VANAIR®
AIR POWER TO GO™

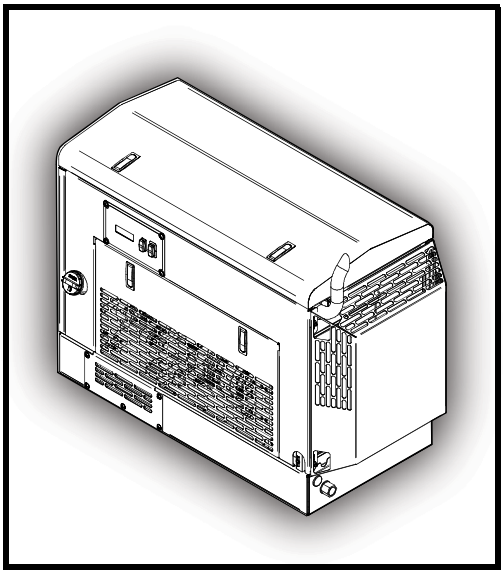
VIPER DIESEL

ROTARY SCREW AIR COMPRESSOR OPERATOR'S MANUAL & PARTS LIST

NOTE

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.



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

NOTE

Use only Vanair 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 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

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

Always inform Vanair Manufacturing, Inc., before beginning any changes to the Viper Diesel system.

KEEP THE MANUAL WITH THE VEHICLE

VANAIR®
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P/N: 090058-OP_r0

Effective Date: August-2014

WARRANTY: VIPER SERIES AIR COMPRESSORS

The rotary screw compressor unit is warranted for life when adhering to the prescribed maintenance schedule. The hydraulic motor on the hydraulic Viper is warranted for two (2) years. This warranty does not cover damage caused by accident, misuse or negligence. If a compressor unit is disassembled the warranty is void. Any disassembly of major components must be approved by Vanair to avoid voiding of warranty. All other parts including the compressor unit shaft seal are warranted for twelve (12) months subject to the same conditions mentioned previously. Any and all such claims for warranty consideration must be coordinated prior to work being performed through the Warranty-Service Department at the address below. Do not return parts without prior authorization.

Warranty is limited to the supply of replacement parts failing within the warranty period. Credit for labor required to refit replacement parts is NOT included. All warranted parts are to be shipped PREPAID to VANAIR. Replacement parts will be shipped back to the customer by VANAIR via ground shipment. Cost to expedite delivery of replacement parts will be incurred by customer.

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

This statement of warranty is expressly in lieu of and disclaims all other express warranties, implied warranties of merchantability and fitness for a particular purpose and all other implied warranties which extend beyond the description on the face hereof. In no event shall Vanair be responsible for special, indirect, incidental, consequential or punitive damages of any kind, including without limitation, lost profits or other monetary loss, whether or not any such matters or causes are within Vanair's control or due to negligence or other fault of Vanair, its agents, affiliates, employees or representatives.

This warranty shall be void and VANAIR shall have no responsibility to repair, replace or repay the purchase price of defective or damaged parts resulting from the use of or repair of replacement parts or fluids not of VANAIR'S manufacture or from buyer's failure to store, install, maintain and operate the compressor according to the recommendations contained in the Manual.

All claims under the Warranty shall be made by contacting VANAIR Warranty-Service Department.

Please note that engines are warranted separately by the engine manufacturer. Consult engine manual.

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Register Your Warranty Online at www.vanair.com under the Support Tab!
Or Call: (800) 526-8817 • Fax: (219) 879-5800
Mail to: 10896 W 300 North • Michigan City, IN 46360

Effective February 11, 2013

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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 engine air filter mounting location (see ***Figure W-1***).

   The engine and the compressor also have individual serial numbers respectively (see ***Figure W-1***). For engine warranty issues, consult the Engine 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. **Have a list of the symptoms/condition/ malfunctions along with any applicable temperature and pressure readings, and also the number of operational hours available:**

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

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

4. **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.**

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

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

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

   Once a current form has been obtained, follow the instructions given on the form to fill in the information needed. This form is used for the purpose of soliciting a warranty case. All of the field information ***except*** for the bottom section block fields, which includes

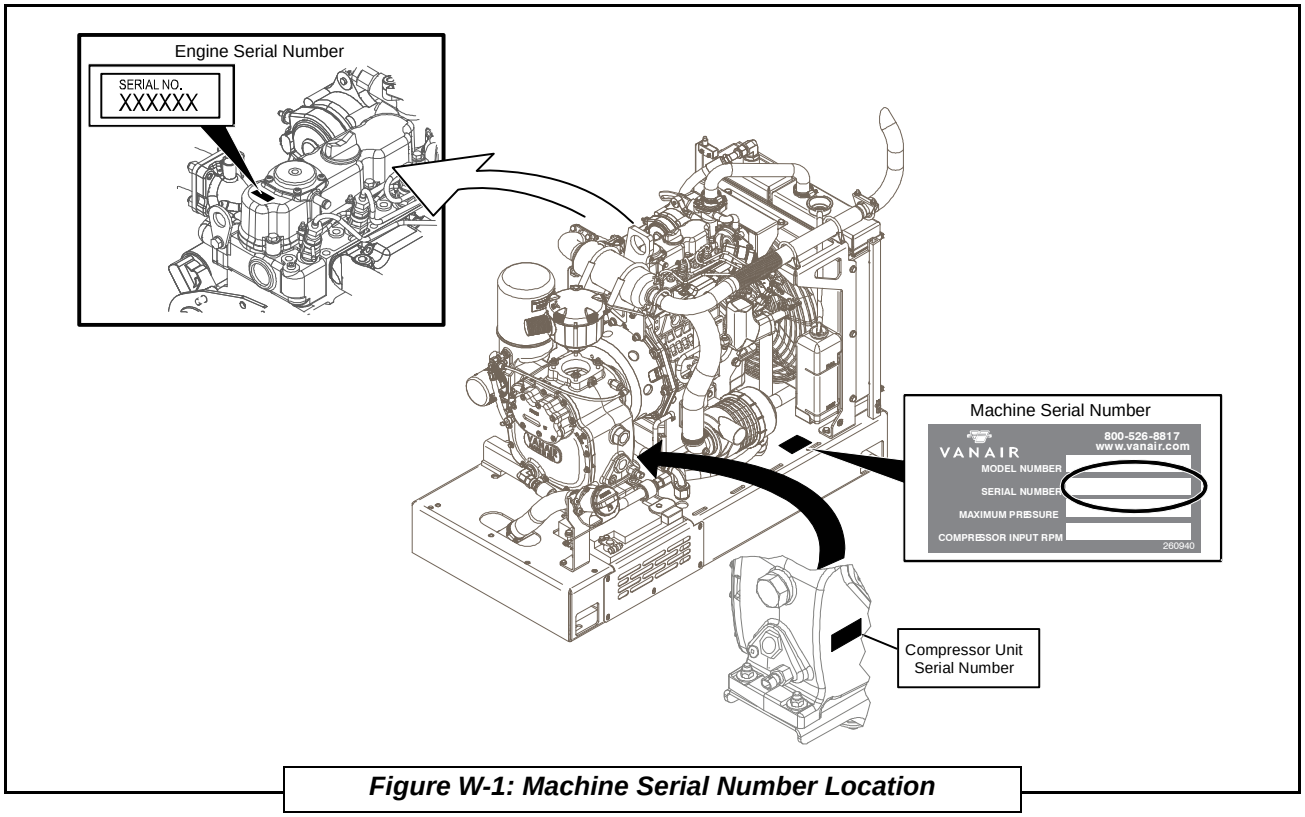

Figure W-1: Machine Serial Number Location

Disposition of Goods, *Notifications* and *Additional Notes*, will be required.

