2.6.6)	S	LOW OIL PRESSURE INDICATOR LAMP (2.6.16)
H	WELDER LEAD CONNECTION (2.6.7)	T	PREHEAT/START CONDITION INDICATOR LAMP (2.6.17)
J	BATTERY CABLE RECEPTACLE (2.6.8)	U	HOUR METER (2.6.18)
K	GENERATOR CONTROL ON/OFF SWITCH (2.6.9)	V	FUEL GAUGE (2.6.18)

SECTION 5: OPERATION


5.1 GENERAL INFORMATION


The Air N Arc 300 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 300 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

<p>Before starting the Vanair® Air N Arc 300 All-In-One Power System, read this section thoroughly and familiarize yourself with the controls and indicators - their purpose, location and use.</p>

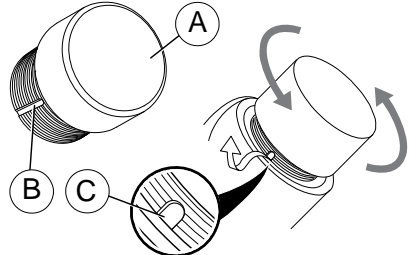
System Operation Group	Manual Section	Location
Engine Start-up and Shutdown Procedure	5.2	page 46
Engine Start-up	5.2.1	page 46
Engine Shutdown	5.2.2	page 47
Engine Throttle Control Functions	5.3	page 48
Operating the Welder	5.4	page 48
Welder Operating Procedure	5.4.1	page 49
CC (Constant Current) Mode	5.4.1.1	page 49
CV (Constant Voltage) Mode - Using a Voltage Sensing Suitcase Feeder	5.4.1.2	page 51
CV (Constant Voltage) Mode - Using a Spool Gun	5.4.1.3	page 51
Operating the Generator	5.5	page 53
Operating the Air Compressor	5.6	page 53

Continued on next page

 DANGER
<p>Grounding must consist of a minimum 10 gauge wire between the instrument panel, the machine, and the truck chassis.</p>

 WARNING
<p>Before performing maintenance or repair operations on the compressor, ensure that all power has been removed by disconnecting battery cables, to prevent accidental start-up.</p>

 WARNING
<p>Before starting, performing maintenance, or replacing parts, relieve the entire system pressure by opening the air tank drain/vent valve, which will vent all pressure to the atmosphere.</p>
<p>Refer to <i>Figure 5-2</i>. Open fill cap SLOWLY (contents under pressure) to make sure all pressure has been relieved.</p>



KEY	DESCRIPTION
A	RED COMPRESSOR FILL CAP
B	FILL CAP BLEED VENT GROOVE
C	Open/crack cap slightly to allow bleed vent to relieve pressure

Figure 5-2: Pressure Relief

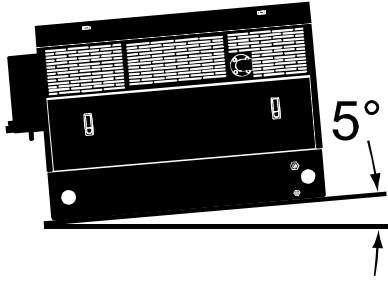
WARNING

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

NOTE

If any of the compressor, generator or welder switches are set to ON prior to starting, the machine will start at full speed.

IMPORTANT



All machine package maximum operation angles of tilt are fifteen degrees (15°) except for: **MAXIMUM** machine angle of tilt for operation for view shown above is five degrees (5°).

WARNING

Machine hood and front access panel must be closed before starting. Interlock switches will not allow starting with panels open. After starting, engine hood may be opened, but opening belt access panel will shut down the engine.

NOTE

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

System Operation Group	Manual Section	Location
Operating the Battery/Boost Charger	5.7	page 54
Connection - Disconnection Sequence and Operation	5.7.1	page 55
Extreme Condition Operation	5.8	page 55
Cold Weather Operation	5.8.1	page 56
Engine Operation	5.8.1.1	page 56
Machine Operation	5.8.1.2	page 58
High Temperature Operation	5.8.2	page 58
Engine Operation	5.8.2.1	page 58
Machine Operation	5.8.2.2	page 59
High Dust Content Operation	5.8.3	page 59
Engine Operation	5.8.3.1	page 59
Machine Operation	5.8.3.2	page 60
High Altitude Operation	5.8.4	page 60

5.2 ENGINE START-UP AND SHUTDOWN PROCEDURE

NOTE

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

Consult *Figure 5-1: Instrument Panel Functions* for operating procedures detailed in this section.

System Operation Group	Manual Section	Location
Engine Start-up and Shutdown Procedure	5.2	page 46
Engine Start-up	5.2.1	page 46
Engine Shutdown	5.2.2	page 47

5.2.1 ENGINE START-UP

Consult *Figure 5-3*, and the following steps:

1. Check to make sure all switches [A] (Welder, Generator, and Compressor) are in the **OFF** position prior to starting.
2. Turn the engine control switch to the **ON** position [B]; wait 3-5 seconds for the fuel pump to prime the system. Depending upon ambient temperature, wait until glow plug light goes out (ten [10] seconds).

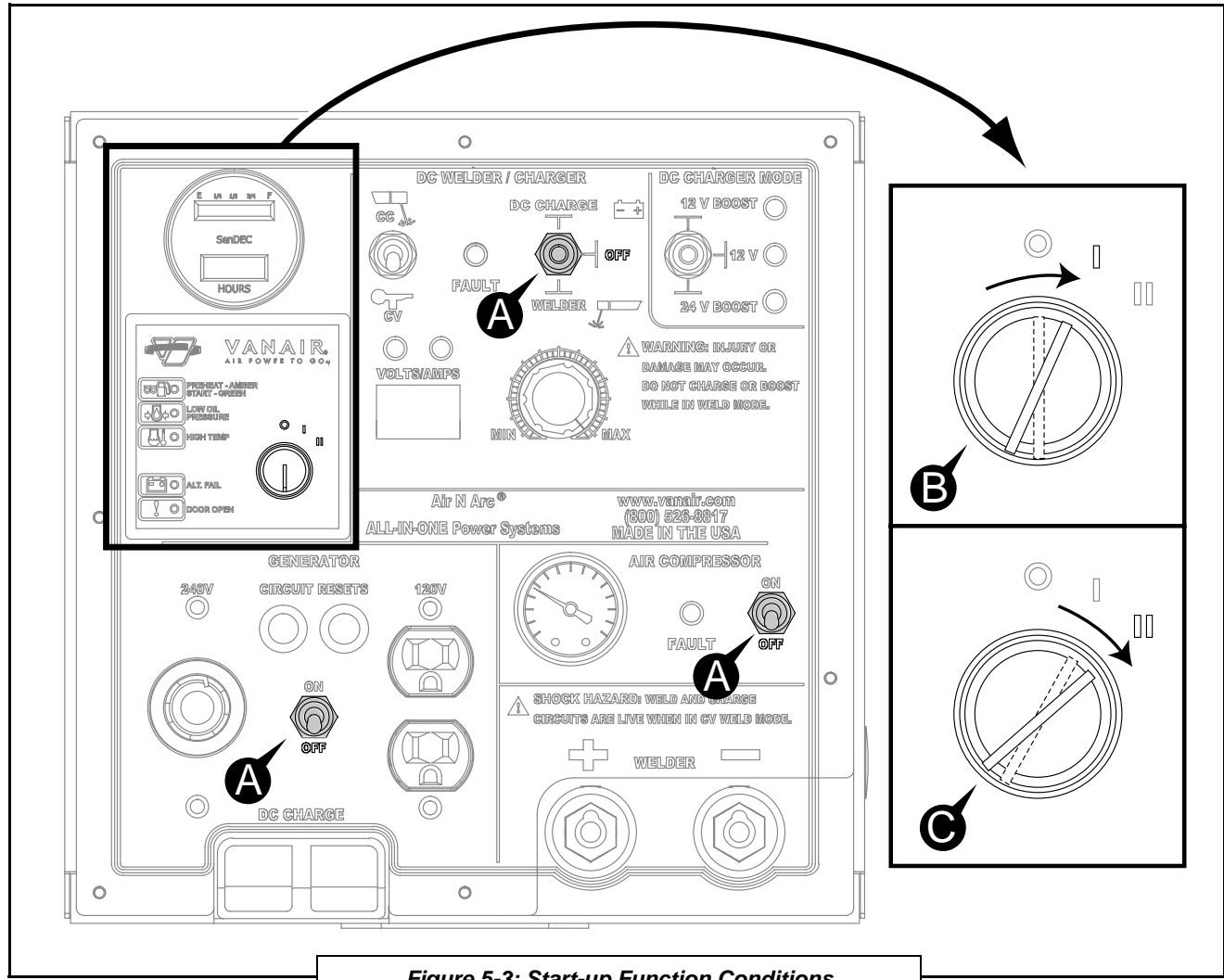


Figure 5-3: Start-up Function Conditions

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.

NOTE

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

5.2.2 ENGINE SHUTDOWN

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

CAUTION

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

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. Unplug any power cords that are plugged into the generator panel.
4. Turn the **Compressor, Generator and Welder** switches on the control panel to the **OFF** position.
5. Allow machine to run at idle for 3-5 minutes to allow for a cool down sequence.
6. Turn the **Engine Control Switch** to the **OFF** position.

NOTE
<p>Regarding the compressor: Once the machine has built up full pressure, it will wait two and a half (2.5) minutes until it idles down; turning off the switch idles it down automatically.</p>

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 compressor switch.
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.

KEY	DESCRIPTION
A	DIGITAL READ OUT DISPLAY
B	RANGE: 30-300 AMPS 15-40 VOLTS

Figure 5-4: Variable Power Dial Adjustment

5.4 OPERATING THE WELDER

WARNING
<p style="text-align: center;">Before attempting any welding procedure, the operator must be aware of general safety practices, and particularly those pertaining to welding, as found in <i>Section 1.4</i> of this manual.</p>

Consult **Figure 5-4**. The **variable power dial** adjusts the welder amperage (30 to 300 amps), or voltage (15 to 40

TABLE 5A: ENGINE THROTTLE CONTROL FUNCTION CONDITIONS ^I				
Pressure Setting	Compressor Switch	Generator Switch	Welder Switch	Engine Speed Condition Result
Tank Pressure Below (<) 100 PSI or Set Pressure ^{II}	ON	OFF	OFF	Engine runs at full throttle (3600 RPM).
	OFF	OFF	OFF	Engine runs at idle speed (2000 RPM), ready for application.
Tank Pressure Above (≥) 100 PSI or Set Pressure ^{II}	ON	OFF	ON	Welder can be activated by striking an arc, and Engine runs at idle speed (2000 RPM), ready for application.
	ON	ON	OFF	Engine runs at full throttle speed (3600 RPM); generator is ready for use ^{III} .
	ON	ON	ON	Full speed and all items available for use.
^I Any combination of the 300 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: 100 PSI = ON / 125 PSI = OFF				
^{III} Consult Appendix A, Section A.3, Wattage Requirements for Common Receptacle Units for a listing of wattage requirements of various implements.				

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.

System Operation Group	Manual Section	Location
Operating the Welder	5.4	page 48
Welder Operating Procedure	5.4.1	page 49
CC (Constant Current) Mode	5.4.1.1	page 49
CV (Constant Voltage) Mode - Using a Voltage Sensing Suitcase Feeder	5.4.1.2	page 51
CV (Constant Voltage) Mode - Using a Spool Gun	5.4.1.3	page 51


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)

NOTE

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

 **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.

NOTE

If a longer welding lead is desired, optional 25 and 50 ft. lead segments may be purchased from Vanair Manufacturing, Inc. for a maximum lead length of 100 ft.

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: ELECTRODE SPECIFICATIONS** for selecting an electrode.
3. Place the ground clamp on the work piece and insert the appropriate welding rod into the electrode clamp.
4. Start the engine (See **Section 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: ELECTRODE SPECIFICATIONS** for electrode amperage ratings). At anytime during welding, the power dial may be adjusted to the desired amperage level.

NOTE

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

7. When you strike the electrode against the material being welded, the engine will go to

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

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.

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 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 300 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 300 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

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.

NOTE

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

2. Place the ground clamp from the Air N Arc 300 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 300 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.

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 (2) digits indicate position and polarity along with what type flux. See **Table 5C: WELDING ROD TYPE, POLARITY AND FLUX CODES**.

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+

5.5 OPERATING THE GENERATOR

IMPORTANT

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

To operate the generator:

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

NOTE

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


Be careful not to overload the rated capacity of the generator - 6,800 watts (28 amps @ 240V) continuous.

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 3,700 watts (15.5 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 5-5*).

5.6 OPERATING THE AIR COMPRESSOR

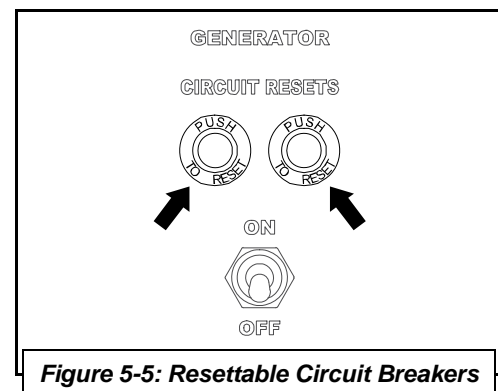
The air compressor and the supply of high pressure air can be turned off. Whenever the pressure in the air tank drops below 100 psi or the set pressure, the engine will run at high speed until the pressure in the tank reaches

 **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.

 **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.



NOTE

The Air N Arc 300 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 6.6.14, Adjusting the Pressure Setting*).

NOTE

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

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.

125 psi or set pressure. the pressure gauge on the panel displays the current tank pressure.


CAUTION



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

When purchasing air tools or planning a project, the rated capacity of the compressor (40 CFM @ 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.

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.

5.7 OPERATING THE BATTERY BOOSTER/CHARGER

The Vanair® state-of-the-art battery charging module and the optional battery charging cables add further versatility to the 300 Series Power System. The battery charging system operates off the DC generator, and not the main AC power generator.


IMPORTANT

To prevent damaging voltage spikes, the vehicle 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 of the vehicle.

System Component or Part Group Task	Manual Section	Location
Operating the Battery/Boost Charger	5.7	page 54
Connection - Disconnection Sequence and Operation	5.7.1	page 55

Consult **Table 5D: FACTORY PRESETS** for factory preset ranges. The module has been factory-adjusted for 12 VDC charging, and a maximum current output of 300 amps.

WARNING



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

TABLE 5D: FACTORY PRESETS

	FACTORY ADJUSTMENT RANGE	STANDARD PRE-SET
12V CHARGER	12V - 15V	14V
12V BOOST	14V - 17V	16V
24V CHARGER/ BOOST	26V - 35V	30V

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

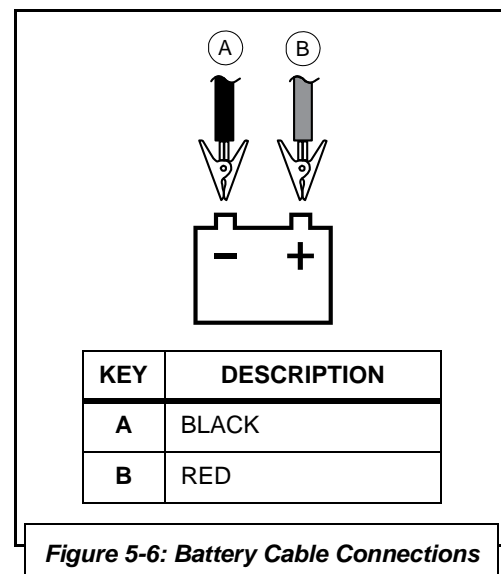
IMPORTANT

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

1. With the engine off, insure that the welder, DC charger switch, and any other engine control switch are in the **OFF** position.
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. When machine begins to cycle between high and low idle then the battery is fully charged.
6. To disconnect the charging system, place the DC Welder/Charger selector toggle switch to the **OFF** position.
7. Allow engine to idle down, then shut down the engine.
8. Now it is safe to disconnect the clamps from the battery being charged, and the battery cable connection on the front 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.



5.8 EXTREME CONDITION OPERATION

System Component or Part Group Task	Manual Section	Location
Extreme Condition Operation	5.8	page 55
Cold Weather Operation	5.8.1	page 56
Engine Operation	5.8.1.1	page 56
Machine Operation	5.8.1.2	page 58
High Temperature Operation	5.8.2	page 58

System Component or Part Group Task	Manual Section	Location
Engine Operation	5.8.2.1	page 58
Machine Operation	5.8.2.2	page 59
High Dust Content Operation	5.8.3	page 59
Engine Operation	5.8.3.1	page 59
Machine Operation	5.8.3.2	page 60
High Altitude Operation	5.8.4	page 60

NOTE
<p>Vanair® offers a cold weather kit option, installed at the factory, which enables operation at temperatures from 0°F down to -40°F (-18°C to -40°C). Consult Appendix <i>Section A.5</i> (options list) and Vanair for details.</p>

When operating in extreme cold or hot conditions, ranging from 0°F to 110°F (-18°C to 43°C) (0°F to -40°F [-18°C to -40°C] with cold weather kit), in the presence of high humidity, or at a high altitude, extra attention should be given to any indication that could lead to a serious problem. If the ambient temperature varies largely, the environment is dusty, or the engine is operated at a high altitude, the engine performance is directly or indirectly influenced.

It is necessary to consider the balance between the output compensation in accordance with the ambient conditions, and actions to adapt the engine to the operating conditions.

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 approaches given in this section before operating the power system package in any type of extreme ambient condition. For additional operation information consult the Engine Operator's Manual, or visit the engine manufacturer's web site.

5.8.1 COLD WEATHER OPERATION

5.8.1.1 ENGINE OPERATION

The 300 Series All-In-One Power System's 25HP engine runs on diesel fuel, which can be more difficult to start in cold weather. Once the engine is started, the air density becomes larger and the intake efficiency also becomes higher. More output can be expected in cold areas. When the temperature is very low, extra care must be taken regarding fuel and oil changes in their viscosity, freezing of water contained in the piping, or of water adhering on the filter. Diesel fuel may gel at very cold temperatures

WATER

Water in the fuel can freeze at temperatures below 32°F (0°C), blocking fuel lines. Keep the fuel tank full to prevent condensation from forming inside the tank and lessen the chances of water getting in the fuel line.

At an extremely cold temperature, the viscosity of hydraulic fluid and lubrication oil may increase and the torque of starter may exceed its permissible value, hindering proper starting (refer to **Table 5E: REQUIREMENTS FOR COLD WEATHER STARTING**).

The standard recommendation of 10W-30 engine oil is suitable for temperatures down to -4°F (-20°C). If temperatures are consistently below 30°F (-1°C), it is recommended that 5W-30 oil be used. If temperatures are below -25°F (-32°C), a high-performance, fully synthetic oil, such as AMSOIL 5W-30 should be used which is suitable to temperatures of -55°F (-48°C).

GELLING

Diesel fuel turns to a gel-like consistency at temperatures around 0°F (-18°C) the diesel forms wax crystals when

NOTE

Vanair® offers a cold weather kit option, installed at the factory, which enables operation at temperatures from 0°F down to -40°F (-18°C to -40°C). Consult Appendix Section A.5 (options list) and Vanair for details.

TABLE 5E: REQUIREMENTS FOR COLD STARTING								
Cold Intensity		Low temperatures more than 258 K (5°F [-15°C])		Intense cold more than 253 K (-4°F [-20°C])		Extreme cold more than 248 K (-13°F [-25°C])		
Item								
Combustion	Fuel	For cold weather	No.1-D (ASTM D975-94)		No.1-D (ASTM D975-94)		No.1-D (ASTM D975-94)	
	Preheating	Combustion chamber	Glow 10 sec		Glow 10 sec		Glow 10 sec	
		Intake air	-		-		Preheating	
		Engine body	-		-		Preheating	
Turning force	Starter		Standard		Size up from std.		Size up from std.	
	Battery		Standard		Size up from std.		Size up from std.	
Lubrication	Oil	For cold weather	SAE #10W or SAE #10W30		SAE #5W or SAE #10W30		SAE #5W or SAE #5W20	
Cooling	Coolant		Antifreeze		Antifreeze		Antifreeze	
			-		-		Preheating	
1) Above table may be changed by application due to the drag torque of various machines.								
2) Material of all pipes, resins and rubbers must be cold resistant material in extreme cold condition.								

the temperatures drop below 15°F (-9°C). As it gets colder, these wax crystals turn to gel. This thicker substance cannot pass the fuel filter, so the engine may run intermittently, or may not start at all.

COLD WEATHER SAFEGUARDS

- Park the vehicle or equipment indoors when not in use.
- Use a block heater or glow plugs.
- Maintain the vehicle's battery; this will make it easier to start a diesel engine in cold weather.
- 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.
- Vanguard™ Premium Synthetic Oil is suitable for use from -40°F to 110°F (-40°C to 43°C).
- Drain the moisture from the tank when it is warm from extended operation.
- For additional engine precautions, consult the Engine Operator's Manual.

5.8.1.2 MACHINE OPERATION

At an extremely cold temperature, the viscosity of hydraulic fluid and lubrication oil may increase and the torque of starter may exceed its permissible value, hindering proper starting. 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.
- Heater blanket is available for air inlet solenoid (also see **NOTE** on this page for cold weather kit option).
- For engine precautions, consult the Engine Operator's Manual.

5.8.2 HIGH TEMPERATURE OPERATION

5.8.2.1 ENGINE OPERATION

High compartment temperatures can be caused by high ambient temperatures, small engine room, soundproof cases and other reasons. Among these the most important factor is the temperature of the intake and cooling air. Reduce load duty cycle to less than 60% when operating in ambient temperatures above 104°F (40°C).

Consult **Table 5F** for fuel, lubrication oil and cooling requirements under extreme temperatures. The standard

NOTE

If operating the machine in high humidity, the drain valve can be left partially open to relieve water build-up during operation. This water may contain a small amount of oil. Consult *Section A.5*, for order number.

NOTE

The effect of humidity should be taken into consideration when operating in areas with high temperatures.

TABLE 5F: REQUIREMENTS FOR HIGH TEMPERATURE OPERATION					
Item		Temperature		High 30° to 40°C (86° to 104°F)	Extremely high 40°C (104°F) or higher
		Combustion	Fuel	Type	No.2-D (ASTM D975-94)
Temperature					
Lubrication	Oil	Type	SAE #30, 10W30,15W40	SAE #40 or 20W50	
		Temperature	120°C (248°F) or lower		
Cooling	Reserve tank		Normal operation allowance	Reduce load to 60%	
	Radiator, fan				
Accessories	Permissible temperature		Starter, regulator, alternator, relay, timer : 80°C (176°F) or lower Emergency relay : 65°C (149°F) or lower		

recommendation of 10W-30 engine oil is suitable for operation in temperatures up to 104°F (40°C).

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

5.8.2.2 MACHINE OPERATION

When operating the machine in high temperature areas, precautions should be taken to prevent overheating. At the minimum, all coolers, including air passage ways around the coolers, should be free of debris and dirt. The fan, driven by its own hydraulic motor, is designed to run continuously to assure a constant flow of cooling air.

The operator should be aware that high temperatures can influence engine performance, which can directly effect some machine function capacity outputs.

5.8.3 HIGH DUST CONTENT OPERATION

5.8.3.1 ENGINE OPERATION

When the machine is to be used in continuously dusty environments, special care must be taken with the engine's air cleaner and radiator. The intake air must be cleaned with the air cleaner. Lowering of the radiator cooling capacity due to clogging dust must be prevented. If intake air resistance becomes higher, this will result in reduced output. In order to maintain air tight seals at the joining sections of intake system component parts, and thus to prevent foreign matter from entering, it is necessary to ensure the security of the air intake system to prevent the component parts from being damaged. This can be accomplished by performing more frequent

monitoring of the air filter and radiator coolers when operating in areas that contain a high dust content.

If the package is not being used for an extended period of time, an additional precaution, such as covering the machine with a tarp, will help to keep the inside of the machine free of dust particle accumulation.

5.8.3.2 MACHINE OPERATION

When the machine is to be used in continuously dusty environments, special care must be taken with the compressor air filter and cooler assembly, as well as the hydraulic fan cooler. This can be accomplished by performing more frequent monitoring of the air filter and coolers when operating in areas that contain a high dust content.

If the machine is not being used for an extended period of time, an additional precaution, such as covering the machine with a tarp, will help to keep the inside of the machine free of dust particle accumulation.

5.8.4 HIGH ALTITUDE OPERATION

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

SECTION 6: MAINTENANCE

6.1 GENERAL INFORMATION

A strict maintenance program is the key to long life for the Air N Arc 300 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 6.6, 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 61
Maintenance Schedule Table	6.3	page 63
Replacement Parts	6.4	page 66
Maintenance Access	6.5	page 66
Parts Replacement and Adjustment Procedures	6.6	page 70
Servicing the System Fuses and Circuit Breakers	6.7	page 102
Storage and Intermittent Use	6.8	page 102

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

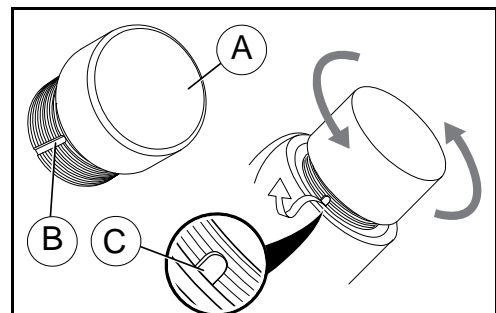


WARNING

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. Relieve the entire system pressure by opening the air tank drain/vent valve, which will vent all pressure to the atmosphere.

Wear personal protective equipment such as gloves, work boots, and eye and hearing protection as required for the task at hand.

Refer to *Figure 6-1*. Open fill cap **SLOWLY** (contents under pressure) to make sure all pressure has been relieved.



KEY	DESCRIPTION
A	RED COMPRESSOR FILL CAP
B	FILL CAP BLEED VENT GROOVE
C	Open/crack cap slightly to allow bleed vent to relieve pressure

Figure 6-1: Pressure Relief

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.

and compressor air filters are serviced, and the engine oil is changed.



WARNING

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

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

6.3 MAINTENANCE SCHEDULE TABLE

		INTERVALS					NOTE
		BREAK-IN PERIOD	MAINTENANCE SCHEDULE Hourly or Calendar Period - whichever comes first				
KEY	TASK DESCRIPTION	After 8 Hours or Daily	Every 100 Hours or One Year	Every 200 Hours	After 300 Hours	After 500 Hours	ACTION TO TAKE
1	Check tension of micro-v belt that drives the air compressor	●	●	●	●	●	Tighten belt if necessary. Consult Section 6.6.15.1 .
2	Change engine oil and engine filter	●	●				Consult the oil change procedure in the Engine Operator's Manual to change the engine oil and engine oil filter.
3	Check engine oil level	●	●	●	●	●	Consult engine oil level check procedure, Section 6.6.12 .
4	Check air tank for water accumulation	●	●	●	●	●	Drain any water from the air tank, per procedure in Section 6.6.9 .
5	Check air compressor oil level	●	●	●	●	●	Check resting oil level; follow compressor fill procedure (Section 6.6.3) if low.
6	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.
7	Inspect cooler fins (both engine and compressor oil coolers) for contamination	●	●	●	●	●	Clean or clear as necessary. Refer to Section 6.6.11 .
8	Inspect ventilation openings	●	●	●	●	●	Ensure openings are not blocked or clogged with debris. Clean or clear as necessary.
							Continued on next page

6.3 MAINTENANCE SCHEDULE TABLE

		INTERVALS						NOTE
		BREAK-IN PERIOD	MAINTENANCE SCHEDULE Hourly or Calendar Period - whichever comes first					
		First 20 Hours of Operation	After 8 Hours or Daily	Every 100 Hours or One Year	Every 200 Hours	After 300 Hours	After 500 Hours	
KEY	TASK DESCRIPTION	ACTION TO TAKE						
9	Clean and inspect engine air filter	●	●	●	●	●	●	Consult the air filter procedure in the Engine Operator's Manual to change the engine air filter.
10	Clean and inspect compressor air filter	●	●	●	●	●	●	Consult the air compressor air filter maintenance procedure (Section 6.6.1).
11	Change air compressor oil, oil filter and coalescer element		●	●			●	Consult the following sections for procedures on how to change compressor oil, oil filter and separator element: Compressor Oil: Sections 6.6.3 and 6.6.5 Compressor Oil Filter: Section 6.6.4 Coalescer Element: Section 6.6.6
12	Replace engine air filter		●	●	●	●	●	Consult the procedure in the Engine Operator's Manual on how to change the air filter.
13	Inspect air compressor drive belt and serpentine welder 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 re-tensioned or replaced, consult Section 6.6.15 .
14	Check battery cables and connections				●	●	●	Clean and tighten as necessary. Replace any worn cables.
15	Inspect unit mounting bolts				●	●	●	Tighten any loose mounting bolts as necessary.
16	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.)
								Continued on next page

6.3 MAINTENANCE SCHEDULE TABLE

		INTERVALS						NOTE
BREAK-IN PERIOD	MAINTENANCE SCHEDULE Hourly or Calendar Period - whichever comes first	After 8 Hours or Daily	Every 100 Hours or One Year	Every 200 Hours	After 300 Hours	After 500 Hours		
		First 20 Hours of Operation						
KEY	TASK DESCRIPTION	ACTION TO TAKE						
17	Replace engine fuel filters			●	●	●	Consult the procedure in the Engine Operator's Manual on how to change the engine filters.	
18	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 6.6.14 .	
19	Check the engine speed				●	●	Ensure that the engine speed is running at correct interval. Adjust if necessary, per Section 6.6.13 .	
20	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.	
21	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.	
22	Replace the air compressor and generator drive belts					●	Consult Section 6.6.15 on how to replace and re-tension the drive belts.	
23	Inspect the generators and the automatic belt tensioner					●	Ensure that the automatic belt tensioner is free of rough, noisy or worn bearings. Consult Section 6.6.15.3 .	

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**.

6.4 REPLACEMENT PARTS

Replacement parts should be purchased through your local Vanair representative or where the 300 Series Power System was purchased. If, for any reason, parts are not available in this manner, they can be purchased through Vanair directly.

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 6.8.2, Long Term Storage**.

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

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6.5 MAINTENANCE ACCESS

Although many of the maintenance requirements of the Air-N-Arc 300 Series machine package can be accessed via the hood or the lift out panel at the front, there are some components that may be difficult to reach, due to the design of the package. Maintenance issues in such locations are best accessed by removing the maintenance access panel assembly, consisting of the back panel [G], hood [H] and connected right-side panel [J] as found in **Figure 6-2**.

NOTE: Removing the back and right-side panels (maintenance access panel assembly) allows direct access to perform maintenance as found in the chart on page 68:

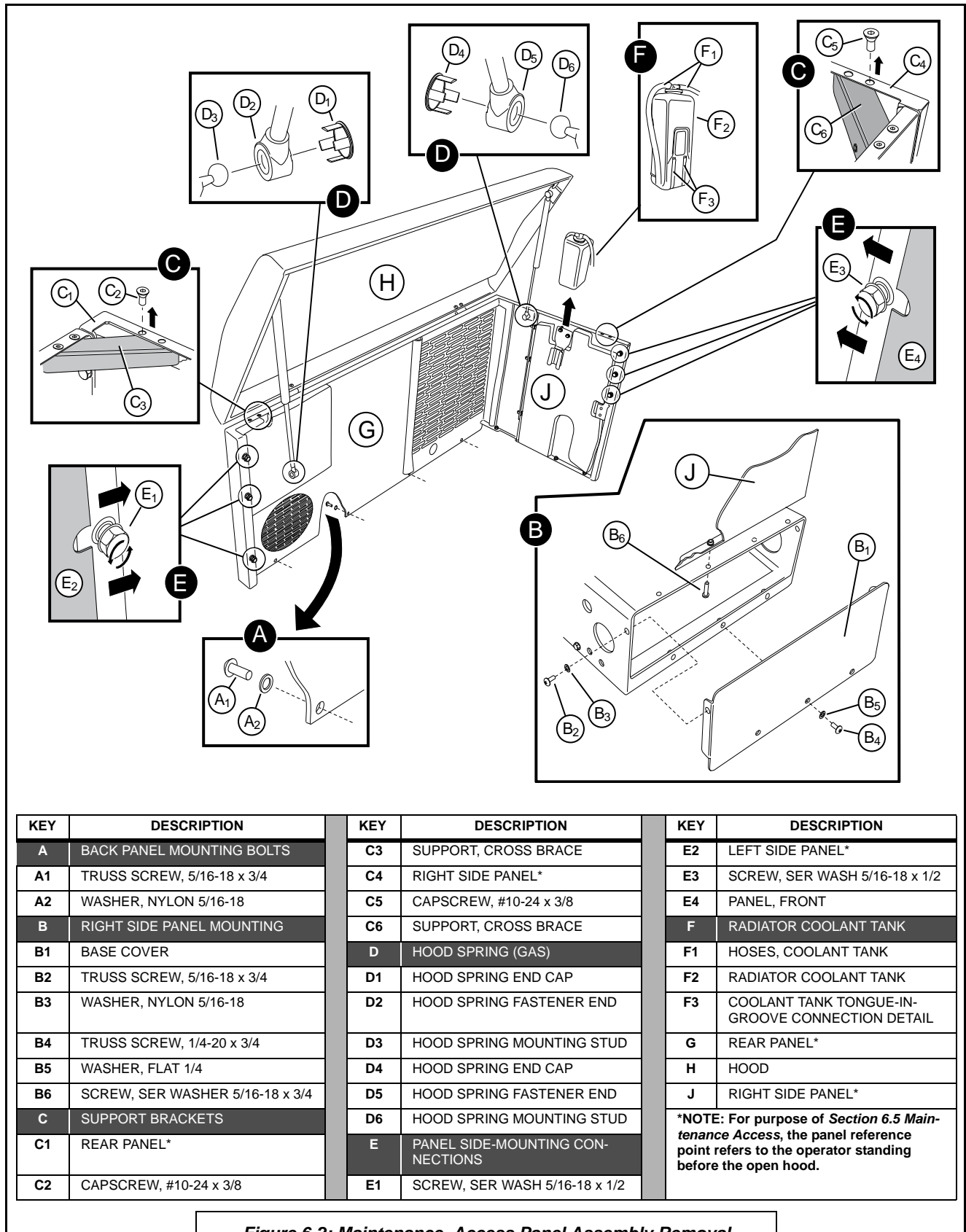


Figure 6-2: Maintenance Access Panel Assembly Removal

MAINTENANCE ISSUE	SECTION LOCATION
Compressor oil filter (easier to access with panels removed)	6.6.4
Engine Oil Filter Change	I
Engine Drive Belt Replacement	I
Engine Hydraulic Pump Drive Belt Replacement	6.6.15.5
Pressure Switch Adjustment	6.6.14
Main Cooler Assembly Cleaning (thorough)	6.6.11
Replace Fuses and Circuit Breakers	6.7
Generator Fuse Replacement	6.7
†Refer to the Engine Operator's Manual.	

Refer to **Figure 6-2** and the following procedure:

STEP 1 - REMOVE BOLTS MOUNTING BACK PANEL TO BASE FRAME

 WARNING
<p>Make certain that the machine is off, and the ignition key removed before attempting this procedure.</p>

Refer to inset [A] in **Figure 6-2**.

1. Remove the four (4) bolts [A₁] and four (4) washers [A₂] fastening the lower edge of the back panel to the base frame.

STEP 2 - FREE THE RIGHT SIDE PANEL FROM THE BASE FRAME

Refer to inset [B] in **Figure 6-2**, which shows the lower right side of the machine package.

1. Facing the base frame right-side base cover [B₁], remove the truss screw [B₂] and washer [B₃] fastening the base cover at the left side. Remove these same fasteners (B₁ & B₂) connecting the base cover's upper right side as well.

2. Remove the three (3) truss screws [B₄] and three (3) washers [B₅] from the bottom edge of the base cover [B₁].
3. Set the base cover [B₁] and hardware aside.
4. Remove the four (4) serrated washer screws [B₆] fastening the right-side panel [J] to the base frame.

STEP 3 - REMOVE THE CROSS BRACE SUPPORTS AT BACK LEFT AND FRONT RIGHT CORNERS

Refer to both insets [C] in **Figure 6-2**.

1. Remove the two (2) flat-head socket capscrews [C₂] connecting the cross brace [C₃] to the back panel [C₁].
2. Remove the two (2) flat-head socket capscrews [C₅] connecting the cross brace [C₆] to the right side panel [C₄] at the front.

STEP 3 - UNFASTEN THE HOOD SPRINGS FROM THE SIDE PANEL STUD MOUNTS

Refer to both insets [D] in **Figure 6-2**.

1. Remove the mounting end caps [D₁ & D₄] from the ends of the spring fasteners [D₂ & D₅] by carefully prying them loose with a screwdriver blade.
2. Pull the ends of the spring fasteners [D₂ & D₅] from the mounting studs [D₃ & D₆].

STEP 5 - LOOSEN THE BACK AND RIGHT-SIDE PANEL CONNECTION BOLTS

Refer to both insets [E] in **Figure 6-2**. Note: The back and right-side panels can remain attached to each other for the removal process.

1. Loosen the three bolts [E₁] at the back left corner, but do not remove; also loosen the three bolts [E₃] at the front right corner, but do not remove. Note: the bolts should be loose enough to allow for the panel grooves [E₂ & E₄] to slide away from the mounted bolts as shown in the inset diagrams.

STEP 6 - REMOVE THE RADIATOR COOLANT RECOVERY TANK

Refer to inset [F] in **Figure 6-2**.


1. Remove both hoses [F₁] from radiator coolant recovery tank [F₂] cap.
2. Grasp the tank and push/slide in an upward motion to separate the tank from the mounting bracket; tank is mounted to bracket via a tongue-and-groove connection [F₃].


STEP 7 - REMOVE THE BACK AND RIGHT-SIDE PANELS FROM THE BASE FRAME

Refer to both insets [E] in **Figure 6-2**. The maintenance access panel assembly, consisting of the back panel [G], hood [H] and connected right-side panel [J], is now ready to be separated from the machine package.

1. Carefully slide the freed back panel and the freed right-side panel so that their connecting bolts, still anchored in the panels, separate away from the grooves in the left-side panel [E₂] and the front panel [E₄].

Keep in mind when moving and setting aside the maintenance access panel assembly to minimize the amount of stress and bending: Move only as far as needed to allow for maintenance, and place on a level surface.

	CAUTION
<p>For safety reasons and to mitigate the possibility of damage, a minimum of two personnel should handle the actual removal of the maintenance access panel assembly from the base frame.</p>	

	WARNING
<p>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.</p>	

NOTE
<p>After all maintenance tasks have been performed, replace the maintenance access panel assembly in reverse order of Steps 1 through 7 above.</p>

6.6 PARTS REPLACEMENT AND ADJUSTMENT PROCEDURES

System Component or Part Group Task	Manual Section	Location
Parts Replacement and Adjustment Procedures	6.6	page 70
Compressor Air Filter	6.6.1	page 72
<i>Continued on next page</i>		

System Component or Part Group Task	Manual Section	Location
Compressor Air Filter Check	6.6.1.1	page 72
Compressor Air Filter Inspection	6.6.1.2	page 73
Compressor Air Filter Replacement	6.6.1.3	page 73
Repairing the Air Inlet Valve	6.6.2	page 74
Checking the Compressor Oil	6.6.3	page 76
Replacing the Compressor Oil Filter Element	6.6.4	page 77
Changing the Compressor Oil	6.6.5	page 78
Replacing the Air/Oil Spin-on Coalescer	6.6.6	page 79
Repairing the Compressor Shaft Seal	6.6.7	page 80
Part I - Removing the Compressor Serpentine Belt	6.6.7.1	page 80
Part II - Accessing the Compressor Unit Shaft Seal	6.6.7.2	page 82
Part III - Replacing the Compressor Serpentine Belt	6.6.7.3	page 83
Replacing the Air Inlet Solenoid Valve	6.6.8	page 83
Solenoid Valve—Preparation Before Mounting	6.6.8.1	page 85
Connecting the New Solenoid Valve	6.6.8.2	page 85
Draining the Air Tank	6.6.9	page 86
Rebuilding the Minimum Pressure/Check Valve	6.6.10	page 88
Setting the Minimum Pressure Valve	6.6.10.1	page 88
Inspecting the System Coolers	6.6.11	page 89
Checking the Engine Oil	6.6.12	page 90
Adjusting The Engine Speed	6.6.13	page 92
Adjusting The Pressure Setting	6.6.14	page 92
Replacing and Re-tensioning the Serpentine Drive Belts	6.6.15	page 93

Continued on next page



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

Do not mix different compressor fluid types. Use Vanguard compressor oil.

NOTE

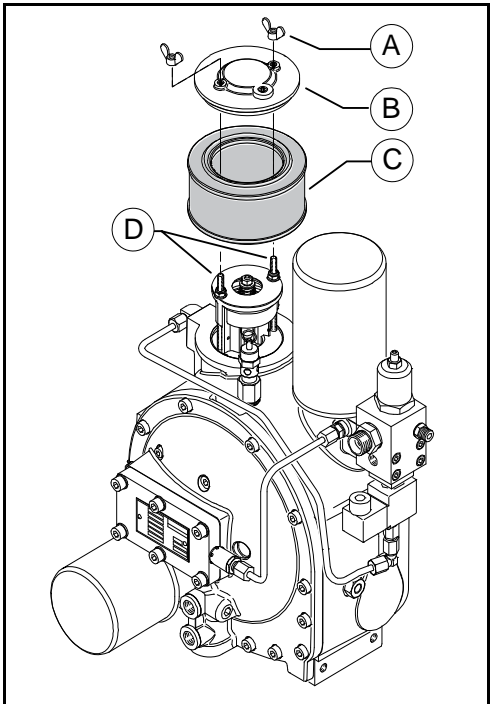
Refer to the Engine Operator's Manual for detailed maintenance and replacement procedures for the engine.

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.

WARNING

Relieve pressure from the compressor system before removing any components.



KEY	DESCRIPTION
A	WING NUT (x 2)
B	AIR FILTER MOUNTING COVER
C	AIR FILTER HOUSING ELEMENT
D	MOUNTING POSTS (x 2)

Figure 6-3: Compressor Air Filter

NOTE

If element is compromised by dirt, holes, tears, or the gaskets are worn, or it is in unsatisfactory condition, then it will need to be replaced.

System Component or Part Group Task	Manual Section	Location
Re-tensioning the Air Compressor Serpentine Drive Belt	6.6.15.1	page 93
Replacing the Air Compressor Serpentine Drive Belt	6.6.15.2	page 95
Re-tensioning the Generator Serpentine Drive Belt	6.6.15.3	page 97
Replacing the Generator Serpentine Drive Belt	6.6.15.4	page 98
Re-tensioning the Engine Hydraulic Pump Drive Belt	6.6.15.5	page 100
Replacing the Engine Hydraulic Pump Drive Belt	6.6.15.6	page 101

6.6.1 COMPRESSOR AIR FILTER

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.