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

NOTE

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

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

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

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:

Phone: 219-879-5100, ext. 400 or toll free 844-VANSERV (826-7378)

Email: warranty@vanair.com

SECTION 1: SAFETY

1.1 ⚠ GENERAL INFORMATION

IMPORTANT

Read this manual before operating or servicing the Viper Diesel compressor system. Failure to do could result in damage equipment, bodily injury, or death

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

These boxes are labeled clearly with the title block listing either Danger, Warning, Caution, or other non-safety issue. They draw attention to specific issues that are pertinent to the safe and correct operation of the machine.

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

The international warning symbol (shown below) 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.

1.3 ⚠ SUMMARY OF WARNINGS, CAUTIONS AND NOTES

These boxed inserts are placed throughout this manual in the sections where they apply. This subsection is a general summary of their contents.

1.3.1 ⚠ DANGERS

- Keep tools or other conductive objects away from live electrical parts.
- Never touch electrical wires or components while the machine is operating. They can be sources of electrical shock.

1.3.2 ⚠ WARNINGS

- **DO NOT EVER** use this compressor as a breathing air source. Vanair Manufacturing Inc., disclaims any and all liabilities for damage or loss due to fatalities, personal injuries resulting from the use of a Vanair compressor to supply breathing air.
- **DO NOT** perform any modifications to this equipment without prior factory approval.
- **DO NOT** install this compressor in a confined space that lacks proper ventilation and airflow; breathing and cooling air circulation must not be compromised.
- **DO NOT** operate the compressor or any of its systems 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.

- **DO NOT** operate the compressor with any by-pass or other safety systems disconnected or rendered inoperative.
- **DO NOT** operate the equipment while you are under the influence of alcohol or drugs.
- **DO NOT** operate the equipment while you are feeling ill.
- **DO NOT** attempt to service the equipment while it is operating.
- Before performing maintenance or replacing parts, relieve the entire system pressure by opening a service valve which will vent all pressure to the atmosphere: remove all electrical power.
- **DO NOT** use the compressor for purposes other than for which it is intended. High pressure air can cause serious and even fatal injuries.
- **DO NOT** operate the compressor outside of its specified pressure and speed ratings. (See **Section 2: Specifications** or refer to the equipment data plate.)
- **DO NOT** use flammable solvents or cleaners for cleaning the compressor or it parts.
- **DO NOT** operate the compressor in areas where flammable, toxic, or corrosive fumes, or other damaging substance can be ingested by the compressor intakes.
- Keep arms, hands, hair and other body parts, and clothing away from fans, drive shafts, and other moving parts.
- **DO NOT** wear jewelry, unbuttoned cuffs, ties, or loose-fitting clothing when you are working near moving/rotating parts.
- **ALWAYS** confine long hair when working near moving/rotating parts.
- **NEVER** operate the equipment while wearing a headset to listen to music or the radio.
- Wear personal protective equipment such as gloves, work shoes, and eye and hearing protection as required for the task at hand.
- **DO NOT** operate the compressor with any guards removed or damaged, or other safety devices inoperative.
- **DO NOT** operate the compressor in enclosed or confined spaces where ventilation is restricted or closed-off.
- Ensure that hoses connected to service valves are fitted with correctly sized and rated flow limiting devices which comply with applicable codes. Pressurized broken or disconnected hoses can whip causing injuries or damage.
- Over speed is hazardous! NEVER tamper with the governor components or settings to increase the maximum speed. Severe personal injury and equipment damage can result if operated at speeds above the maximum.
- **DO NOT** use tools, hoses, or equipment that have maximum ratings below that of this compressor.
- Keep metal tools, and other conductive objects away from live electrical components.
- Before performing maintenance or repair operations on the compressor, ensure that all power has been removed and been locked out to prevent accidental application.
- **DO NOT** assume that because the compressor is in a STOPPED condition that power has been removed.
- Use this compressor only to compress atmospheric air. Use of this equipment as a booster pump and/or to compress any other gaseous or aerosol substance constitutes improper use. It can also cause damage or injuries. Such misuse will also void the warranty.
- Install, operate, and maintain this equipment in full compliance with all applicable OSHA, other Federal, state, local codes, standards, and regulations.
- When lifting objects, be aware of proper lifting techniques to avoid injury.
- **ALWAYS** read and follow safety related precautions found on containers of hazardous substances.
- **DO NOT** play with compressed air. It can cause serious injury.

1.3.3 ⚠ CAUTIONS

- Check all safety devices for proper operation on a routine basis.
- Ensure that no tools, rags, or other objects are left on compressor drive systems or near intakes.

- Keep the equipment clean when performing maintenance or service actions. Cover openings to prevent contamination.
- **DO NOT** operate the compressor if cooling air is not available (fan/cooler not operating) or if lubricant levels are below their specified minimum levels.
- Ensure all plugs, hoses, connectors, covers, and other parts removed for maintenance actions are replaced before applying power to the compressor.
- Avoid touching hot surfaces and components.
- Ensure that electrical wiring, terminals; hoses and fittings are kept in serviceable condition through routine inspections and maintenance. Replace any damaged or worn components.
- **DO NOT** install safety devices and/or replacement parts other than authorized Vanair® replacement parts.
- Keep personnel out of line with, and away from discharge opening of valves, hoses and tools.
- Immediately clean up any lubricant or spills.

1.3.4 ⚠ SAFETY DECALS

Safety decals are placed onto, or located near, system components that can present a hazard to operators or service personnel. All pertinent decals listed in **Section 7.11A, Decal Locations** are located near a component, which is subject to respect in terms of safety precautions. Always heed the information noted on the safety decals.

⚠ WARNING

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

1.4 ♻ 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 label of the fluid in question.

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SECTION 2: SPECIFICATIONS

TABLE 2A: SPECIFICATIONS FOR VIPER DIESEL ROTARY SCREW COMPRESSOR

GENERAL SYSTEM INFORMATION	SPECIFICATION
ENGINE	Diesel 25HP [I]
Engine Speed	**Idle Speed:** 2200 RPM // **Full Speed:** 3600 RPM
Engine Oil Capacity	Four (4) Quarts 15W40 (Refer to Engine Operator's Manual for Extreme Conditions)
Fuel Consumption	1.25 GPH at Full Engine Speed / Load Nine (9) Hour Runtime (one gallon/hour @ 60% Duty Cycle)
Fuel Tank Capacity	Nine (9) Gallons
Fuel Type	Diesel Fuel [II]
Operating Temperature Limits	+10 °F (-7°C) to 120 °F (49 °C) [III]
COMPRESSOR	Single Stage, Oil Injected Rotary Screw
Model	80 CFM / 100 PSIG 70 CFM / 125 PSIG 60 CFM / 150 PSIG High Altitude: 70 CFM / 100 PSIG
Inlet Control	Electric
Air Filter	Pleated Paper, Dry Type

Table continued on next page

[I] For specification and requirements regarding the Kubota® 25 HP Diesel Engine, refer to the Engine Operator's Manual. **IMPORTANT:** Do not adjust the engine speed without first consulting the Vanair® Service Department (refer to ***Section 5.5.1***).

[II] Vanair recommends: 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 6.3** (Extreme Condition Operation), and the Engine Operator's Manual.

[III] With cold weather option kit temperature range expands to: -40 °F (-40 °C). Refer to **Section 7, Table 7B** for options list.

NOTE: Specifications are subject to change without notice.

TABLE 2A: SPECIFICATIONS FOR VIPER DIESEL ROTARY SCREW COMPRESSOR (cont.)	
GENERAL SYSTEM INFORMATION	**SPECIFICATION**
COMPRESSOR (*specifications continued from previous page*)	
Oil Filter	Spin-on Style
Oil Capacity / Type	Air End - **3 Quarts** // **Machine - 4 Quarts** (1 gallon) (Vanguard™ Premium Synthetic Oil)
Safety Relief Valve Setting	200 PSIG
Operating Pressure Range	75-100 (Maximum) PSI; *Pressure setting is set at factory to 100 PSI, but may be adjusted downward accordingly.*
Electrical System	12 VDC
Cooling System	Air to Oil Heat Exchanger
Instrumentation Display	Run Hours, Fuel Level, Compressor Temperature, Pressure, RPM

I For specification and requirements regarding the Kubota® 25 HP Diesel Engine, refer to the Engine Operator's Manual. **IMPORTANT:** Do not adjust the engine speed without first consulting the Vanair® Service Department (refer to ***Section 5.5.1***).

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III With cold weather option kit temperature range expands to: -40 °F (-40 °C). Refer to **Section 7, Table 7B** for options list.

NOTE: Specifications are subject to change without notice.

VANAIR MANUFACTURING, INC.
(800) 526-8817 • www.vanair.com

SECTION 3: INSTALLATION

3.1 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 Viper Diesel Compressor System, refer to the following sections.

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.

3.2 INSTALLATION INSTRUCTIONS

⚠ DANGER

DO NOT install in enclosed spaces.

⚠ WARNING

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

NOTE

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

Refer to ***Figure 3-1 (parts 1 and 2)***, and the following procedure:

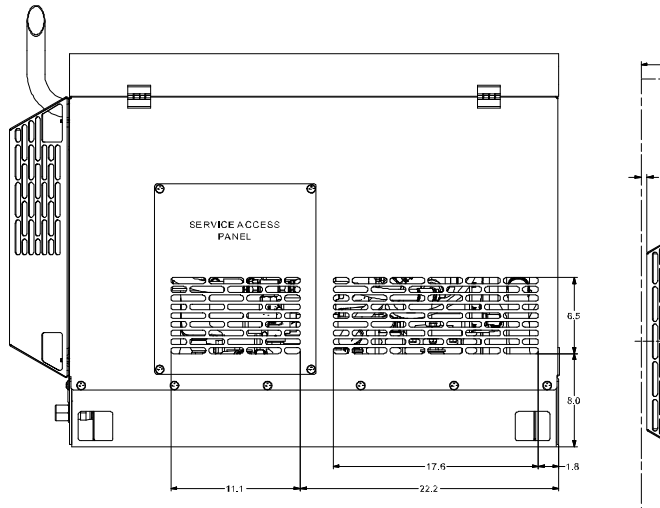
1. Position the machine so that there is no restriction of cooling air through the enclosure (minimum of 12 inches from front access side; minimum of six inches from rear side. Cooling air enters the enclosure through the front and rear panels, passes through the cooler, and exits through vents in the end shroud.
2. Ensure that adequate height and clearance exists to allow for the hood to open (minimum of 49.9 inches from mounting surface), and a clear passage for service allowance to the maintenance access panel located at the back.
3. Mounting surface or support should be adequate for the weight of the machine and should be level for normal operation. Mounting holes for four (4) 1/2” hold down bolts are provided. Refer to ***Section 7, Illustrations and Parts Lists*** for additional installation and system schematic drawings.
4. Service connections are conveniently grouped at the end of the unit in the base frame.
5. Electrical connections (system designed for 12VDC negative ground).

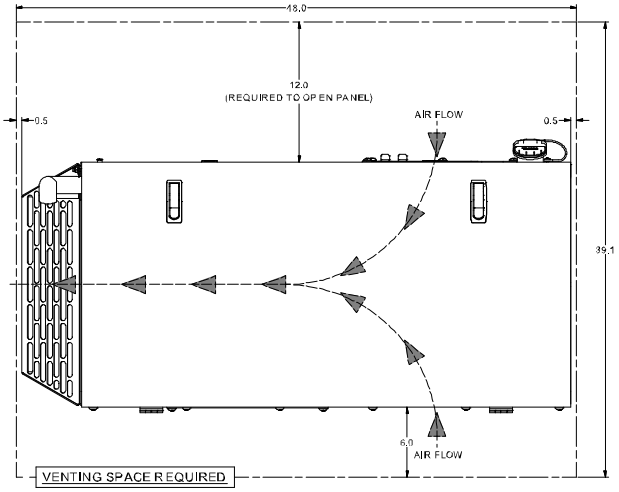
Ensure all supply hoses and electrical wiring are correctly specified, adequately supported and do not touch or rest on any sharp edges. Wiring should be protected with split loom to prevent corrosion and consequently, loose due to down time.

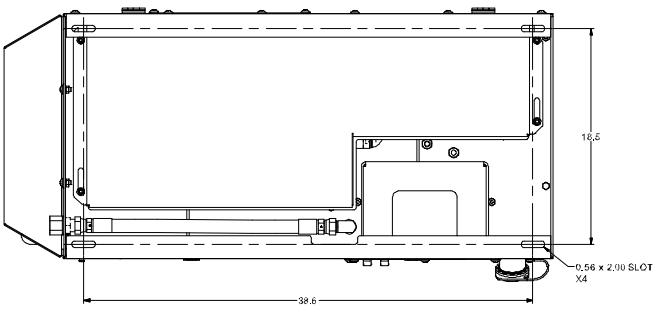
3.3 INSTRUMENT PANEL RELOCATION

The Viper Diesel compressor allows for the instrument panel to be remote mounted if it better-suits the vehicle's mounting allowance space or the compressor's functions. The optional extension harness must be used for remote panel installation (see ***Table 7B***).

Please note that if relocating the panel, you should re-apply any zip ties that were cut to re-establish the cable wire to the new location. Tying the wire at intervals may be needed to secure the panel cable away from moving objects or sharp edges during operation.







DISCLAIMER

If machine package is to be mounted within a confined space such as beneath a canopy, the unit must have a minimum of eight (8) inch clearances on the front and back sides for ventilation.

NOTE

The dimensions listed in this diagram are the *minimum* required clearance distances needed for properly cooling the machine. Additional clearance room may be desired for easier access for control and/or maintenance functions.