6.6.1.1 COMPRESSOR AIR FILTER CHECK

Consult **Figure 6-3** and the following procedure to check the compressor air filter.

TOOLS/ITEMS NEEDED
Not Applicable

REPLACEMENT PART(S)
Not Applicable

1. With the machine off and the ignition key removed, open the hood panel.
2. Remove the two (2) wing nuts [A] from the air filter cover [B] at the top of the compressor unit.
3. Remove air filter element [C] from the air filter mounting posts [D].
4. Inspect the air filter element for visible dirt, debris, or damage. **NOTE:** To perform a more thorough inspection of the compressor air filter element, refer to **Section 6.6.1.2**.

If element is in adequate shape to continue using:

5. Re-seat the filter element [C] onto the air filter mounting posts [D].
6. Replace cover [B] and wing nuts [A].
7. Close hood.

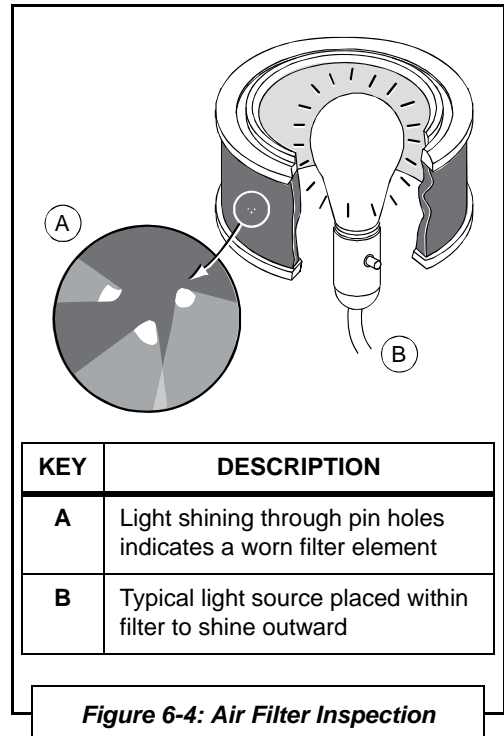
6.6.1.2 COMPRESSOR AIR FILTER INSPECTION

Consult **Figure 6-4** and the following procedure to inspect the compressor air filter.

TOOLS/ITEMS NEEDED
Light source

REPLACEMENT PART(S)
Not Applicable

1. Place a bright light source inside of the filter element and carefully inspect the filter from the outside in a dark environment to detect any pinholes or tears that may have developed.
2. Inspect the gaskets on the top and bottom of the air filter for any damage or wear.
3. Replace the element if it shows any damage or wear even if the inspection occurs before the recommended replacement interval. Consult **Section 6.6.1.3** if filter needs to be replaced.



6.6.1.3 COMPRESSOR AIR FILTER REPLACEMENT

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

TOOLS/ITEMS NEEDED
Container large enough to accommodate filter

REPLACEMENT PART(S)
Air Filter Element No. 264469

To replace worn or damaged air filter with new filter, consult **Figure 6-3**, and the following procedure:

1. With the machine off and the ignition key removed, open the hood panel and locate the compressor air filter.
2. Remove two (2) wing nuts [A] from the air filter cover [B] at the top of the compressor unit.

	<h2>WARNING</h2>
<p>Relieve pressure from the compressor system before removing any components.</p>	

3. Remove worn air filter element [C] from the air filter mounting posts [D].
4. Seat a new filter element [C] onto the filter mounting posts [D].
5. Replace cover [B] and wing nuts [A].
6. Close the hood.
7. Dispose of discarded filter within the guidelines of all applicable local, regional and/or federal laws.

6.6.2 REPAIRING THE AIR INLET VALVE

Should a condition occur that requires air inlet valve maintenance (see **Section 7.2, Troubleshooting Guide**), a repair kit is available. To repair the air inlet valve, order air inlet rebuild kit no. 264154-102. Refer to **Figure 6-5**, and the following procedure:

IMPORTANT
DO NOT let loose parts fall into the air inlet.

TOOLS/ITEMS NEEDED
Hex Head Screwdriver or Wrench
Adjustable Wrench

REPLACEMENT PART(S)
Air Inlet Rebuild Kit No. 264154-102

1. Shut down machine and lock out all power, as per the Safety Section of the manual.
2. Locate the compressor's air filter compartment housing and remove the two (2) wing screws [A] from cover [B].
3. Remove air filter [C], and put it aside temporarily so it will not get damaged or soiled; the full air filter inlet valve [D] is now accessible.
4. Remove the two (2) nuts [E] and two (2) washers [F] from the mounting posts [V].
5. Grasp the governor body [P] and pull upwards to disengage the valve from its seating.
6. Disassemble the valve and replace used parts with new parts found in the kit. Refer to **Figure 6-5** to assure correct part positions for re-assembly.
7. Once the valve's parts have been replaced with the kit parts and re-assembled, place the rebuilt, complete inlet valve assembly back into position on the mounting posts [V].

NOTE
Valve is under spring tension

NOTE
Use all of the parts provided in the kit regardless of the replaceable part's condition.

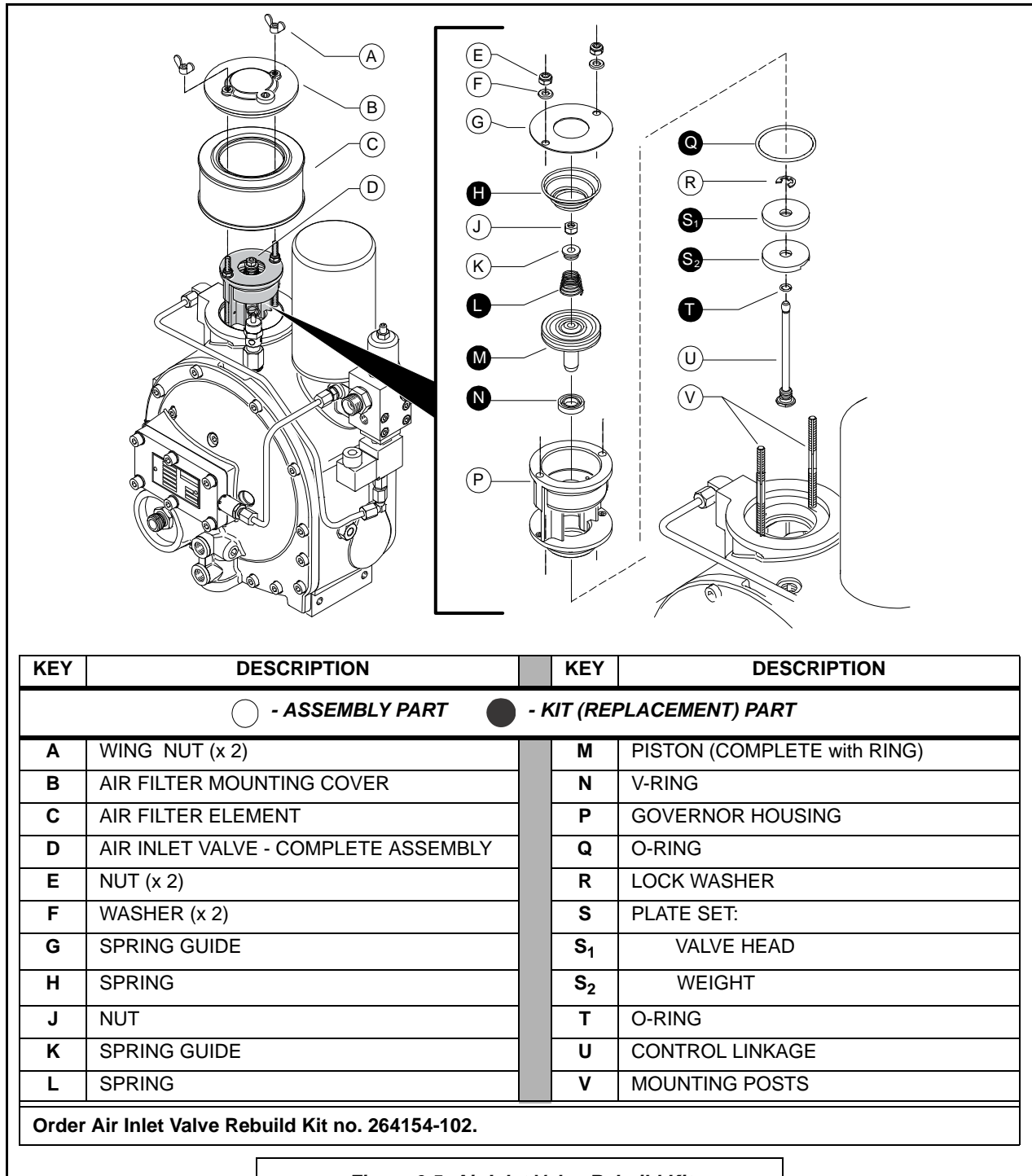


Figure 6-5: Air Inlet Valve Rebuild Kit

8. Replace the two (2) nuts and two (2) washers [F] on the mounting posts [V], and tighten securely.
9. Replace the air filter [C], or exchange it for a new one if air filter is soiled (refer to **Section**

6.6.1, **Compressor Air Filter** for air filter inspection check, etc.).

10. Replace the cover [B].
11. Replace the two (2) wing nuts [A], and secure tightly.

6.6.3 CHECKING THE COMPRESSOR OIL

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. Relieve the entire system pressure by opening the air tank drain/vent valve, which will vent all pressure to the atmosphere.

Refer to *Figure 6-1*. Open fill cap SLOWLY (contents under pressure) to make sure all pressure has been relieved.

DANGER

NEVER check the compressor oil level with the compressor running. Hot oil is under pressure and will spray, causing severe burns.

When checking compressor oil level, blow down the pressure to zero and allow system oil level to settle before removing the fill cap.

Having the proper amount of oil in the compressor system is essential to prolonging the equipment's useful life. Checking the compressor oil is the most important

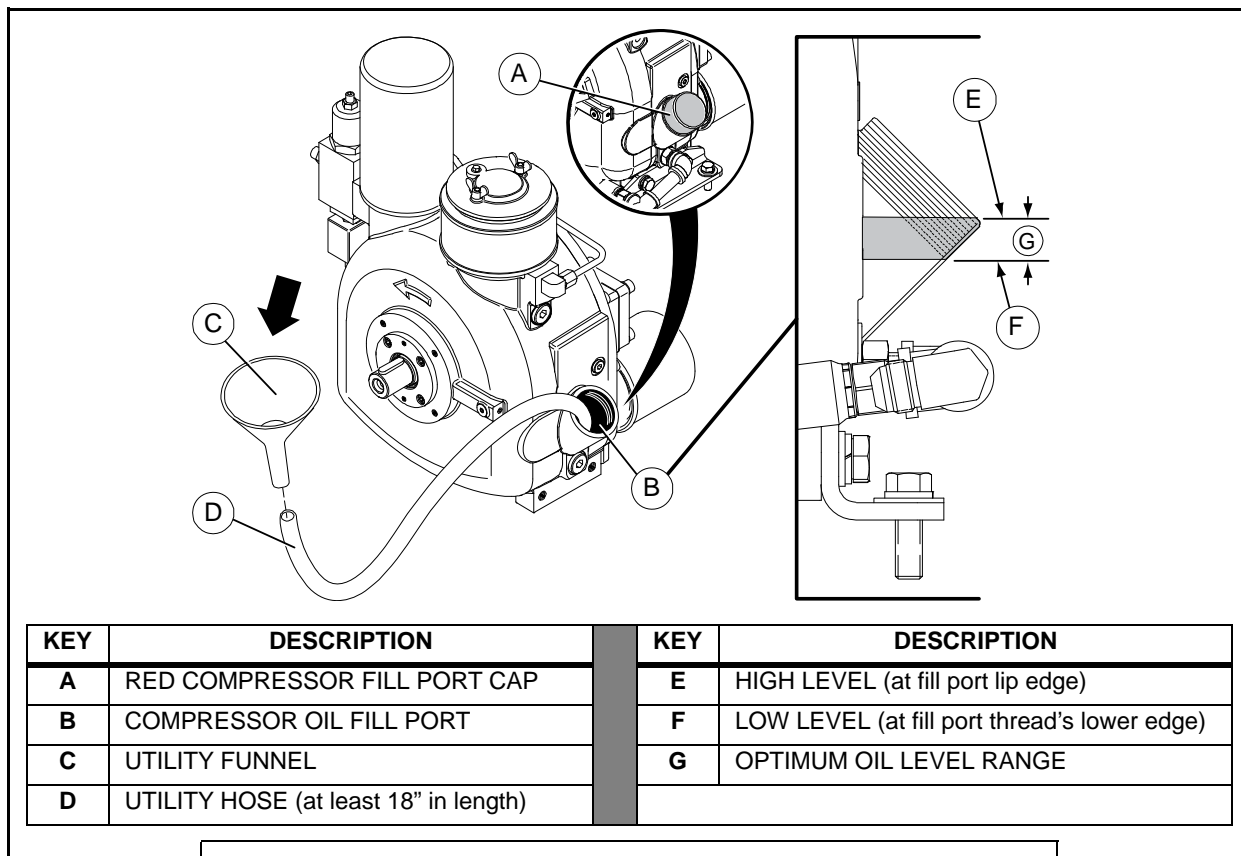


Figure 6-6: Compressor Oil Fill Location and Level Check


service to perform on the 300 Series All-In-One Power System package. Consult **Section 6.3, Maintenance Schedule Table** for routine compressor oil inspection intervals.

Consult **Figure 6-6** and the following procedure to check the compressor oil.

TOOLS/ITEMS NEEDED
Strap Wrench
Adjustable Wrench

REPLACEMENT PART(S)
Vanguard™ Premium Synthetic Oil No. 264626-1GAL

1. With the machine off and the ignition key removed, open the hood panel.
2. Locate the fill port of the compressor, and unscrew and remove the red oil fill cap [A].
3. Verify the oil level by comparing actual level to range [G] in **Figure 6-6**.
4. Add oil as needed; addition of oil to compressor chamber can be more easily accessed by using a utility hose [D] and funnel [C], as per **Figure 6-6**.
5. Replace the oil fill cap.

	WARNING
Compressor oil can ignite if it comes in contact with very hot surfaces, like a muffler or exhaust manifold on the engine.	

NOTE
This procedure should only be performed when the compressor is warm immediately after extended operation.

NOTE
The cooler has an aluminum core and if internal cleaning is required, it should be done at a qualified radiator shop. If the lubrication system is properly maintained (changing the oil and filters at the recommended intervals) an internal cleaning should not be necessary during the compressor's service life.

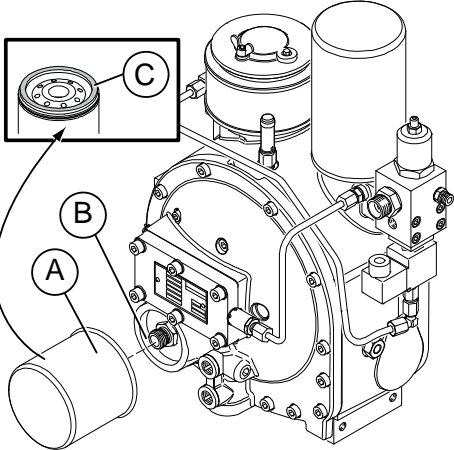
6.6.4 REPLACING THE COMPRESSOR OIL FILTER ELEMENT

The compressor oil filter element is a spin-on disposable type. Consult **Figure 6-7**, and the following procedure to change the compressor oil filter element. Consult **Section 6.3, Maintenance Schedule Table** for routine compressor oil element change intervals.

NOTE
For ease of access, the maintenance access panel assembly will need to be removed. Consult Section 6.5.

TOOLS/ITEMS NEEDED
Strap Wrench
Compressor Oil (enough to coat seal ring, and possibly for a top-off to the proper level)

REPLACEMENT PART(S)
Oil Filter Element No. 264471



KEY	DESCRIPTION
A	OIL FILTER ELEMENT
B	OIL FILTER SEATING
C	ELEMENT SEALING SURFACE

Figure 6-7: Compressor Oil Filter

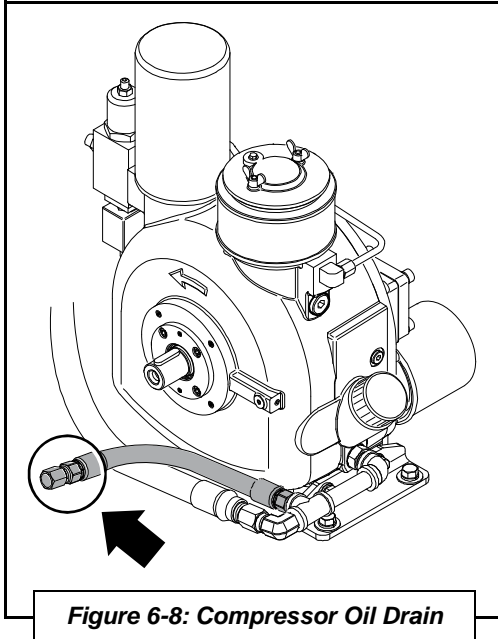



Figure 6-8: Compressor Oil Drain

1. With the machine off and the ignition key removed, open the hood panel access door.
2. Locate the compressor oil filter on the compressor unit body as per **Figure 6-7 [A]**.
3. Remove the worn oil filter element [A] by turning it counterclockwise using a strap wrench.
4. Clean the filter seating [B] on the compressor unit with a lint-free wiper or cloth.
5. Apply a light film of compressor oil to the replacement element's sealing surface rim [C] for an air-tight seal between the element and the filter seating.
6. Install the new element [A] by manually turning it clockwise onto the filter seating [B] until the seal contacts the machined groove on the rim of the filter seating. Then turn an additional 3/4 of a turn, using a strap wrench if necessary.
7. Run the compressor and check for leaks.
8. Dispose of discarded filter within the guidelines of all applicable local, regional and/or federal laws.

To check and/or replace or refill the compressor system, refer to **Section 6.6.5**.

6.6.5 CHANGING THE COMPRESSOR OIL

During periodic maintenance intervals, or more frequently if needed, it will be necessary to perform a complete compressor system oil change. Follow the procedure below, along with **Figure 6-8** and **Sections 6.6.3, 6.6.4** and **6.6.6** to change the oil.

 **WARNING**

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

Refer to **Figure 6-1**. Open fill cap **SLOWLY** (contents under pressure) to make sure all pressure has been relieved.

NOTE

This procedure should only be performed when the compressor is warm immediately after extended operation.

TOOLS NEEDED	REPLACEMENT PART(S)
Clean Utility Hose (18" in length)	Vanair® Vanguard™ Premium Synthetic Oil No. 264626-1GAL
Clean Utility Funnel	Oil Filter Element No. 264471
Strap Wrench	Air/Oil Coalescer Element No. 264470
Adjustable Wrench	
Oil Pan	
Clean Rag or Towel	

1. With the machine off and the ignition key removed, place a suitable receptacle under the compressor drain tube end and remove the drain cap.
2. After oil has completely drained, securely replace the drain cap.
3. Replace the oil filter (see **Section 6.6.4** for instructions on how to replace the compressor oil filter element).
4. Replace the air/oil coalescer (see **Section 6.6.6** for instructions on how to replace the spin-on air/oil coalescer filter).
5. Once the oil filter and air/oil coalescer have been replaced, access the compressor oil fill port by removing the cap ([A] in **Figure 6-6**) and filling the compressor unit to the service capacity level (two and a half [2.5] quarts) with Vanguard™ Premium Synthetic Oil. Note the acceptable range for the oil level [G] from **Figure 6-6** when filling the compressor unit reservoir.

IMPORTANT

Only Use Vanguard Premium Synthetic Oil.

6. Run the compressor momentarily, turn off, and verify that the level of compressor oil [G] is within satisfactory range.

6.6.6 REPLACING THE SPIN-ON AIR/OIL COALESCER

The air/oil coalescer element is a spin-on disposable type. Consult **Figure 6-9**, and use the following procedure to replace the coalescer element. Consult **Section 6.3, Maintenance Schedule Table** for routine coalescer element change intervals.

TOOLS NEEDED	REPLACEMENT PART(S)
Strap Wrench	Coalescer Replacement Element No. 264470
Compressor Oil (to coat seal)	

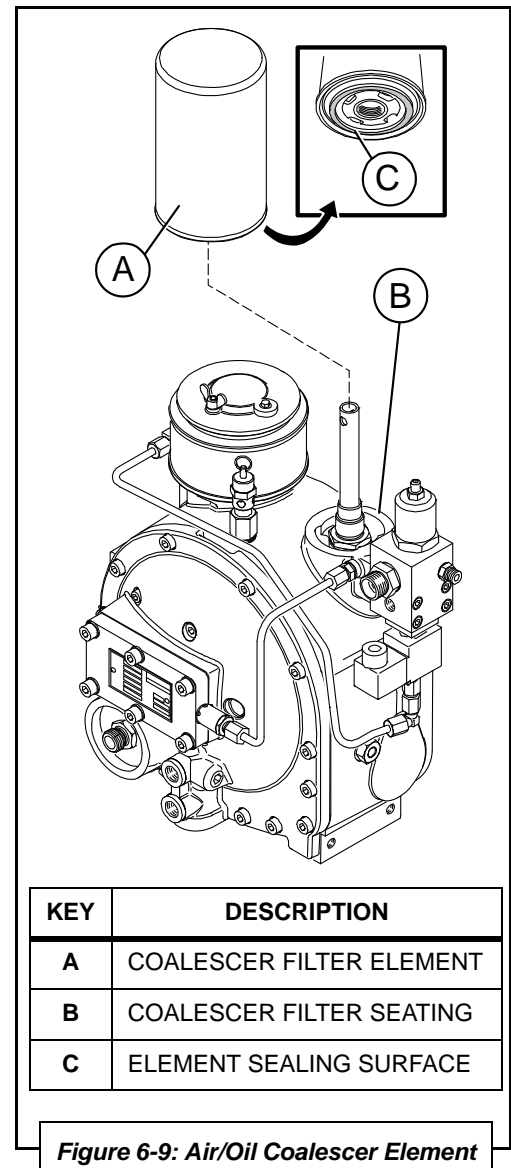
1. With the machine off and the ignition key removed, open the hood panel.
2. Locate the spin-on element situated on the topside at the rear of the compressor unit.

NOTE

DO NOT overfill the compressor system; stay within the recommended guidelines as prescribed in Section 3, Table 3B: Specifications - Air Compressor.

NOTE

For extreme weather conditions, refer to Section 5.8.



3. With the aid of a strap wrench, remove the old element [A] by turning it counterclockwise.
4. Apply a thin coat of compressor oil to the new seal [C] on the new element.
5. Install the new element [A] into place on the filter seating [B].
6. Turn element clockwise until it seats snugly. Rotate one more complete turn, using a strap wrench if necessary.
7. Run the compressor and check for leaks.
8. Dispose of discarded filter and drained oil within the guidelines of all applicable local, regional and/or federal laws.

6.6.7 REPAIRING THE COMPRESSOR SHAFT SEAL

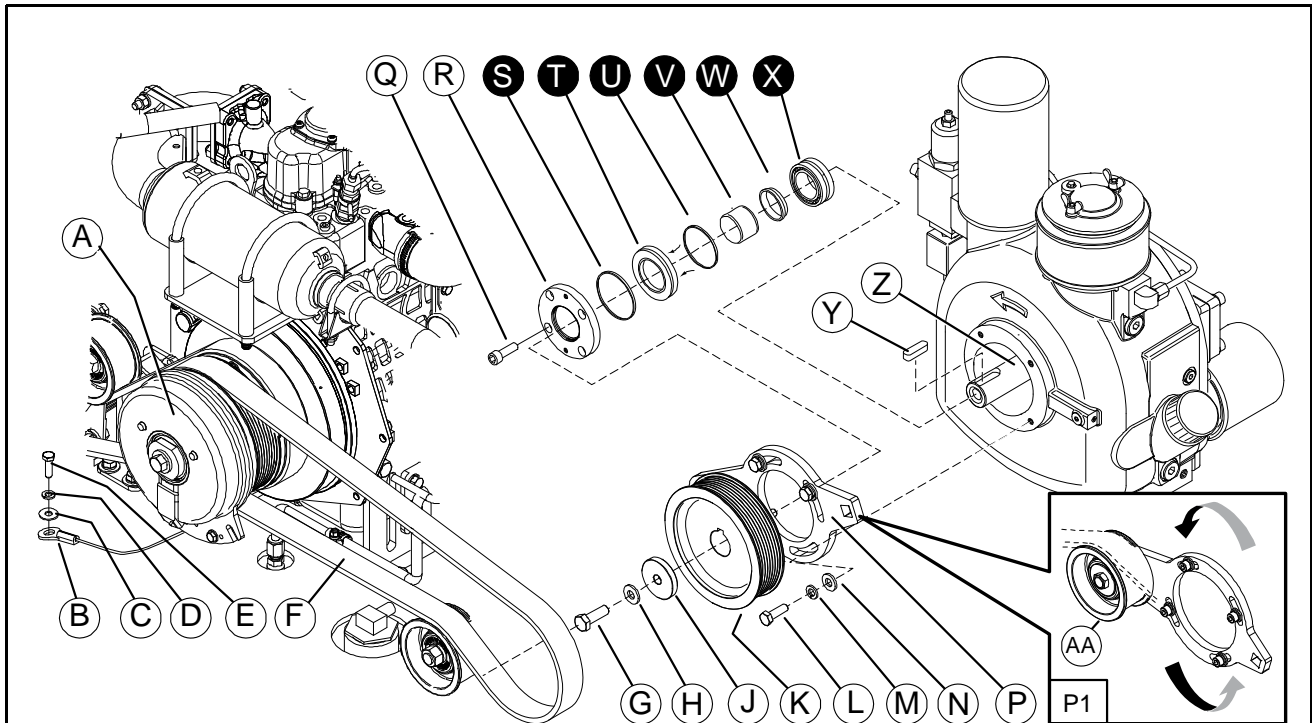
If the air compressor shaft seal requires servicing, order shaft seal repair kit no. 270766.

The compressor belt and compressor drive sheave must first be removed in order to access the seal components. Refer to **Figure 6-10**, and the following procedure to perform maintenance on the compressor shaft seal:

TOOLS NEEDED	REPLACEMENT PART(S)
Wrench - Size 6mm Hex Head	Shaft Seal Rebuild Kit No. 270766
Torque Wrench, 1/2" Drive	
Clean Cloth	
Puller Tool	

6.6.7.1 PART I – REMOVING THE COMPRESSOR SERPENTINE BELT

1. With the machine off and the ignition key removed, open the front access panel.
2. Locate the clutch retaining cable [B] secured to the base floor of the machine near the clutch apparatus [A] on the engine.
3. Loosen and remove retaining cable bolt [E], lock washer [D] and washer [C].
4. Slightly loosen the four (4) capscrews [L] enough to allow the compressor sheave (air end) tensioner plate [P] to rotate/slide counterclockwise [Insert P1] to its maximum position allowed by the plate's slots. This



KEY	DESCRIPTION	KEY	DESCRIPTION
○ - ASSEMBLY PART		● - KIT (REPLACEMENT) PART	
A	CLUTCH	P	AIR END TENSIONER PLATE
B	CLUTCH RETAINING CABLE	P ₁	TENSIONER PLATE ADJUSTMENT (refer to Section 6.6.15.1)
C	WASER	Q	PAN HEAD SCREW
D	LOCK WASHER	R	COMPRESSOR FRONT COVER
E	RETAINING CABLE BOLT	S	O-RING
F	SERPENTINE BELT (COMPRESSOR)	T	SHAFT SEAL RING
G	CAPSCREW (10MM 1.5 x 30MM)	U	SEAL O-RING
H	WASHER	V	INNER RING
J	SHEAVE WASHER	W	SPACER
K	DRIVE SHEAVE	X	NEEDLE BEARING
L	CAPSCREW (M8 x 1.25 x 30MM) (x4 for Plate)	Y	KEY
M	LOCK WASHER (M8) (x4 for Plate)	Z	MALE ROTOR DRIVE SHAFT
N	SHEAVE WASHER (M8) (x4 for Plate)	AA	COMPRESSOR TENSIONER SHEAVE

Order Shaft Seal Rebuild Kit no. 270766.

Figure 6-10: Compressor Shaft Seal Replacement

maximum position will loosen the serpentine belt [F] enough to be removed.

5. Remove serpentine belt [F].

6.6.7.2 PART II – ACCESSING THE COMPRESSOR UNIT SHAFT SEAL

1. Loosen and remove the drive sheave capscREW [G], washer [H] and sheave washer [J] securing drive sheave [K] into place.
2. Remove the drive sheave [K] from the end of the male rotor drive shaft [Z].
3. Remove key [Y] from the groove in the end of the male rotor drive shaft [Z].
4. Loosen and remove the four (4) M8 capscREWS [L], and also the lock washers [M], and sheave washers [N] securing the tensioner plate [P] into place.
5. Remove the four pan head capscREWS [Q], securing the front cover [R] to the front of the compressor unit.
6. Remove the front cover [R] to expose the seal assembly. Remove the worn o-ring [S], shaft seal ring [T], seal o-ring [U], inner ring [V], spacer [W] and needle bearing [X] from the end of the male rotor drive shaft [Z].
7. Wipe down any excess contaminants that may have accumulated on the male rotor drive shaft.
8. Replace the needle bearing [X] and spacer [W] with their new counterparts from the kit.
9. Replace inner ring [V] with its new counterpart from the kit; the inner ring should be gently tapped into place using the tool as a guide. Note that it should seat snugly on the spacer [W].
10. Replace metal seal o-ring [U] within the lip-end of the new shaft seal ring [T] (both parts from the kit).
11. Gently tap the shaft seal ring [T] onto the male rotor [Z].
12. When the edge of shaft seal ring [T] is flush with the inner ring [V] on the shaft, the shaft seal is in position.
13. Lubricate new o-ring [S] with the silicon lubrication supplied with the kit.

NOTE

Before attempting to affix the seal to the shaft, make note that the lip-end side of the shaft seal (which contains the seated metal seal o-ring [U]), faces the rotor.

14. Place o-ring [S] within the groove on the inside of the compressor cover [R].
15. Place the compressor cover [R] over its seating position on the compressor unit body.
16. Fasten compressor cover [R] to compressor body using the four (4) pan head screws [Q]. Tighten bolt pairs evenly in a criss-cross pattern (**Figure 6-11**).
17. Place the compressor tensioner plate [P] so that its holes line up with its compressor mounting surface.
18. Fit a lock washer [M] and sheave washer [N] over an M8 capscrew [L], and place it through one of the upper aligned holes of the tensioner plate and compressor cover. Screw it into place snugly, but not fully tightened.
19. Repeat Step #18 for the three remaining holes until the aligned tensioner plate [P] is secured (but not tightened) to the compressor unit; do not tighten the capscrews yet, as the tensioner plate will have to be adjusted to allow for repositioning of the tensioner sheave/serpentine belt.

6.6.7.3 PART III – REPLACING THE COMPRESSOR SERPENTINE BELT

1. Replace/re-thread the serpentine belt [F] back onto the engine sheave and compressor drive sheave [K], making sure that the belt lies over the compressor tensioner sheave [AA] (as shown in insert P1).
2. For details on how to adjust the compressor belt tension, consult **Section 6.6.15.1, Retensioning the Air Compressor Serpentine Belt**. Note that if either of the serpentine belts driving the compressor or the generator needs to be replaced, then both should be replaced at the same time (consult **Section 6.6.15** in this Operator's Manual).

6.6.8 REPLACING THE AIR INLET SOLENOID VALVE

If an air inlet malfunction is caused by a faulty solenoid signal, the solenoid valve will need to be replaced. Order air inlet valve replacement kit no.270775. Refer to **Figure 6-12**, and the following procedures:

NOTE

If present, scrape off any remnant pieces of previous gasket from the compressor cover [R] before replacing o-ring.

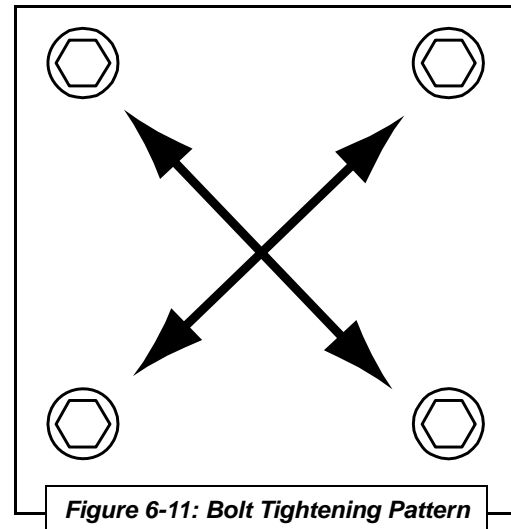


Figure 6-11: Bolt Tightening Pattern

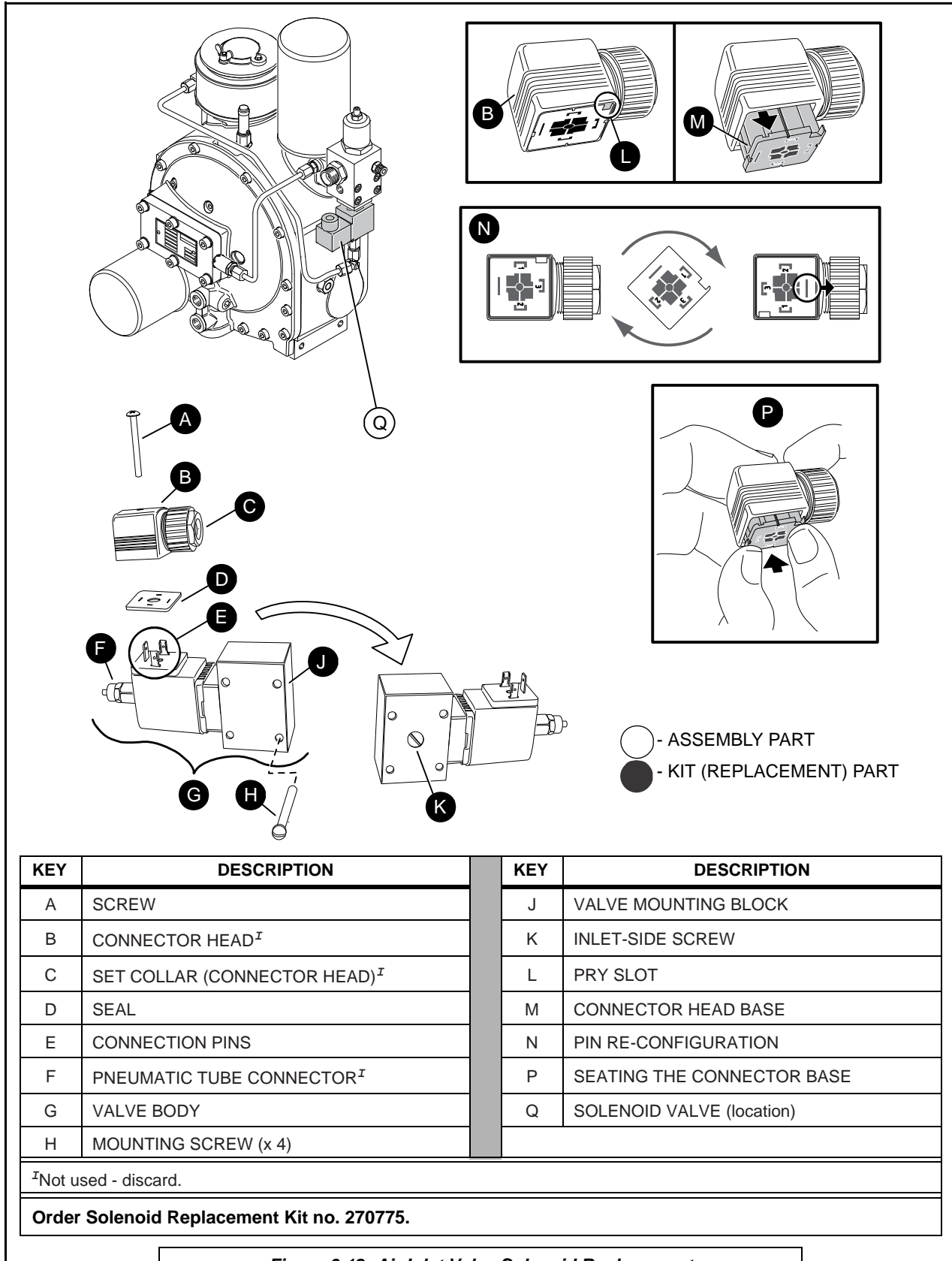


Figure 6-12: Air Inlet Valve Solenoid Replacement

TOOLS NEEDED	REPLACEMENT PART(S)
Screwdriver	Solenoid Replacement Kit No. 270775

6.6.8.1 SOLENOID VALVE – PREPARATION BEFORE MOUNTING

Before installing the new solenoid, the connector's base needs to be rotated so that the connector situates correctly with the wire direction once it is plugged into the solenoid block. To achieve the correct connector base configuration:

1. Unpack the new solenoid valve from the kit packaging.
2. Remove the screw [A] securing the connector head [B] to the valve body [G], and gently pull the connector away from the solenoid block's connection pins [E].
3. Remove the seal [D].
4. Set the solenoid block aside, taking care not to bend or damage the three connector pins [E].
5. Insert a screwdriver into the access indent on the base [K]. Apply prying pressure to the pry slot [L], so that the base comes away from the connector head (shown in [M]).
6. Rotate the base so that the slit corresponding to the only flat pin is closest to the wire connection end of the valve connector head, as shown in [N].
7. While holding the connector, with your thumbs, push the base into the connector head until it snaps into place [P]. Base should be flush with the connector head to assure a good seating.
8. Replace the seal [D] over the pins [E] on the valve body.
9. Gently push the connector head [B] onto the valve body; the pins will now align the collar side [C] of the connector head so that it points away from the valve mounting block [J] side of the valve body.

6.6.8.2 CONNECTING THE NEW SOLENOID VALVE

Refer to **Figure 6-12** and the following procedure:

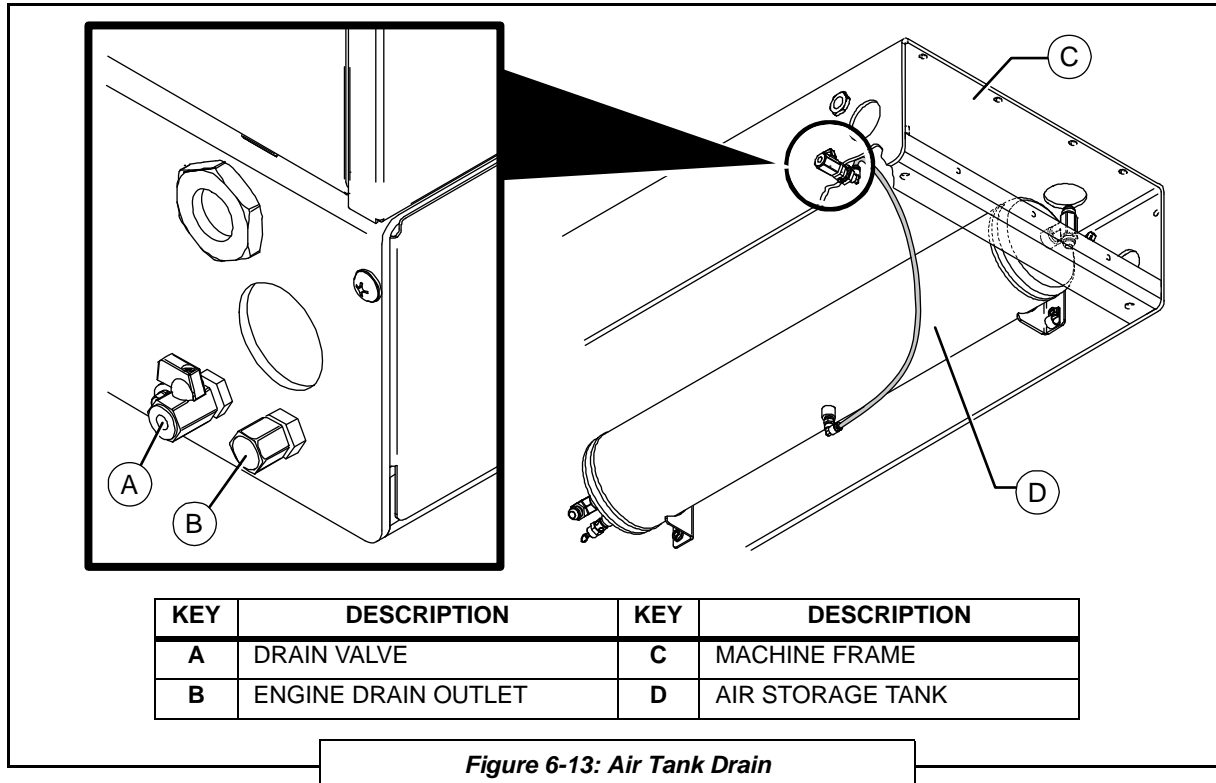
1. With the machine off and the ignition key removed, locate the inlet solenoid valve [Q] mounted on the compressor's control manifold.
2. Remove the top securing screw [A] of the valve connected to the unit, and gently pull the connector away from the solenoid block's connection pins [E].
3. Remove the wires connected to the valve connector head [B] by unscrewing the collar [C] securing the wires in place.
4. Remove the collar from the pneumatic tube connection [F] to separate the tube from the body.
5. Remove the four (4) screws [H] securing the solenoid block to the unit.
6. Position the new solenoid valve body so that the four (4) mounting holes of the valve body align with the four (4) holes on the unit mounting surface. Note that the screw [K] side of the new valve faces into the compressor unit.
7. Use the four (4) mounting screws from the kit [H] to secure the new valve body to the compressor unit.
8. Unplug the connector head from the new solenoid body, but leave the seal in place.
9. Unscrew the collar [C] from the new connector head.
10. On the wire, replace the old connector collar with the new one from the new connector head.
11. Run the collar up the wire, and secure it to the valve connector head.
12. Position the connector head onto the valve body making sure the pins align correctly before applying pressure.
13. Connect the pneumatic tube [F] to the new valve body.
14. Test the unit to assure that the valve is working properly.

NOTE

If operating the machine in high humidity, the drain valve can be left partially open to relieve water build-up during operation. This water may contain a small amount of oil.

6.6.9 DRAINING THE AIR TANK

Refer to **Figure 6-13**. 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 ball



valve located at the lower right corner of the base frame on the back end of the machine. 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.

TOOLS NEEDED
Catch Tray or Cloth to Absorb Drained Moisture

REPLACEMENT PART(S)
Not Applicable

1. Turn handle of drain valve [A] to release moisture buildup. If preferred, place a container below the valve to catch discharge.

NOTE

The 1/4" NPT fitting at the end of the drain valve can be piped to a holding tank.