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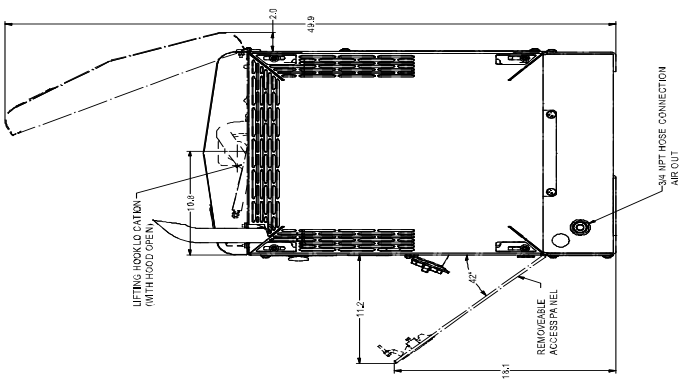
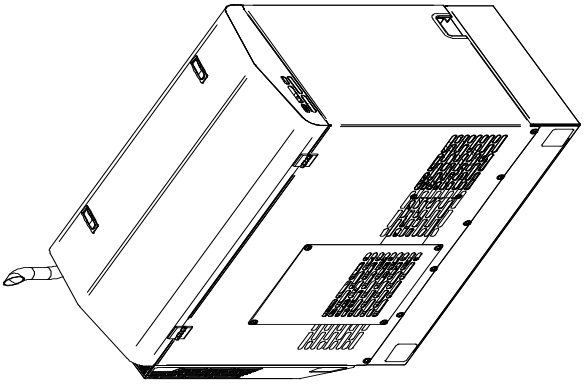
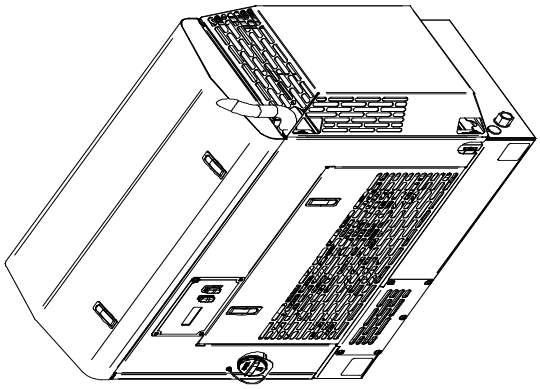
Figure 3-1: Dimension Diagram - Part 1 of 2

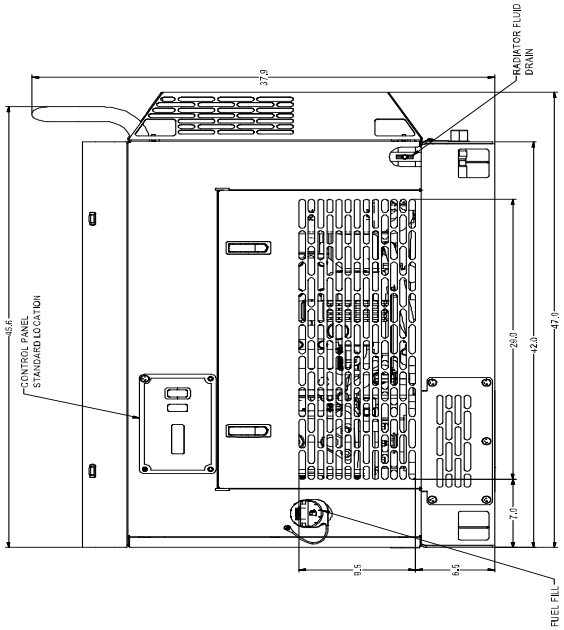
NOTE

The dimensions listed in this diagram are the *minimum* required clearance distances needed for properly cooling the machine. Additional clearance room may be desired for easier access for control and/or maintenance functions.









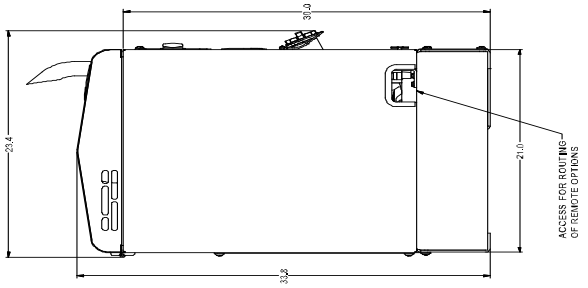


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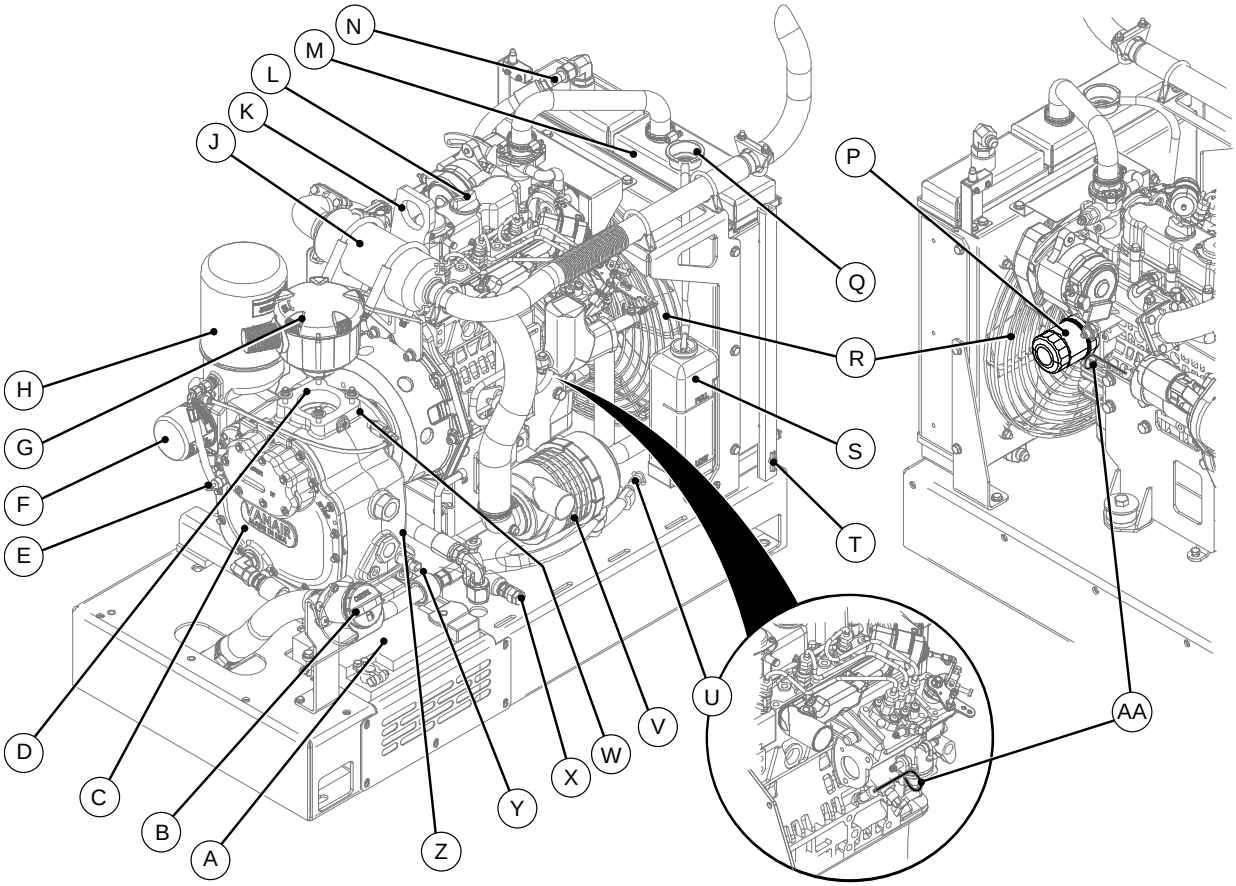
Figure 3-1: Dimension Diagram - Part 2 of 2