2. Close the valve after the water has drained off.

6.6.10 REBUILDING THE MINIMUM PRESSURE/ CHECK VALVE

Should a condition occur that requires the minimum pressure/check valve to be serviced (see **Section 7.2, Troubleshooting Guide**), a repair kit is available. To repair the minimum pressure/check valve, order minimum pressure/check valve kit no. 270765. Refer to **Figure 6-14**, and the following procedure:

TOOLS NEEDED	REPLACEMENT PART(S)
Clean Cloth	Minimum Pressure/ Check Valve Rebuild Kit No. 270765
Adjustable Wrench	

1. With the machine off and the ignition key removed, open the hood panel.
2. Locate the minimum pressure/check valve [A] situated on the compressor unit's control manifold, close to the coalescer element.
3. Loosen and remove the lock nut [B] securing the grub screw [C] in position.
4. Loosen the grub screw [C] to relieve any spring tension in the valve.
5. Loosen and carefully remove the valve body [D], which holds the internal parts in place. The internal parts will be freed to drop out with the removal of the valve body.
6. Wipe internal surface of valve body [D] with a clean cloth.
7. Consult **Figure 6-14**, and re-assemble the kit by replacing all old parts with corresponding part provided in the kit.
8. Once the kit parts (parts E through L) have been situated in correct order into the valve body, replace the valve body back into the mounting position. Retighten body securely.
9. Replace the grub screw [C] into position on valve body [D], and hand-tighten. Replace the lock nut [B] over the grub screw, and position it loosely over the grub screw.

NOTE

Use all of the parts provided in the kit regardless of the replaceable part's condition.

6.6.10.1 SETTING THE MINIMUM PRESSURE VALVE

1. Start the machine and allow it to assume idle speed.

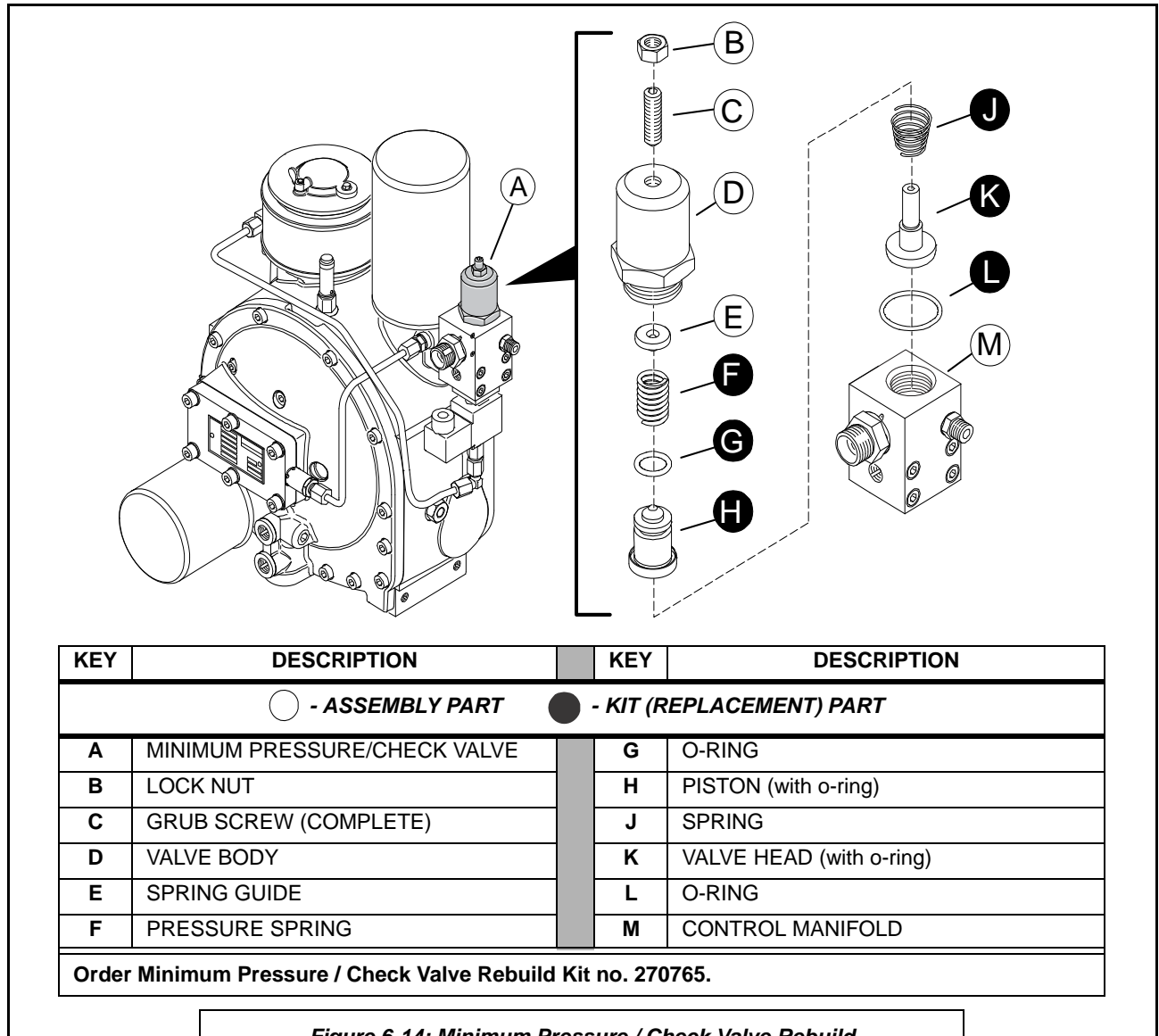


Figure 6-14: Minimum Pressure / Check Valve Rebuild

2. Start the compressor and allow it to accumulate pressure build-up.
3. Using the panel pressure gauge as a guide, adjust the grub screw [C] until minimum pressure level is achieved.
4. Tighten the lock nut [B] to secure the grub screw at the proper minimum pressure level.

6.6.11 INSPECTING THE SYSTEM COOLERS

Refer to **Figure 6-15**. Periodically as per **Section 6.3, Maintenance Schedule Table**, inspect the cooler fins of both the engine and the compressor for any build up of

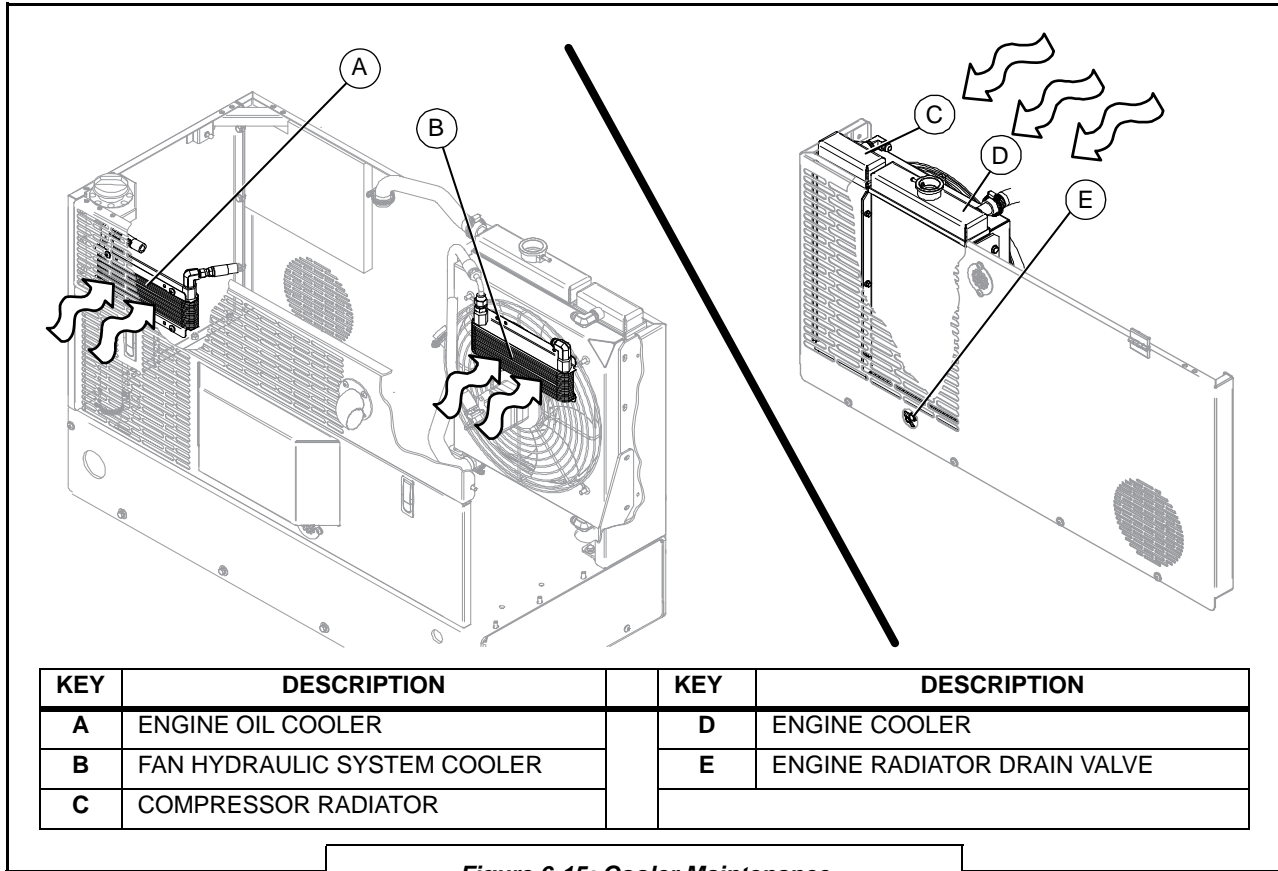


Figure 6-15: Cooler Maintenance

NOTE

Use only low pressure air to clean the cooler fins. DO NOT use high pressure air or a pressure washer.



WARNING

For any engine maintenance function, the operator must be familiar with all safety referrals in Section 1: Safety and the Engine Operator's Manual.

NOTE

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

dirt or contamination. Should any residue appear during inspection, clear with the use of air blown across the surface of the cooler fins.

6.6.12 CHECKING THE ENGINE OIL

Refer to **Figure 6-16**. 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

Clean Cloth

REPLACEMENT PART(S)

Engine Oil^I

^IEngine may need additional amount of oil if low. Consult Engine Operator's Manual for oil grade used, amount needed, and oil change intervals.

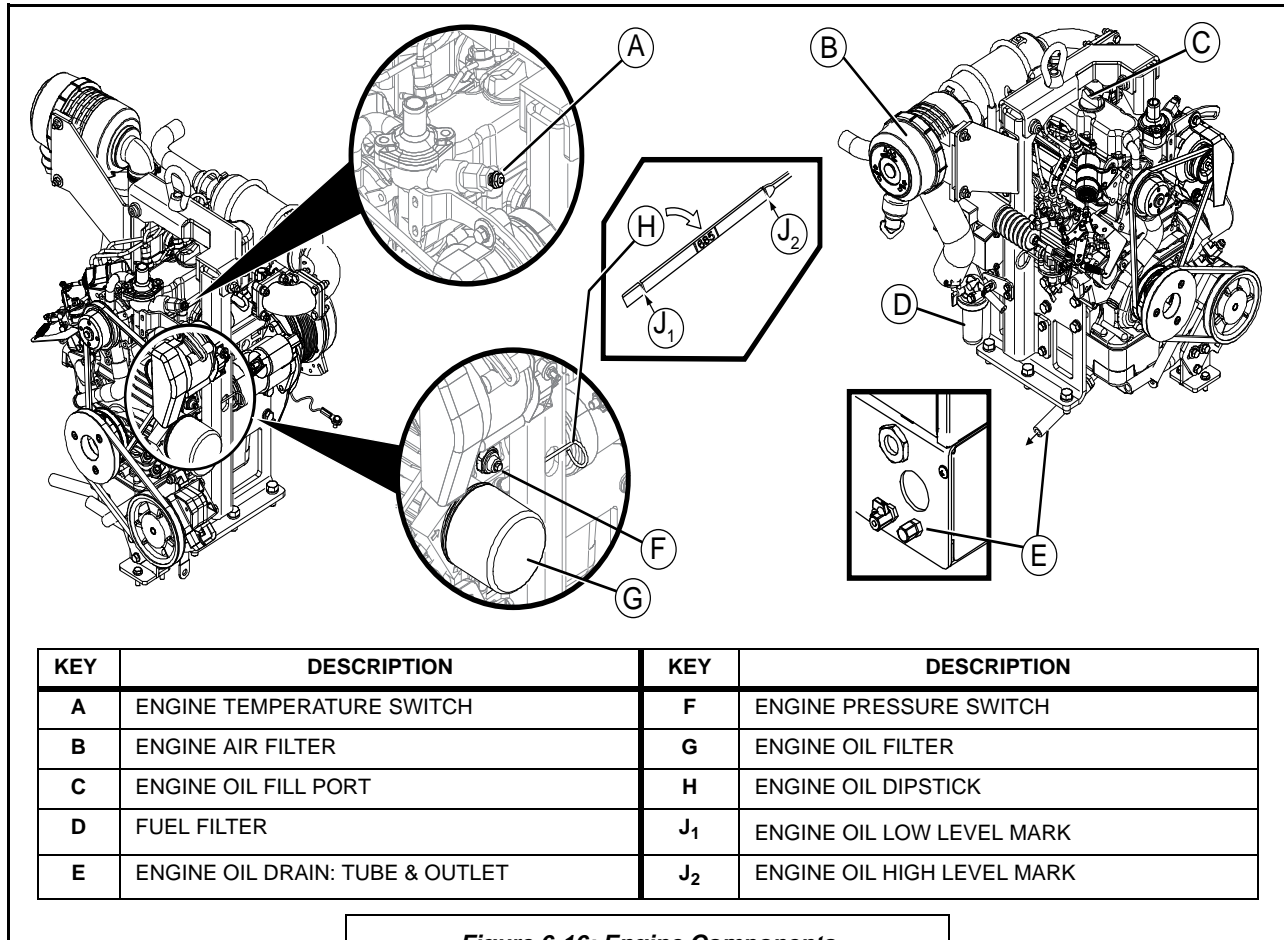


Figure 6-16: Engine Components


1. Locate the engine dipstick handle [H] 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.

The level should be somewhere within the range shown on the stick [between J₁ and J₂]. 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 [C].

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

NOTE


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

 **WARNING**

The compressor cut-in/cut-out pressures have been factory-adjusted within the limits of the compressor manufacturer. The maximum pressure limit of the compressor is 175 psi. Pressure should never be allowed to go beyond this limit or what has been set by local laws and regulators. This system will disengage the clutch at 185 psi. A 200 psi safety relief valve is located on the air tank to prevent over pressurizing the system.

NOTE

There must be a minimum of 25 psi difference between the cut-in and cut-out pressures for the system to operate properly.

 **WARNING**

Pressure settings (both minimum and maximum) are pre-secured within the rated capacity levels for this machine at the factory before shipping. However, it may be necessary to manually adjust. NEVER adjust the pressures beyond the recommended or rated capacity specified for the machine.

section, consult the Engine Operator's Manual for oil change scheduling, and the procedure on how to change the engine oil.

6.6.13 ADJUSTING THE ENGINE SPEED

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

NOTE

Do not tamper with the governor setting to increase the maximum engine speed. Overspeed is hazardous and will void the engine warranty.

6.6.14 ADJUSTING THE PRESSURE SETTING

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.

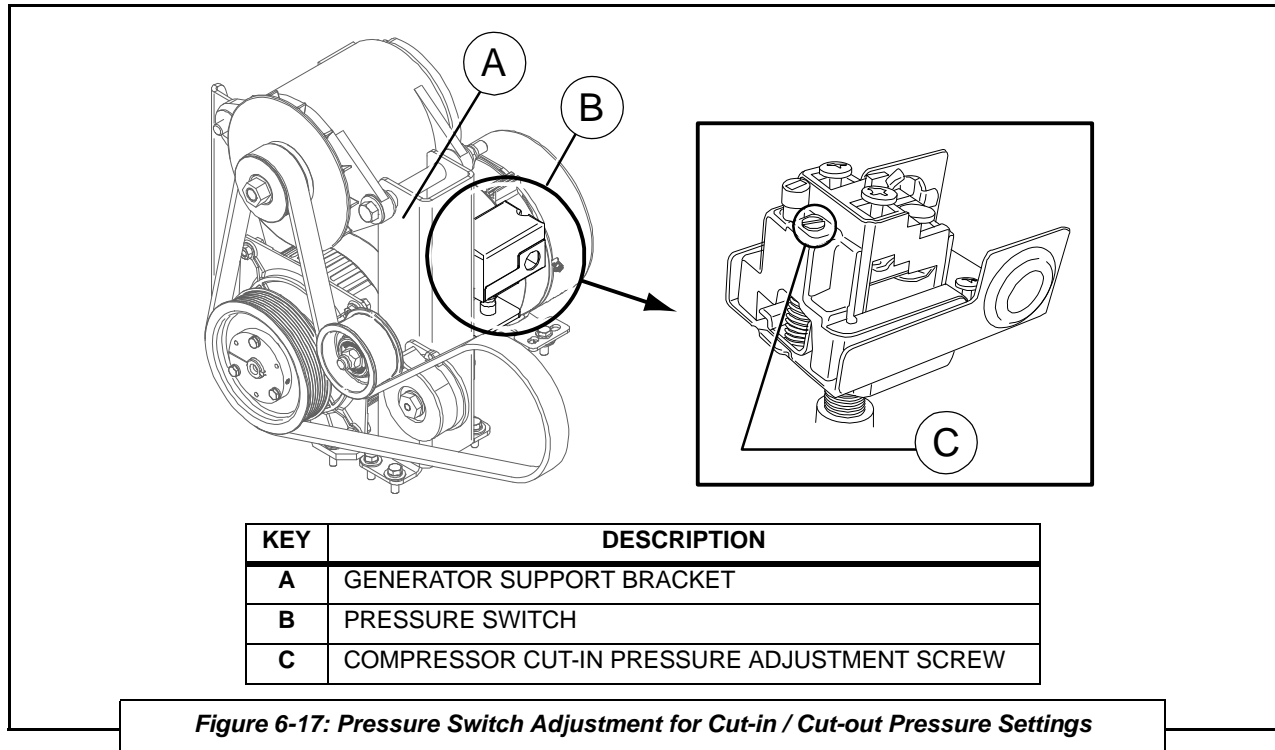
The **Cut-out pressure** is defined as the pressure in which the compressor stops pumping. When the pressure in the air tank rises above this pressure the compressor is signaled to stop pumping.

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 **Figure 6-17**, and the following procedure:

TOOLS NEEDED
Screwdriver

REPLACEMENT PART(S)
Not Applicable

1. Locate the air pressure control switch [B] at the rear-side of the generator support bracket [A]. Remove the cover-retaining screw fastening the cover to the switch, and remove the cover.
2. To adjust the compressor pressure, turn the cut-in pressure adjustment screw [C] clockwise to increase the pressure and counterclockwise to lessen the pressure.



3. After making your adjustments, position and re-fasten the cover to the pressure switch body with the cover retaining screw.
4. Close the hood, and cycle the compressor several times to ensure the correct pressures are set.
5. If additional adjustments are needed, repeat steps one through four until the correct pressures are set.

NOTE

Vanair® recommends that the air compressor and generator serpentine belts both be changed at the same time even if only one of the belts is in need of being changed.

NOTE

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

Misalignment of the v-belts can cause unnecessary jumping and wear of the belt, resulting in the belt coming off.

6.6.15 REPLACING AND RE-TENSIONING THE SERPENTINE DRIVE BELTS

The compressor and generator are driven by the engine using two belts. The belts will generally not need replacement during the service life of the compressor system. However, you may find that over time they 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.

6.6.15.1 RE-TENSIONING THE AIR COMPRESSOR SERPENTINE DRIVE BELT

Consult **Figure 6-18**, and the following procedure.

WARNING

Never operate the machine with the access door removed.

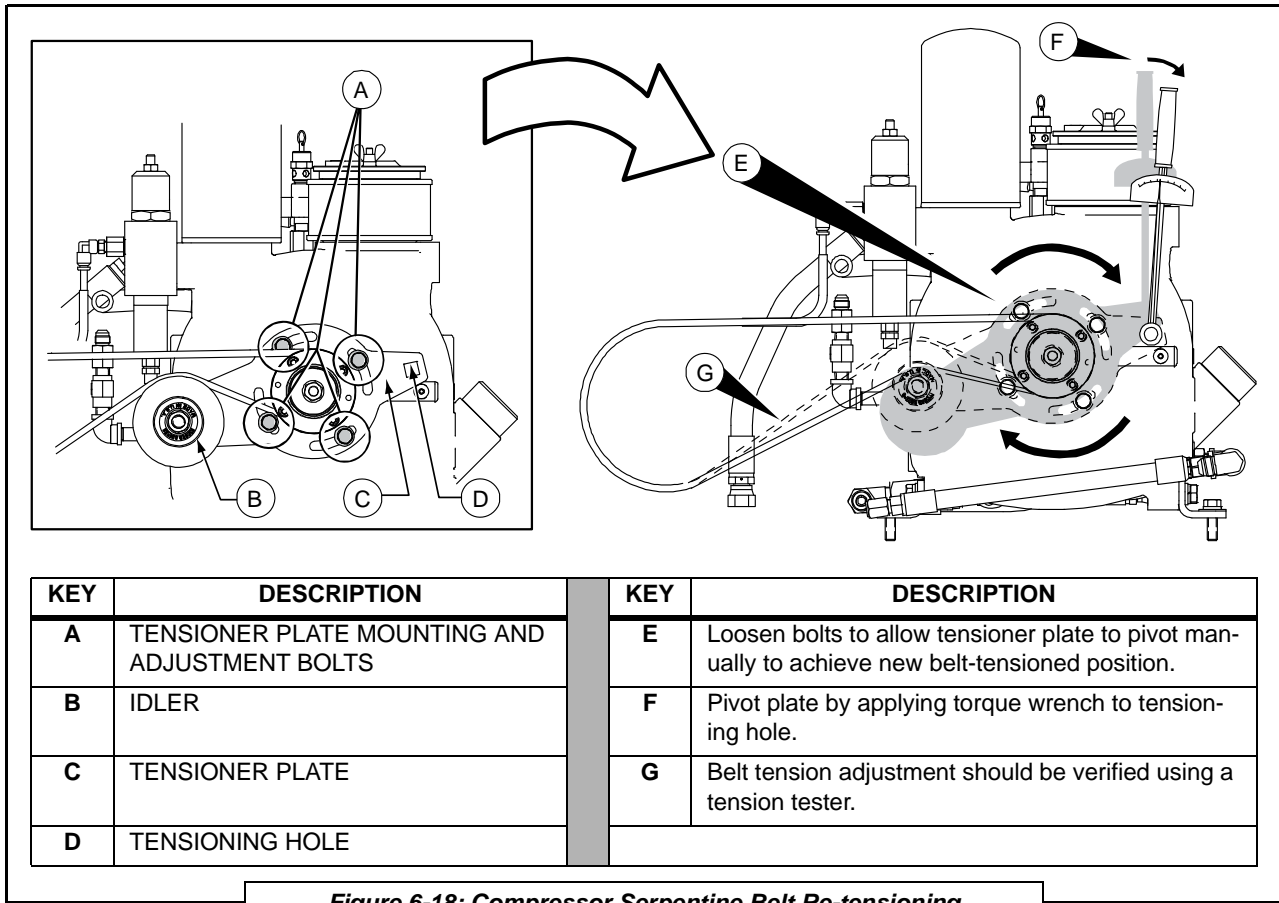


Figure 6-18: Compressor Serpentine Belt Re-tensioning

NOTE

If new belts are installed, recheck the tension after 10-20 hours of operation, and adjust if necessary.

TOOLS NEEDED

- Wrench - Size 6mm Hex Head
- Torque Wrench, 1/2" Drive

REPLACEMENT PART(S)

Not Applicable

1. With the machine off and the ignition key removed, open and remove the front panel.
2. Loosen the four tensioner plate bolts [A] mounting the tensioner plate [C] to the compressor only enough to allow tensioner plate to rotate/slide along the grooves in the plate while still in position (**DO NOT** remove).
3. Use a 1/2" drive torque wrench applied to the square tensioning hole [D] to manually rotate the plate/idler about the loosened, but anchored, mounting bolt. Apply torque of 51 in-lbs as per **Table 6B: Measuring Belt**

TABLE 6B: MEASURING BELT DEFLECTION [‡]					
			<p>P - Span Length c - Center Distance F - Deflection Force q - Deflection Distance</p>		
SPAN LENGTH (in)	DEFLECTION DISTANCE (in)	DEFLECTION FORCE (lbs)			
		ALL RIBS		TORQUE TO IN-LB TENSION	
		RE-TENSION	NEW INSTALL	RE-TENSION	NEW INSTALL
17.91	0.25	12.000	18.5	53	81
[‡] All measurements given are estimations.					

Deflection for the proper tension measurement.

- Once a position is achieved that accounts for a satisfactory tension in the belt, torque the four (4) tensioner plate bolts [A] to 12 ft-lbs (16.3 Nm) to secure the tensioner into position.

6.6.15.2 REPLACING THE AIR COMPRESSOR SERPENTINE DRIVE BELT

To replace the air compressor serpentine belt consult **Figures 6-19** and **6-20**, and the following procedure:

TOOLS NEEDED	REPLACEMENT PART(S)
Socket Wrench - Size 6 mm Hex Head (for Tensioner Plate Bolts)	Serpentine Belt No. DR27584
Torque Wrench, 1/2" Drive	
Ratchet, 1/2" with Extension	

- With the machine off and the ignition key removed, open and remove the access panel.
- Locate the clutch retaining cable ([F] in **Figure 6-19**) secured to the base floor of the machine near the clutch apparatus of the engine.

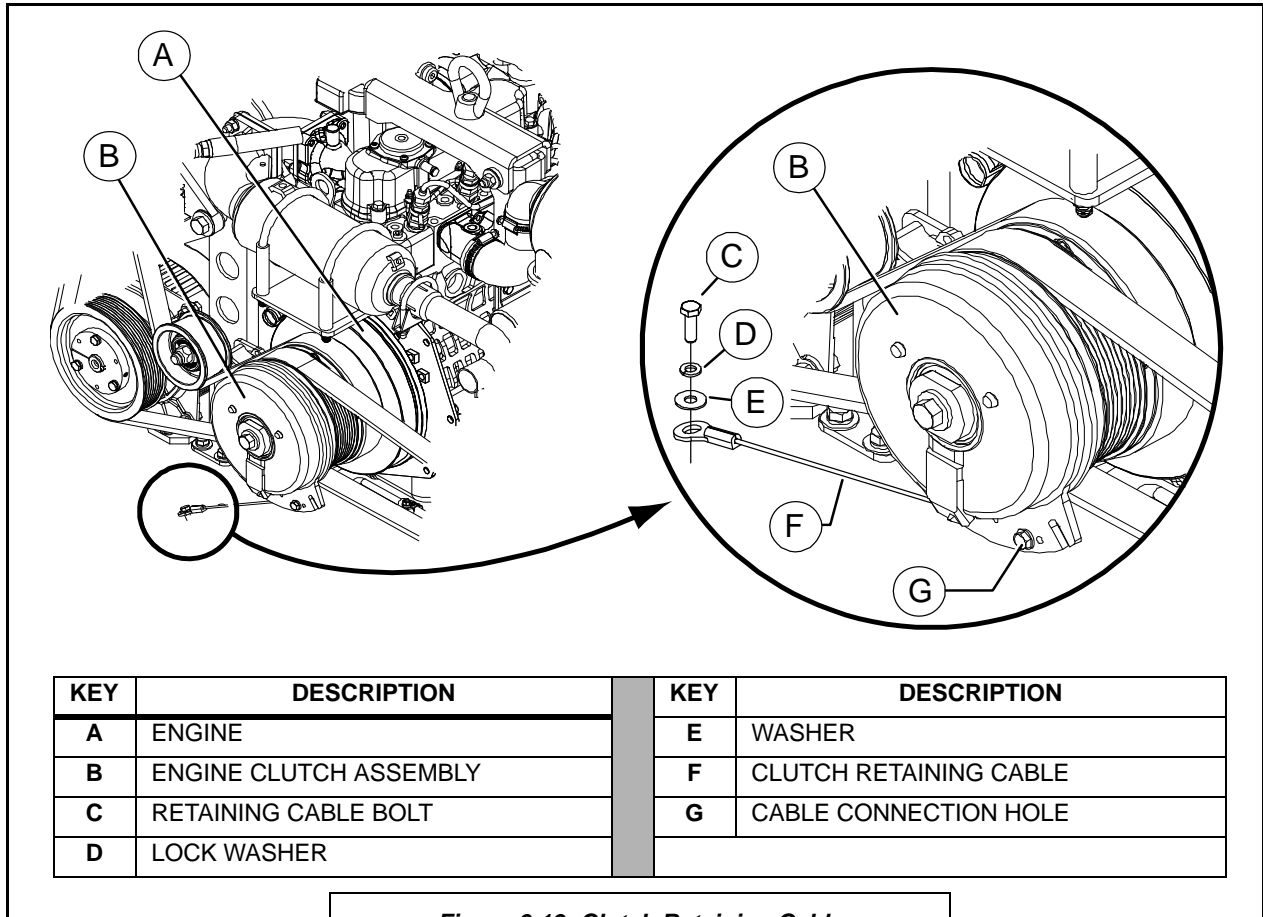


Figure 6-19: Clutch Retaining Cable

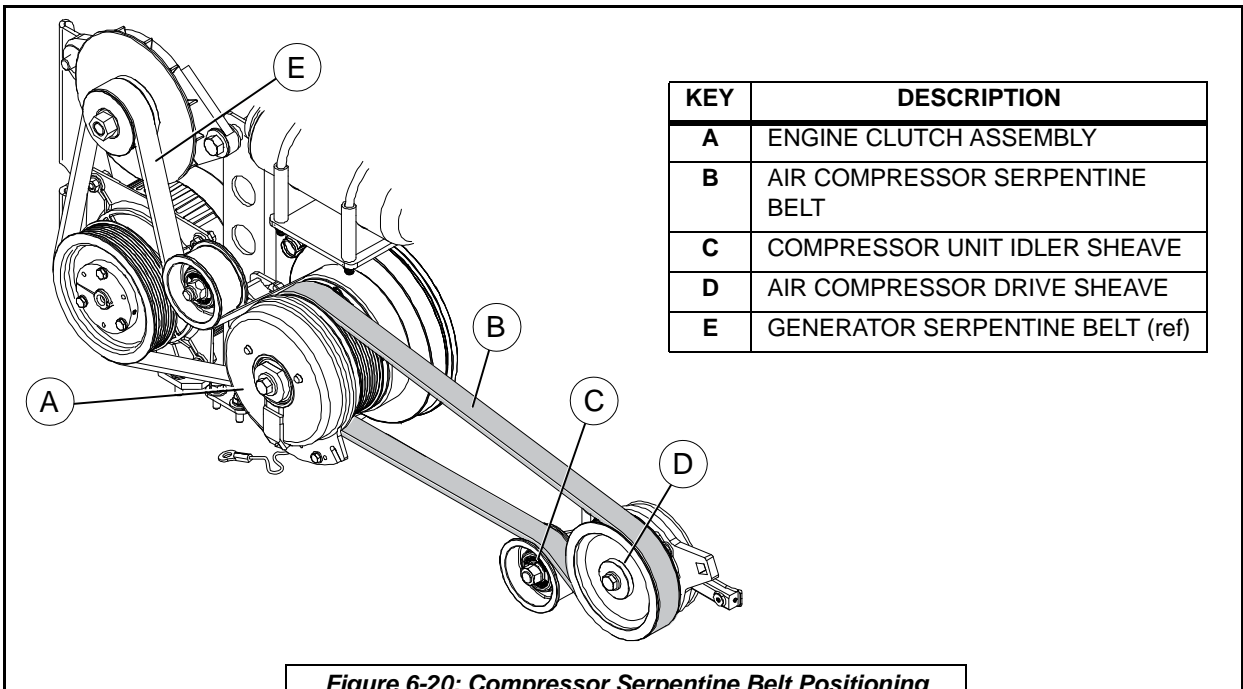


Figure 6-20: Compressor Serpentine Belt Positioning

3. Unfasten the clutch retaining cable [F] (*Figure 6-19*) by removing the retaining cable bolt [C], lock washer [D], and washer [E] securing the cable to the floor. Retain parts for reassembly.
4. Position and route the new air compressor serpentine belt as shown in *Figure 6-20*, making sure that it goes on the outside of the double sheave track on the engine clutch assembly.
5. Reposition the clutch retaining cable [F] (*Figure 6-19*): apply washer [E], lock washer [D] and retaining cable bolt [C]. Tighten the bolt securely.

NOTE
<p>After replacing the serpentine belt, the belt will need to be checked for proper tension. Consult Section 6.6.15.1 on how to check and adjust the air compressor serpentine belt tension.</p>

6.6.15.3 RE-TENSIONING THE GENERATOR SERPENTINE BELT

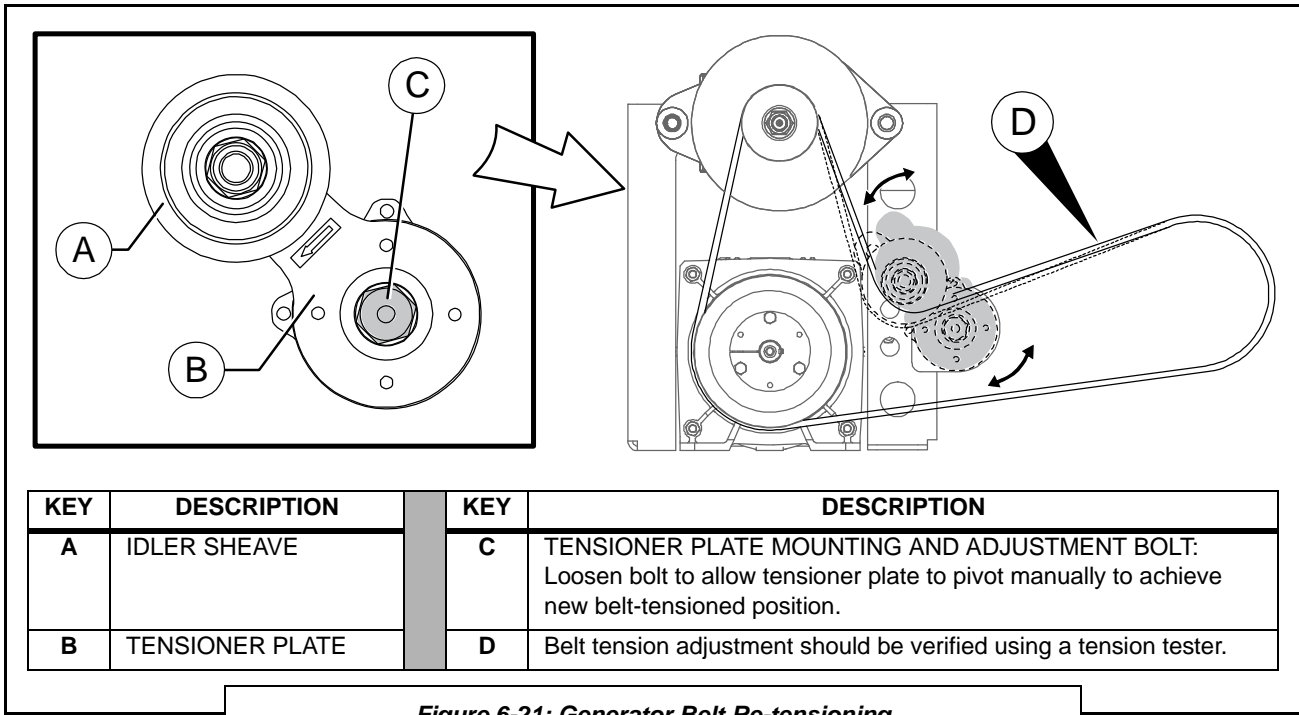
To re-tension the generator serpentine belt, consult *Figure 6-21* and the following procedure:

TOOLS NEEDED	REPLACEMENT PART(S)
Wrench - Size 3/8"	Not Applicable
Tension Tester	

1. With the machine off and the ignition key removed, open and remove the front panel.
2. Locate the generator belt idler sheave [A] on the generator tensioner plate [B]. 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.

Vanair® recommends rotating the tensioner plate to its maximum position.

3. Once the 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.



6.6.15.4 REPLACING THE GENERATOR SERPENTINE DRIVE BELT

TOOLS NEEDED	REPLACEMENT PART(S)
Wrench - Size 5/16" (for Tensioner Bolt)	Serpentine Belt No. DR62184
Tension Tester	
Socket Wrench - Size 3/4"	

NOTE

Vanair® recommends that the air compressor and generator serpentine belts both be changed at the same time even if only one of the belts is in need of being changed.

To replace the generator serpentine belt consult **Figures 6-19** and **6-22**, and the following procedure:

1. With the machine off and the ignition key removed, open and remove the front access panel.
2. Locate the clutch retaining cable ([F] in **Figure 6-19**) secured to the base floor of the machine near the clutch apparatus of the engine.
3. Unfasten the clutch retaining cable [F] (**Figure 6-19**) by removing the retaining cable bolt [C], lock washer [D], and washer [E] securing

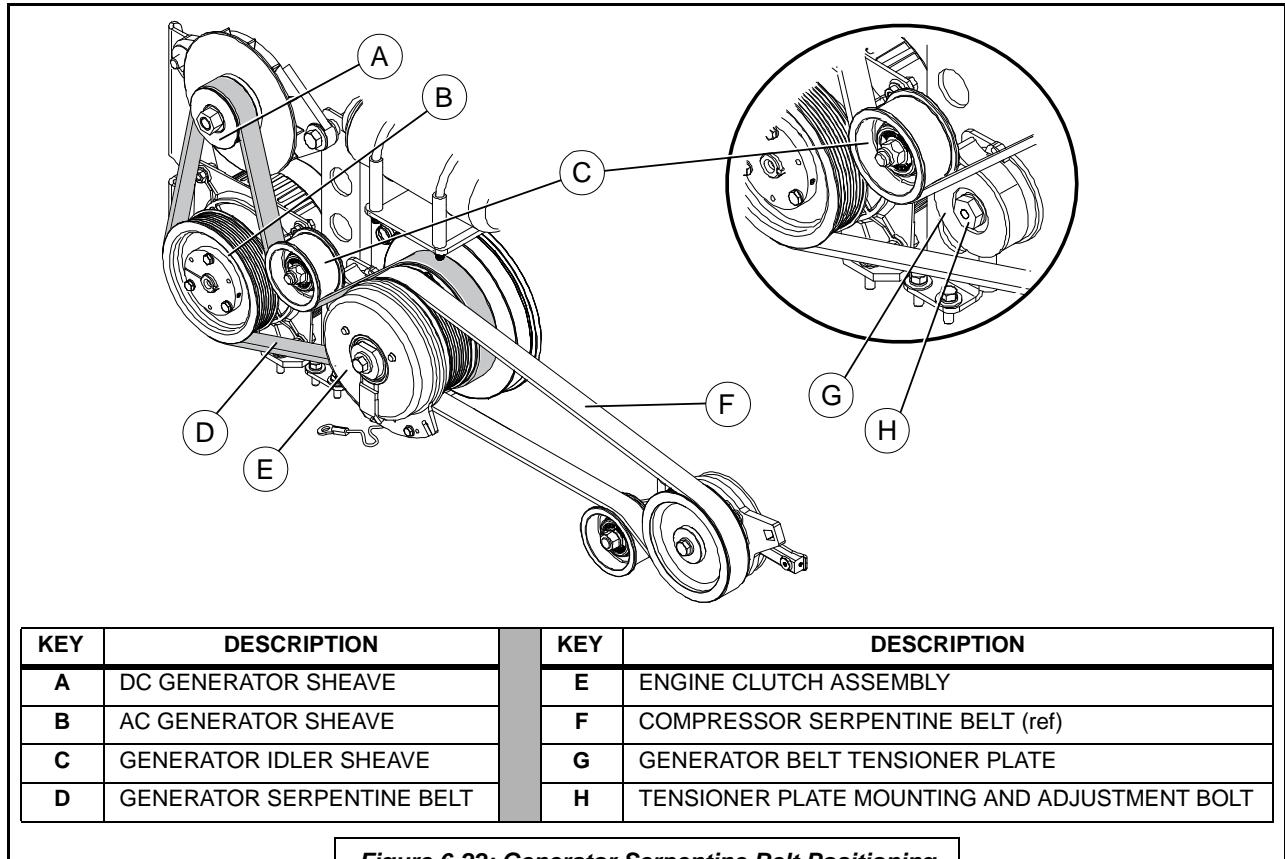


Figure 6-22: Generator Serpentine Belt Positioning

the cable to the floor. Retain parts for reassembly.

After removing the air compressor serpentine belt ([F] in **Figure 6-22**; refer to **Section 6.6.15.2** for compressor serpentine belt removal), The worn generator serpentine belt can now be replaced. Refer to **Figure 6-22** and the following steps:

4. Using a 3/4" socket wrench on tensioner plate bolt [H], pivot the belt tensioner [G] to relieve enough tension on the sheave [C] in order to remove the belt [D]—remove belt [D].
5. Position and route the new generator serpentine belt as shown in **Figure 6-22**.
6. Replace the compressor serpentine belt (refer to **Section 6.6.15.2**).
7. At this point the belt will need to be checked for proper tension. Consult **Section 6.6.15.3** on how to re-tension the generator serpentine belt, and **Section 6.6.15.1** to re-tension the compressor serpentine belt.

NOTE

Compressor belt goes on the outer track of the engine (clutch) sheave; generator belt goes on the inner track.

6.6.15.5 RE-TENSIONING THE ENGINE HYDRAULIC PUMP DRIVE BELT

TOOLS NEEDED	REPLACEMENT PART(S) ¹
Wrench - Size 5/16"	Serpentine Belt No. DR270393
Tension Tester	
Torque Wrench, 1/2" Drive	

The hydraulic pump can only be accessed when the machine's maintenance access panels are removed. Follow the procedure in **Section 6.5, Maintenance Access**. Once the panels are removed, Consult **Figure 6-23**, and the following procedure:

1. Make certain that the machine is off and the ignition key removed.

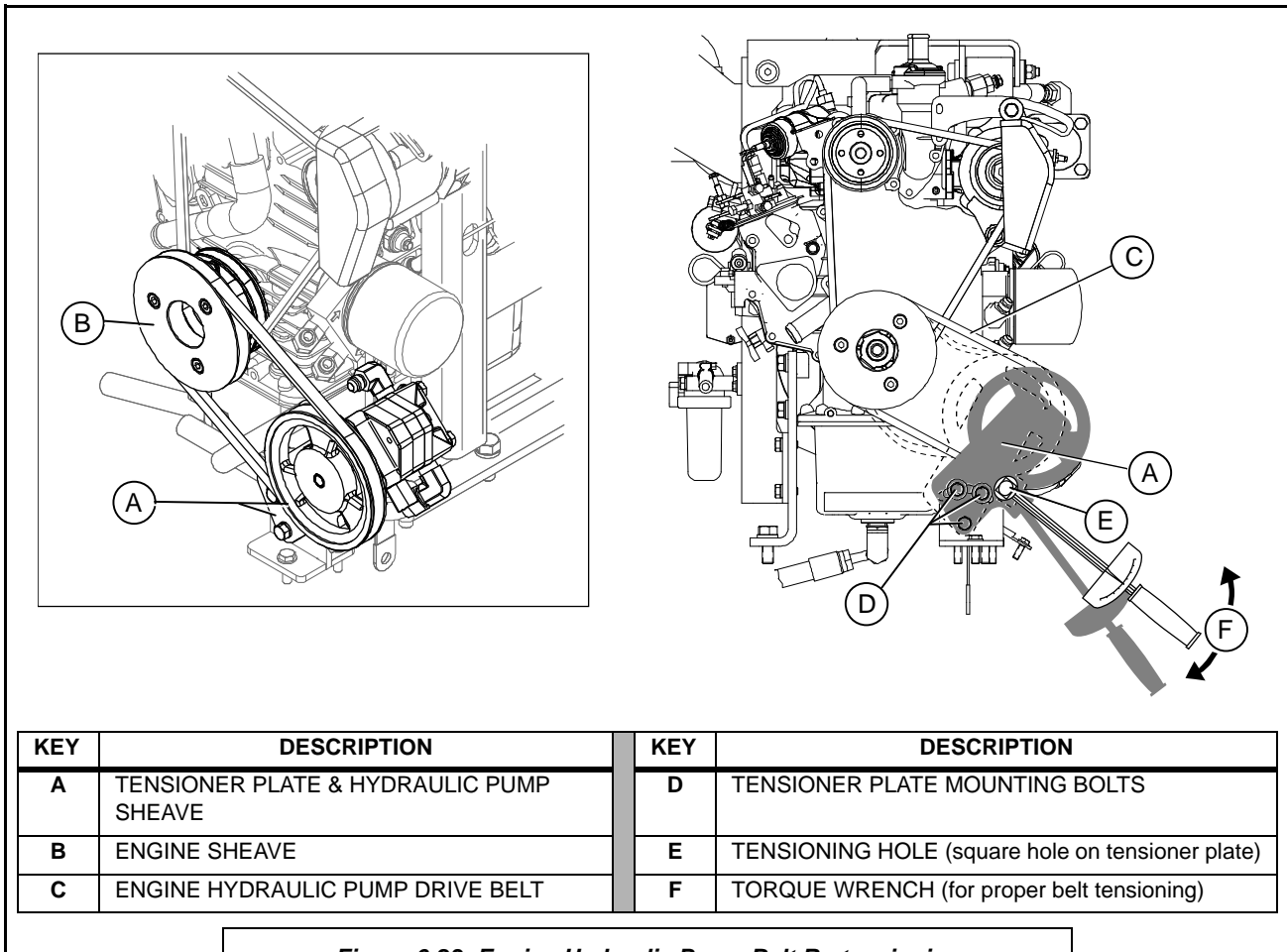


Figure 6-23: Engine Hydraulic Pump Belt Re-tensioning

2. Loosen, but do not remove, the three (3) tensioner plate bolts [D] mounting the tensioner plate/pump sheave [A] in place. Loosen only enough to allow tensioner plate to pivot along the grooves in the plate while still remaining in position.
3. Use a 1/2" drive torque wrench applied to the square tensioning hole [E] to manually rotate the plate/pump sheave about the loosened, but anchored, mounting bolt (bottom bolt). Apply torque of 51 in-lbs as per **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 three (3) tensioner plate bolts [D] to 12 ft-lbs (16.3 Nm) to secure the tensioner into position.

6.6.15.6 REPLACING THE ENGINE HYDRAULIC PUMP DRIVE DRIVE BELT

The hydraulic pump can only be accessed when the machine's maintenance access panels are removed. Follow the procedure in **Section 6.5, Maintenance Access**. Once the panels are removed, Consult **Figure 6-23**, and the following procedure:

1. Make certain that the machine is off and the ignition key removed.
2. Loosen, but do not remove, the three (3) tensioner plate bolts [D] mounting the tensioner plate/pump sheave [A] in place. Loosen only enough to allow the tensioner plate to pivot along the grooves in the plate while still remaining in position.
3. Pivot the tensioner plate counterclockwise to its maximum position. This will shorten the distance between the engine sheave and the drive sheave, and allow the loosened belt to be removed.
4. Replace the worn drive belt with a new belt in position on the engine and drive sheaves.
5. Use a 1/2" drive torque wrench applied to the square tensioning hole [E] to manually rotate the plate/pump sheave about the loosened, but anchored, mounting bolt (bottom bolt). Apply torque of 51 in-lbs as per **Table 6B: Measuring Belt Deflection** for the proper tension measurement.

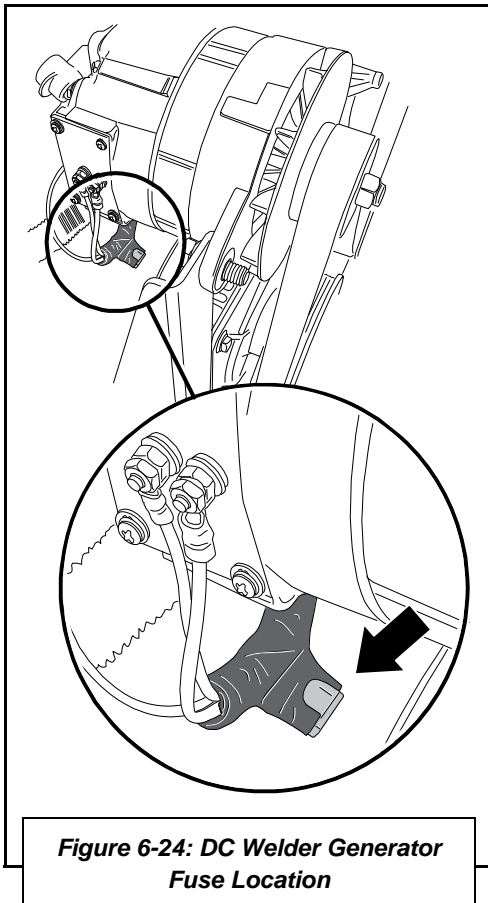


Figure 6-24: DC Welder Generator Fuse Location

- Once a position is achieved that accounts for a satisfactory tension in the belt, torque the three (3) tensioner plate bolts [D] to 12 ft-lbs (16.3 Nm) to secure the tensioner into position.

6.7 SERVICING THE SYSTEM FUSES AND CIRCUIT BREAKERS

Consult **Figure 6-24** for the location of the DC welder generator fuse, and **Figure 6-25** for the locations of the Power System fuses. Consult **Figure 6-26** to determine the location of the engine fuse.

TOOLS NEEDED	REPLACEMENT PART(S) ^I	FIG / KEY#
Fuse Removal Tool (recommended), or Pliers	10 Amp Fuse No. 263173	6-25/ E, F, G
	15 Amp Fuse No. 265909	6-25/E
	40 Amp Relay No. 270501	6-25/A
	50 Amp Breaker No. 267306	6-26/A

6.8 STORAGE AND INTERMITTENT USE

! 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**.

NOTE

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

! CAUTION

Parts can wear over time. Do not operate with worn equipment; replace as needed.

System Component or Part Group Task	Manual Section	Location
Storage and Intermittent Use	6.8	page 102
Intermittent Use	6.8.1	page 102
Long-term Storage	6.8.2	page 102

6.8.1 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.

6.8.2 LONG TERM STORAGE

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

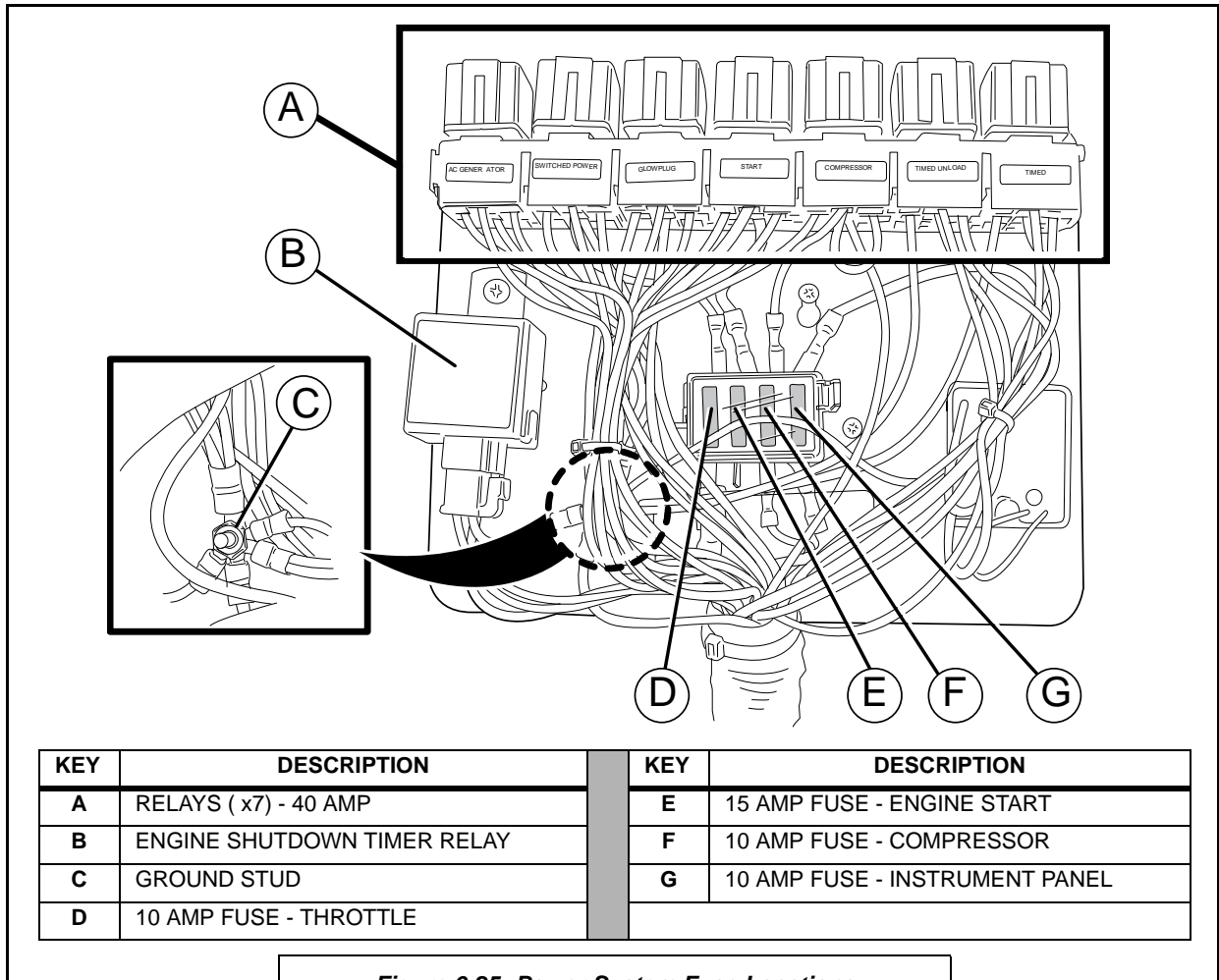


Figure 6-25: Power System Fuse Locations

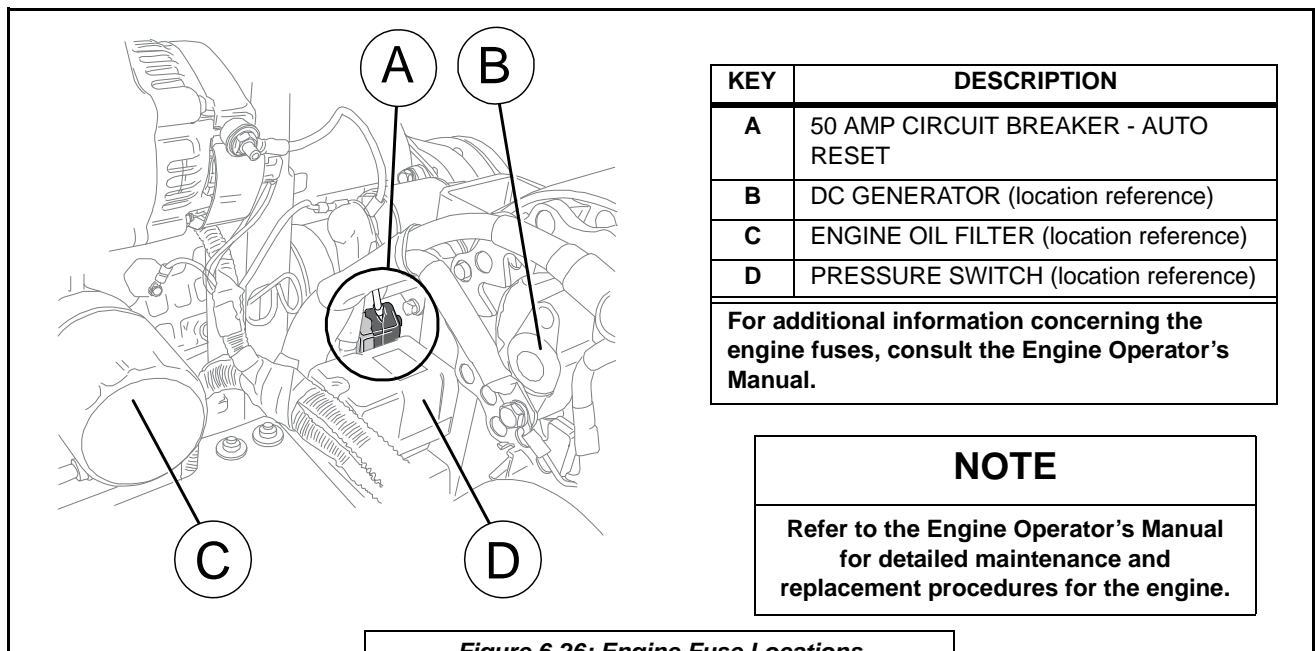


Figure 6-26: Engine Fuse Locations

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 the fuel 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** 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 and the Generator 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

NOTE

When contacting the Vanair Service Department, please have machine serial number on hand to quickly expedite service. See *Figures W-1 (machine) and/or W-2 (compressor unit)* in the *Warranty Details Section* for serial plate locations.

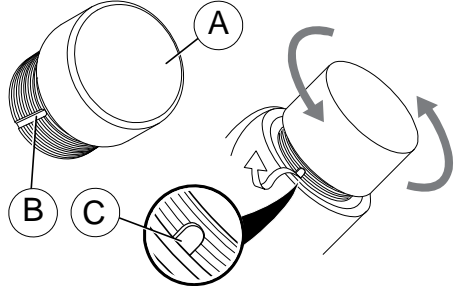
 **WARNING**

DO NOT operate any of the Air N Arc 300 Serie'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/vent valve, which will vent all pressure to the atmosphere.

Refer to *Figure 7-1*. Open fill cap **SLOWLY** (contents under pressure) to make sure all pressure has been relieved.



KEY	DESCRIPTION
A	COMPRESSOR FILL CAP (red)
B	FILL CAP BLEED VENT GROOVE
C	Open/crack cap slightly to allow bleed vent to relieve pressure

Figure 7-1: Pressure Relief

7.2 TROUBLESHOOTING GUIDE		
Fault/Malfunction	Possible Cause	Corrective Action
ENGINE		
Engine will not crank	Faulty battery connection.	Check for proper battery connections and battery charge.
	Battery out of power	Recharge or replace battery.
	Engine fuse blown	Check engine fuse: See Section 6.7, Servicing the System Fuses and Circuit Breakers , and/or consult the Engine Operator's Manual.
Engine will not start	Low fuel and/or oil supply	Check fuel gauge. Check engine oil level; refer to Section 6.6.12, Checking the Engine Oil . Replenish as necessary. Consult the Engine Operator's Manual for additional information on engine maintenance.
	Pinched fuel line	Replace or reroute if necessary.
	Plugged fuel filter(s)	Replace if necessary. Refer to Section 2.4, Engine , and the Engine Operator's Manual for additional information on engine maintenance.
	Low battery voltage	Recharge or replace if necessary.
		Loose connections; tighten connections.
		Dirty connections; clean connections.
	Plugged engine air filter	Replace engine air filter. Refer to Engine Operator's Manual.
	Defective oil pressure switch	Check continuity, and replace if necessary.
	Defective engine temperature switch	Check continuity, and replace if necessary.
	Poor ground connection	Check and clean/renew connection.
Machine hood shutdown safety switch prevents start-up of engine	Close hood panel or check if roof switch is faulty. See Section 1.11, Machine Canopy Access Safety Switch .	
Improper Control Operation: Engine does not speed up	Throttle solenoid stuck	Lubricate; replace throttle solenoid if necessary.
	Governor stuck	Free governor and lubricate if necessary.
	Fuel filter partly plugged	Replace fuel filter. Refer to Section 2.4, Engine , and the Engine Operator's Manual.
<i>Continued on next page</i>		

7.2 TROUBLESHOOTING GUIDE		
Fault/Malfunction	Possible Cause	Corrective Action
ENGINE (CONTINUED)		
Improper Control Operation: Engine does not speed up (continued)	Operating pressure too high	Adjust to proper pressure setting. Refer to Section 2.2.7, Adjustable Pressure Switch , and Section 6.6.14, Adjusting the Pressure Setting . Replace if switch continues to deviate from setting.
	Fuel filter partly plugged	Replace fuel filter. Refer to Section 2.4, Engine , and the Engine Operator's Manual. Auxiliary fuel pump may be needed for remote fuel tank. Refer to Section 4, Installation .
Defective Throttle Control Relay	Solenoid not actuating	Inspect; replace if necessary.
Improper Control Operation: Engine does not slow down	Leak in control line	Check for leaks; replace line if necessary.
	Pressure switch out of adjustment	Adjust to proper pressure setting. Refer to Section 2.2.7, Adjustable Pressure Switch , and Section 6.6.14 Adjusting the Pressure Setting . Replace if switch continues to deviate from setting.
	Pressure switch faulty	Replace pressure switch.
	Governor stuck	Free governor and lubricate if necessary. Refer to Engine Operator's Manual.
Engine overheats	Low oil level	Check engine oil level; refer to Section 6.6.12, Checking the Engine Oil . Replenish as necessary. Consult the Engine Operator's Manual for additional information on engine maintenance.
	Engine coolant level low	Check; add if necessary. Refer to Engine Operator's Manual.
	Located too close to obstruction	Move further from obstruction.
	Engine oil filter plugged	Replace engine oil filter. Refer to Section 2.4, Engine , and the Engine Operator's Manual.
	Engine oil radiator plugged	Clear debris/dirt from cooler core/flush shroud. Refer to 6.6.11 .
	Restricted cooling air in or out	Clear debris/dirt from engine radiator. Refer to 6.6.11 .
<i>Continued on next page</i>		

7.2 TROUBLESHOOTING GUIDE		
Fault/Malfunction	Possible Cause	Corrective Action
ENGINE (CONTINUED)		
Engine overheats (continued)	Fault with engine cooling system	Consult Engine Operator's Manual.
	Compressor oil level low (fan hydraulics depend on compressor oil level)	Check oil level and refill to proper level if necessary (ensure machine is parked on a level surface). Refer to Section 6.6.3, Checking the Compressor Oil.
Engine stops during operation	Low oil level	Check engine oil level; refer to Section 6.6.12, Checking the Engine Oil. Replenish as necessary. Consult the Engine Operator's Manual for additional information on engine maintenance.
	High engine temperature	Let engine cool. Check for engine coolant level. Refer to <i>Engine Overheats</i> fault.
	Engine shutdown switch activated	Confirm that access door is properly in place. Replace faulty engine shutdown switch; see Section 1.11, Machine Canopy Access Safety Switches.
Gradual loss of engine power	Contaminated fuel	Draw and replace fuel supply.
	Engine air filter contaminated	Check air filter. Replace if necessary (refer to the Engine Operator's Manual).
	Fuel filter(s) contaminated	Check fuel filters. Refer to Section 2.4, Engine , and the Engine Operator's Manual for additional information on engine maintenance.
	Low fuel level	Add fuel.
	Overload	Reduce load; check load use, and reduce
	Engine not warmed up	Allow engine to warm up.
For additional information concerning an engine problem, consult the Engine Operator's Manual.		
COMPRESSOR		
Compressor overheats This condition will cause a compressor shutdown and compressor fault light to turn on. Before restarting the compressor, determine the cause for overheating.	Low compressor oil level	Check oil level and refill to proper level if necessary (ensure machine is parked on a level surface). Refer to Section 6.6.3, Checking the Compressor Oil.
	Obstructed fluid cooler	Clear debris/dirt from cooler core/flush shroud.
	Obstructed cooler fins	Clear/clean if required. Refer to Section 6.6.11.
Continued on next page		

7.2 TROUBLESHOOTING GUIDE		
Fault/Malfunction	Possible Cause	Corrective Action
COMPRESSOR (CONTINUED)		
Compressor overheats (continued) This condition will cause a compressor shutdown and compressor fault light to turn on. Before restarting the compressor, determine the cause for overheating.	Insufficient air flow over cooler	Check for obstructions (frame, body, etc.) to cooling air flow.
	Defective temperature switch	Check switch; replace if necessary.
	Compressor oil filter plugged	Replace filter; refer to Section 6.6.4, Replacing the Compressor Oil Filter Element.
	Input rpm too high	Adjust to proper setting; refer to Section 6.6.13, Adjusting the Engine Speed, and the Engine Operator's Manual.
	Fan not operating	Low oil; check oil level and refill to proper level if necessary (ensure machine is parked on a level surface). Refer to Section 6.6.3, Checking the Compressor Oil. Belt slip on hydraulic pump. Refer to Section 6.6.15.5 or Section 6.6.15.6.
Compressor shuts down with air demand present	Compressor temperature switch opening	Check compressor oil level. Replenish if necessary.
	Restricted cooling air intake	Reposition machine.
	Fan not operating	Low oil; check oil level and refill to proper level if necessary (ensure machine is parked on a level surface). Refer to Section 6.6.3, Checking the Compressor Oil. Belt slip on hydraulic pump. Refer to Section 6.6.15.5 or Section 6.6.15.6.
	Compressor oil filter plugged	Replace filter; refer to Section 6.6.4, Replacing the Compressor Oil Filter Element.
	Clutch faulty	Inspect; replace if necessary.
	Plugged or restricted cooler core	Flush cooler. Consult the Vanair Service Department for assistance in cleaning/flushing the cooler core.
	Contaminated cooler fins	Clean cooler fins. Refer to Section 6.6.11, Inspecting the System Coolers.
	Compressor will not build up pressure	Low compressor oil level Check oil level and refill to proper level if necessary (ensure machine is parked on a level surface). Refer to Section 6.6.3, Checking the Compressor Oil.
<i>Continued on next page</i>		

7.2 TROUBLESHOOTING GUIDE		
Fault/Malfunction	Possible Cause	Corrective Action
COMPRESSOR (CONTINUED)		
Compressor will not build up pressure (continued)	Air demand too high	Check for leaks and take corrective action.
		Check air tools for wear, damage, or malfunctions. Replace or repair.
	Compressor capacity too low to accommodate demand	Substitute larger capacity compressor system.
	Compressor air filter plugged	Check air filter. Replace if necessary; refer to Section 6.6.1, Compressor Air Filter .
	Pressure switch out of adjustment	Reset pressure switch. Refer to Section 2.2.7, Adjustable Pressure Switch , and Section 6.6.14, Adjusting the Pressure Setting . Replace if switch continues to deviate from setting.
	Defective pressure switch	Replace pressure switch.
	Engine does not speed up	Adjust speed control. Consult Section 6.6.13, Adjusting the Engine Speed , and the Engine Operator's Manual.
	Engine governor stuck	Free governor and lubricate if necessary. Consult the Engine Operator's Manual.
	Control throttle solenoid stuck	Replace throttle solenoid.
	Belt(s) slipping	Re-situate and adjust belt tension, or replace belt if necessary. Consult Section 6.6.15, Replacing and Re-tensioning the Serpentine Belts
	Service valve is open	Close service valve.
	Pressure gauge is malfunctioning	Check pressure gauge function/control line routing: adjust, repair or replace as necessary.
		Check for proper operation with an auxiliary air source. Replace if necessary.
Inlet valve fails to open	Repair/replace inlet valve. Refer to Section 6.6.2, Repairing the Air Inlet Valve . Order inlet valve repair kit—see Table 9A: Recommended Spare Parts List .	
Inlet valve frozen shut	Repair/replace inlet valve. Refer to Section 6.6.2, Repairing the Air Inlet Valve . Order inlet valve repair kit—see Table 9A: Recommended Spare Parts List .	
<i>Continued on next page</i>		

7.2 TROUBLESHOOTING GUIDE		
Fault/Malfunction	Possible Cause	Corrective Action
COMPRESSOR (CONTINUED)		
<p>Compressor system over-pressures</p> <p>This condition will cause a compressor shutdown, and a fault light will turn on. Before restarting the compressor, determine the cause of the over-pressure. May also cause the relief valve to open.</p>	Pressure switch setting too high	Reset pressure switch. Refer to Section 2.2.7, Adjustable Pressure Switch , and Section 6.6.14, Adjusting the Pressure Setting . Replace if switch continues to deviate from setting.
	Pressure switch malfunction	Check for operation/damage: repair or replace.
	Unload solenoid valve defective	Replace solenoid valve.
	Leak in air control line	Check for leaks and take corrective action.
	Restriction in control line	Clean if soiled; if ice is present, clear and remove.
	Damaged/kinked control line	Check line for damage (wear, kinks, etc.). Re-route, re-tie or replace if necessary (refer to Appendix A, A.6 Hose Installation Guide for assistance in running or checking hose lines).
	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).
	Inlet valve Teflon "O" ring popped out of groove	Replace "O" ring: Refer to Section 6.6.2, Repairing the Air Inlet Valve . Order inlet valve repair kit—see Table 9A: Recommended Spare Parts List .
	Inlet valve piston is stuck in down position.	Check for proper operation with an auxiliary air source—replace or rebuild inlet valve. Consult Section 6.6.2 .
	Compressor shaft seal is leaking	Replace shaft seal with available kit. Refer to Section 6.6.7 .
	Minimum pressure/check valve is malfunctioning	Rebuild or replace check valve: Refer to Section 6.6.10 ; order check valve repair kit—see Table 9A: Recommended Spare Parts List .
	Pressure gauge is malfunctioning	Check gauge for proper operation; replace if necessary and check controls.
Defective safety valve	Replace safety valve.	
Plugged coalescer	Replace coalescer. Refer to Section 6.6.6, Replacing the Spin-on Air/Oil Coalescer .	
<i>Continued on next page</i>		

7.2 TROUBLESHOOTING GUIDE		
Fault/Malfunction	Possible Cause	Corrective Action
COMPRESSOR (CONTINUED)		
No service air output (See also <i>Compressor will not build up pressure</i>)	If equipped, OSHA valve/velocity fues, not functioning properly	Reset or replace OSHA valve.
Low service air output (See also <i>Compressor will not build up pressure</i>)	Clogged compressor air filter	Check air filter. Replace if necessary; refer to Section 6.6.1, Compressor Air Filter.
	Solenoid valve sending continuous signal to inlet valve	Rebuild or replace solenoid valve if defective. Refer to Section 6.6.8
	Incorrect compressor speed	Adjust speed. Refer to Section 6.6.14.
Compressor stalls	Pressure switch setting too high	Adjust pressure switch setting. Refer to Section 2.2.7, Adjustable Pressure Switch , and Section 6.6.14 Adjusting the Pressure Setting. Replace if switch continues to deviate from setting.
	Speed is set too low	Check to see if compressor goes to high speed.
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.
	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 2.2.7, Adjustable Pressure Switch , and Section 6.6.14, Adjusting the Pressure Setting. Replace if switch continues to deviate from setting.
	Input rpm too low	Adjust to proper setting.
	Contaminated inlet valve	Remove valve and clean piston. Refer to Section 6.6.2, Repairing the Air Inlet Valve. Order inlet valve repair kit—see Table 9A: Recommended Spare Parts List.
	Inlet valve fails to open	Repair/replace inlet valve. Refer to Section 6.6.2, Repairing the Air Inlet Valve. Order inlet valve repair kit—see Table 9A: Recommended Spare Parts List.
<i>Continued on next page</i>		

7.2 TROUBLESHOOTING GUIDE		
Fault/Malfunction	Possible Cause	Corrective Action
COMPRESSOR (CONTINUED)		
System operating pressure below specified minimum (continued)	Inlet valve frozen shut	Repair/replace inlet valve. Refer to Section 6.6.2, Repairing the Air Inlet Valve . Order inlet valve repair kit—see Table 9A: Recommended Spare Parts List .
Excess amount of oil in air discharge	Machine not on level surface	Move machine to level surface.
	Compressor oil level too high	The correct oil level is between the bottom of the oil port threads (low level) to the top lip of the port's threads (high level). Drain excess oil to correct level.
		Tank not positioned with the drain at its lowest point. Reposition machine. NOTE: Machine must be operated while on a level surface in order for proper compressor oil circulation throughout the system.
	Scavenger system not operating	Inspect scavenger line for obstructions or leaks. Replace if necessary.
	Coalescer element plugged or damaged	Replace the coalescer element. Consult Section 6.6.6, Replacing the Spin-on Air/Oil Coalescer . Order replacement coalescer element—see Table 9A: Recommended Spare Parts List .
Excessive moisture in the compressed air	Moisture accumulating in air tank	Drain water from air tank. Refer to Section 6.6.9, Draining the Air Tank .
WELDER		
Welder and battery charger behave erratically	Connection cables or receptacles are soiled/contaminated	Check for twisted cables and/or soiled/contaminated or loose receptacle connections.
		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 6.7, Servicing the System Fuses and Circuit Breakers
<i>Continued on next page</i>		

7.2 TROUBLESHOOTING GUIDE		
Fault/Malfunction	Possible Cause	Corrective Action
WELDER (CONTINUED)		
No welder output in CC mode	Bad ground connect	Make sure of connection. Clean welding surface.
	Faulty electrical circuit	Check electrical circuit.
GENERATOR		
No AC generator output	Serpentine belt slipping or damaged	Re-situate and adjust belt tension, or replace belt if necessary. Consult Section 6.6.15, Replacing and Re-tensioning the Serpentine Belts . Order replacement belt—see Table 9A: Recommended Spare Parts List .
	Faulty AC generator relay	Check; replace if necessary.
	Faulty capacitor	Check; replace if necessary.
Low AC voltage	Engine speed too low for demand	Adjust speed control. Consult Section 6.6.13, Adjusting the Engine Speed , and the Engine Operator's Manual.
	Weak or faulty capacitor	Check; replace if necessary.
	Belt slipping	Check tension or replace belt if necessary. Consult Section 6.6.16, Replacing and Re-tensioning the Serpentine Belts . Order replacement belt—see Table 9A: Recommended Spare Parts List .
High AC voltage	Engine speed too high for demand	Adjust speed control. Consult Section 6.6.13, Adjusting the Engine Speed , and the Engine Operator's Manual.

SECTION 8: DIAGRAMS

8.1 GENERAL INFORMATION

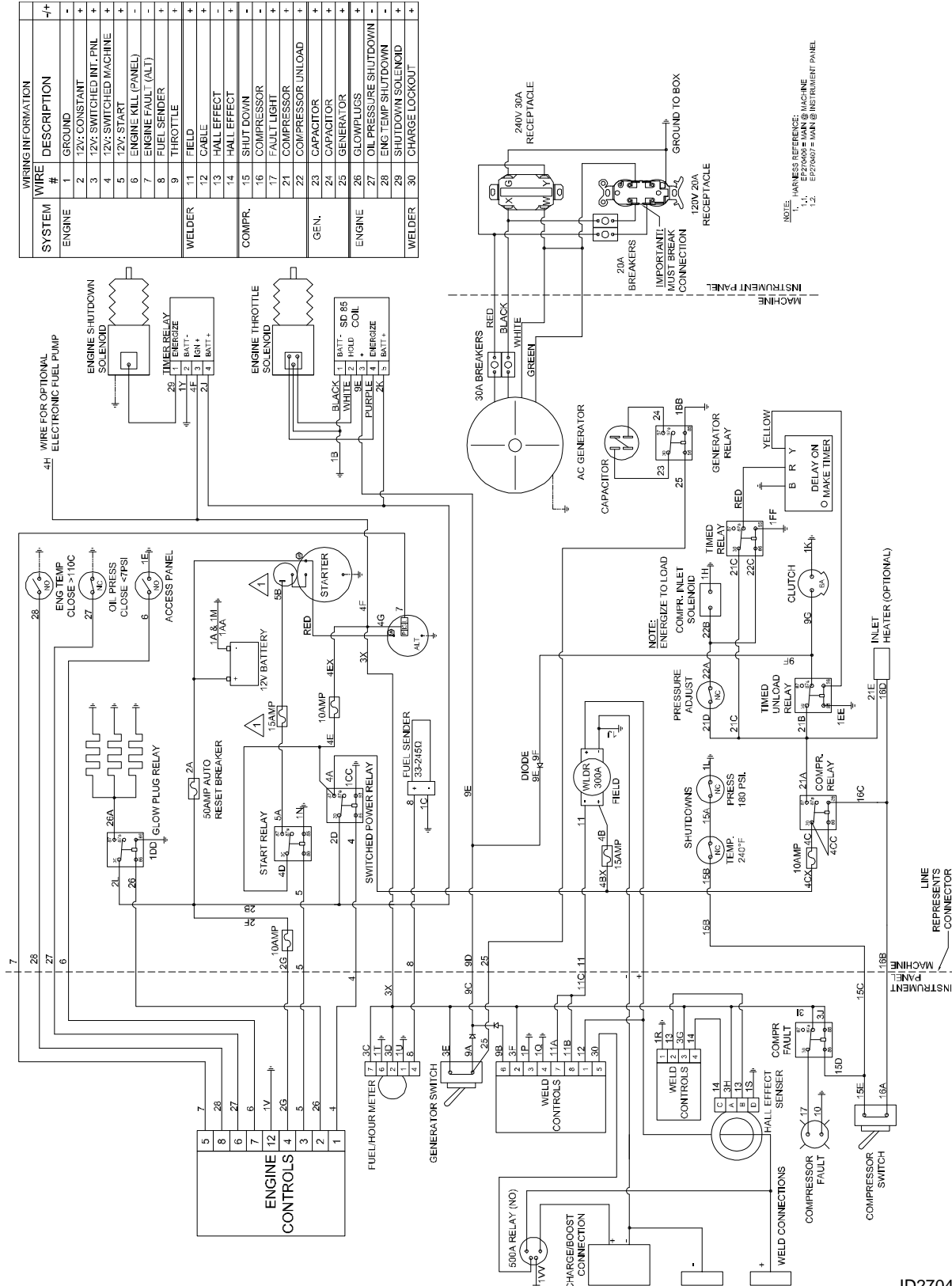
The diagrams located in this section of the manual are designed to assist the service technician with troubleshooting any problems that may arise while operating the All-In-One Power System within its intended use.

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
<p>For machine measurement specifications refer to <i>Section 4.5 Installation and Dimensions Diagram (Part 1 of 2)</i>, and <i>Section 4.6 Installation and Dimensions Diagram (Part 2 of 2)</i>.</p>

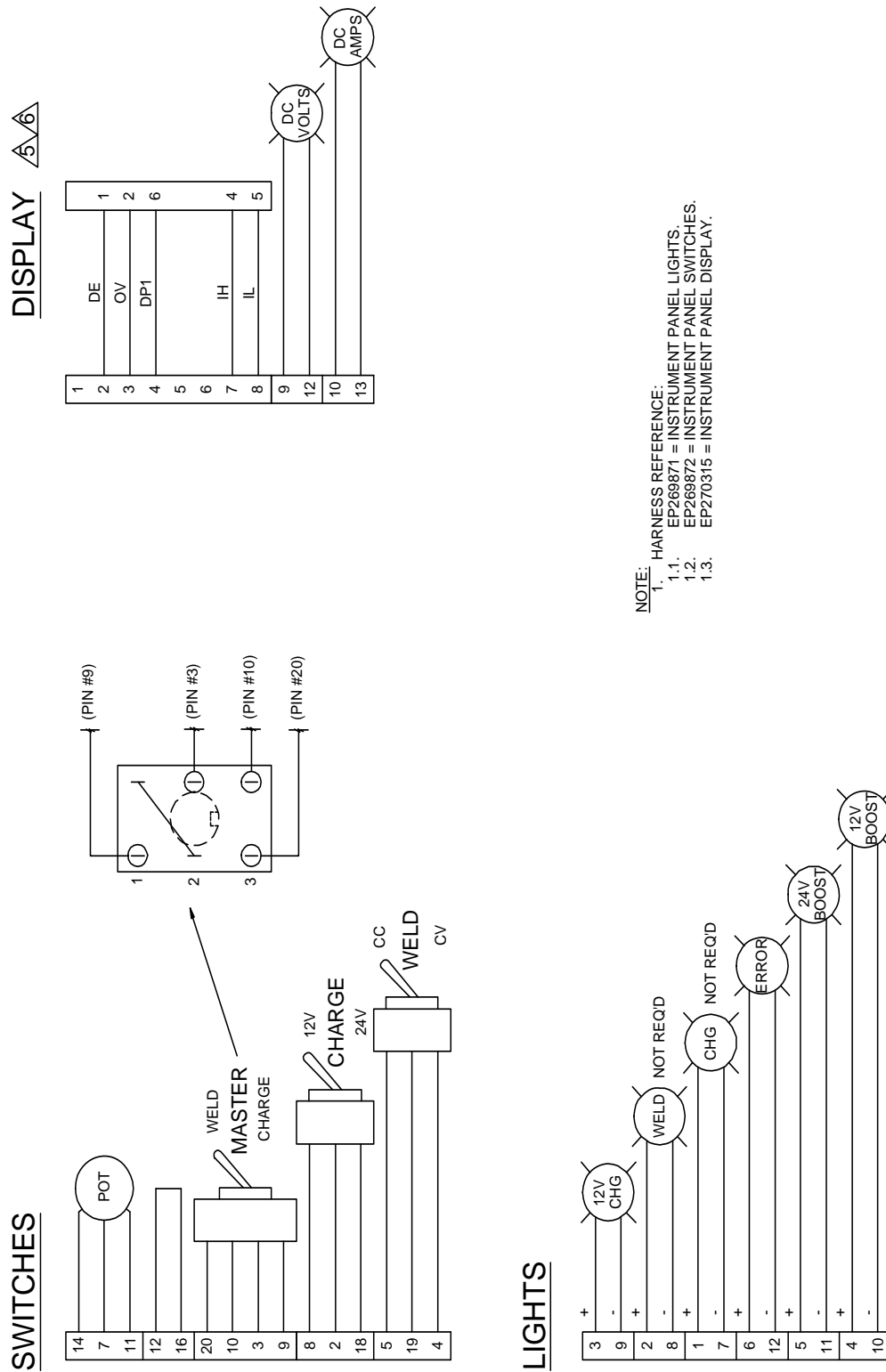
8.2 WIRING DIAGRAM - AIR N ARC 300 SERIES (DIESEL)

WIRING INFORMATION		DESCRIPTION
SYSTEM	WIRE #	
ENGINE	1	GROUND
	2	12V CONSTANT
	3	12V SWITCHED INT. PNL
	4	12V SWITCHED MACHINE
	5	12V START
	6	ENGINE KILL (PANEL)
	7	ENGINE FAULT (ALL)
	8	FUEL SENDER
	9	THROTTLE
WELDER	11	FIELD
	12	CABLE
	13	-HALL EFFECT
COMPR.	14	-HALL EFFECT
	15	SHUT DOWN
	16	COMPRESSOR
	17	FAULT LIGHT
	21	COMPRESSOR
	22	COMPRESSOR UNLOAD
GEN.	23	CAPACITOR
	24	GENERATOR
	25	GENERATOR
ENGINE	26	GLOWPLUGS
	27	OIL PRESSURE SHUTDOWN
	28	ENG TEMP SHUTDOWN
	29	SHUTDOWN SOLENOID
WELDER	30	CHARGE LOCKOUT



NOTE:
 1. WIRE #S REFER TO MACHINE INSTRUMENT PANEL
 1.1. EPP0007 = MAIN B INSTRUMENT PANEL
 1.2.