KEY	DESCRIPTION	KEY	DESCRIPTION	KEY	DESCRIPTION
A	BATTERY	**K**	LIFTING BAIL	**U**	ENGINE OIL DRAIN OUTLET/TUBE
B	DIESEL FUEL PORT CAP	**L**	ENGINE OIL FILL PORT CAP	**V**	ENGINE AIR FILTER (HOUSING)
C	COMPRESSOR UNIT	**M**	COOLER ASSEMBLY - ENGINE RADIATOR	**W**	INLET VALVE SOLENOID
D	COMPRESSOR AIR INLET	**N**	COOLER ASSEMBLY / COMPRESSOR OIL COOLER	**X**	COMPRESSOR OIL DRAIN OUTLET/ TUBE
E	PRESSURE RELIEF VALVE	**P**	ENGINE OIL FILTER	**Y**	COMPRESSOR OIL LEVEL SIGHT GLASS
F	COMPRESSOR OIL FILTER	**Q**	RADIATOR FILL PORT	**Z**	COMPRESSOR OIL FILL PORT
G	COMPRESSOR AIR FILTER (HOUSING)	**R**	COOLING FAN ASSEMBLY	**AA**	ENGINE OIL LEVEL/ DIPSTICK INDICATOR [I]
H	COMPRESSOR AIR/OIL SEPARATOR	**S**	COOLANT RECOVERY TANK		
J	ENGINE EXHAUST MUFFLER	**T**	RADIATOR DRAIN VALVE		

[I] There is an oil dipstick indicator located on either side of the engine.

Figure 4-1: Main Machine Component Locations

SECTION 4: OPERATION

4.1 GENERAL INFORMATION

Refer to ***Figure 4-1***. The Vanair® Viper Diesel compressor has a comprehensive array of controls and indicators for optimum machine performance. Understanding the correct operation of the system will help to distinguish between a properly functioning system and a system that may be indicating the beginning of a malfunction. The information in the Operation Section will help the operator to recognize and interpret the readings to assure that the system is performing optimally.

NOTE

Before starting the Vanair Viper Diesel compressor, read this section thoroughly and familiarize yourself with the controls and indicators - their purpose, location and use.

NOTE

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

4.2 INSTRUMENTATION

Refer to ***Figure 4-2***. The standard instrument panel for the Viper Diesel compressor features a digital display screen with scrolling and operational rocker switches.

4.2.1 DIGITAL DISPLAY SCREEN

The air pressure readout monitors service air pressure and incorporates an over-pressure shutdown function.

4.2.2 SCROLL SELECTOR ROCKER SWITCH

The scroll selector rocker switch allows the operator to navigate through the settings and displays related to the machine's functions during operation.

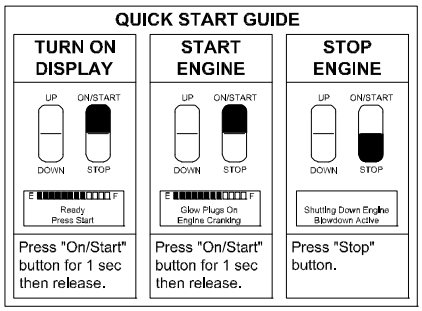
4.2.3 ON AND STOP SELECTION KEY SWITCH

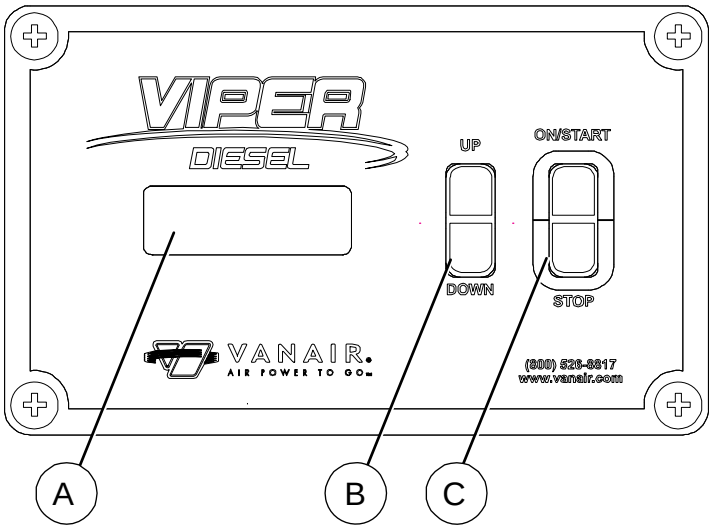
The ON AND STOP selection key switch is used to turn the machine on and off.

4.3 INITIAL START-UP PROCEDURE

The following procedure should be used to make the initial start-up of the compressor.

1. Position the compressor on a level surface so that proper amounts of liquid can be added, if required.
2. Check engine and compressor oil levels and add oil, if necessary.
3. Fill fuel tank.
4. Connect air hose/piping to discharge.
5. Press and hold Start button for one (1) second to turn on display.
6. Press and hold Start button a second time for one (1) second to start Engine cranking sequence.
7. Allow the machine to sufficiently warm-up before operating.





KEY	DESCRIPTION
A	INSTRUMENT PANEL MODULAR DISPLAY SCREEN: Display contains four lines, 20 characters/line.
B	SCROLL SELECTOR ROCKER SWITCH
C	**ON/START** AND **STOP** SELECTION ROCKER SWITCH

Figure 4-2: Controller Panel

8. After the initial run, shut down machine allow it to depressurize and top off compressor oil sump, as required. Inspect for any leaks, and tighten any loose fittings.

4.4 SHUTDOWN PROCEDURE

1. Allow engine to run at idle for approximately sixty (60) seconds.
2. Press the STOP button; NOTE: Allow the compressor to blow down prior to re-starting.

IMPORTANT

In case of emergency where immediate shutdown is required, this procedure is not necessary.
Press the STOP button immediately.

4.5 SUBSEQUENT START-UP PROCEDURE

On subsequent starts, follow the procedure explained below:

1. Check engine and compressor oils and add oil, if necessary.
2. Fill the fuel tank.
3. Press and hold Start button for one (1) second to turn on display.
4. Press and hold Start button a second time for one (1) second to start Engine cranking sequence.
5. Allow the machine to warm up sufficiently before operating.

⚠ WARNING

Engage stop button prior to opening panel or servicing machine. Engine can start at any time in Auto mode.

4.6 CONTROLLER GUIDE

Refer to ***Figure 4-2*** for controller panel display features. The electronic controller supplied in the Diesel Viper package has been designed to work in conjunction with the linear actuator that operates the speed control. When used properly, they will reduce fuel consumption, remind the user when periodic service is due, extend the useful life

of the package, and help diagnose any problems that may arise during the life of the compressor system.

4.6.1 HOME SCREEN

The home screen displays the basic information required during each state the package can exist in. Before startup, it displays fuel level and a message that helps instruct the user how to start the engine. While the engine is in its cranking sequence, it displays a message describing what it is doing (glow plugs, warm-up period, etc.). During regular operation, it displays engine RPM, compressor pressure and temperature, fuel level, and hours of operation. After shutdown, it displays the blowdown timer required to elapse before engine can be restarted.