8.3 WIRING DIAGRAM - SWITCHES & LIGHTS

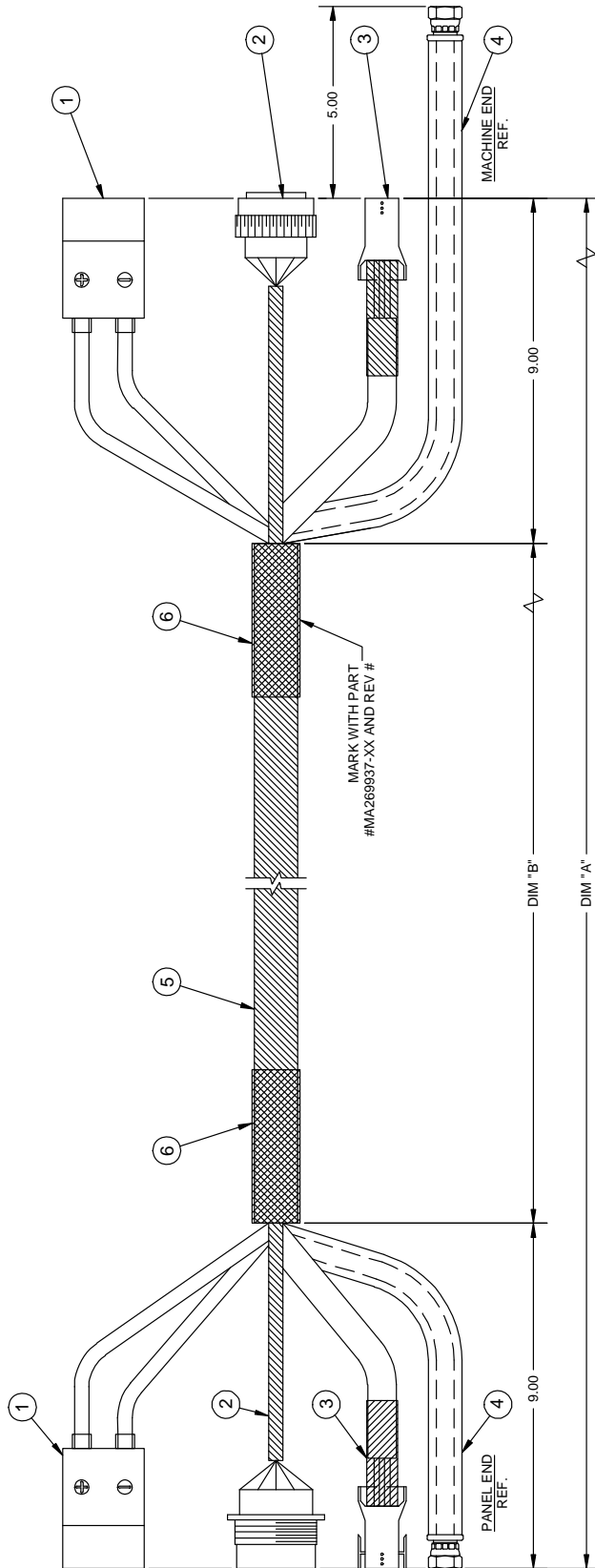


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8.4 TRUNK LINE ASSEMBLY HARNESS

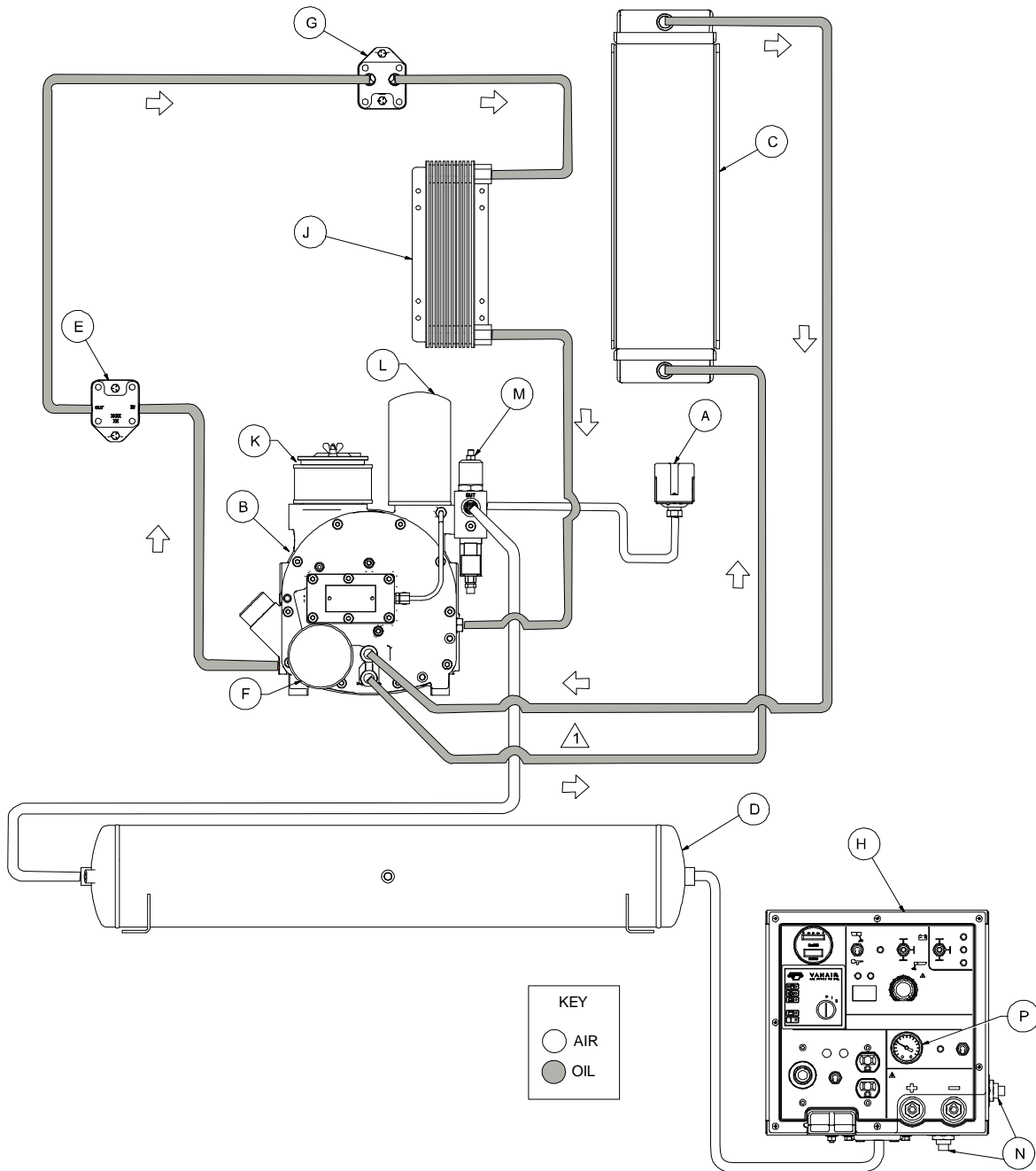
PARTS LIST	
ITEM #	DESCRIPTION
1	WELD CABLE TRUNK LINE
2	DC CONTROL TRUNK LINE
3	AC CORD TRUNK LINE
4	HOSE ASSEMBLY TRUNK LINE
5	SLEEVING, EXPANDABLE, Ø2 X "B"-DIM LG.
6	HEAT SHRINK, BLACK Ø3" X 8" LG.

PART #	ITEM #1	ITEM #2	ITEM #3	ITEM #4	DIM "A"	DIM "B"	DIM "B"	DIM "A"
MA269937-24	EP269979-24	EP269978-24	EP270470-24	EP73450-24	288" [24'-0"]	270" [22'-6"]	270" [22'-6"]	
MA269937-22	EP269979-22	EP269978-22	EP270470-22	EP73450-22	264" [22'-0"]	246" [20'-6"]	246" [20'-6"]	
MA269937-20	EP269979-20	EP269978-20	EP270470-20	EP73450-20	240" [20'-0"]	240" [20'-0"]	270" [22'-6"]	
MA269937-18	EP269979-18	EP269978-18	EP270470-18	EP73450-18	216" [18'-0"]	198" [16'-6"]	198" [16'-6"]	
MA269937-16	EP269979-16	EP269978-16	EP270470-16	EP73450-16	192" [16'-0"]	174" [14'-6"]	174" [14'-6"]	
MA269937-14	EP269979-14	EP269978-14	EP270470-14	EP73450-14	168" [14'-0"]	150" [12'-6"]	150" [12'-6"]	
MA269937-12	EP269979-12	EP269978-12	EP270470-12	EP73450-12	144" [12'-0"]	126" [10'-6"]	126" [10'-6"]	
MA269937-10	EP269979-10	EP269978-10	EP270470-10	EP73450-10	120" [10'-0"]	102" [8'-6"]	102" [8'-6"]	
MA269937-8	EP269979-8	EP269978-8	EP270470-8	EP73450-8	96" [8'-0"]	78" [6'-6"]	78" [6'-6"]	
MA269937-6	EP269979-6	EP269978-6	EP270470-6	EP73450-6	72" [6'-0"]	54" [4'-6"]	54" [4'-6"]	



MA269937-XX_r1

8.5 COMPRESSOR FLOW SCHEMATIC DIAGRAM



KEY	DESCRIPTION	KEY	DESCRIPTION
A	ADJUSTABLE PRESSURE SWITCH	H	INSTRUMENT PANEL
B	COMPRESSOR	J	HYDRAULIC OIL COOLER
C	COMPRESSOR OIL COOLER	K	AIR FILTER
D	AIR ACCUMULATOR TANK	L	COALESCER
E	HYDRAULIC PUMP W / RELIEF VALVE	M	MINIMUM PRESSURE VALVE
F	OIL FILTER	N	AIR OUT
G	HYDRAULIC MOTOR	P	TANK AIR PRESSURE

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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

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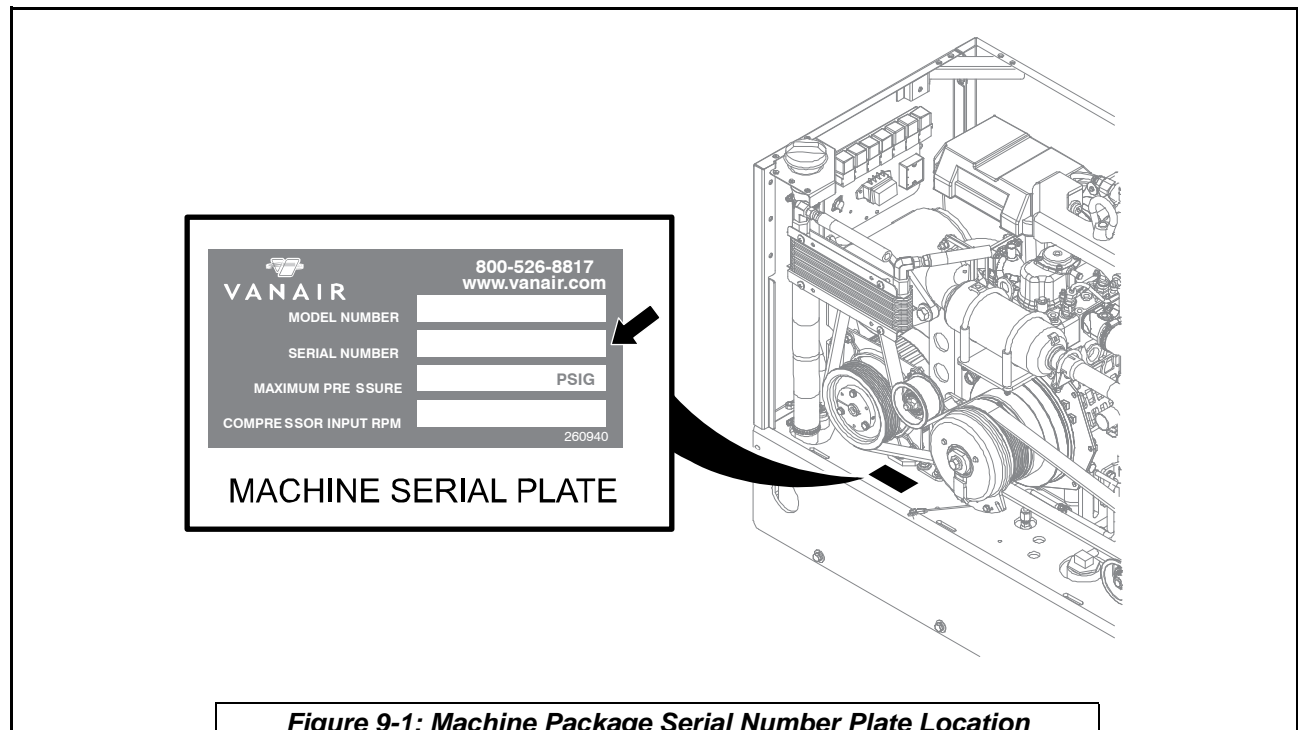


Figure 9-1: Machine Package Serial Number Plate Location

TABLE 9A: RECOMMENDED SPARE PARTS LIST					
KEY NO.	PART NUMBER	DESCRIPTION	QTY	IDENTIFICATION REFERENCE	
				SECTION	KEY NO.
ROUTINE/SCHEDULED MAINTENANCE ITEMS					
1	264626-1GAL	Vanguard™ Premium Oil ^I	1 Gal.	-	-
2	264471	Element, Oil Filter (compressor)	1	9.3	A
3	264469	Element, Compressor Air Filter	1	9.3	B
4	264470	Element, Air/Fluid Separator Spin-on Style Coalescer	1	9.3	C
5	270764	Element, Engine Air Filter	1	9.11	#11 ^{II}
6	EN38480	Filter, Engine Oil Filter	1	9.11	#79
7	RC77662	Filter, In-line Fuel	1	9.11	#85
NON-ROUTINE MAINTENANCE ITEMS					
8	HY270357	Pump, Hydraulic	1	9.11	#87
9	HY270358	Motor, Hydraulic (Fan)	1	9.5	#32
10	CO89649	Gauge, Air, Dry	1	9.8	#30
11	PR270548	Boot, Breaker	1	9.8	#49
12	263173	Fuse, 10 Amp	3	Figure 6-25	D, F, G
13	265909	Fuse, 15 Amp	1	Figure 6-25	E
14	CO269748	Gauge, Fuel/Hour Meter	1	9.8	#22
15	267306	Breaker, 50 Amp Auto-Reset	1	Figure 6-26	A
16	264325	Switch, 240 Deg F NC	1	9.3	#13
17	CO62617	Breaker, Circuit 20A	2	9.8	#28
18	CO71774	Breaker, Circuit 30A	2	9.12	#4
19	DR27584	Belt, Serpentine Compressor	1	9.3	#45
20	DR62184	Belt, Serpentine Generator	1	9.9	#30
21	DR270393	Belt, Hydraulic Pump Drive	1	9.10	#72
22	270766	Kit, Compressor Shaft Seal Rebuild	1	Figure 6-10	-
23	270765	Kit, Minimum Pressure / Check Valve Rebuild	1	Figure 6-14	A
24	264154-102	Kit, Air Inlet Valve Rebuild	1	Figure 6-5	D
^I Use only Vanair® Vanguard™ Premium Synthetic Oil and Genuine Vanair Parts. Inspect and replace damaged components before operation. Substituting non-Vanguard™ Oil or non-genuine Vanair filter components WILL VOID THE COMPRESSOR WARRANTY!					
^{II} Air filter element (270764) is enclosed within air filter house #11(269660) on assembly drawing in Section 9.11 .					

NOTE

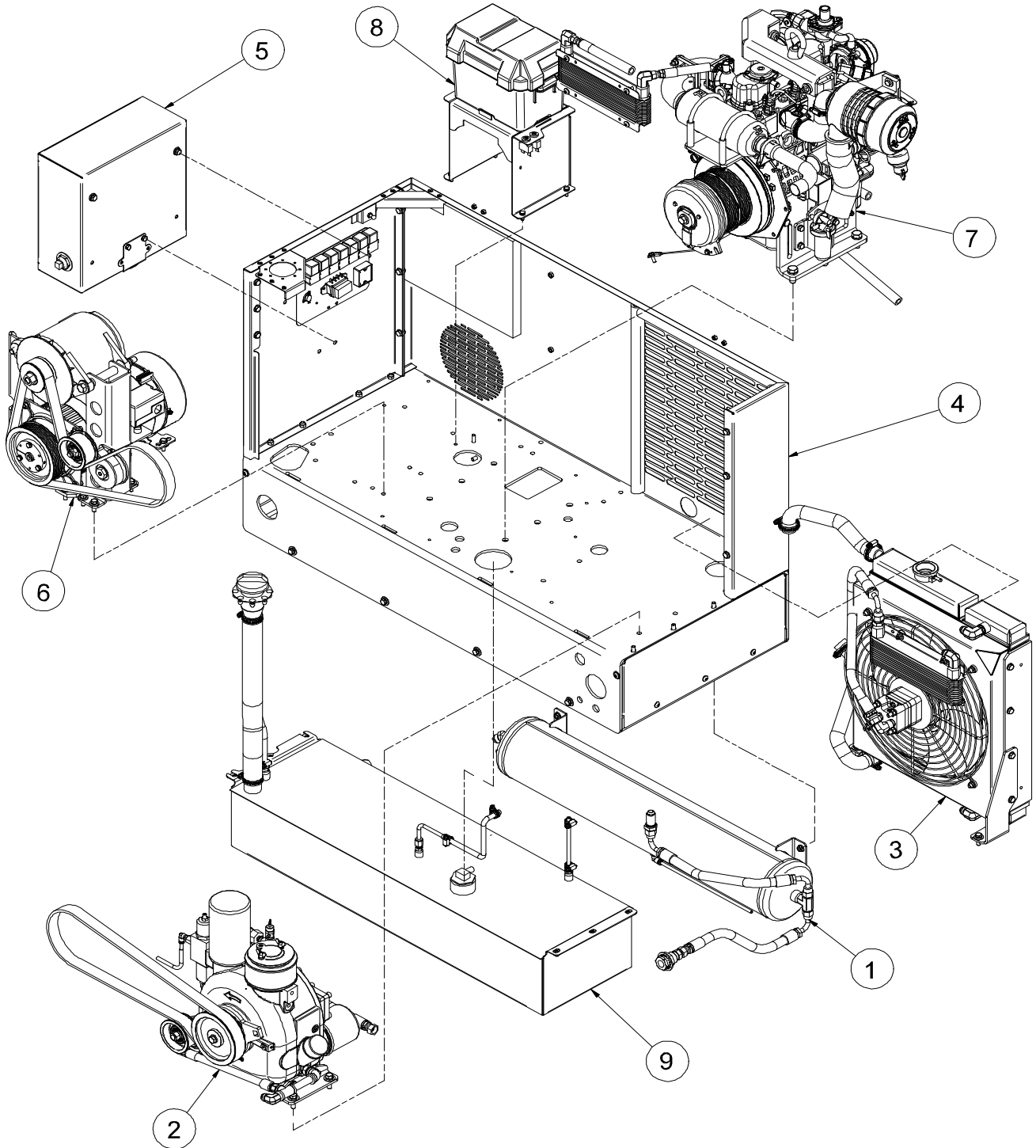
For a complete list of available options, see Appendix A, **Section A.5 Air N Arc 300 Series All-In-One Power System Available Options List**

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 6.8.2, Long Term Storage**.

NOTES

9.2 AIR N ARC 300 SYSTEMS ASSEMBLIES



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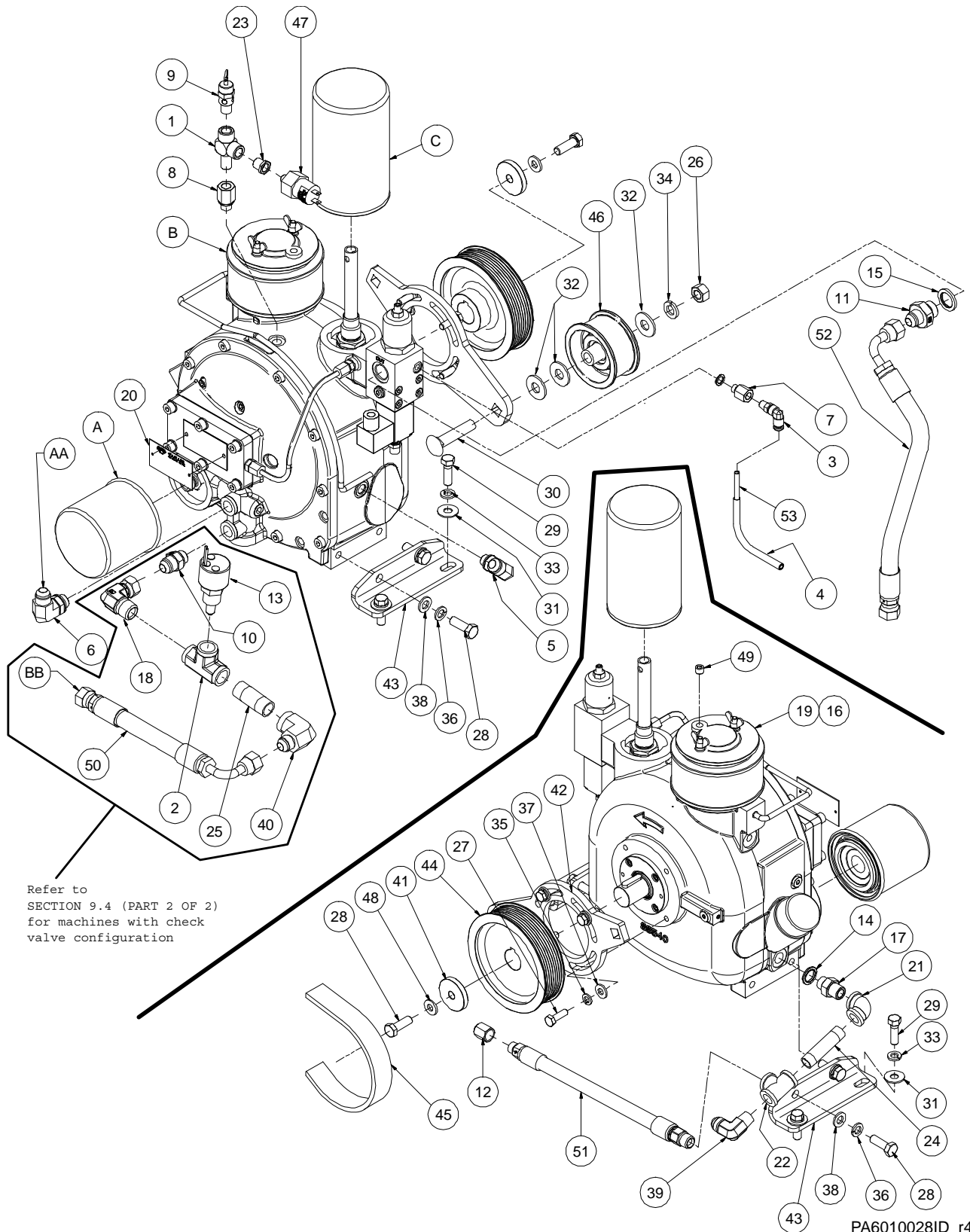
9.2 AIR N ARC 300 SYSTEMS ASSEMBLIES

ITEM	DESCRIPTION	PART NUMBER	QTY	REFERENCE SECTION [‡]
1	AIR STORAGE ASSEMBLY	PA6000040ID	1	9.12
2	ID, COMPRESSOR & PARTS	PA6010028ID	1	9.3 & 9.4
3	ID, COOLER ASSEMBLY	PA6020024ID	1	9.5
4	ID, FRAME & CANOPY	PA6030013ID	1	9.6 & 9.7
5	INSTRUMENT PANEL	PA6040015ID	1	9.8
6	ID, GENERATORS AND PARTS	PA6050007ID	1	9.9
7	ID, ENGINE & DRIVE PARTS	PA6100012ID	1	9.10 & 9.11
8	ID, ELECTRICAL SYSTEM	PA6120048ID	1	9.12
9	ID, FUEL TANK ASSY	PA6140005ID	1	9.13

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

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

9.3 COMPRESSOR AND PARTS ASSEMBLY (1 OF 2)



9.3 COMPRESSOR AND PARTS ASSEMBLY (1 OF 2)

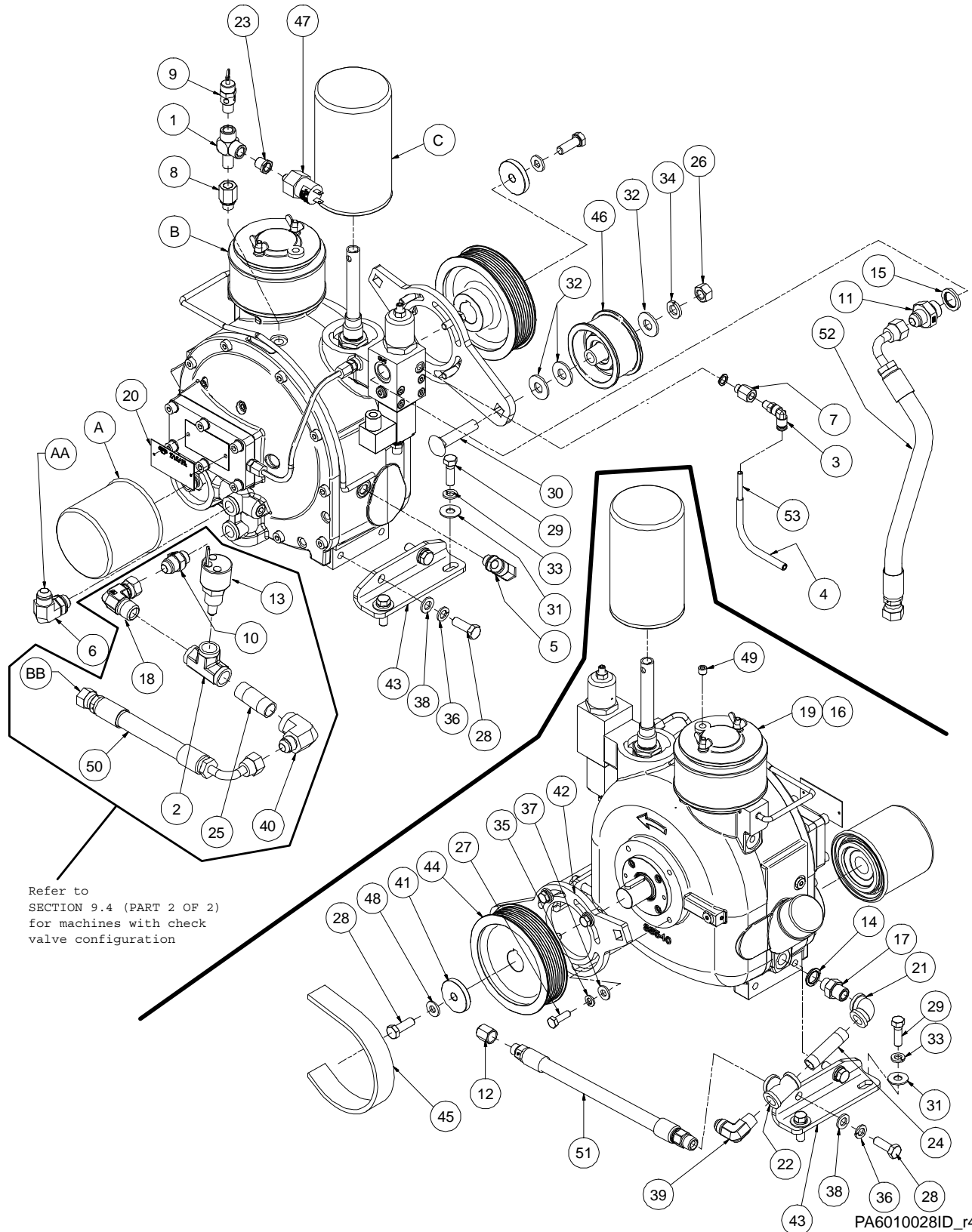
ITEM	DESCRIPTION	PART NUMBER	QTY
1	TEE, MALE STREET 1/4 x 1/4 x 1/4	260402-102	1
2	TEE, PIPE STL 1/2-14	260451-104	1
3	ELBOW, 1/4T x 1/8P PUSH-ON	261309	1
4	LOOM, FLEX-GARD 1/4 ID X 3 FT	262751	1
5 ²	ELBOW, 90 DEG. 1/2 MJIC X 1/4 MBSPP ADJ	263747-020	1
6	ELBOW, 90 DEG. 1/2 MJIC X 3/8 MBSPP ADJ	263747-021	1
7	ADAPTER, FEMALE PIPE x BSPP 1/8	263748-001	1
8	ADAPTER, FEMALE PIPE x BSPP 1/4	263748-004	1
9	VALVE, RELIEF 200 PSI 1/4 NPT MALE	264232	1
10	ADAPTER, M-JIC 1/2 x BSPP 3/8	264312-007	1
11	ADAPTER, MJIC x MBSPP 1/2 x 1/2	264312-008	1
12	CAP, FEMALE JIC 9/16-18 #6	264322-002	1
13	SWITCH, TEMP 240 DEG F NC NASON	264325	1
14	WASHER, SEALING FOR PARKER G3/8 BSPP	264449-002	1
15	WASHER, SEALING BSPP #8	264449-003	1
16	OIL, VANGUARD 3.5 QUARTS	264626	1
17	NIPPLE, HEX G3/8BSPP x 3/8 NPT	267334	1
18	ELBOW, 1/2MPT X 1/2FJIC SWVL 90	268929-008	1
19	COMPR & PART VANAIR 31 EMC, 12VDC STD SHAFT	269761	1
20	TAG, COMPR VANAIR 31	270610	1
21	ELBOW, PIPE GALV 90 DEG 3/8	803515-015	1
22	TEE, PIPE GALV 3/8	804415-015	1
23	BUSHING, RED STEEL 1/4 x 1/8	807600-005	1
24	NIPPLE, PIPE GALV 3/8 x 2.5	823106-025	1
25	NIPPLE, PIPE GALV 1/2 x 2	823108-020	1
26	NUT, HEX 1/2-13	825208-448	1
27	CAPSCREW, HEX M8-1.25 x 25mm	828008-025	4
28	CAPSCREW, HEX 10MM 1.5 X 30MM	828010-030	5
29	CAPSCREW, HEX GR8 3/8-16X1 1/4	829406-125	4
30	BOLT, CARRIAGE 1/2-13UNC X 2-1/2" LG.	829508-250	1
31	WASHER, FLAT 3/8	838206-071	4

Continued on page 129

²From hydraulic cooler.

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

9.3 COMPRESSOR AND PARTS ASSEMBLY (1 OF 2)



Refer to SECTION 9.4 (PART 2 OF 2) for machines with check valve configuration

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9.3 COMPRESSOR AND PARTS ASSEMBLY (1 OF 2)

ITEM	DESCRIPTION	PART NUMBER	QTY
32	WASHER, FLAT 1/2	838208-112	3
33	WASHER, LOCK 3/8	838506-094	4
34	WASHER, LOCK 1/2	838508-125	1
35	WASHER, LOCK METRIC M8	838808-200	4
36	WASHER, LOCK METRIC M10	838810-220	4
37	WASHER, FLAT METRIC M8	838908-180	4
38	WASHER, FLAT METRIC M10	838910-220	4
39 ^{II}	ELBOW, 37FL/90M #08 x 3/8	860208-038	1
40	ELBOW, 37FL/90F 1/2X1/2	860308-050	1
41	WASHER, SHEAVE COMPRESSOR	A1269989	1
42	TENSIONER, AIR END	A1270372	1
43	BRACKET, COMPRESSOR MTG	A1270373	2
44	SHEAVE, COMPRESSOR "8-GROOVE"	DR270371	1
45	BELT, SERPENTINE, 8 RIB X 53.75" LG EFFECTIVE LENGTH, BLACK RUBBER	DR27584	1
46	IDLER, 1.375 WIDTH, 3 3/8 DIA	DR46584	1
47	SWITCH, PRESSURE N.C. 185 PSI	EL270002	1
48	WASHER, 3/8ID X 13/16OD	FA49463	1
49	PIPE BRASS, PLUG, COUNTERSUNK 1/8" NPT	FI67437	1
50	COMPRESSOR TO OIL COOLER, LOWER	TU270453-002	1
51 ^{III}	DRAIN HOSE, COMPRESSOR	TU270453-003	1
52 ^{IV}	COMPRESSOR TO AIR TANK UPPER	TU270453-004	1
53 ^V	TUBING, 1/4 DIA., NYLON, 230 PSI X 3 FT	TU95945	1
A	ELEMENT, COMPRESSOR OIL FILTER	264471	1
B	ELEMENT, COMPRESSOR AIR FILTER (enclosed)	264469	1
C	ELEMENT, SPIN-ON COALESCER	264470	1

AA - FROM COMPRESSOR COOLER (UPPER)

BB - TO COMPRESSOR COOLER (LOWER)

^{II} TO HYDRAULIC PUMP

^{III} OIL DRAIN

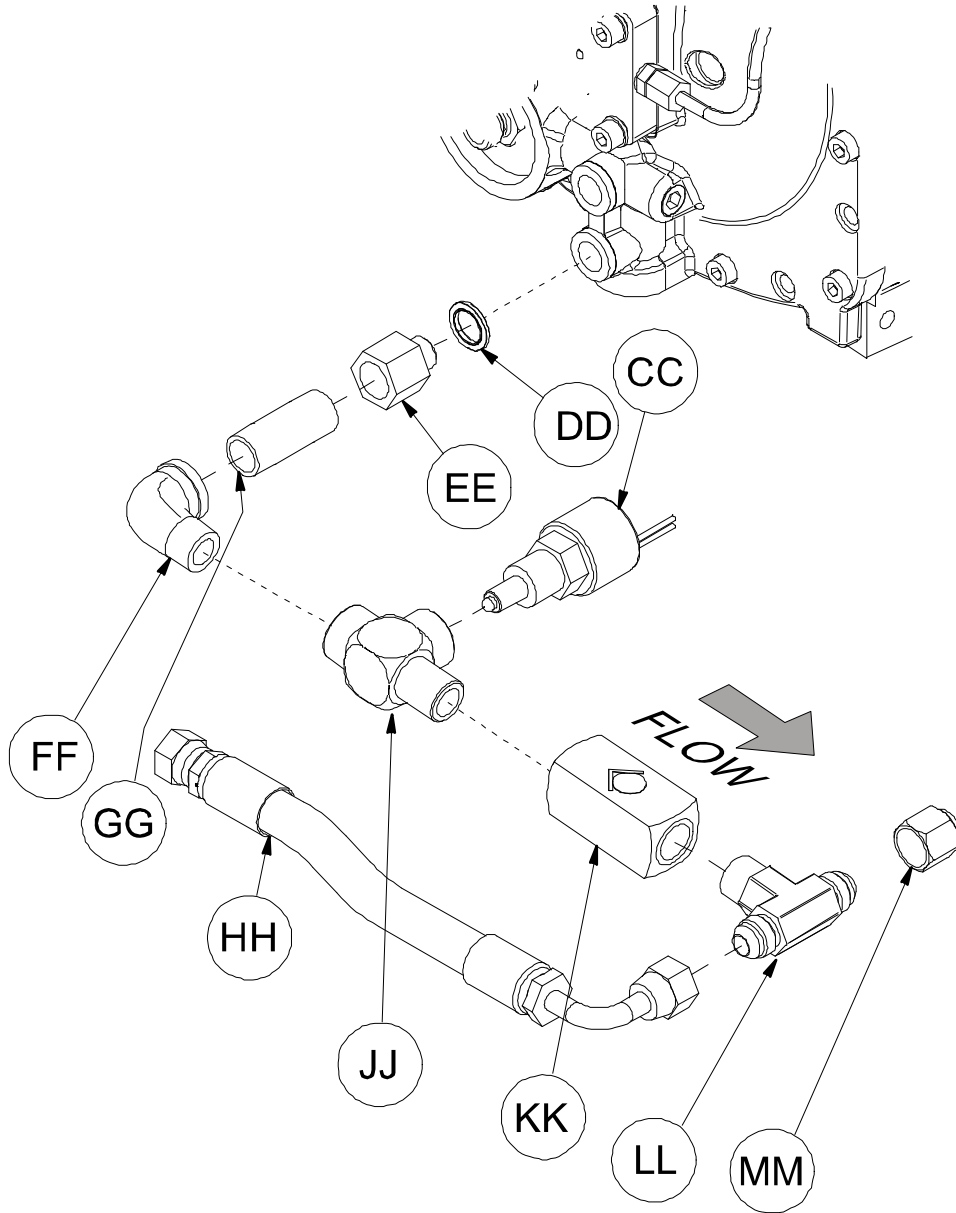
^{IV} TO BULKHEAD (AIR OUT)

^V TO PRESSURE SWITCH

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

9.4 COMPRESSOR AND PARTS ASSEMBLY (2 OF 2)

This assembly is representative of machines with a check valve. Refer to **SECTION 9.3, COMPRESSOR AND PARTS ASSEMBLY (1 OF 2)** for machine configuration without check valve.



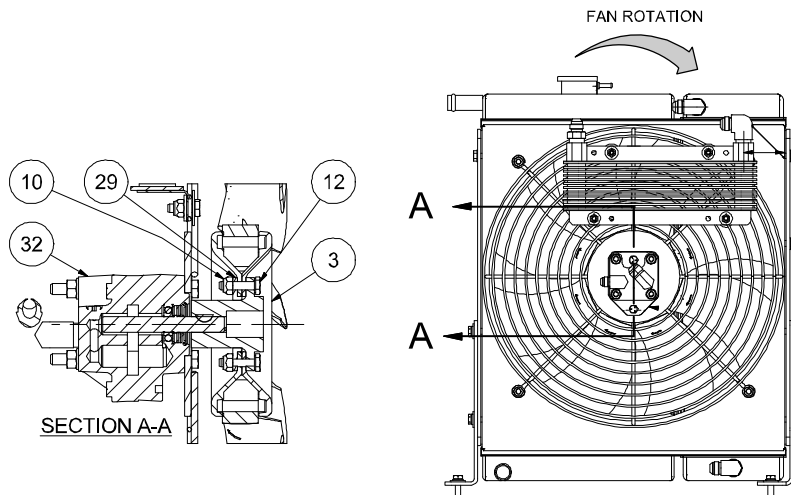
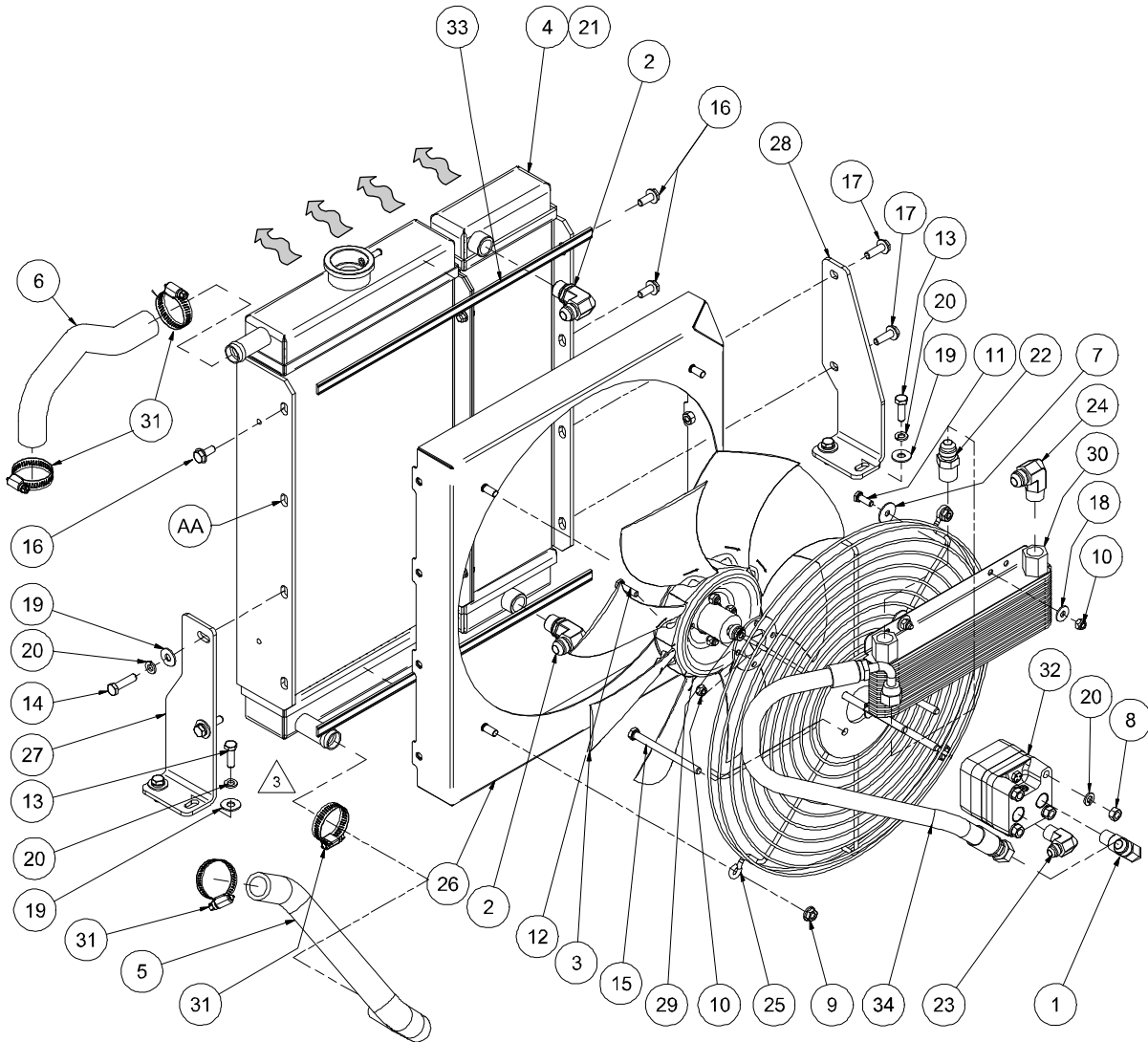
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9.4 COMPRESSOR AND PARTS ASSEMBLY (2 OF 2)

ITEM	DESCRIPTION	PART NUMBER	QTY
CC	SWITCH, TEMP 240 DEG F NC NASON	264325	1
DD	WASHER, SEALING FOR PARKER G3/8 BSPP	264449-002	3
EE	ADAPTER, 1/2 FEMALE PIPE X 3/8 BSPP LESS WASHER	263748-011	2
FF	ELBOW, PIPE STREET 1/2	801115-020	1
GG	NIPPLE, PIPE GALV 1/2 x 2	823108-020	1
HH	COMPRESSOR TO OIL COOLER, LOWER	TU270453-002	1
JJ	TEE, MALE STREET 1/2 x 1/2 x 1/2	260402-104	1
KK	VALVE, CHECK 1 PSI 1/2 NPT	CO270584	1
LL	TEE, 37FL/M BR #8 x 1/2	861708-050	1
MM	CAP, FEMALE JIC 3/4-16 #8	264322-003	1

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

9.5 COOLING SYSTEM



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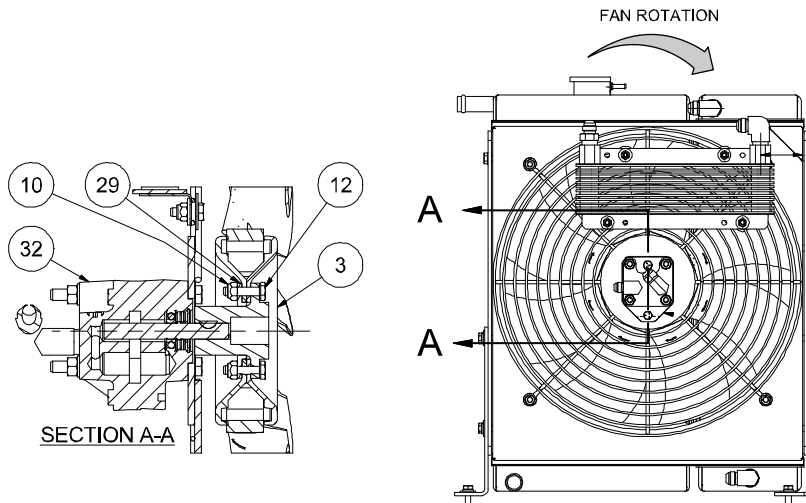
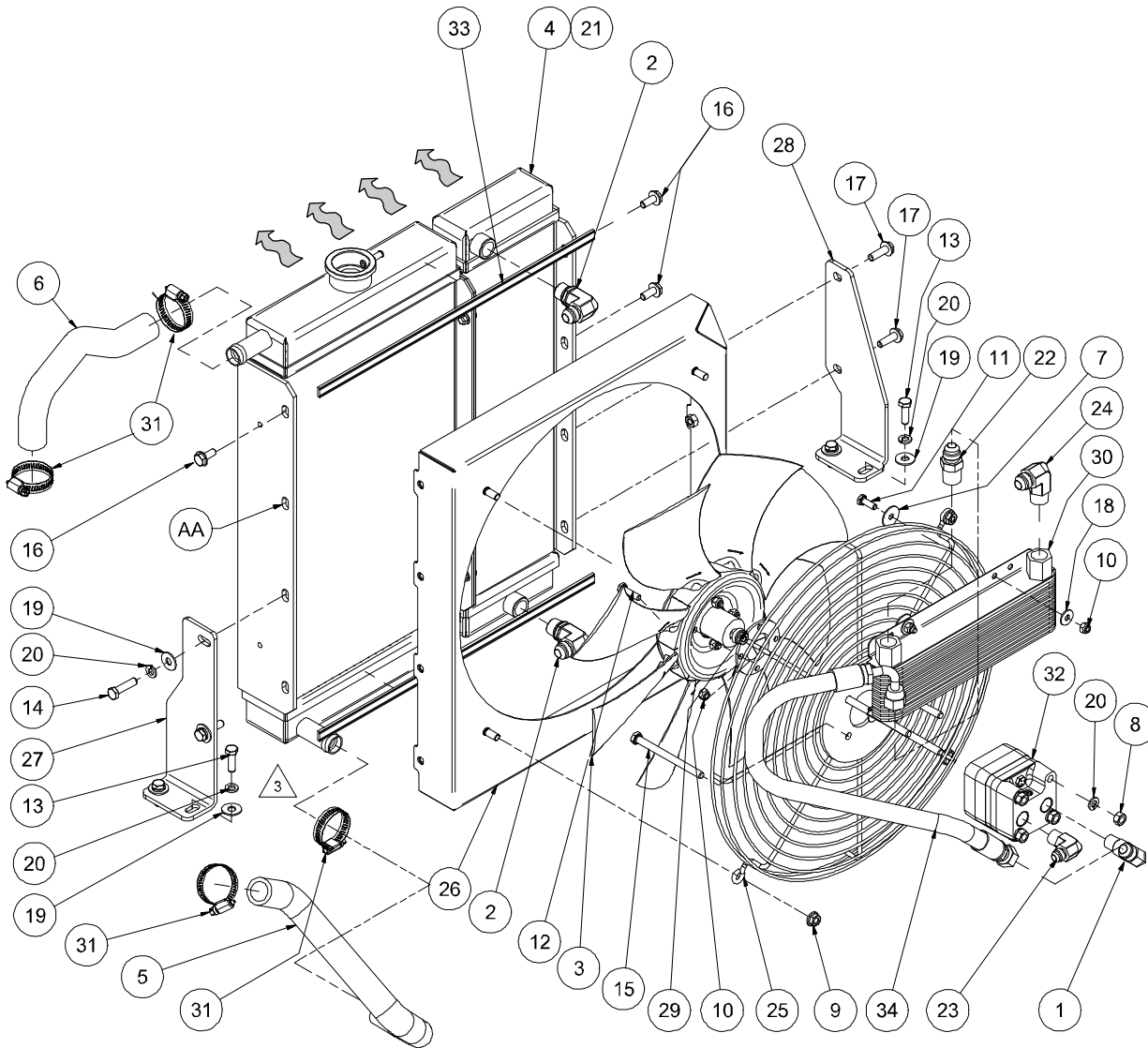
9.5 COOLING SYSTEM

ITEM	DESCRIPTION	PART NUMBER	QTY
1	ELBOW, 90 DEG 3/8P X 1/2J LONG	044832-007	1
2	ELBOW, 90 DEG #8 MJIC x #8 MSAE	260403-104	2
3	FAN, COOLER, 16 DIA, 8 BLADE (REVERSE ROTATION)	270366	1
4	RADIATOR, ENGINE & COMPR COOLER	270374	1
5	HOSE, RADIATOR 7/8" ID X 19" LG	270605	1
6	HOSE, RADIATOR 7/8" ID X 12" LG	270605.	1
7	WASHER, FENDER 1/4 x 1	270714	4
8	NUT, HEX 5/16-18	825205-273	4
9	NUT, HEX FLANGE 5/16-18	825305-283	4
10	NUT, HEX LOCKING 1/4-20	825504-145	8
11	CAPSCREW, HEX GR5 1/4-20X 3/4	829104-075	4
12	CAPSCREW, HEX GR5 1/4-20X1	829104-100	4
13	CAPSCREW, HEX GR5 5/16-18 x 1	829105-100	4
14	CAPSCREW, HEX GR5 5/16-18X1-1/4	829105-125	2
15	CAPSCREW, HEX GR5 5/16-18 x 4	829105-400	4
16	SCREW, SER WASH 5/16-18 x 0.75	829705-075	3
17	SCREW, SER WASH 5/16-18 x 1	829705-100	2
18	WASHER, FLAT 1/4	838204-071	4
19	WASHER, FLAT 5/16	838205-071	6
20	WASHER, LOCK 5/16	838505-078	10
21	ANTI FREEZE, GAL 50/50 MIX	844400-001	1 GAL
22	CONNECTOR, 37FL/MPT #08 x 1/2	860108-050	1
23	ELBOW, 37FL/90M #06 x 3/8	860206-038	1
24	ELBOW, 37FL/90M #08 x 1/2	860208-050	1
25	GUARD, COOLER	A1270356	1
26	SHROUD, COOLER	A1270375	1
27	BRACKET, COOLER LH	A1270382	1
28	BRACKET, COOLER RH	A1270383	1
29	RING, FAN ADAPTER	A1270692	1
30	COOLER, OIL, 12 PLATE, ALUMINUM	EN37997	1

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

9.5 COOLING SYSTEM (CONTINUED)



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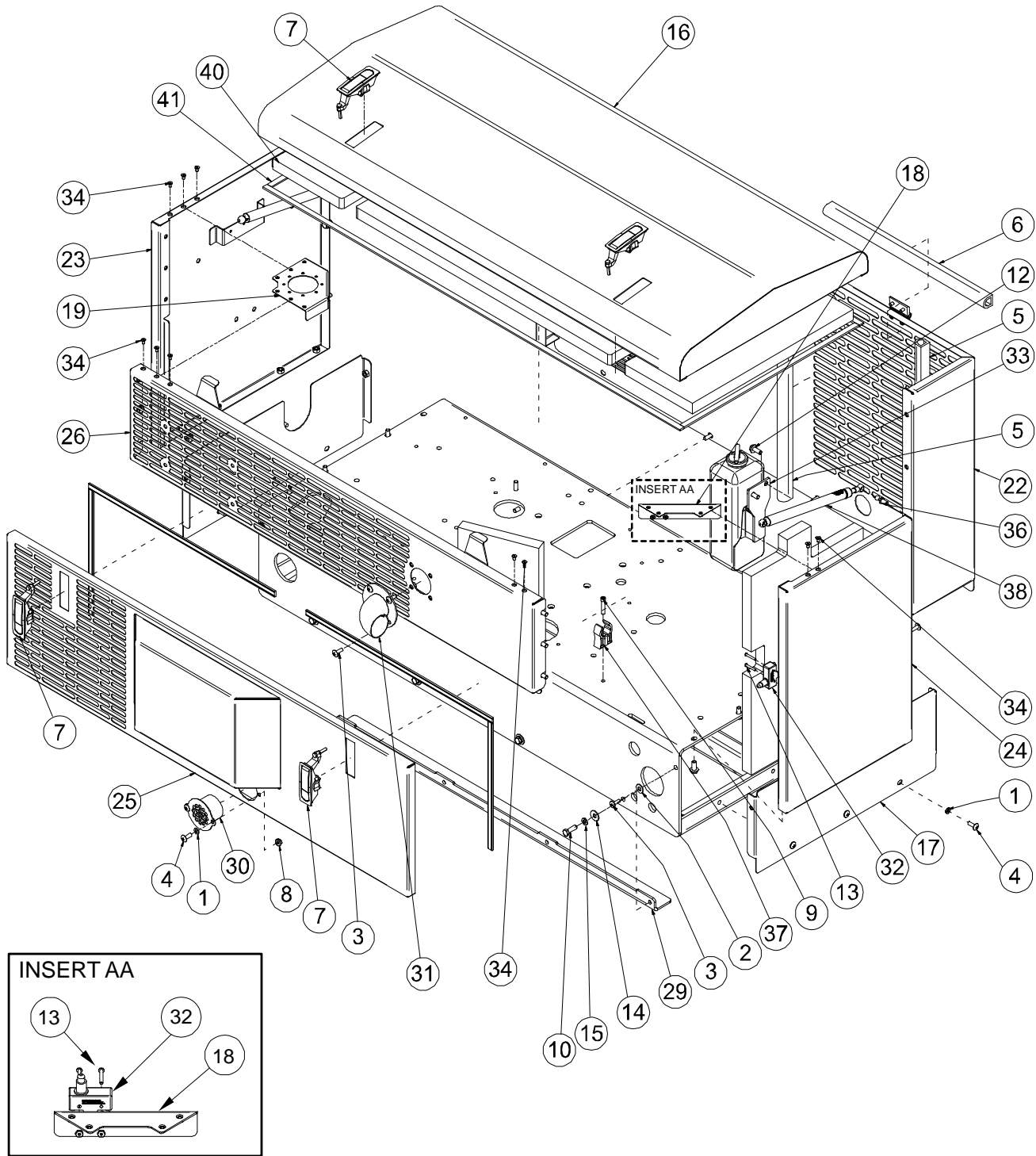
9.5 COOLING SYSTEM (CONTINUED)

ITEM	DESCRIPTION	PART NUMBER	QTY
31	CLAMP, HOSE, #20, 1.75DIA.	FA47720	4
32	MOTOR, HYD BI-ROT	HY270358	1
33	GASKET, SEAL AND TRIM, EXTRUDE 17-1/4" LG.	PR35734	2
34	HOSE, MOTOR TO COOLER	TU270453-009	1

AA - NO FASTENER

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

9.6 FRAME AND CANOPY (1 OF 2)



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9.6 FRAME AND CANOPY (1 OF 2)

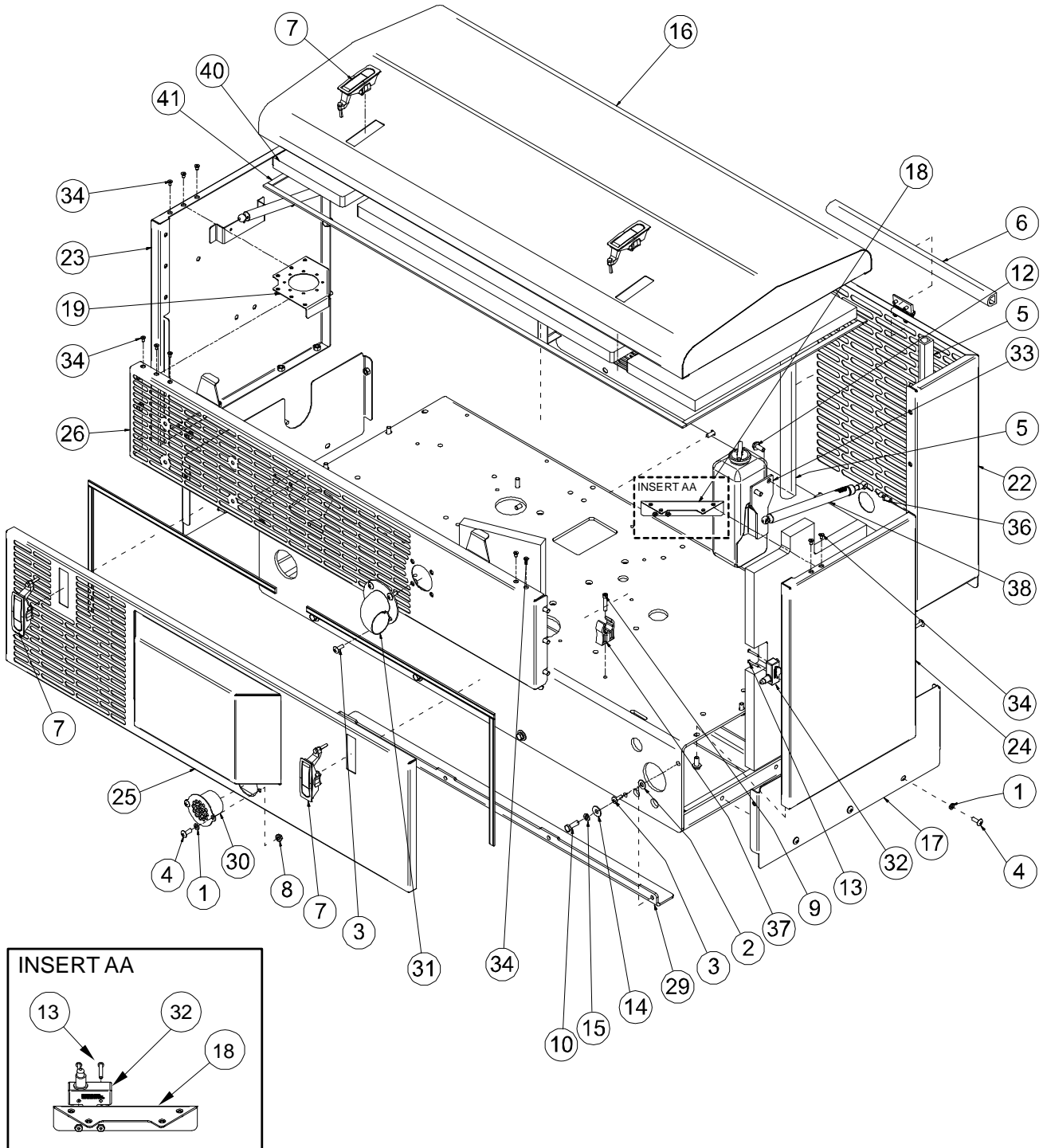
ITEM	DESCRIPTION	PART NUMBER	QTY
1	WASHER, NYLON FLAT 1/4	262704	8
2	WASHER, NYLON 5/16-18	262943	8
3	SCREW, TRUSS HD 5/16-18 x 3/4 SS	262945	12
4	SCREW, TRUSS HD 1/4-20 x 3/4	262953	8
5	SEAL, RUBBER "D" TRIM-LOK 1" x 1" x 21-3/16" LG	264138	2
6	SEAL, RUBBER "D" TRIM-LOK 1" x 1" x 17-15/16" LG	264138	1
7	LATCH, SENTRY PANEL	267124	4
8	NUT, HEX FLANGE 1/4-20	825304-236	2
9	CAPSCREW, S.H. 1/4-20 x 1 1/4	828304-125	1
10	CAPSCREW, HEX GR5 5/16-18 x 1	829105-100	8
11	SCREW, SER WASH 5/16-18 x 0.5	829705-050	12
12	SCREW, SER WASH 5/16-18 x 0.75	829705-075	10
13	SCREW, MACHINE #6-32 x 1	831600-100	2 ^I
14	WASHER, FLAT 5/16	838205-071	4
15	WASHER, LOCK 5/16	838505-078	8
16	CANOPY, HOOD	A1269763	1
17	COVER, BASE	A1269769	1
18	SUPPORT, CROSS BRACE	A1269797	1
19	SUPPORT, FUEL FILL NECK	A1269798	1
20	COVER, BASE WITH CUTOUT	A1269980	1
21	PLATFORM	A1270359	1
22	CANOPY, BACK	A1270360	1
23	CANOPY, SIDE RH	A1270361	1
24	CANOPY, SIDE LH	A1270362	1
25	CANOPY, FRONT LOWER	A1270363	1
26	CANOPY, FRONT UPPER	A1270364	1
27	SUPPORT, CROSS BRACE	A1270459	1
28	MOUNT, PLATFORM RH	A1270464	1
29	MOUNT, PLATFORM LH	A1270465	1

Continued on page 139

^IThis quantity doubles if machine is equipped with hood safety switch (see INSERT AA).

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

9.6 FRAME AND CANOPY (1 OF 2) (CONTINUED)



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9.6 FRAME & CANOPY ASSEMBLY (1 OF 2) (CONTINUED)

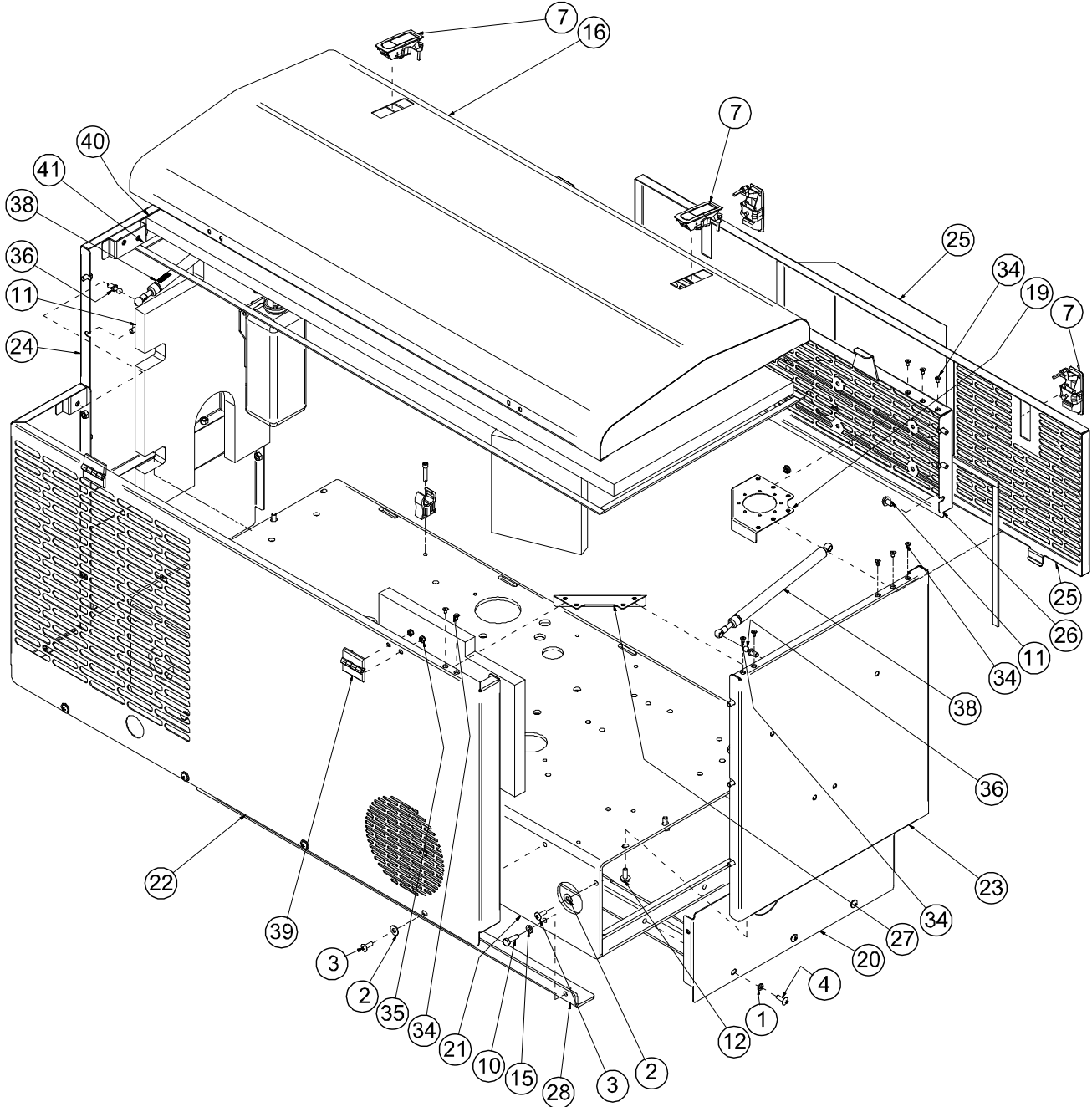
ITEM	DESCRIPTION	PART NUMBER	QTY
30	PANEL, ENGINE INLET	A1270550	1
31	EXHAUST, OUTLET	A14883P	1
32	SWITCH, HOOD SAFETY NO/NC 15A-125V. AC	CO81774	1 ^I
33	TANK, 1 GAL RECOVERY, COOLANT	EN45487	1
34	CAPSCREW, S.H.FLAT #10-24 x 3/8	FA269805	14
35	NUT, LOCK, M6 x 1.0 PITCH	FA55272	9
36	STUD, BALL, .39 DIA. x .55LG.	FA58724	4
37	CLIP, DRAIN HOSE HOLDER, 3/4	HA270218	1
38	GAS SPRING, 6 STROKE, 20#	HA72205	2
39	HINGE, 2" x 2", BLACK	HA88014	2
40	KIT, 1" ACOUSTICAL FOAM INSULATION	PR270450	1
41	GASKET, SEAL AND TRIM (16 FT TOTAL)	PR35734	1

^IThis quantity doubles if machine is equipped with hood safety switch (see INSERT AA).

INSERT AA - Hood safety switch (if equipped), is mounted on cross brace #18. NOTE: The addition of the hood safety switch doubles part number quantities for #13 and #32 in the Parts List above.

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

9.7 FRAME AND CANOPY (2 OF 2)



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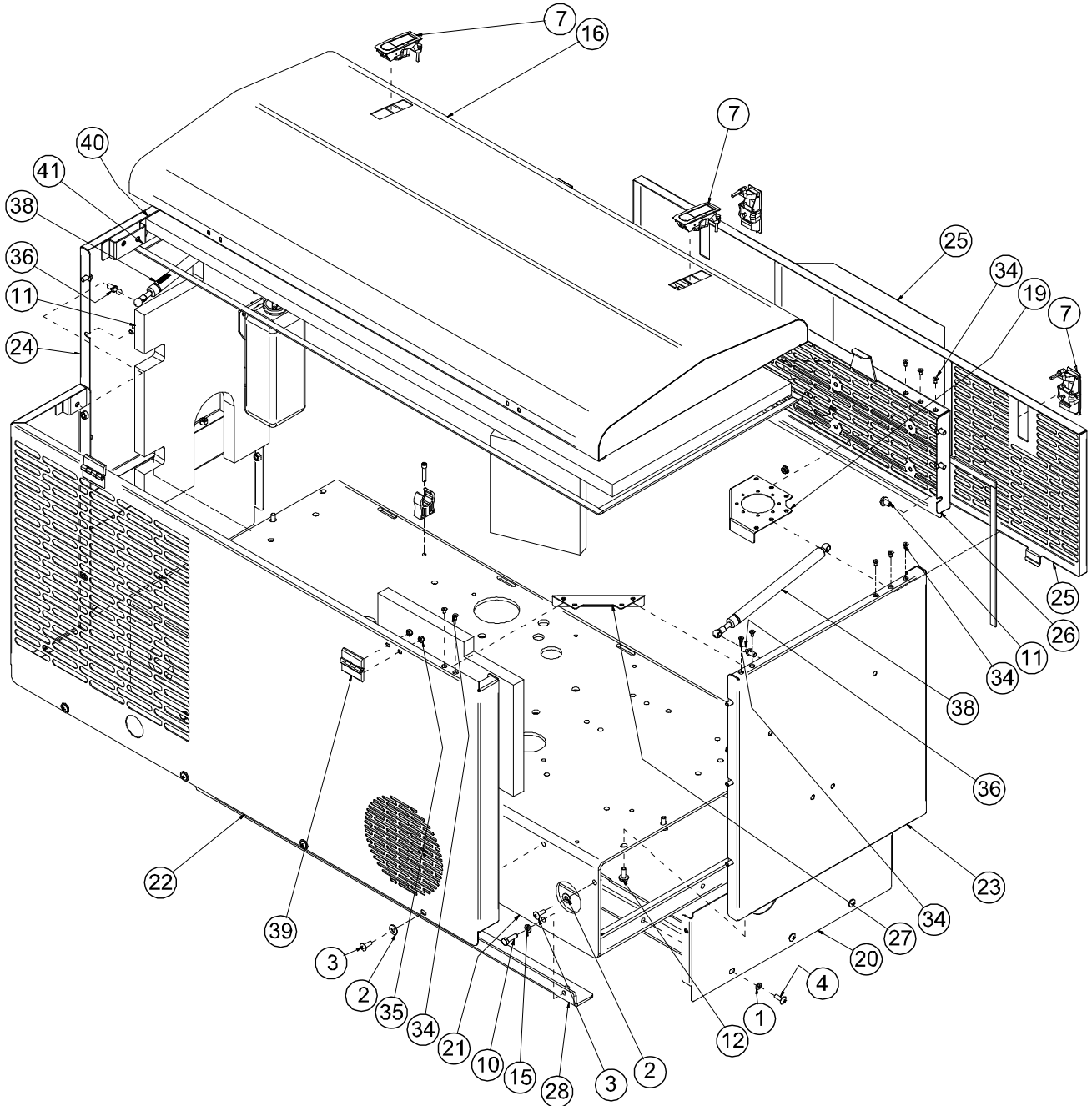
9.7 FRAME AND CANOPY (2 OF 2)

ITEM	DESCRIPTION	PART NUMBER	QTY
1	WASHER, NYLON FLAT 1/4	262704	8
2	WASHER, NYLON 5/16-18	262943	8
3	SCREW, TRUSS HD 5/16-18 x 3/4 SS	262945	12
4	SCREW, TRUSS HD 1/4-20 x 3/4	262953	8
5	SEAL, RUBBER "D" TRIM-LOK 1" x 1" x 21-3/16" LG	264138	2
6	SEAL, RUBBER "D" TRIM-LOK 1" x 1" x 17-15/16" LG	264138	1
7	LATCH, SENTRY PANEL	267124	4
8	NUT, HEX FLANGE 1/4-20	825304-236	2
9	CAPSCREW, S.H. 1/4-20 x 1 1/4	828304-125	1
10	CAPSCREW, HEX GR5 5/16-18 x 1	829105-100	8
11	SCREW, SER WASH 5/16-18 x 0.5	829705-050	12
12	SCREW, SER WASH 5/16-18 x 0.75	829705-075	10
13	SCREW, MACHINE #6-32 x 1	831600-100	2
14	WASHER, FLAT 5/16	838205-071	4
15	WASHER, LOCK 5/16	838505-078	8
16	CANOPY, HOOD	A1269763	1
17	COVER, BASE	A1269769	1
18	SUPPORT, CROSS BRACE	A1269797	1
19	SUPPORT, FUEL FILL NECK	A1269798	1
20	COVER, BASE WITH CUTOUT	A1269980	1
21	PLATFORM	A1270359	1
22	CANOPY, BACK	A1270360	1
23	CANOPY, SIDE RH	A1270361	1
24	CANOPY, SIDE LH	A1270362	1
25	CANOPY, FRONT LOWER	A1270363	1
26	CANOPY, FRONT UPPER	A1270364	1
27	SUPPORT, CROSS BRACE	A1270459	1
28	MOUNT, PLATFORM RH	A1270464	1
29	MOUNT, PLATFORM LH	A1270465	1
30	PANEL, ENGINE INLET	A1270550	1

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

9.7 FRAME AND CANOPY (2 OF 2) (CONTINUED)



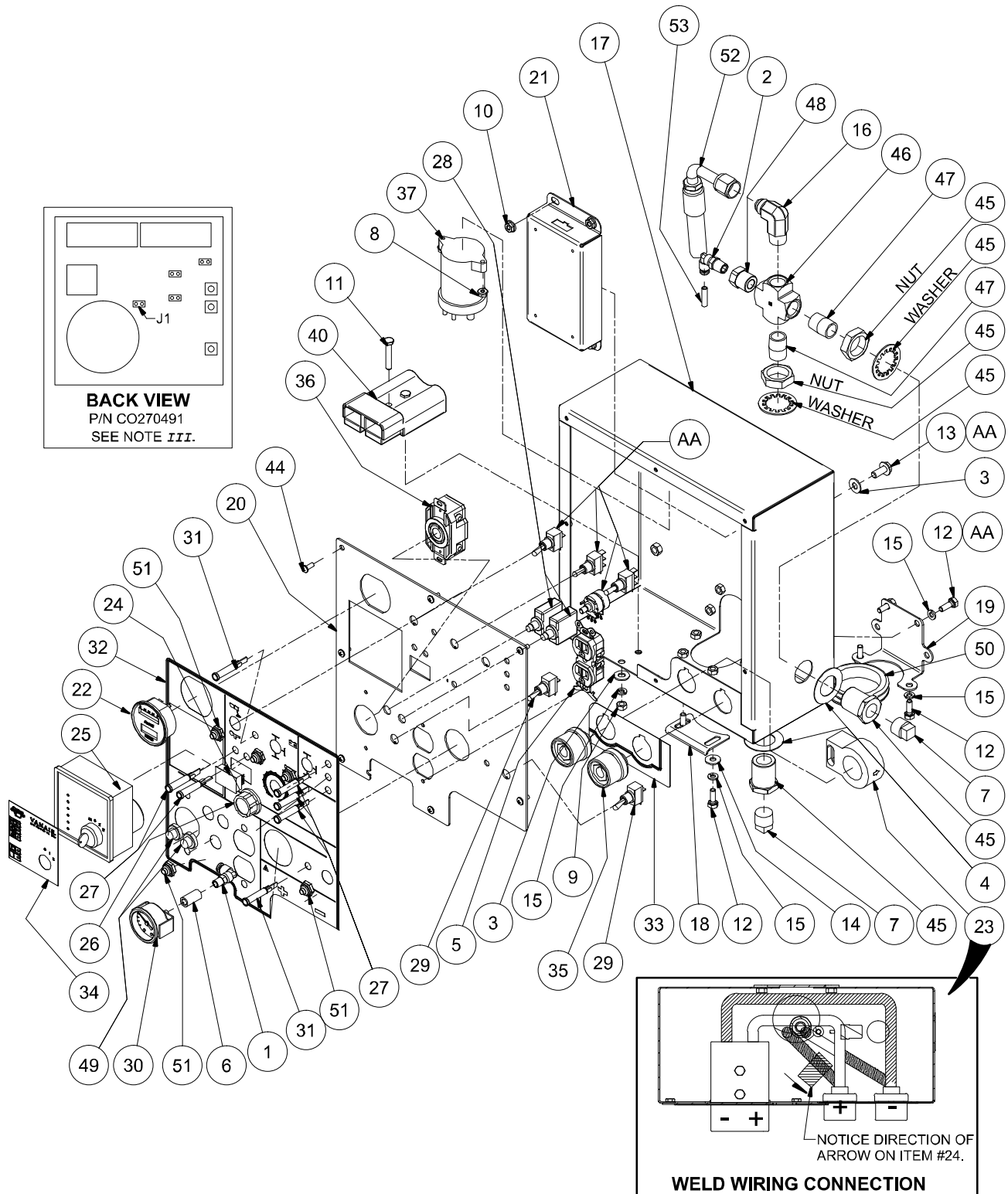
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9.7 FRAME AND CANOPY ASSEMBLY (2 OF 2) (CONTINUED)

ITEM	DESCRIPTION	PART NUMBER	QTY
31	EXHAUST, OUTLET	A14883P	1
32	SWITCH, HOOD SAFETY NO/NC 15A-125V. AC	CO81774	1
33	TANK, 1 GAL RECOVERY, COOLANT	EN45487	1
34	CAPSCREW, S.H.FLAT #10-24 x 3/8	FA269805	14
35	NUT, LOCK, M6 x 1.0 PITCH	FA55272	9
36	STUD, BALL, .39 DIA. x .55LG.	FA58724	4
37	CLIP, DRAIN HOSE HOLDER, 3/4	HA270218	1
38	GAS SPRING, 6 STROKE, 20#	HA72205	2
39	HINGE, 2" x 2", BLACK	HA88014	2
40	KIT, 1" ACOUSTICAL FOAM INSULATION	PR270450	1
41	GASKET, SEAL AND TRIM (16 FT TOTAL)	PR35734	1

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

9.8 INSTRUMENT PANEL



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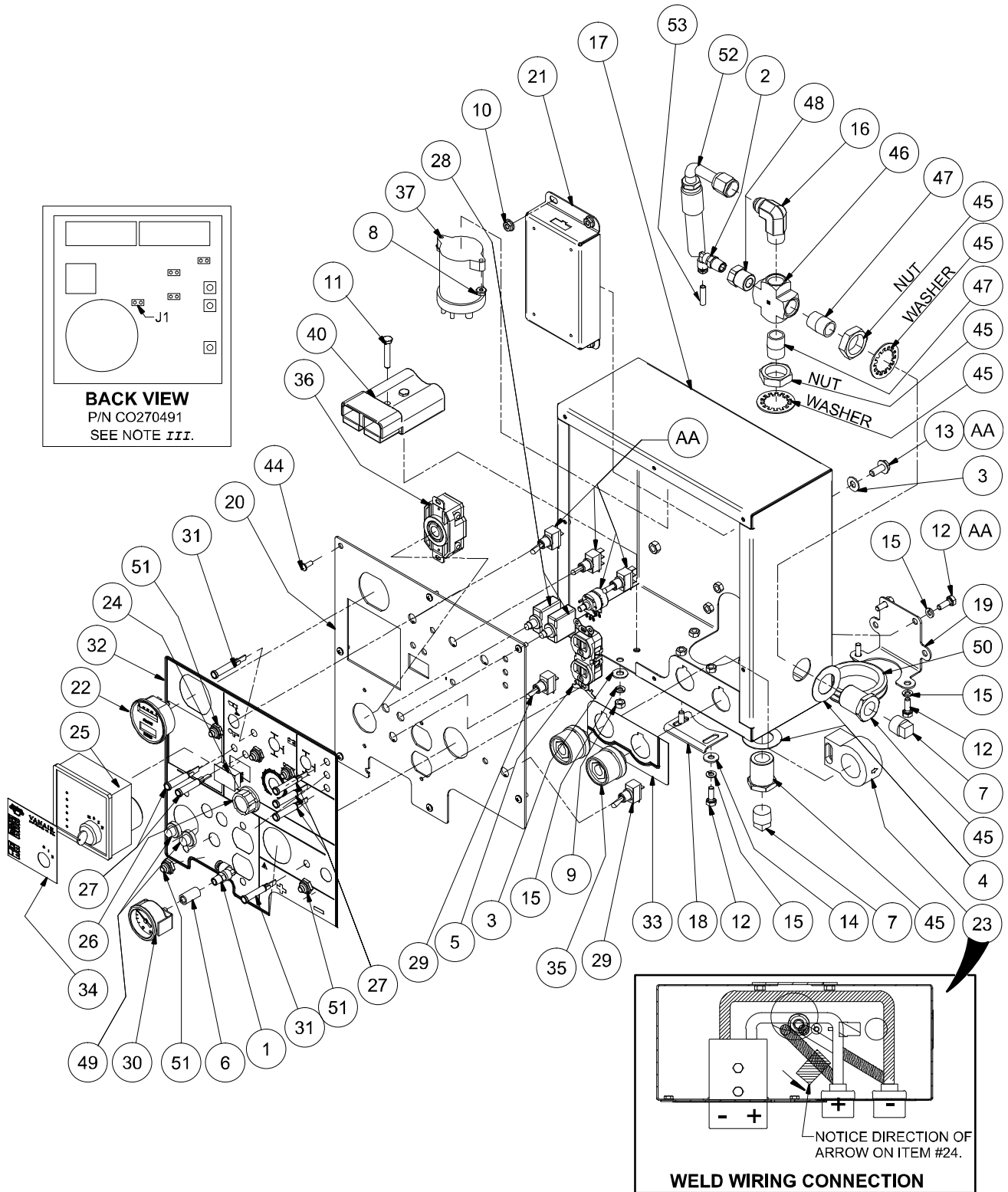
9.8 INSTRUMENT PANEL

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	CAPSCREW, HEX GR8 1/4-20 X 3/4 LG	829404-075	6
13	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	PANEL, CONTROL BACK	A1269489	1
18	CLAMP, CONTROL PANEL CABLE	A1269491	1
19	COVER, CONTROL PANEL CABLE	A1269492	1
20	FACEPLATE, CONTROL PANEL	A1270503	1
21	MODULE, WELD CONTROL SYS ASSY	CO269598	1
22	GAUGE, FUEL / HOUR METER	CO269748	1
23	SENSOR, HALL EFFECT WELD CONTROLS	CO269900	1
24	PANELMETER, VOLTAGE, LED	CO270314	1
25	CONTROL, ENG. START/STOP	CO270491	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
29	SWITCH, TOGGLE, SPST, ON/OFF	CO78077	2

Continued on page 147

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

9.8 INSTRUMENT PANEL (CONTINUED)



PA6040015ID_r0

9.8 INSTRUMENT PANEL (CONTINUED)

ITEM	DESCRIPTION	PART NUMBER	QTY
30	GAUGE, AIR, DRY, 0-200 PSI	CO89649	1
31	LAMP, INDICATOR, LED, RED	CO89659	2
32	DECAL, FACEPLATE	DL270502	1
33	DECAL, CONTROL PANEL, WELDER	DL270502-002	1
34	DECAL, CONTROL, ENG. START/STOP	DL270508	1
35	RECEPTACLE, PANEL 350 AMP	EL269932	2
36	RECEPTACLE, 240V/30A TURNLOC	EL270148	1
37 ^I	RELAY, 500 AMP 12V COIL NO	EL270483	1
38	HARNESS, WIRE INST PNL LIGHTS	EP269871	1
39	HARNESS, WIRE INST PNL SWITCH	EP269872	1
40	HARNESS, WELD CABLE JUMPER	EP270171	1
41	HARNESS, A/C PANEL TO MACHINE	EP270230	1
42	HARNESS, WIRE INST. PNL DISPLAY	EP270315	1
43	HARNESS, WIRE INST PNL	EP270407	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, WEATHER PROOF	PR77230	5
52	HOSE, AIR TANK TO PANEL	TU270453-006	1
53	TUBING, 1/4 DIA., NYLON, 230 PSI x 1.25 FT	TU95945	1

AA - SEE NOTE ^{II}

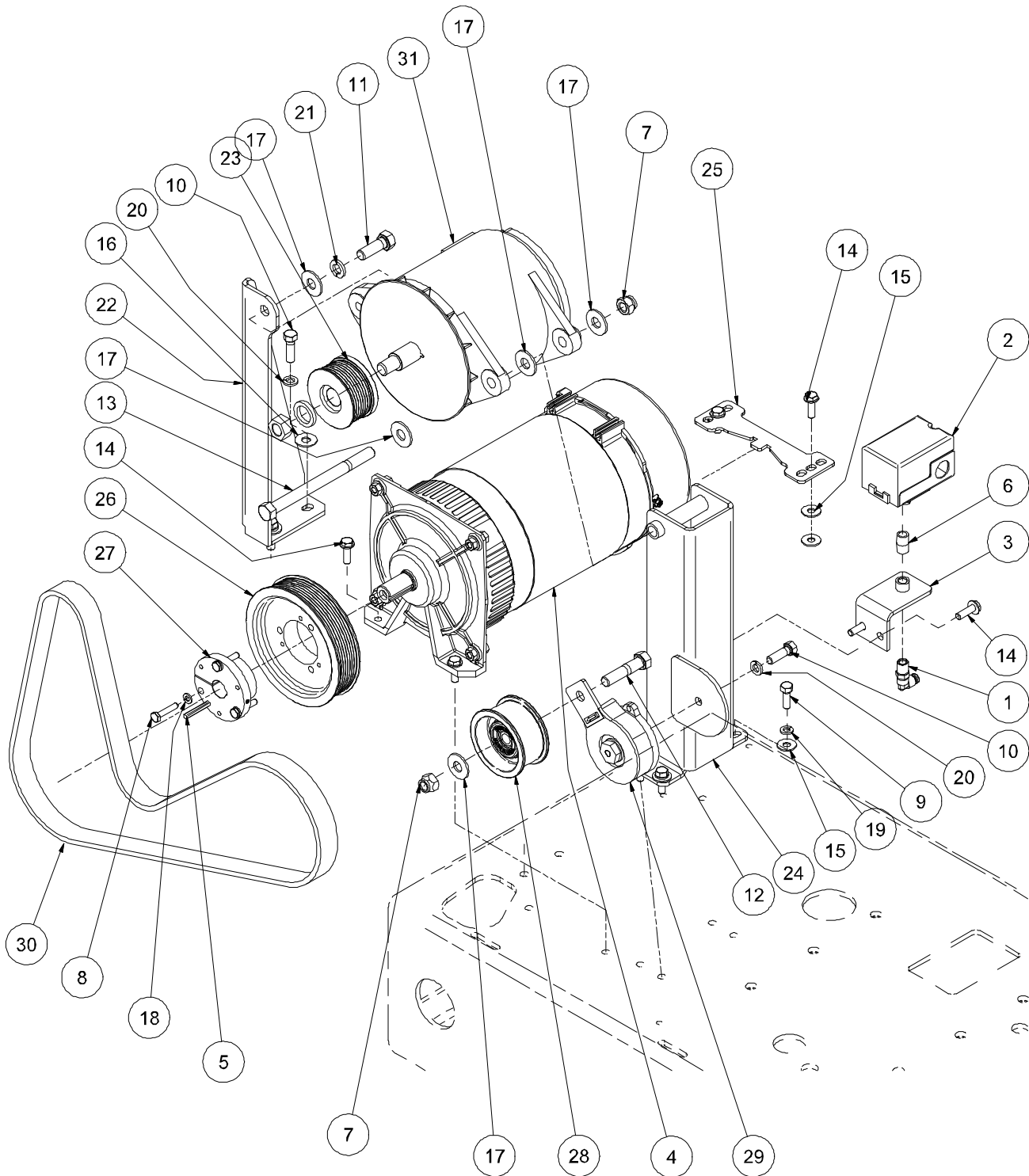
^I Optional relay shown.

^{II} Toggle switches and potentiometer are included with harness EP269872; wiring instrument panel switches.

^{III} Remove jumper J1.