4.6.2 SPLASH SCREEN

When the display first turns on, it displays the manufacturer information, software version, current hours, and serial number of the machine. To access this screen after the display goes to the home screen, press the Up or Down button while at the home screen and it can be accessed like the adjustable parameters.

4.6.3 ADJUSTING USER SETTINGS

The Diesel Viper controller has several settings that can be adjusted to suit each user's specific requirements. The following parameters can be adjusted as follows:

4.6.3.1 PARAMETERS

Parameter Name	Setting Limits (Increment)	Default
Auto Shutdown (min.)	0-30 (1)	5
Auto Crank	On/Off	On
Sleep State Timer (min.)	0-15 (5)	10

1. After the display is turned on, from the home screen press the Up or Down buttons on the control panel to toggle between each parameter.
2. Press ON/START to select a parameter to adjust.
3. Use the Up and Down buttons to cycle between available settings.
4. Press ON/START to confirm the parameter setting. This will return view access to the home screen.

4.6.3.2 AUTO SHUTDOWN

When enabled, auto shutdown will turn off the compressor package until air demand is needed again.

4.6.3.3 AUTO CRANK

When enabled (ON/OFF, default to ON), auto crank will apply the appropriate length of glow plugs, crank the engine until it starts, and allow for a brief warm-up period before making air. When off, manual crank by depressing ON/OFF switch.

4.6.3.4 SLEEP STATE TIMER

The sleep state timer is the length of time that the package can be “asleep” before it will turn off completely to reduce battery draw and reduce the possibility of accidental restart when no one is around.

4.6.4 SETTING PRESSURE

Refer to **Section 2, Specifications** for pressure range. When the machine is running, the Up and Down buttons adjust the pressure set point.

4.6.5 SAFETY

The controller is designed with the user's safety in mind. There are several safety conditions that must be met to run the compressor package. The pressure transducer and temperature thermistor on the compressor must be plugged in and functional for the package to run. The alternator connector must be plugged in for the package to run. The hood must remain closed until after the engine has started. If any unsafe condition is present before the package is started or during its operation, the controller will alert the user with a message

on the display. Once the problem is corrected, the message can be cleared by holding the Up button.

4.6.6 SERVICE INTERVALS

The controller will remind the user of periodic service intervals. Once the package has been serviced, the message can be cleared by holding the Up button.

4.7 OPERATING CONDITIONS

1. Operate only in well-ventilated areas. Exhaust fumes can be lethal.
2. Ensure there are no obstructions on cooling air intakes at both ends of the machine.
3. Do not leave anything resting on top of the machine. Hot engine exhaust and cooling air will generate high heat.
4. Be sure to leave sufficient room around the machine for cooling air. See ***Figure 3-1***.
5. Operate machine with top cover closed to avoid engine exhaust fumes and heat from being deflected.
6. Refer to specifications for operating parameters, speeds, etc.

4.8 EXTREME CONDITIONS

When operating in extreme cold or hot conditions, 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. Preventative safeguards exist that can minimize the possibility of malfunctions that are prone to occur under certain ambient conditions. Refer to **Section 6.3, Extreme Condition Operation**, for additional information on variable ambient operating conditions, and adjustment adaptations that can be made accordingly.

SECTION 5: MAINTENANCE

5.1 GENERAL INFORMATION

A strict maintenance program is the key to long life for the Viper Series Compressor System package. Below is a program that, when adhered to, should keep the package in top operating condition. Refer to **Table 5.3A**, **Table 5.3B**, and **Section 5.5, Parts Replacement and Adjustment Procedures** for detailed descriptions of specific compressor system components. Refer to **Table 7A** in **Section 7** for part order information.

⚠ WARNING

To avoid accidental system start-ups during periods of maintenance, disconnect the positive (+) cable to the battery terminal, and place the wire aside, or tape the contact end so that it cannot accidentally contact the battery post.

NOTE

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

5.2 ROUTINE MAINTENANCE SCHEDULE

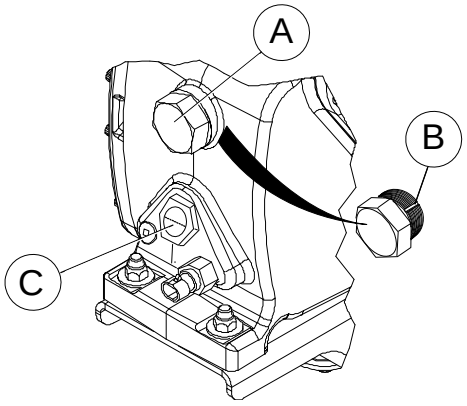
Vanair® Manufacturing, Inc. considers the maintenance schedule given in **Section 5.3, Maintenance Schedule Table (5.3A for compressor; 5.3B for engine)**, to be part of the warranty agreement with the customer. This maintenance regimen must be followed in order to protect the warranty of the machine package.

⚠ 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, if equipped, 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 5-1*. Open fill cap SLOWLY (contents under pressure) to make sure all pressure has been relieved.



KEY	DESCRIPTION
A	COMPRESSOR FILL CAP
B	FILL CAP BLEED VENT GROOVE: Open/crack cap slightly to allow bleed vent to relieve air pressure before removing cap.
C	OIL FILL LEVEL: Full indication is the center of the sight glass.

Figure 5-1: Compressor Pressure Relief Check

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.

Vanair® Manufacturing, Inc. especially requires that a consistent service regimen be established for engine oil changes, and engine and compressor air filter servicing. The following schedule is designed so that many of the other maintenance tasks are completed when the engine and compressor air filters are serviced, and the engine oil is changed.

⚠ WARNING

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

Please take a moment to acquaint yourself with the service schedule presented in **Section 5.3 (5.3A for compressor; 5.3B for engine)** to assist the customer in establishing a maintenance routine log.

For assistance in obtaining routine maintenance or replacement parts, consult ***Section 7.1, Parts Ordering Procedure***, and **Table 7A: Recommended Spare Parts List.**

5.3A MAINTENANCE SCHEDULE TABLE - COMPRESSOR INTERVALS

⚠ WARNING		BREAK-IN PERIOD	MAINTENANCE SCHEDULE				NOTE
Before performing maintenance: Shut down machine, relieve all system pressure and lock out all power, as per the Safety Section of this manual. **Always clearly tag the start-up instrumentation against accidental system start-ups during maintenance.**		**First 50 Hours**	**DAILY**	**Every 100 Hours**	**Every 500 Hours or One (1) year**	**Every 1000 Hours or Two (2) years**	**If working in dusty or dirty conditions, reduce the recommended time intervals between servicing by half for engine and compressor oil change, and engine and compressor filter servicing.**
KEY	**TASK DESCRIPTION**						**ACTION TO TAKE**
1	Check oil level	•	•				Refer to *Figure 5-1* to determine proper oil level, which is equal to the center of the sight glass. Add as necessary.
2	Check line fittings and electrical connections	•	•				Ensure that all connections and fittings, including tubing and electrical connections, are snugly fastened without being twisted or compromised by extreme bending or contact with sharp corners or surfaces. Zip-tie any loose length of fitting if it appears to have a tendency to shift or cause wear while machine is in operation.
3	System inspection		•				Visually review the entire machine being mindful of any evidence of abnormal wear, including pooled oil, frayed or rubbed connection piping, loose fasteners or hardware, leaks, etc.
4	Change compressor oil and filter	•			•		Order oil and oil filter element replacement kits. Refer to **Table 7A: Recommended Spare Parts** for reorder number.
5	Change air filter element (check every 100 hours)				•		Order air filter replacement element.Refer to **Table 7A: Recommended Spare Parts** for reorder number.
6	Clean cooler (check every 100 hours)				•		Use low pressure wash down on exterior.
7	Change separator element					•	Order separator/coalescer replacement element. Refer to **Table 7A: Recommended Spare Parts** for reorder number.