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

9.9 GENERATORS AND PARTS



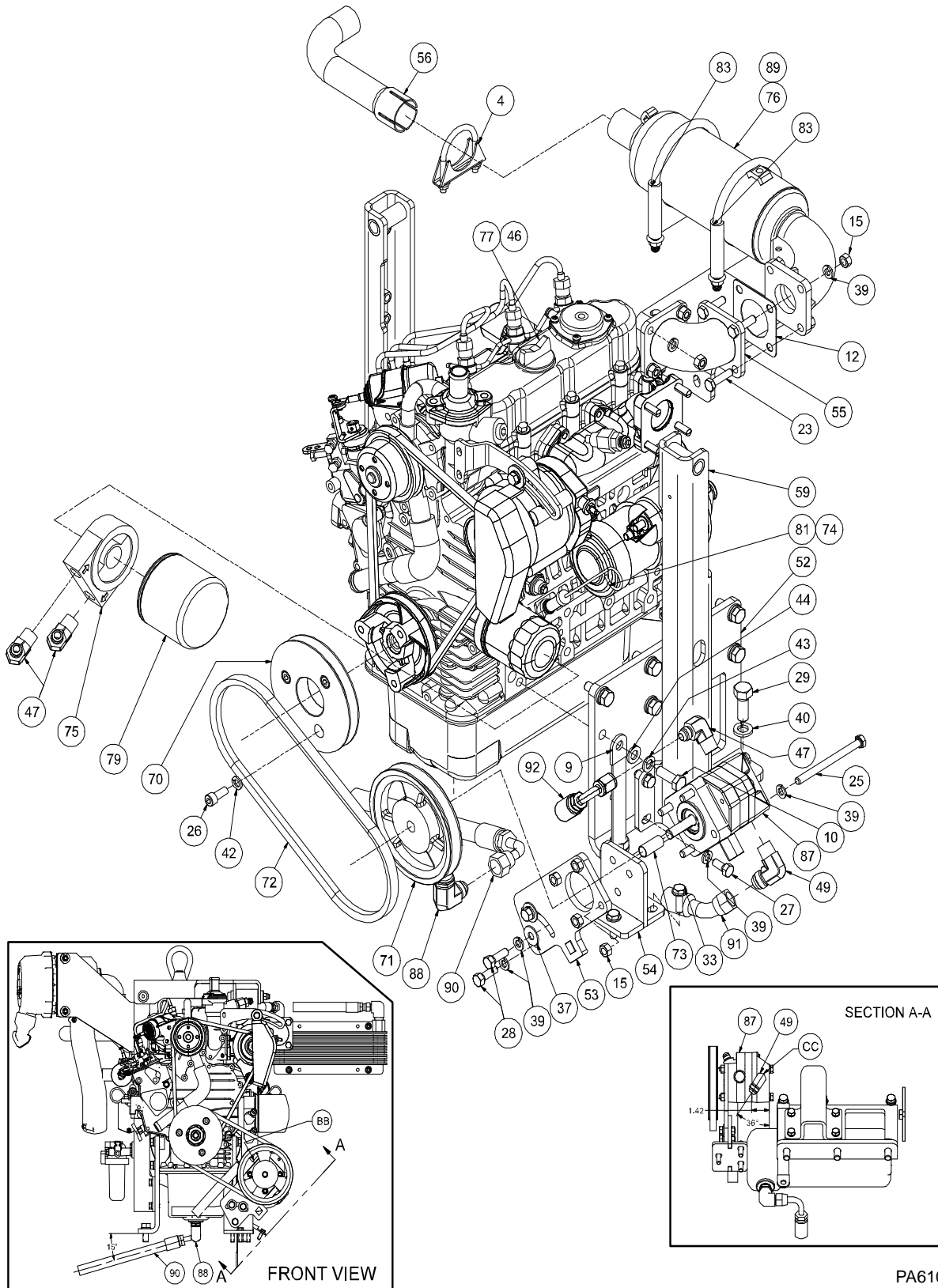
PA6050007ID_r1

9.9 GENERATORS AND PARTS

ITEM	DESCRIPTION	PART NUMBER	QTY
1	ELBOW, 90 DEG. PUSH ON 1/4T x 1/4P	261310	1
2	SWITCH, PRESSURE ADJUSTABLE	263850	1
3	BRACKET, ADJ. PRESSURE SWITCH	269299	1
4	GENERATOR, AC, 6.8KW	269530	1
5	KEY, SQUARE 3/16 x 3/16 x 1.5	821103-150	1
6	NIPPLE, PIPE XS CLOSE 1/4	822204-000	1
7	NUT, HEX LOCKING 1/2-13	825508-262	2
8	CAPSCREW, HEX GR5 1/4-20 x 1 1/4	829104-125	3
9	CAPSCREW, HEX GR8 5/16-18 x 1.0 LG.	829405-100	4
10	CAPSCREW, HEX GR8 3/8-16 x 1 1/4	829406-125	3
11	CAPSCREW, HEX GR8 1/2-13 x 1 1/2	829408-150	1
12	CAPSCREW, HEX GR8 1/2-13 x 2.25	829408-225	1
13	CAPSCREW, HEX GR8 1/2-13 x 6.5	829408-650	1
14	SCREW, SER WASH 5/16-18 x 1	829705-100	6
15	WASHER, FLAT 5/16	838205-071	8
16	WASHER, FLAT 3/8	838206-071	2
17	WASHER, FLAT 1/2	838208-112	5
18	WASHER, LOCK 1/4	838504-062	3
19	WASHER, LOCK 5/16	838505-078	4
20	WASHER, LOCK 3/8	838506-094	3
21	WASHER, LOCK 1/2	838508-125	1
22	BRACKET, WELD GENERATOR	A1269734	1
23	SHEAVE, 8 GROOVE, WELD GENERATOR, KEYED	A1270083	1
24	BRACKET, WELD GENERATOR SUPPORT	A1270388	1
25	MOUNT, REAR GENERATOR	A15865P	1
26	SHEAVE, SERPENTINE, 8 GROOVE	A15891Z	1
27	BUSHING, SDS, QD, 7/8DIA.	DR41395Z	1
28	IDLER, 1.375 WIDTH, 3 3/8 DIA	DR46584	1
29	TENSIONER, ROTARY, LARGE, 42#	DR61391	1
30	BELT, SERPENTINE, 8 RIB x 62.0", BLACK RUBBER	DR62184	1
31	WELDER, GENERATOR 300AMP	GE269529	1

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

9.10 ENGINE AND DRIVE PARTS (1 OF 2)



PA6100012ID_r2

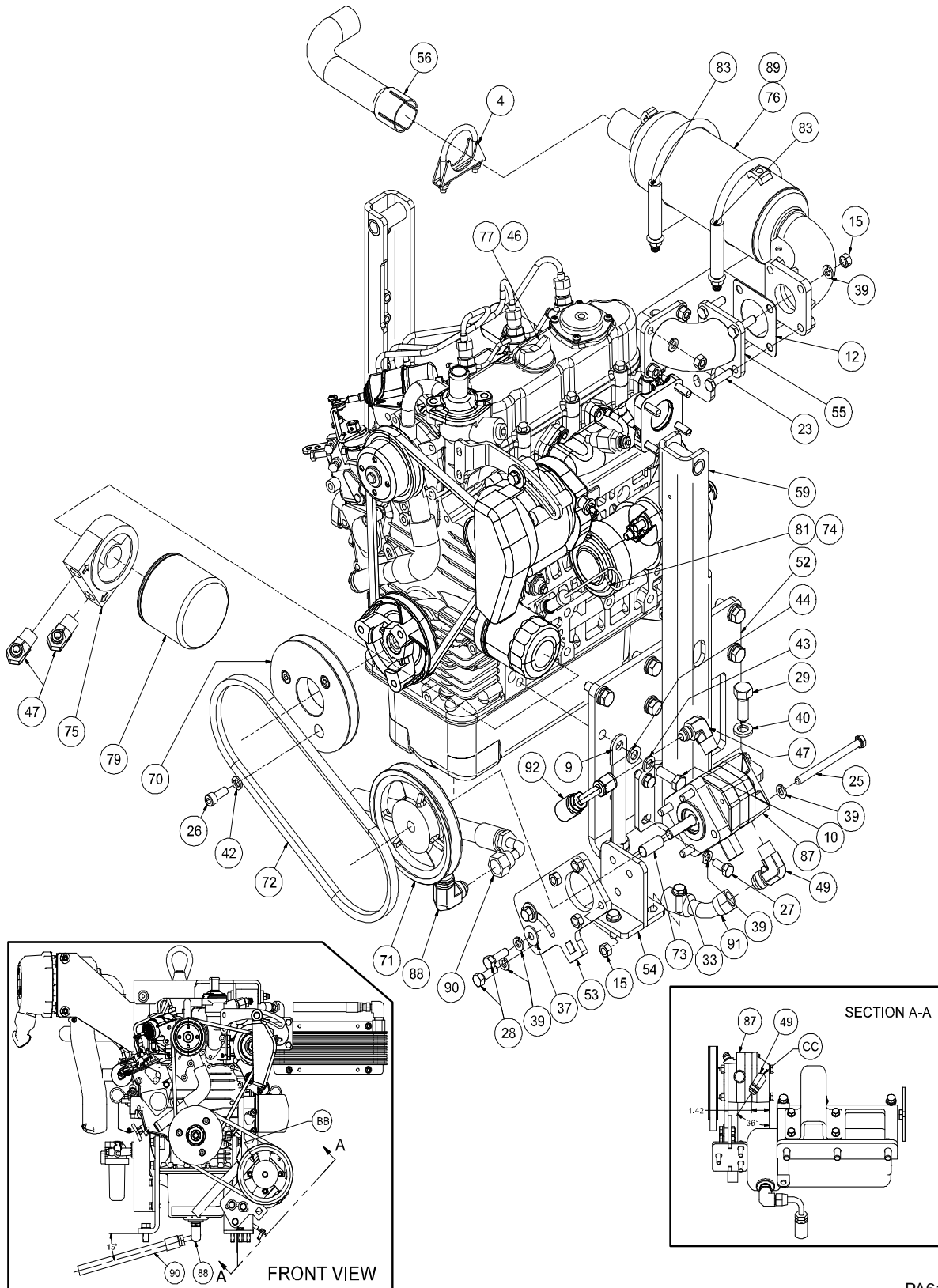
9.10 ENGINE AND DRIVE PARTS (1 OF 2)

ITEM	DESCRIPTION	PART NUMBER	QTY
1	CLAMP, HOSE 3/16 - 5/16 HOSE	260864	2
2	WASHER, NYLON FLAT 1/4	262704	4
3	HOSE, FLEX 2" I.D. X 21" LG.	262705	1
4	CLAMP, EXHAUST 1 1/2	262906-150	1
5	SCREW, TRUSS HD 1/4-20 x 3/4	262953	4
6	EYENUT, 5/8-11	264113	1
7	CLAMP, HOSE #28	265560	4
8	ADAPTER, AIR FILTER RUBBER	267312	1
9	STRAP, GROUND 8" w/ 3/8 HOLES	267498	1
10	CAPSCREW, HEX 10MM 1.25 x 30MM GR10.9	269438	12
11	FILTER, AIR 6" 90DEG	269660	1
12	GASKET, MUFFLER REPLCMT KUBOTA D902	269961	1
13	HOSE, FLEX 1-3/4" I.D. X 9" LG.	270698	1
14	NUT, HEX 1/4-20	825204-226	2
15	NUT, HEX 5/16-18	825205-273	8
16	NUT, HEX FLANGE 1/4-20	825304-236	5
17	NUT, HEX FLANGE 5/16-18	825305-283	1
18	NUT, HEX LOCKING #8-32	825501-070	2
19	NUT, HEX LOCKING 5/16-18	825505-166	2
20	NUT, HEX LOCKING 3/8-16	825506-198	2
21	CAPSCREW, HEX 6MM X 40MM	828006-040	1
22	CAPSCREW, HEX 8mm 1.25 x 50	828008-050	5
23	CAPSCREW, HEX GR5 5/16-18X1 1/4	829105-125	6
24	CAPSCREW, HEX GR5 5/16-18 x 3	829105-300	1
25	CAPSCREW, HEX GR5 5/16-18 x 4	829105-400	4
26	CAPSCREW, S.H. M8x1.25 x 20mm	829308-020	3
27	CAPSCREW, HEX GR8 5/16-18 x 3/4	829405-075	8
28	CAPSCREW, HEX GR8 5/16-18 x 1	829405-100	3
29	CAPSCREW, HEX GR8 1/2-13 x 1.25	829408-125	6
30	CAPSCREW, HEX GR8 5/8-11 x 1.25	829410-125	1
31	SCREW, SER WASH 1/4-20 x 0.75	829704-075	9
32	SCREW, SER WASH 1/4-20 x 1	829704-100	1
33	SCREW, SER WASH 5/16-18 x 1	829705-100	5

Continued on page 153

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

9.10 ENGINE AND DRIVE PARTS (1 OF 2) (CONTINUED)



PA6100012ID_r2

9.10 ENGINE AND DRIVE PARTS (1 OF 2) (CONTINUED)

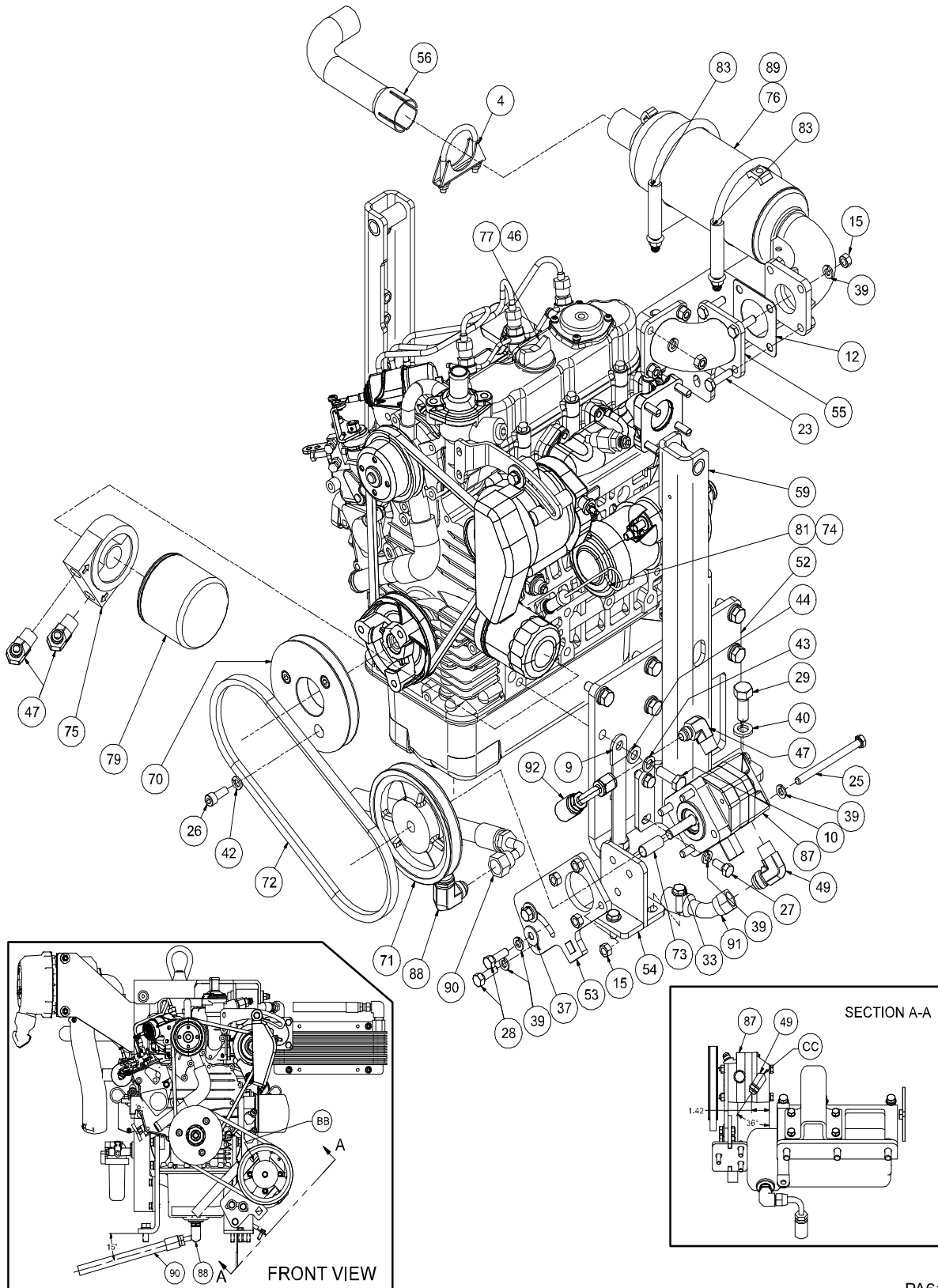
	DESCRIPTION	PART NUMBER	QTY
34 [‡]	CAPSCREW, HEX GR8 7/16-20UNF x 2.5	829807-250	1
35	SCREW, MACH SHOULDER 1/2X 3 LG	830508-300	2
36	SCREW, ROUND HD #8-32 X 1/2	831601-050	2
37	WASHER, FLAT 5/16	838205-071	6
38	WASHER, FLAT 3/8	838206-071	2
39	WASHER, LOCK 5/16	838505-078	20
40	WASHER, LOCK 1/2	838508-125	6
41	WASHER, LOCK 5/8	838510-156	1
42	WASHER, LOCK METRIC M8	838808-200	8
43	WASHER, LOCK METRIC M10	838810-220	12
44	WASHER, FLAT METRIC M10	838910-220	12
45	HOSE, FUEL LINE 5/16 (FT)	842315-031	1
46	OIL, MOTOR 10W30, 1 GAL	844300-001	1
47	ELBOW, 37FL/90M #06 x 3/8	860206-038	3
48	ELBOW, 37FL/90M #06 x 1/2	860206-050	2
49	ELBOW, 37FL/90M #08 x 3/8	860208-038	1
50	CABLE, ASSEMBLY, CLUTCH 9.0 LG.	A1269740-002	1
51	BRACKET, ENGINE RH	A1270367	1
52	BRACKET, ENGINE LH	A1270368	1
53	BRACKET, PUMP	A1270376	1
54	BRACKET, PUMP LOWER	A1270379	1
55	ELBOW, EXHAUST	A1270384	1
56	ELBOW, EXHAUST OUT	A1270385	1
57	BRACKET, EXHAUST	A1270387	1
58	SUPPORT, MACHINE RH	A1270390	1
59	SUPPORT, MACHINE LH	A1270391	1
60	BRACKET, LIFTING BAR	A1270392	1
61	BRACKET, AIR FILTER SUPPORT	A1270394	1
62	BRACKET, FUEL FILTER	A1270395	1
63	BRACKET, THROTTLE SPRING, KUBOTA	A1270578	1
64	MOUNT, SD85 CONTROLLER	A13502SS	1
65	SOLENOID, 12VDC PUSH/PULL,	CO23288	1

Continued on page 155

[‡] Torque fastener to 50-55 ft-lbs value for dry, plated fastener.

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

9.10 ENGINE AND DRIVE PARTS (1 OF 2) (CONTINUED)



PA6100012ID_r2

9.10 ENGINE AND DRIVE PARTS (1 OF 2) (CONTINUED)

ITEM	DESCRIPTION	PART NUMBER	QTY
66	RELAY, SOLENOID CONTROL, SD85	CO72121	1
67	SENDER, TEMPERATURE, DIESEL	CO74454	1
68	CLUTCH, CMS 5.8 P.D. 8 GRV "K" STYLE SHEAVE	DR269574	1
69	SHEAVE, STUB SHAFT 8 GROOVE	DR270365	1
70	SHEAVE, ENGINE, "A" GROOVE	DR270377	1
71	SHEAVE, A SINGLE GROOVE	DR270378	1
72	BELT, DRIVE "A" SECTION X 31.0 OUTSIDE	DR270393	1
73	BUSHING, 1/2 OD X 7/16 ID.	DR270397	1
74	GUIDE, DIP STICK	EN22893	1
75	ADAPTER, OIL FILTER, SANDWICH	EN24145	1
76	EXHAUST, KUBOTA	EN270396	1
77	ENGINE DIESEL, 25 HP, HZ SHAFT	EN270451	1
78	COOLER, OIL, 12 PLATE, ALUMINUM	EN37997	1
79	FILTER, OIL	EN38480	1
80 ^{II}	CLEVIS, YOKE THROTTLE	EN52698	1
81	DIP STICK, OIL	EN71817	1
82	SPRING, 7/16DIA. X .030 X 1 7/8" LG	EN75074	1
83	U-BOLT, 3/8-16 X 3 1/2 WD X 5 1/16	FA270399	2
84	WASHER, 1/2ID X 1OD, 2 PIECE	FA37629	1
85	SHIPPED WITH ENGINE	FUEL FILTER	1
86	LINK, QUICK, THREADED NUT	HA87028	1
87	PUMP, HYD CWDE W/ RELIEF VALVE	HY270357	1
88	ELBOW, 90 DEG, METRIC 22 X 1.5	HY83058	1
89 ^{III}	HEADER WRAP, HIGH TEMP	PR81122	1
90	HOSE, ENGINE DRAIN	TU270453-007	1
91	HOSE, INTAKE PUMP	TU270453-010	1
92	HOSE, PUMP TO MOTOR	TU270453-011	1
93	HOSE, TO COOLER, ENGINE	TU270453-014	1
94	HOSE, COOLER RETURN, ENGINE	TU270453-015	1

BB - IN PORT

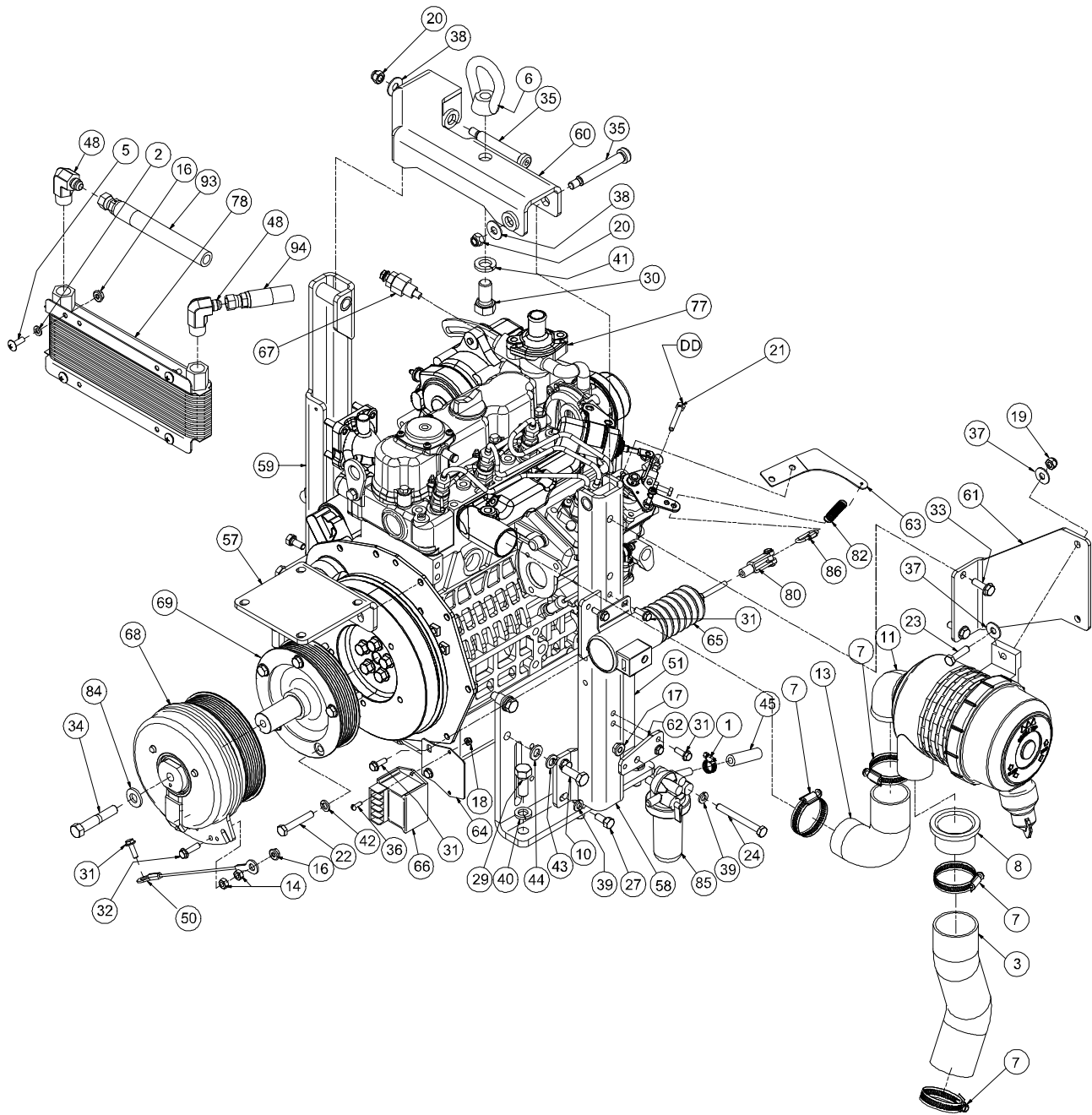
CC - OUT PORT

^{II} High throttle adjust.

^{III} Wrap exhaust from manifold to the end of the exhaust.

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

9.11 ENGINE AND DRIVE PARTS (2 OF 2)



PA6100012ID_r2

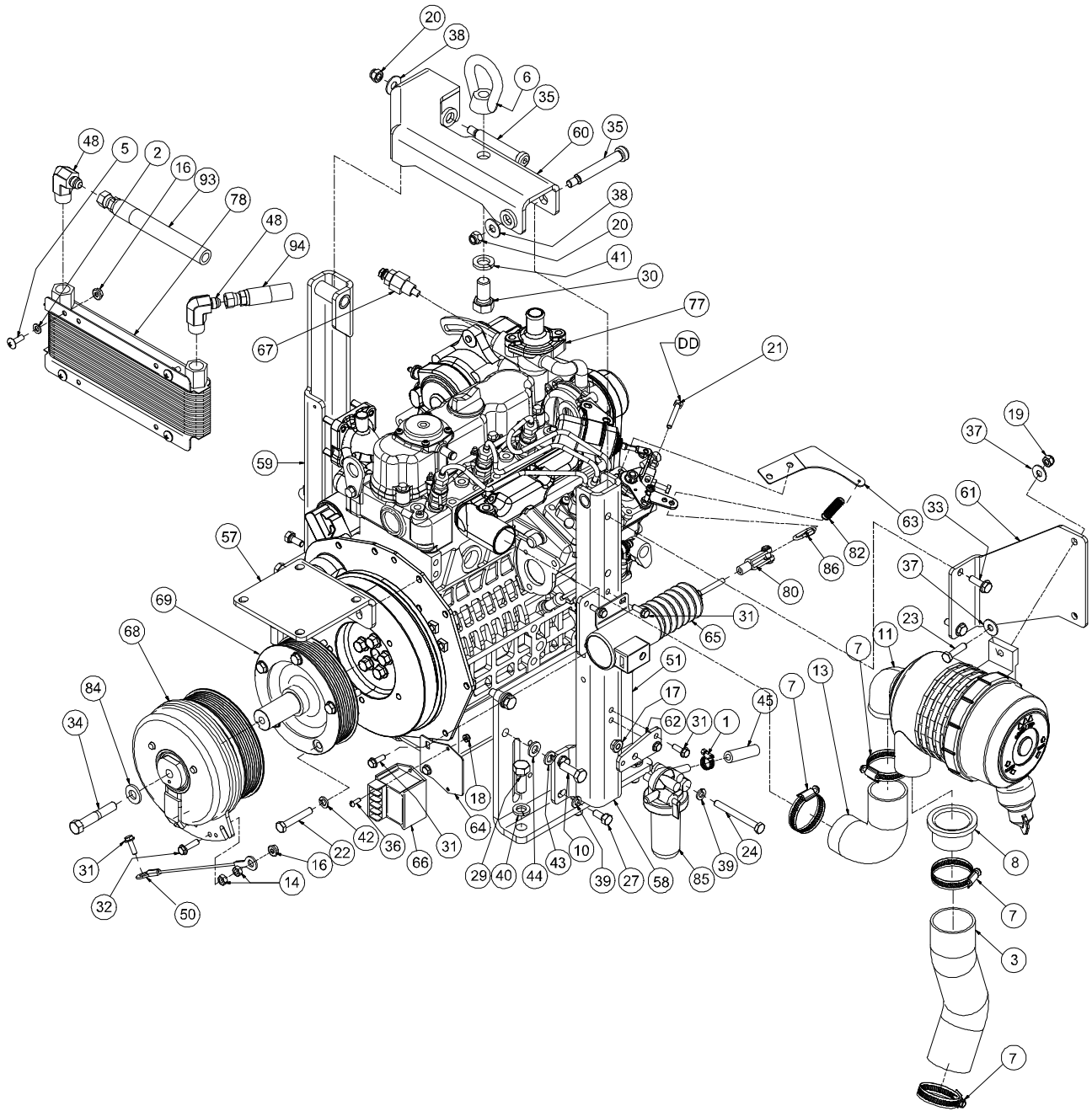
9.11 ENGINE AND DRIVE PARTS (2 OF 2)

ITEM	DESCRIPTION	PART NUMBER	QTY
1	CLAMP, HOSE 3/16 - 5/16 HOSE	260864	2
2	WASHER, NYLON FLAT 1/4	262704	4
3	HOSE, FLEX 2" I.D. X 21" LG.	262705	1
4	CLAMP, EXHAUST 1 1/2	262906-150	1
5	SCREW, TRUSS HD 1/4-20 x 3/4	262953	4
6	EYENUT, 5/8-11	264113	1
7	CLAMP, HOSE #28	265560	4
8	ADAPTER, AIR FILTER RUBBER	267312	1
9	STRAP, GROUND 8" w/ 3/8 HOLES	267498	1
10	CAPSCREW, HEX 10MM 1.25 x 30MM GR10.9	269438	12
11	FILTER, AIR 6" 90DEG	269660	1
12	GASKET, MUFFLER REPLCMT KUBOTA D902	269961	1
13	HOSE, FLEX 1-3/4" I.D. X 9" LG.	270698	1
14	NUT, HEX 1/4-20	825204-226	2
15	NUT, HEX 5/16-18	825205-273	8
16	NUT, HEX FLANGE 1/4-20	825304-236	5
17	NUT, HEX FLANGE 5/16-18	825305-283	1
18	NUT, HEX LOCKING #8-32	825501-070	2
19	NUT, HEX LOCKING 5/16-18	825505-166	2
20	NUT, HEX LOCKING 3/8-16	825506-198	2
21	CAPSCREW, HEX 6MM X 40MM	828006-040	1
22	CAPSCREW, HEX 8mm 1.25 x 50	828008-050	5
23	CAPSCREW, HEX GR5 5/16-18X1 1/4	829105-125	6
24	CAPSCREW, HEX GR5 5/16-18 x 3	829105-300	1
25	CAPSCREW, HEX GR5 5/16-18 x 4	829105-400	4
26	CAPSCREW, S.H. M8x1.25 x 20mm	829308-020	3
27	CAPSCREW, HEX GR8 5/16-18 x 3/4	829405-075	8
28	CAPSCREW, HEX GR8 5/16-18 x 1	829405-100	3
29	CAPSCREW, HEX GR8 1/2-13 x 1.25	829408-125	6
30	CAPSCREW, HEX GR8 5/8-11 x 1.25	829410-125	1
31	SCREW, SER WASH 1/4-20 x 0.75	829704-075	9
32	SCREW, SER WASH 1/4-20 x 1	829704-100	1
33	SCREW, SER WASH 5/16-18 x 1	829705-100	5

Continued on page 159

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

9.11 ENGINE AND DRIVE PARTS (2 OF 2) (CONTINUED)



PA6100012ID_r2

9.11 ENGINE AND DRIVE PARTS (2 OF 2) (CONTINUED)

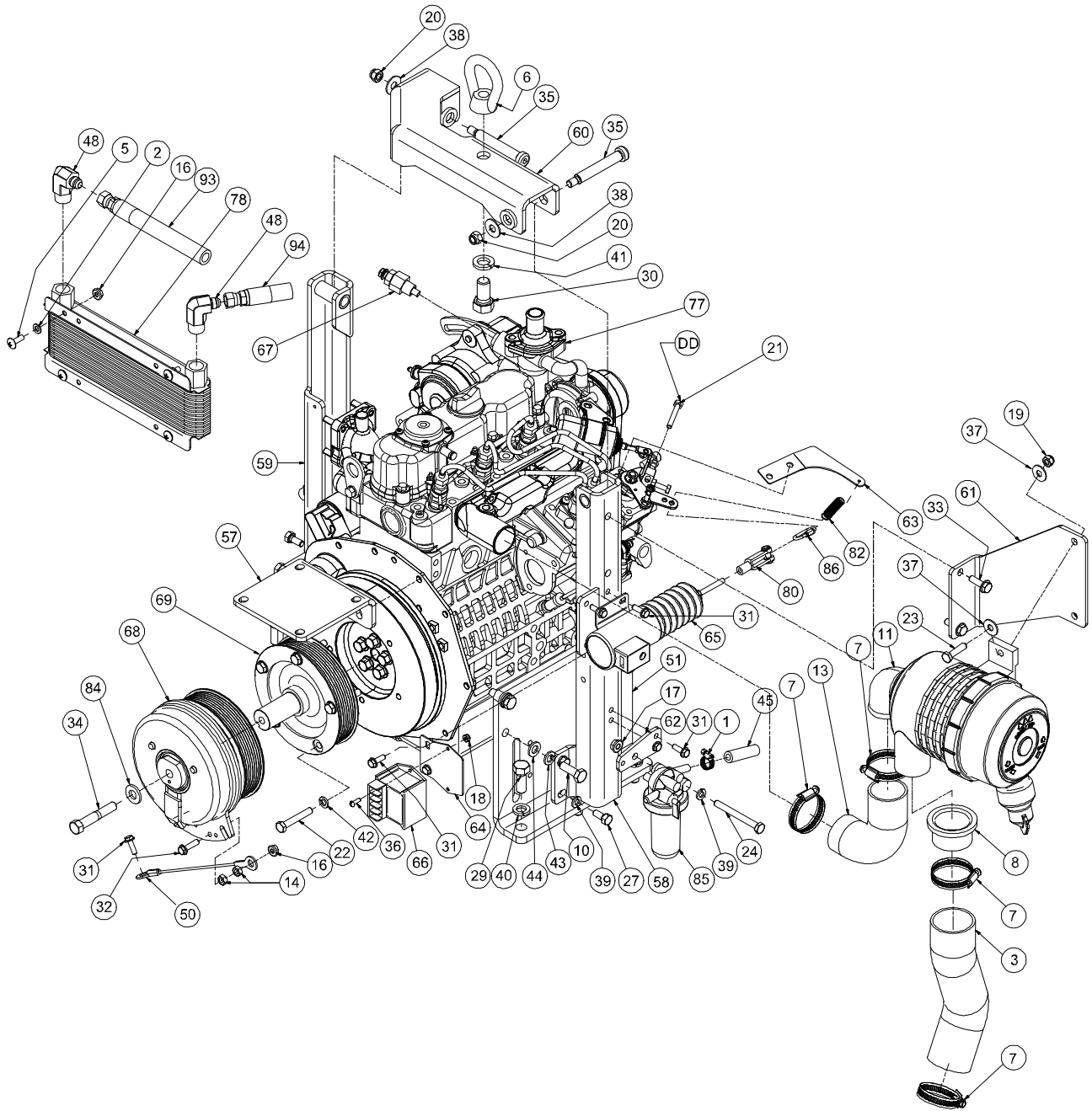
	DESCRIPTION	PART NUMBER	QTY
34 [‡]	CAPSCREW, HEX GR8 7/16-20UNF x 2.5	829807-250	1
35	SCREW, MACH SHOULDER 1/2X 3 LG	830508-300	2
36	SCREW, ROUND HD #8-32 X 1/2	831601-050	2
37	WASHER, FLAT 5/16	838205-071	6
38	WASHER, FLAT 3/8	838206-071	2
39	WASHER, LOCK 5/16	838505-078	20
40	WASHER, LOCK 1/2	838508-125	6
41	WASHER, LOCK 5/8	838510-156	1
42	WASHER, LOCK METRIC M8	838808-200	8
43	WASHER, LOCK METRIC M10	838810-220	12
44	WASHER, FLAT METRIC M10	838910-220	12
45	HOSE, FUEL LINE 5/16 (FT)	842315-031	1
46	OIL, MOTOR 10W30, 1 GAL	844300-001	1
47	ELBOW, 37FL/90M #06 x 3/8	860206-038	3
48	ELBOW, 37FL/90M #06 x 1/2	860206-050	2
49	ELBOW, 37FL/90M #08 x 3/8	860208-038	1
50	CABLE, ASSEMBLY, CLUTCH 9.0 LG.	A1269740-002	1
51	BRACKET, ENGINE RH	A1270367	1
52	BRACKET, ENGINE LH	A1270368	1
53	BRACKET, PUMP	A1270376	1
54	BRACKET, PUMP LOWER	A1270379	1
55	ELBOW, EXHAUST	A1270384	1
56	ELBOW, EXHAUST OUT	A1270385	1
57	BRACKET, EXHAUST	A1270387	1
58	SUPPORT, MACHINE RH	A1270390	1
59	SUPPORT, MACHINE LH	A1270391	1
60	BRACKET, LIFTING BAR	A1270392	1
61	BRACKET, AIR FILTER SUPPORT	A1270394	1
62	BRACKET, FUEL FILTER	A1270395	1
63	BRACKET, THROTTLE SPRING, KUBOTA	A1270578	1
64	MOUNT, SD85 CONTROLLER	A13502SS	1
65	SOLENOID, 12VDC PUSH/PULL,	CO23288	1

Continued on page 161

[‡] Torque fastener to 50-55 ft-lbs value for dry, plated fastener.

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

9.11 ENGINE AND DRIVE PARTS (2 OF 2) (CONTINUED)



PA6100012ID_r2

9.11 ENGINE AND DRIVE PARTS (2 OF 2) (CONTINUED)

ITEM	DESCRIPTION	PART NUMBER	QTY
66	RELAY, SOLENOID CONTROL, SD85	CO72121	1
67	SENDER, TEMPERATURE, DIESEL	CO74454	1
68	CLUTCH, CMS 5.8 P.D. 8 GRV "K" STYLE SHEAVE	DR269574	1
69	SHEAVE, STUB SHAFT 8 GROOVE	DR270365	1
70	SHEAVE, ENGINE, "A" GROOVE	DR270377	1
71	SHEAVE, A SINGLE GROOVE	DR270378	1
72	BELT, DRIVE "A" SECTION X 31.0 OUTSIDE	DR270393	1
73	BUSHING, 1/2 OD X 7/16 ID.	DR270397	1
74	GUIDE, DIP STICK	EN22893	1
75	ADAPTER, OIL FILTER, SANDWICH	EN24145	1
76	EXHAUST, KUBOTA	EN270396	1
77	ENGINE, DIESEL, 25 HP, HZ SHAFT	EN270451	1
78	COOLER, OIL, 12 PLATE, ALUMINUM	EN37997	1
79	FILTER, OIL	EN38480	1
80 ^{II}	CLEVIS, YOKE THROTTLE	EN52698	1
81	DIP STICK, OIL	EN71817	1
82	SPRING, 7/16DIA. X .030 X 1 7/8" LG	EN75074	1
83	U-BOLT, 3/8-16 X 3 1/2 WD X 5 1/16	FA270399	2
84	WASHER, 1/2ID X 1OD, 2 PIECE	FA37629	1
85 ^{III}	SHIPPED WITH ENGINE	FUEL FILTER	1
86	LINK, QUICK, THREADED NUT	HA87028	1
87	PUMP, HYD CWDE W/ RELIEF VALVE	HY270357	1
88	ELBOW, 90 DEG, METRIC 22 X 1.5	HY83058	1
89 ^{IV}	HEADER WRAP, HIGH TEMP	PR81122	1
90	HOSE, ENGINE DRAIN	TU270453-007	1
91	HOSE, INTAKE PUMP	TU270453-010	1
92	HOSE, PUMP TO MOTOR	TU270453-011	1
93	HOSE, TO COOLER, ENGINE	TU270453-014	1
94	HOSE, COOLER RETURN, ENGINE	TU270453-015	1

BB - IN PORT

CC - OUT PORT

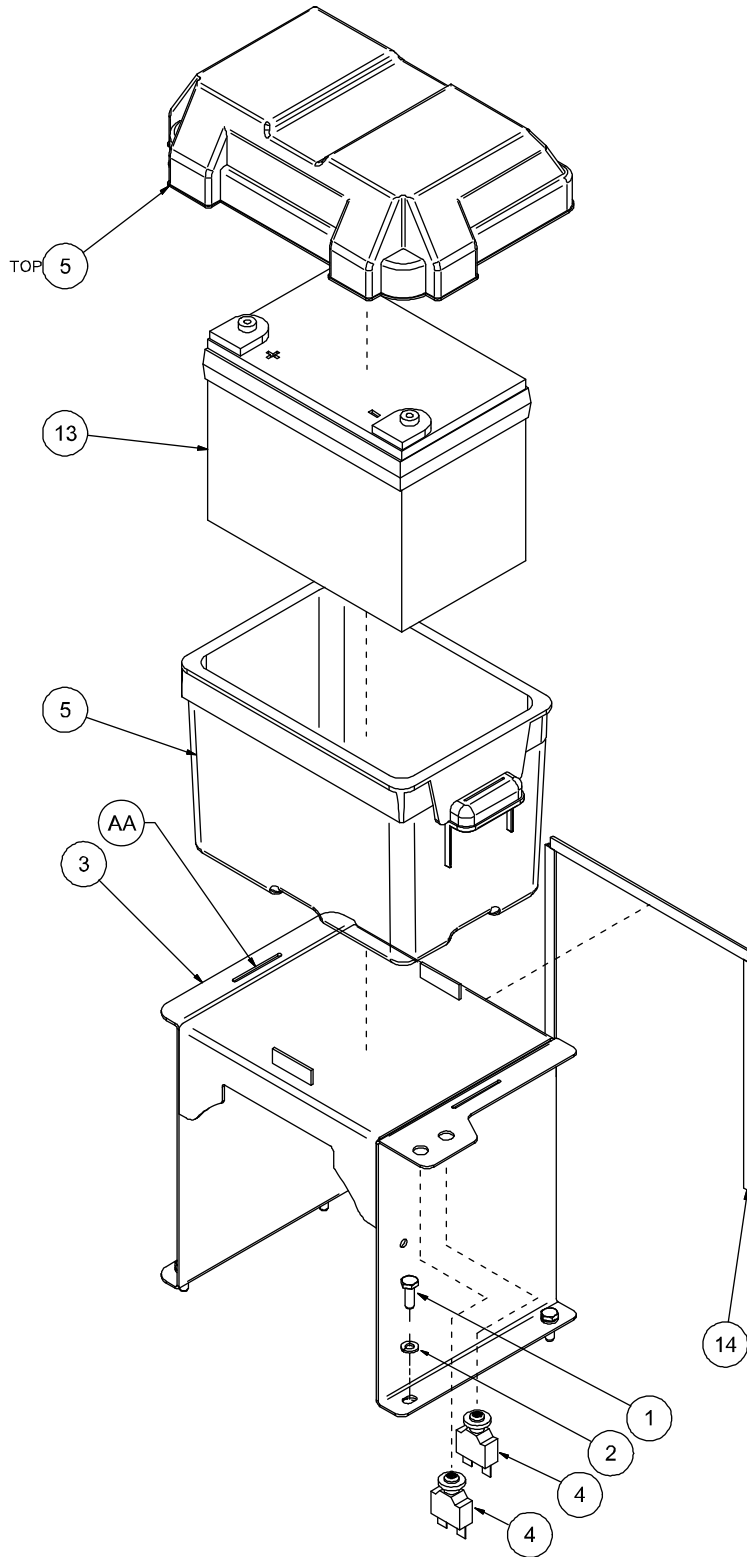
^{II} High throttle adjust.

^{III} Replacement filter no. RC77662.

^{IV} Wrap exhaust from manifold to the end of the exhaust.

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

9.12 ELECTRICAL SYSTEM



PA6120048ID_r1

9.12 ELECTRICAL SYSTEM

ITEM	DESCRIPTION	PART NUMBER	QTY
1	CAPSCREW, HEX GR5 1/4-20 x 3/4	829104-075	4
2	WASHER, LOCK 1/4	838504-062	4
3	BRACKET, BATTERY	A1270389	1
4	CIRCUIT BREAKER, 30 AMP	CO71774	2
5	BOX, BATTERY	EL269924	1
6 ^I	HARNESS, WIRE WELDER	EP269873	1
7 ^I	HARNESS, WIRE GENERATOR	EP269874	1
8 ^I	HARNESS, WELD CABLE MACH TO PANEL	EP270170	1
9 ^I	HARNESS, WIRE MAIN	EP270406	1
10 ^I	CABLE, BATTERY, NEGATIVE	EP34513	2
11 ^I	CABLE, BATTERY, POSITIVE	EP270599	1
12	WD, AIR N ARC, 300	ID270405	1
13	BATTERY, 12 VOLT 35 AMP DEEP	MA31821	1
14	GASKET, ADHESIVE BACK, D SHAPE 7-3/4 LG.	PR81501	3

AA - RUN STRAP THROUGH CUTOUTS IN BRACKET.