5.3B MAINTENANCE SCHEDULE TABLE - ENGINE INTERVALS

⚠ WARNING		BREAK-IN PERIOD	MAINTENANCE SCHEDULE							NOTE
Before performing maintenance: Shut down machine, relieve all system pressure and lock out all power, as per the Safety Section of this manual. **For lock-out/tag-out disconnect the negative (-) battery cable.**		First 50 Hours	Daily	Every 50 Hours	Every 100 Hours or One (1) Year	Every 200 Hours	Every 400 Hours	Every 500 Hours	Every two (2) years	**If working in dusty or dirty conditions, reduce the recommended time intervals between servicing by half for engine and compressor oil change, and engine and compressor filter servicing.**
KEY	**TASK DESCRIPTION**									**ACTION TO TAKE**
1	Change engine oil.	•			•					Consult the Engine Operator's Manual for engine oil specification. Consult **Table 7A: Recommended Spare Parts List** for replacement kit or part order number.
2	Check fuel lines and clamps	•		•						Ensure that all fuel hose connections and fittings are free of any telltale signs of leaking and well connected. Zip-tie any loose length of hose fitting if it appears to have a tendency to shift or contact an abrasive surface while machine is in operation.
3	Check engine air filter element (replace if necessary), and fuel filter bowl (clean if necessary).		•		•					Consult the Engine Operator's Manual for procedure on changing the engine air filter element. Should the element need to be replaced, refer to **Table 7A: Recommended Spare Parts List** for replacement kit or part order number. Consult the Engine Operator's Manual for procedure on cleaning the engine fuel filter.
4	Check alternator belt tightness				•					Tighten if necessary. Consult the Engine Operator's Manual for fan belt information.
5	Change oil filter					•				Consult the Engine Operator's Manual for procedure on changing the engine oil filter, and manufacturer's recommended oil usage.
6	Check air intake hose		•							Ensure that the intake hose is properly fastened and free from any compromises such as tears or holes.

5.3B MAINTENANCE SCHEDULE TABLE - ENGINE INTERVALS

⚠ WARNING		BREAK-IN PERIOD	MAINTENANCE SCHEDULE							NOTE
Before performing maintenance: Shut down machine, relieve all system pressure and lock out all power, as per the Safety Section of this manual. **For lock-out/tag-out disconnect the negative (-) battery cable.**		First 50 Hours	Daily	Every 50 Hours	Every 100 Hours or One (1) Year	Every 200 Hours	Every 400 Hours	Every 500 Hours	Every two (2) years	**If working in dusty or dirty conditions, reduce the recommended time intervals between servicing by half for engine and compressor oil change, and engine and compressor filter servicing.**
KEY	**TASK DESCRIPTION**									**ACTION TO TAKE**
										Continued on next page
7	Check radiator hoses and clamp bands		•			I				Ensure that the radiator hoses and clamp bands are intact, in good working order and fastened correctly. If hoses are showing signs of wear (cracking, stretching, etc.), replace hoses (refer to **Section 7.14, Hose Installation Guide** for assistance when replacing damaged hoses).
8	Replace fuel filter element						•			Consult the Engine Operator's Manual for procedure on replacing the engine fuel filter element. Refer to **Table 7A: Recommended Spare Parts List** for replacement kit or part order number.
9	Flush cooling system							•		Consult the Engine Operator's Manual for procedure on cleaning the radiator water jacket.
10	Replace fan belt							•		Consult the Engine Operator's Manual for procedure on replacing the engine fan belt. Refer to **Table 7A: Recommended Spare Parts List** for replacement kit or part order number.
11	Replace air filter element									Consult the Engine Operator's Manual for procedure on changing the engine air filter. Refer to **Table 7A: Recommended Spare Parts List** for replacement kit or part order number.

I Every 200 hours or six (6) months.

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5.3B MAINTENANCE SCHEDULE TABLE - ENGINE INTERVALS

⚠ WARNING		BREAK-IN PERIOD	MAINTENANCE SCHEDULE							NOTE
Before performing maintenance: Shut down machine, relieve all system pressure and lock out all power, as per the Safety Section of this manual. **For lock-out/tag-out disconnect the negative (-) battery cable.**		First 50 Hours	Daily	Every 50 Hours	Every 100 Hours or One (1) Year	Every 200 Hours	Every 400 Hours	Every 500 Hours	Every two (2) years	**If working in dusty or dirty conditions, reduce the recommended time intervals between servicing by half for engine and compressor oil change, and engine and compressor filter servicing.**
KEY	**TASK DESCRIPTION**									**ACTION TO TAKE**
										Continued on next page
12	Replace radiator hoses and clamp bands								●	Replace the radiator hoses and clamp bands. Refer to **Section 7.14, Hose Installation Guide** for assistance when replacing worn or damaged hoses. Refer to **Table 7A: Recommended Spare Parts List** for replacement kit or part order number.
13	Replace battery								●	Due to shipping regulations pertaining to lead acid batteries, Vanair recommends procuring a replacement battery from a localized source. Two possible replacement models include: BatteriesPlus® no. SLi96R, and NAPA battery no. BAT 7590.
14	Inspect fuel lines and clamps				●				*II*	Replace the fuel hose and clamp bands. Refer to **Section 7.14, Hose Installation Guide** for assistance when replacing worn or damaged tubing. Refer to **Table 7A: Recommended Spare Parts List** for replacement kit or part order number.
15	Change radiator coolant								●	Consult the Engine Operator's Manual for procedure on changing the radiator coolant. Follow Engine Operator's Manual recommendations for coolant type to use.

II Consult the Vanair® Service Department.

5.4 REPLACEMENT PARTS

Replacement parts should be purchased through your local Vanair® representative or where the Viper Diesel Air Compressor 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 7.1, Parts Ordering Procedure*, and Table 7A: 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 5.7.2, Long Term Storage*.

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5.5 PARTS REPLACEMENT AND ADJUSTMENT PROCEDURES

5.5.1 ADJUSTING THE ENGINE SPEED

The Viper Diesel was designed in such a way that the governor speeds should not need to be adjusted. Should the unit operate outside of specified speeds, consult the

NOTE

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

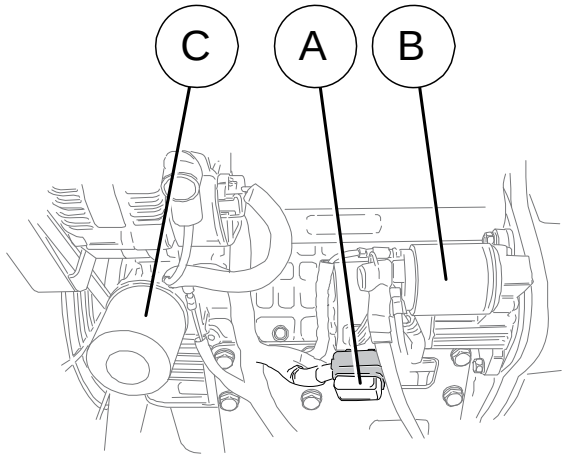
5.6 SERVICING THE SYSTEM FUSES AND CIRCUIT BREAKER

Consult **Section 7.9, Electrical System**, (FUSE LAYOUT diagram insert) to determine the location of the specific fuses. Refer to ***Figure 5-2*** for reference location of the 50A circuit breaker.