^I Item not shown.

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

9.13 FUEL TANK ASSEMBLY

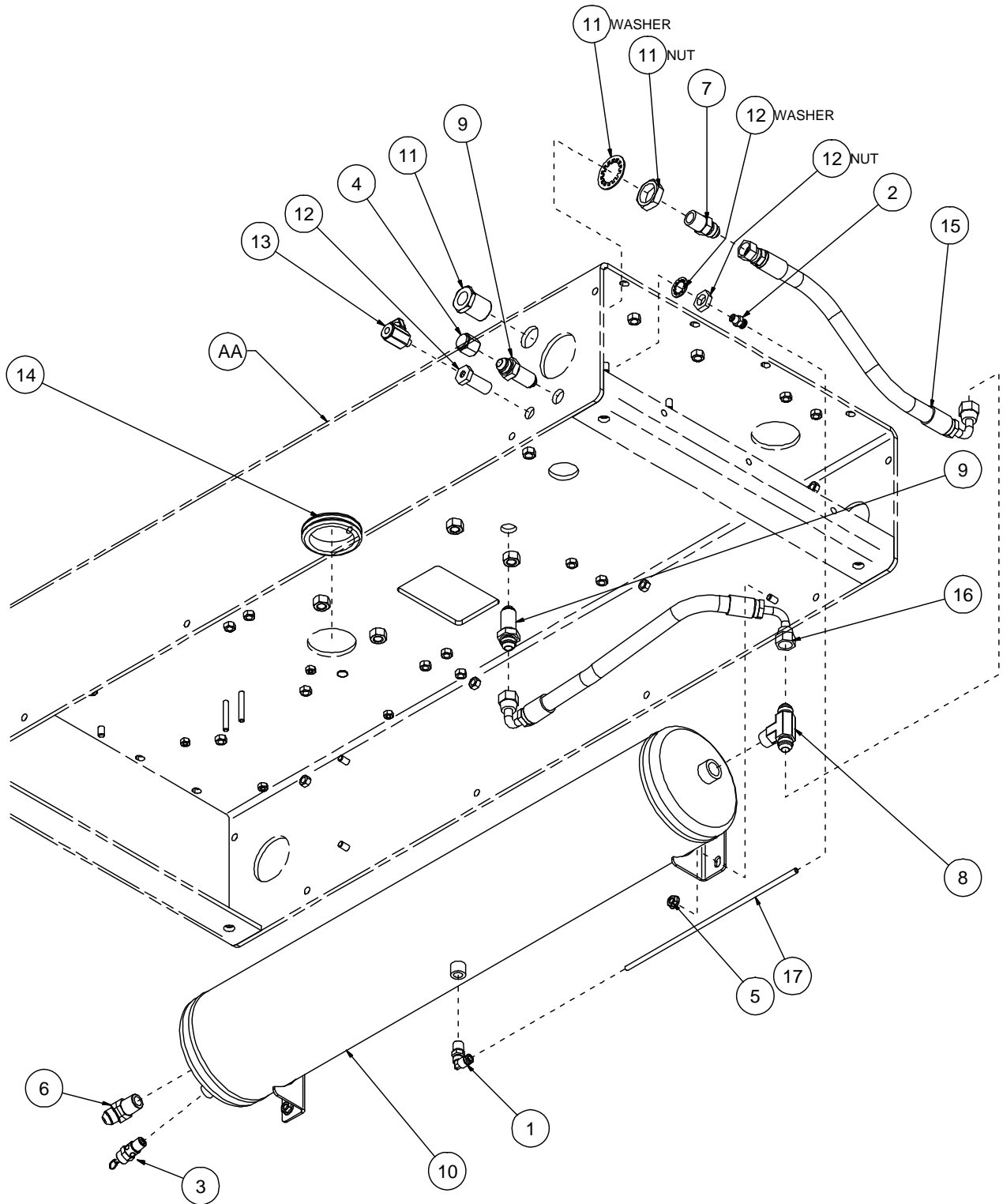
ITEM	DESCRIPTION	PART NUMBER	QTY
1	RIVET, 3/16" DIA, S.S.	263194	8
2	CLAMP, HOSE, #6, 5/16" - 7/8"	264787	6
3	CLAMP, HOSE, #24, 1"-2" DIA.	270493	2
4	NUT, HEX LOCKING #10-24	825502-083	2
5	NUT, HEX LOCKING 5/16-18	825505-166	6
6	WASHER, FLAT 5/16	838205-071	6
7	HOSE, FUEL LINE 5/16" x 7" LG.	842315-031	1
8	FUEL TANK, 12 GAL	A1269741	1
9	BRACKET, WIRING HARNESS	A1270047	1
10	TUBE, FUEL PICK UP	A1270398	1
11	FUEL FILL NECK, DIESEL	A1270456	1
12	SENDER UNIT, FUEL LEVEL, 6.50 LG	CO269912	1
13	ADAPTER, 1/2" HOSE BARB / 1/2" MALE PIPE	FI270258	1
14	PUSH - ON, MALE ADAPTER, 1/4 MALE x 3/16 PUSH	FI92363	1
15	CAP, DIESEL VENTED	HA270455	1
16	1-1/2" DIA HOSE, FUEL, LOW PRESSURE SAE, 19" LG.	TU269928	1
17	HOSE, FUEL 1/2" SAE 30R9, 20" LG.	TU270224	1
18	HOSE, 3/16 DIA HT, FUEL x 30 LG.	TU28641	1

AA - CONNECTS TO FUEL FILTER.

BB - CONNECTS TO FUEL RAIL ON TOP OF ENGINE.

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

9.14 AIR STORAGE ASSEMBLY



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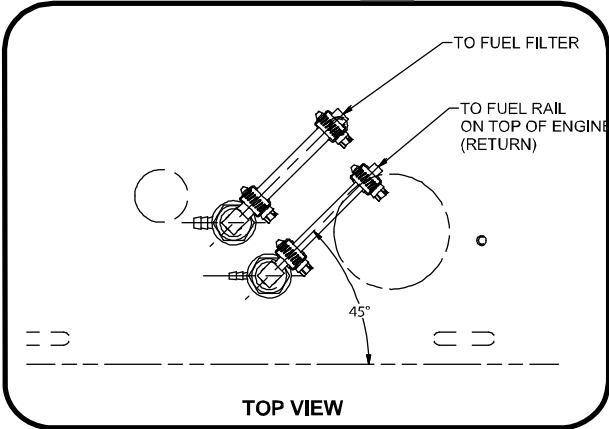
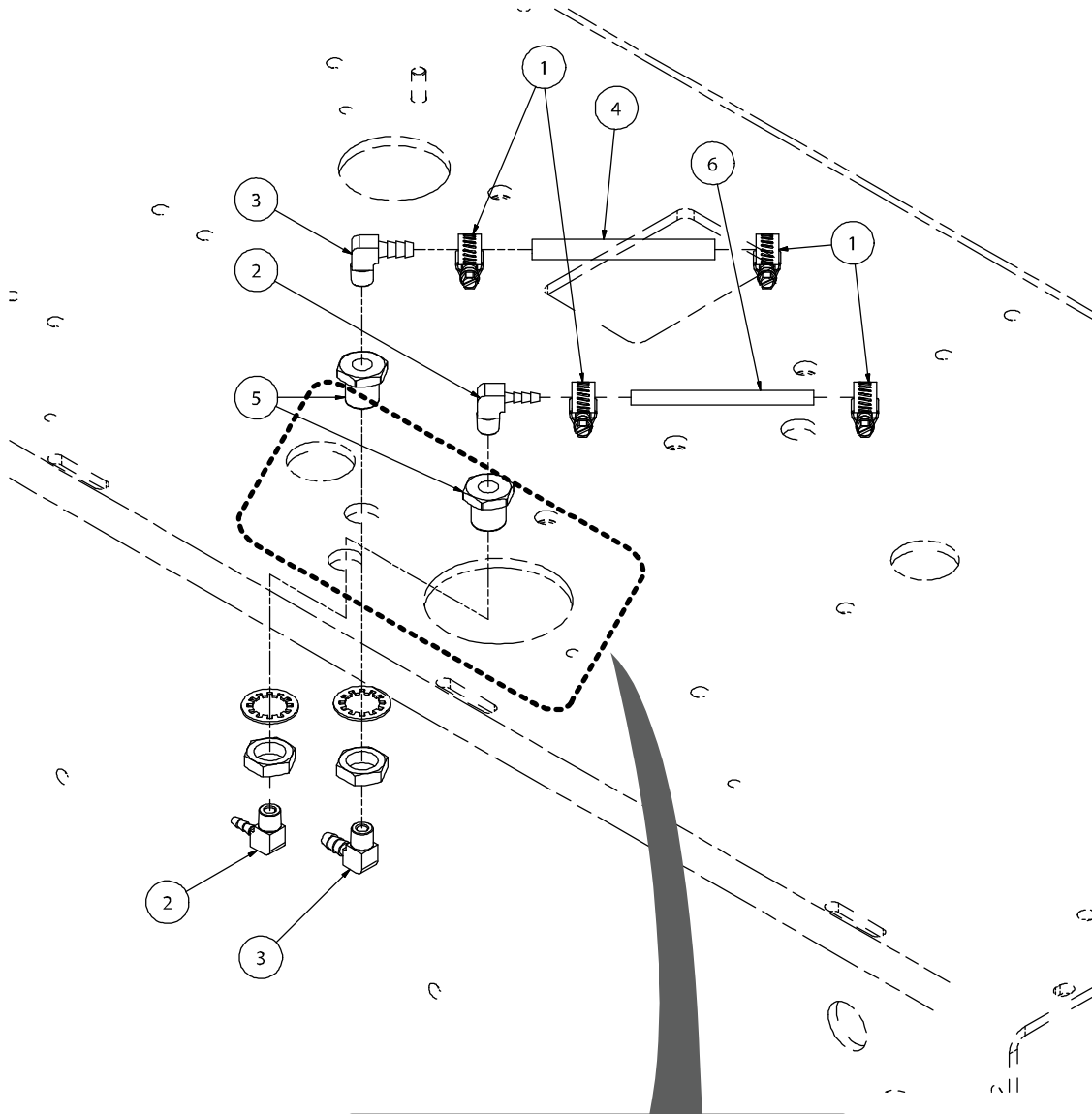
9.14 AIR STORAGE ASSEMBLY

ITEM	DESCRIPTION	PART NUMBER	QTY
1	ELBOW, 90 DEG. PUSH ON 1/4T x 1/4P	261310	1
2	CONNECTOR, 1/8P x 1/4T PUSH ON	261316	1
3	VALVE, RELIEF 200 PSI 1/4 NPT MALE	264232	1
4	CAP, FEMALE JIC 3/4-16 #8	264322-003	1
5	NUT, HEX FLANGE 5/16-18	825305-283	4
6	ELBOW, 45 DEG. 1/2 MPT x #8 MJIC	860008-050	1
7	CONNECTOR, 37FL/MPT #08 x 1/2	860108-050	1
8	TEE, 37FL/M BR #8 x 1/2	861708-050	1
9	BULKHEAD, MJIC x MJIC #8	862108-050	2
10	TANK, AIR ACCUMULATOR 4 GAL	A1269633	1
11	PIPE BRASS, BULKHEAD 1/2 NPT	FI23542	1
12	PIPE BRASS, BULKHEAD 1/8 NPT	FI54337	1
13	VALVE, BALL MINI, 1/8 NPT M/F	FI95272	1
14	GROMMET, BLACK RUBBER, 2.25 ID	PR74492	1
15	HOSE, AIR TANK TO SERVICE PORT	TU270453-004	1
16	COMPRESSOR TO OIL COOLER	TU270453-012	1
17	TUBING, 1/4 DIA., NYLON, 230 PSI x 3.5 FT	TU95945	1

AA - Ref. A1270359; Platform, ANA 300 Diesel.

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

9.15 FUEL ASSEMBLY - WITHOUT FUEL TANK



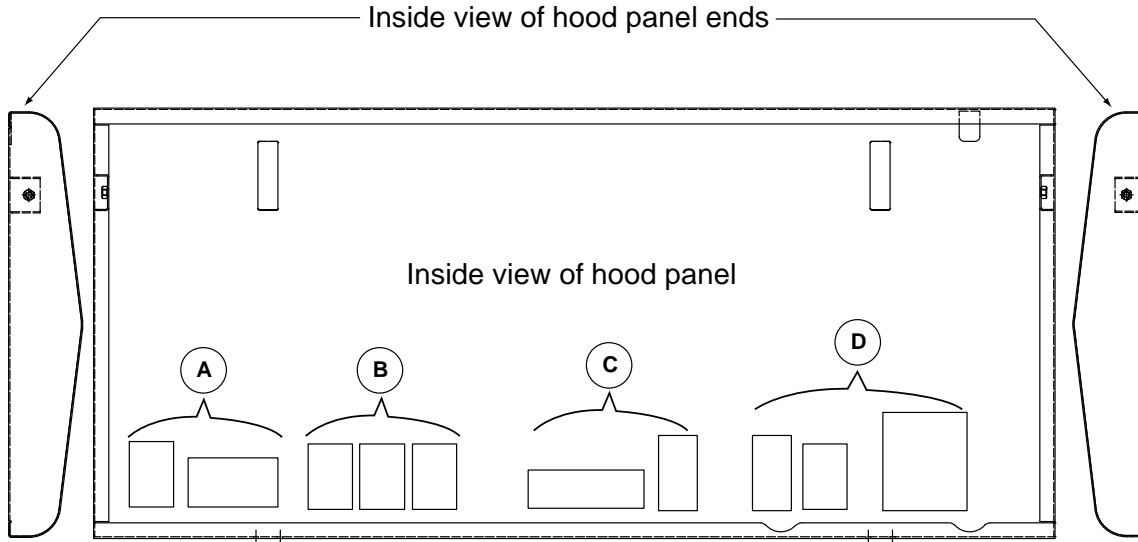
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9.15 FUEL ASSEMBLY - WITHOUT FUEL TANK

ITEM	DESCRIPTION	PART NUMBER	QTY
1	CLAMP, HOSE, #6, 5/16" -7/8"	264787	4
2	ELBOW, 1/4 NPT x 3/16 HOSE BARB	270612	2
3	ELBOW, 1/4 NPT x 5/16 HOSE BARB	270651	2
4	HOSE, FUEL LINE 5/16" X 14" LG.	842315-031	1
5	PIPE BRASS, BULKHEAD 1/4 NPT	FI45068	2
6	HOSE, 3/16 DIA. HT, FUEL X 24 LG.	TU28641	1

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

9.16 DECAL AND PLATE LOCATIONS (1 OF 4)



A

WARNING

Explosive fuel can cause fires and severe burns. Stop engine before filling fuel tank. Allow engine to cool.

CAUTION

- *Do not operate machine or weld near flammable materials.
- *Machine produces arc flash. Wear a welding helmet with a shade of 10 or higher.
- *Wear proper protective clothing. Gloves, helmet, eye protection, and ear protection.
- *Keep away from moving parts. Do not operate with safety shields removed.
- *Use adequate ventilation while operating machine.
- *Welding fumes may be toxic.
- *Review owner's manual before operating machine.

D-270103

C

DANGER

Read the operator's manual before starting this unit. Failure to adhere to instructions can result in personal injury. Replacement manuals can be purchased from: Vanair Mfg. Inc. (800) 526-8817 www.vanair.com

40117

B

WARNING

Sulphuric acid in batteries can cause severe injury or death. Change only in well ventilation. Keep sources of ignition away.

WARNING

Hot parts can cause severe burns. Do not touch any internal surfaces while operating or just after stopping.

WARNING

Carbon monoxide can cause severe nausea, fainting or death. Do not operate engine in closed or confined area.

D

WARNING

Do not remove caps, plugs or other components when compressor is running or pressurized. Stop compressor and relieve all internal pressure before doing so.

49695

WARNING

Do not operate without fan guard in place.

D

COMPRESSOR MAINTENANCE

DAILY OPERATION: (BEFORE STARTING)

- 1) CHECK COMPRESSOR FLUID LEVEL/MACHINE LEVEL.
- 2) CHECK DRIVE BELT TENSION.
- 3) CHECK FOR FLUID LEAKS AND LOOSE BOLTS.

AFTER 50 HOURS:

- 1) CHANGE COMPRESSOR OIL WITH VANGUARD QUAND OIL FILTER WITH GENUINE VANAIR PARTS.
- 2) CHECK DRIVE BELT TENSION.
- 3) CHECK FOR FLUID LEAKS AND LOOSE BOLTS.

EVERY 500 HOURS OR ANNUALLY:

- 1) CHANGE COMPRESSOR OIL WITH VANGUARD QUAND OIL FILTER WITH GENUINE VANAIR PARTS.
- 2) CHANGE AIR FILTER WITH GENUINE VANAIR PARTS.
- 3) CHANGE SEPARATOR ELEMENT WITH GENUINE VANAIR PARTS.
- 4) CHECK FOR BELT TENSION & PULLEY ALIGNMENT.
- 5) CHECK FOR FLUID LEAKS AND LOOSE BOLTS.
- 6) CHECK PRESSURE SAFETY RELIEF VALVE.
- 7) CLEAN OIL COOLER CORE EXTERIOR.

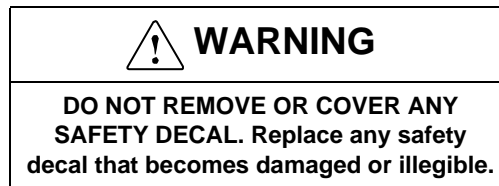
NOTE: MORE FREQUENT SERVICE INTERVALS MAY BE REQUIRED WHEN USED IN EXTREME ENVIRONMENTS

VANAIR
AIR POWER TO GO. (800) 526-8817 • www.vanair.com

9.16 DECAL AND PLATE LOCATIONS (1 OF 4)

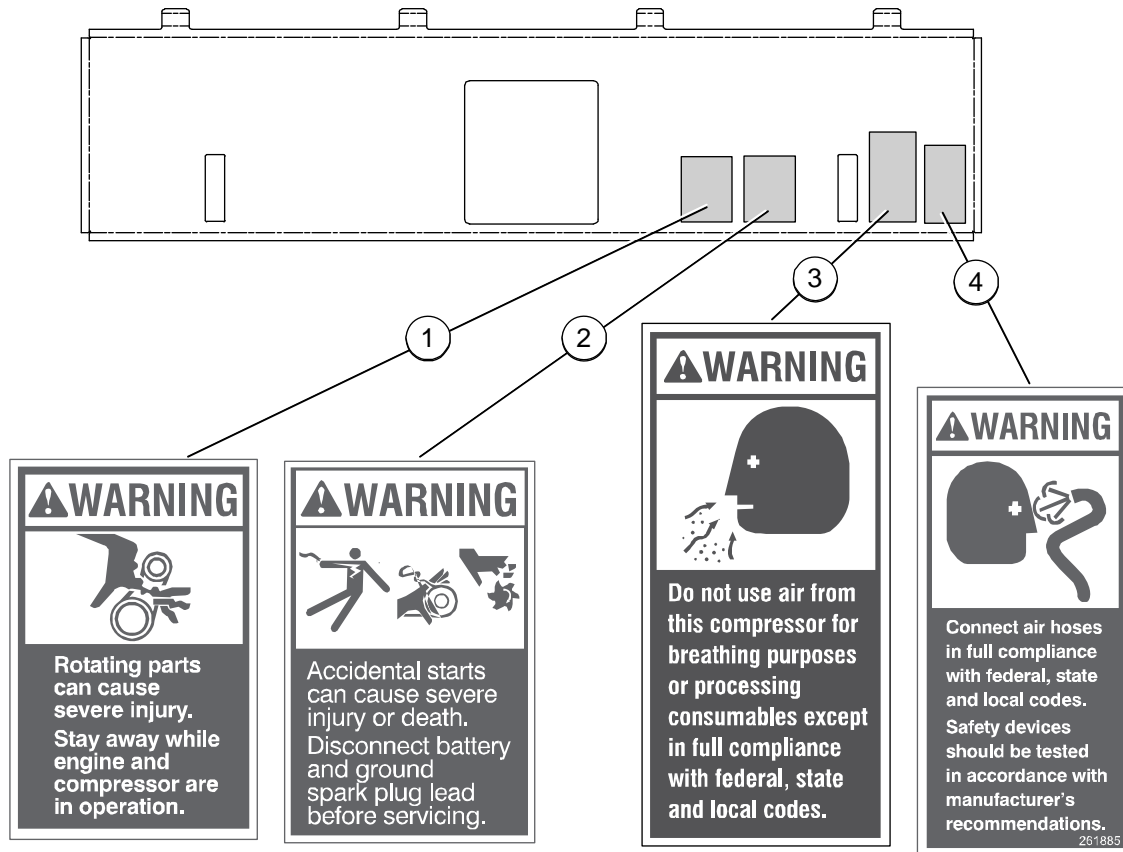
ITEM	DESCRIPTION	PART NUMBER	QTY
1 ^I	DECAL, EXPLOSIVE FUEL	264377	1
2	DECAL, CAUTION	DL270120	1
3 ^I	DECAL, VANAIR	265605	1
4 ^I	DECAL, READ MANUAL	49117	1
5 ^I	DECAL, SULFURIC ACID	264375	1
6 ^I	DECAL, HOT PARTS	264372	1
7 ^I	DECAL, CARBON MONOXIDE	264376	1
8 ^I	DECAL, CAP REMOVAL	049685	1
9 ^I	DECAL, FAN GUARD	264383	1
10 ^I	DECAL, COMPRESSOR MAINTENANCE	-	1

^IThis decal is included with decal sheet no. 263453.



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

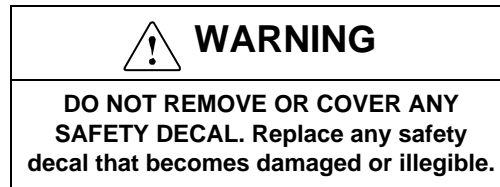
9.17 DECAL AND PLATE LOCATIONS (2 OF 4)



9.17 DECAL AND PLATE LOCATIONS (2 OF 4)

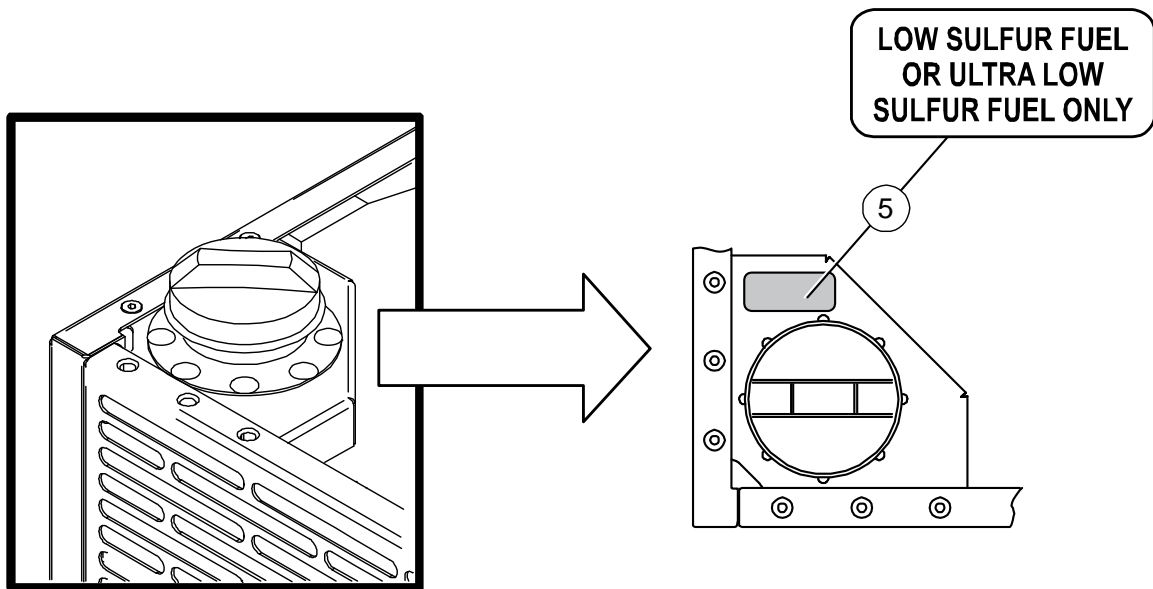
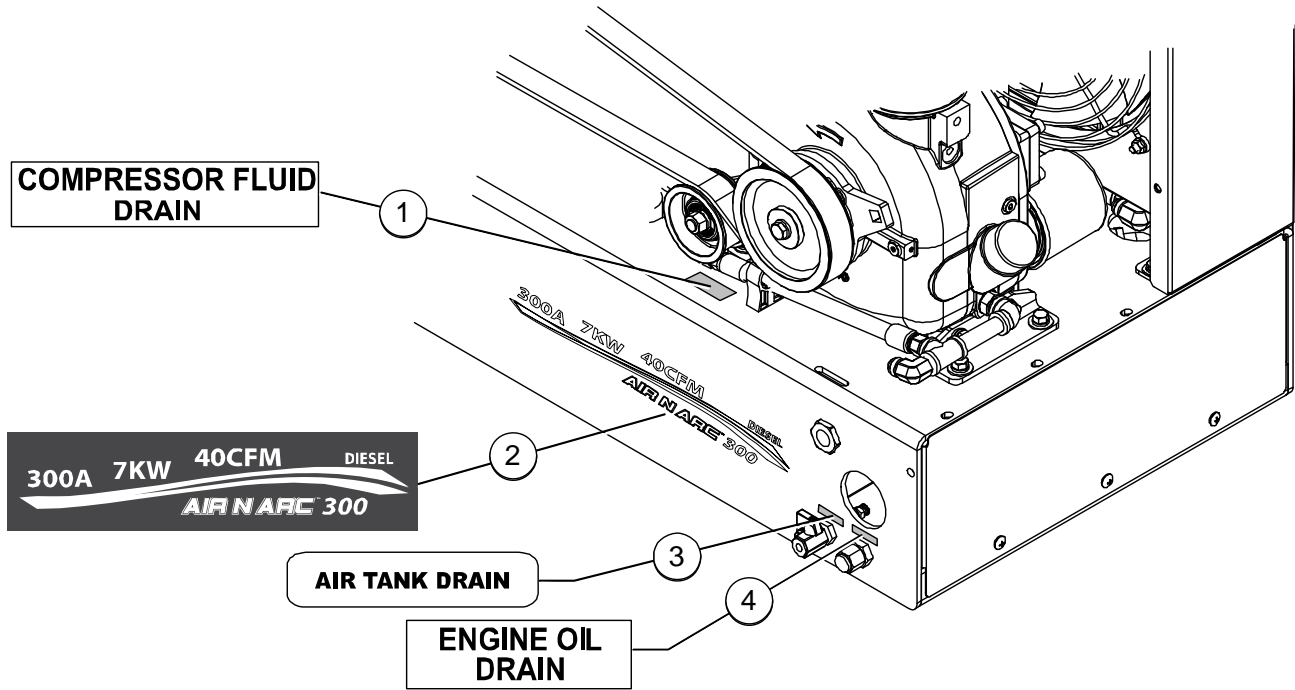
ITEM	DESCRIPTION	PART NUMBER	QTY
1 [‡]	DECAL, ROTATING PARTS	264374	1
2 [‡]	DECAL, ACCIDENTAL STARTS	264373	1
3 [‡]	DECAL, BREATHING AIR	361886	1
4 [‡]	DECAL, AIR HOSE	261885	1

[‡]This decal is included with decal sheet no. 263453.



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

9.18 DECAL AND PLATE LOCATIONS (3 OF 4)



9.18 DECAL AND PLATE LOCATIONS (3 OF 4)

ITEM	DESCRIPTION	PART NUMBER	QTY
1 [‡]	DECAL, COMPRESSOR FLUID DRAIN	—	1
2	DECAL, ANA BY VANAIR, WHT, DIESEL	DL270487	1
3	DECAL, AIR TANK DRAIN	ANA27	1
4 [‡]	DECAL, ENGINE OIL DRAIN	ANA82	1
5	DECAL , LOW SULFUR FUEL	270802	1

[‡]This decal is included with decal sheet no. 263453.



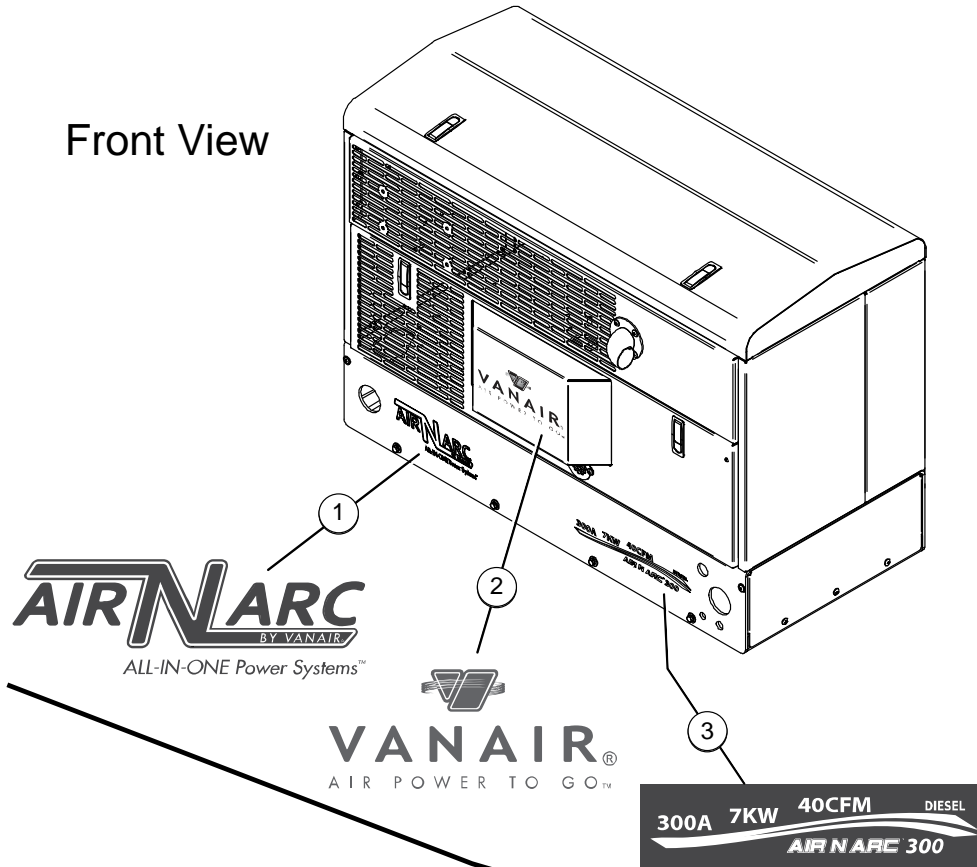
WARNING

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

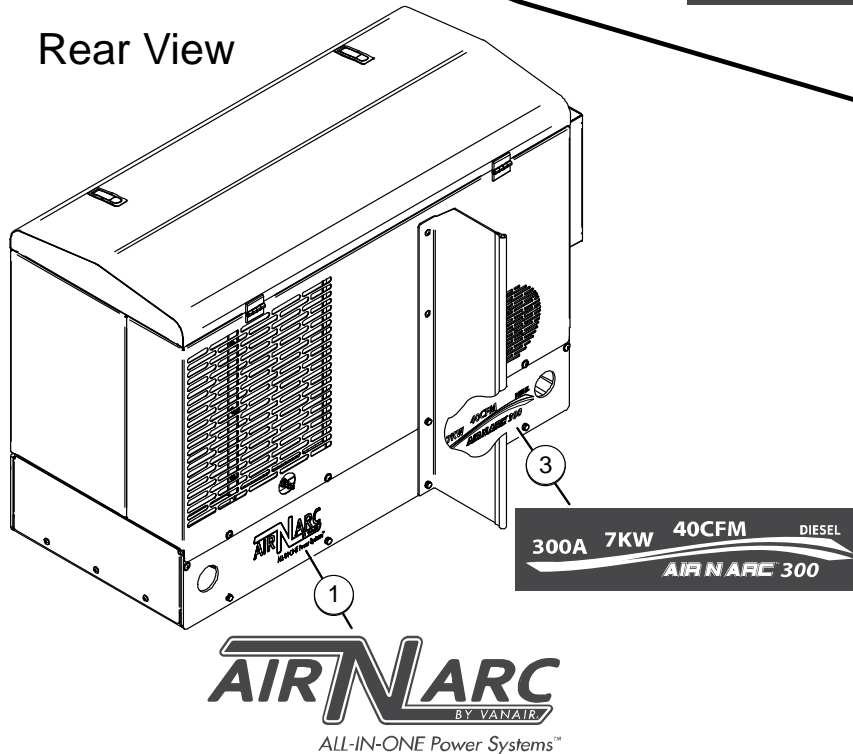
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE MACHINE SERIAL NUMBER.

9.19 DECAL AND PLATE LOCATIONS (4 OF 4)

Front View



Rear View



9.19 DECAL AND PLATE LOCATIONS (4 OF 4)

ITEM	DESCRIPTION	PART NUMBER	QTY
1	DECAL, ANA BY VANAIR WHT.	DL269706	1
2	DECAL, VANAIR LOGO	DL270724	2
3	DECAL, ANA 300 PERF BADGE WHT.	DL269704	1
4	DECAL, ANA 300 PERF BADGE WHT.	DL269704	1

NOTE: For location of machine serial number plate, see *Figure 9-1*.



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

^IApproximate 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 lb Pavement Breaker	37 SCFM
<i>Continued on next page</i>	

A.4 AIR TOOL AIR CONSUMPTION CHART (CONTINUED)

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

A.5 AIR N ARC 300 SERIES ALL-IN-ONE POWER SYSTEM AVAILABLE OPTIONS LIST

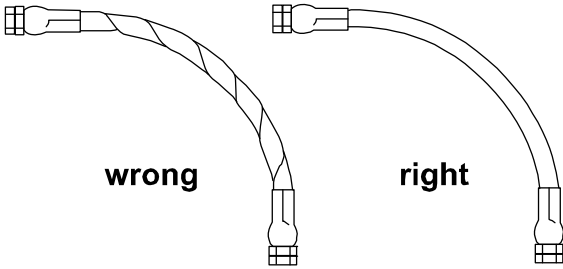
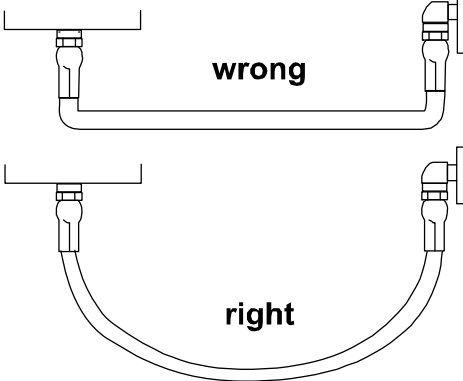
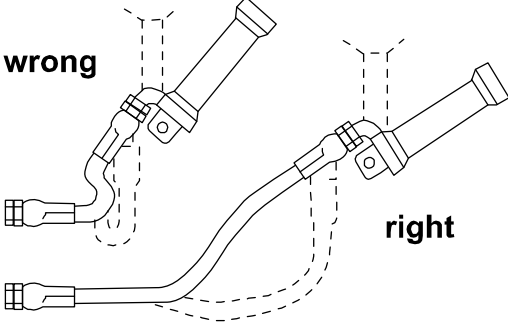
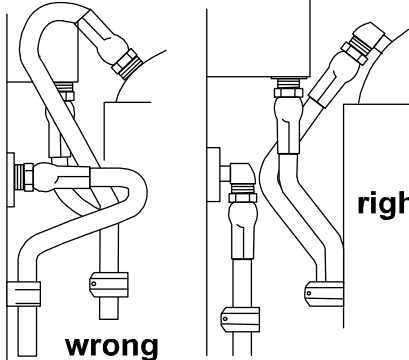
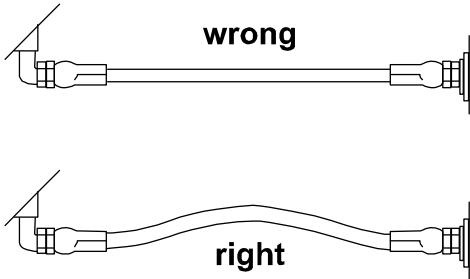
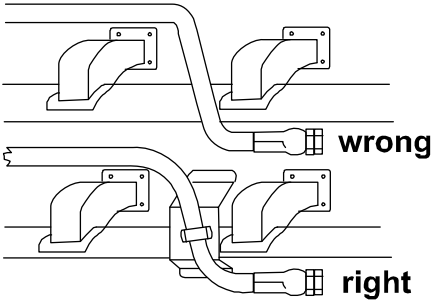
KEY NO.	OPTION ITEM	DESCRIPTION	PART ORDER NUMBER	QTY
1	REMOTE PANEL MOUNT	This bracket is used for remote panel installation to space panel off from truck body	A16738P	1
2	COMPRESSOR UNLOAD SOLENOID HEATER BLANKET	This heater component is integrated with the electronic fan system so that anytime that compressor switch is on, the blanket is on if the fan is not running. For cold conditions: <ul style="list-style-type: none"> Let the machine warm up with all switches off After the machine has warmed up the compressor can be turned on. 	265870	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)	032770	1
4	BATTERY BOOST CABLES	These cables are 25 feet in length, with quik-connect ends	MA269938	1 set
5	AIR TANK AUTO DRAIN KIT	Automatically drains moisture from the air reservoir	MA66434	1
6	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
7	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
8	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

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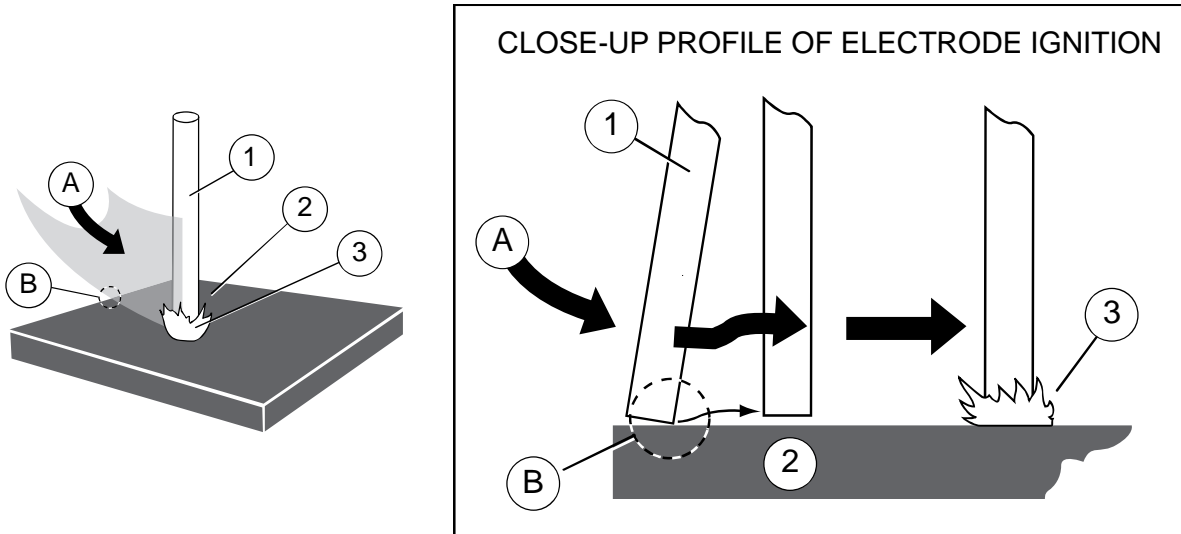
***A.5 AIR N ARC 300 SERIES ALL-IN-ONE POWER SYSTEM AVAILABLE OPTIONS LIST
(CONTINUED)***

KEY NO.	OPTION ITEM	DESCRIPTION	PART ORDER NUMBER	QTY
9	BATTERY	12 volt, 35 amp, sealed lead acid	MA31821	1
10	BATTERY	LTV, dry cell 100 KSI	MA44454	1
11	EXTENSION SEGMENT FOR WELD CABLE	50 feet in length, 1/0 cable with connectors	MA269942	1
12	WELD HELMET	2 x 4 auto-darkening lens, solid color (blue)	MA269903	1
13	WELD HELMET LENSE	Replacement lens for welding shield	MA270500	
14	WELD LEAD	25 feet in length, 1/0 cable with electrode holder and connector - 330 amp	MA269814-25	1
15	WELD LEAD	50 feet in length, 1/0 cable with electrode holder and connector - 330 amp	MA269814-50	1
16	WELD LEAD	25 feet in length, 1/0 cable with ground clamp, and connector - 330 amp	MA269815-25	1
17	WELD LEAD	50 feet in length, 1/0 cable with ground clamp, and connector - 330 amp	MA269815-50	1
18	WELDING ROD	LaGrange 100 KSI 1/8" blue	MA98018	per pound
19	WELDING ROD	LaGrange 100 KSI 3/32" blue	MA44890	per pound
20	WELDING ROD	LaGrange 100 KSI 5/32" blue	MA99727	per pound
21	ISOLATOR (BOLT DOWN)	Used to dampen vibration transferred from direct mounting of package. One per mounting bolt (x 4) needed.	PR93969	4
22	AIR GOUGE TORCH	Torch, air gouge	MA269933	1
23	CARBON ARC ELECTRODES	Carbons, pointed arc gouging 3/16" x 12"	MA269935	50 / box

A.6 HOSE INSTALLATION GUIDE

 <p>wrong right</p> <p>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.</p>	 <p>wrong right</p> <p>2. Ample bend radius should be provided to avoid collapsing of line and restriction of flow.</p>
 <p>wrong right</p> <p>3. Exceeding minimum bend radius will greatly reduce hose assembly life.</p>	 <p>wrong right</p> <p>4. Use elbows or other adapters as necessary to eliminate excess hose length and to insure neater installation for easier maintenance.</p>
 <p>wrong right</p> <p>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.</p>	 <p>wrong right</p> <p>6. When properly routing, use clamps to secure the hose in its proper position.</p>

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.

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

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 as any non-routine repairs or changes made, throughout the productive life of the machine package.

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 300 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 sections. 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.

B.2 MAINTENANCE AND SERVICE LOG

Date of Purchase: _____

BREAK-IN PERIOD SERVICE POINTS

Date Completed: _____

50 HOURS OR TWO MONTHS SERVICE POINTS

Dates Completed: _____

200 HOURS OR EIGHT MONTHS SERVICE POINTS

Dates Completed & Parts Replaced:

300 HOURS OR ONE YEAR SERVICE POINTS

Dates Completed & Parts Replaced:

OTHER SERVICE NOTES

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Vanair Manufacturing, Inc.

10896 West 300 North

Michigan City, IN 46360

Phone: (219) 879-5100

(800) 526-8817

Service Fax: (219) 879-5335

Parts Fax: (219) 879-5340

Sales Fax: (219) 879-5800

www.vanair.com

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