NOTE

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

5.7 STORAGE AND INTERMITTENT USE



KEY	DESCRIPTION
A	50 AMP CIRCUIT BREAKER - AUTO RESET
B	ENGINE STARTER (Location reference)
C	ENGINE OIL FILTER (Location reference)

Figure 5-2: 50A Circuit Breaker Location

5.7.1 INTERMITTENT USE

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

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

5.7.2 LONG TERM STORAGE

Disconnect the battery cable that is connected to the negative (-) side of the battery.

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 6: TROUBLESHOOTING

6.1 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.

⚠ WARNING

Before starting, performing maintenance, or replacing parts, relieve the entire system pressure by opening a service valve, which will vent all pressure to the atmosphere.

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. 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
Fax: 219-879-5335

NOTE

When contacting the Vanair Service Department, please have machine serial number on hand to quickly expedite service. See below for machine serial plate location.

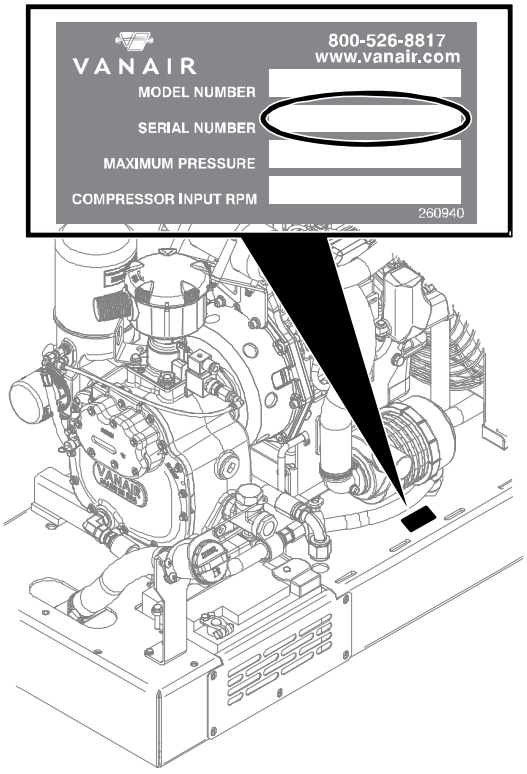


Figure 6-1: Machine Serial Plate Location

NOTE

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

6.2 TROUBLESHOOTING GUIDE

Fault/Malfunction	Possible Cause	Corrective Action
Machine does not start **Fault:** **Freq Sensor Error, Machine Will Not Run**	Controller is not receiving input from alternator connector	Check connection/continuity.
		During extremely cold weather, use of heater pads is required to get engine to spin fast enough to generate a usable signal. If no heater pads are installed, change crank sequence to Manual Crank (refer to **Section 4.6.3.1, Parameters**).
ENGINE		
Engine will not crank	Faulty battery connection.	Check for proper battery connections and battery charge.
	Battery out of power	Recharge or replace battery.
	Control module fuse blown	Check fuse; refer to **Section 7.9**.
	Machine hood shutdown safety switch prevents start-up of engine	Close hood panel or check if roof switch is faulty.
	Faulty starter or starter solenoid	Replace.
	Faulty 50A circuit breaker	Replace.
Engine will not start	Low fuel and/or oil supply	Check fuel gauge. 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 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.
Improper Control Operation: Engine does not speed up	Speed control actuator stuck	Lubricate; replace speed control actuator if necessary.
	Engine speed control lever stuck	Free lever and lubricate if necessary.

Continued on next page

6.2 TROUBLESHOOTING GUIDE

Fault/Malfunction	Possible Cause	Corrective Action
ENGINE (CONTINUED)		
Improper Control Operation: Engine does not speed up (continued)	Fuel filter partly plugged	Replace fuel filter. Refer the Engine Operator's Manual.
		Auxiliary fuel pump may be needed for remote fuel tank.
Improper Control Operation: Engine does not slow down	Speed control actuator stuck	Lubricate; replace speed control actuator if necessary.
	Engine speed control lever stuck	Free lever and lubricate if necessary. Refer to Engine Operator's Manual.
	Faulty pressure tranducers	Check and replace, if necessary.
Engine stops during operation **Fault:** **Engine High Temp Shutdown**	Located too close to obstruction	Move further from obstruction.
	Engine radiator plugged	Clear debris/dirt from engine radiator.
	Fault with engine cooling system	Consult Engine Operator's Manual.
	Ambient temperature too high	Consult ***Section 6.3.3, High Temperature Operation***.
	Faulty temperature switch	Replace.
Engine stops during operation **Fault:** **Low Engine Oil Pressure**	Low oil level	Check engine oil level; replenish as necessary. Consult the Engine Operator's Manual for additional information on engine maintenance.
	Engine shutdown switch activated	Confirm that access door is properly in place. Replace faulty engine shutdown switch.
	Faulty oil pressure switch	Replace.
	Engine oil filter plugged	Replace engine oil filter. Refer to the Engine Operator's Manual.
Gradual loss of engine power	Contaminated fuel	Drain 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 the Engine Operator's Manual for additional information on engine maintenance.
	Low fuel level	Add fuel.
	Overload	Reduce load; check load use, and reduce

Continued on next page

6.2 TROUBLESHOOTING GUIDE

Fault/Malfunction	Possible Cause	Corrective Action
ENGINE (CONTINUED)		
Gradual loss of engine power (continued)	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 **Fault:** **Compressor High Temp Shutdown**	Low compressor oil level	Check oil level and refill to proper level if necessary (ensure machine is parked on a level surface).
	Obstructed cooler fins	Clear/clean if required.
	Insufficient air flow over cooler	Check for obstructions (frame, body, etc.) to cooling air flow.
	Defective temperature thermistor	Check sensor; replace if necessary.
	Compressor oil filter plugged	Replace compressor oil filter.
	Defective compressor thermal valve	Replace valve.
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).
	Unload solenoid valve defective	Replace solenoid valve.
	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.
	Engine does not speed up: input RPM too slow	Check engine speed control actuator.
	Engine speed control lever stuck	Free lever and lubricate if necessary. Consult the Engine Operator's Manual.
	Service valve is open	Close service valve.
	Pressure transducer is malfunctioning	Replace as necessary.
		Check for proper operation with an auxiliary air source. Replace if necessary.
	Inlet valve fails to open	Repair/replace inlet valve.
	Inlet valve frozen shut	Repair/replace inlet valve.
	Leak in air control line	Check for leaks and take corrective action.

Continued on next page

6.2 TROUBLESHOOTING GUIDE

Fault/Malfunction	Possible Cause	Corrective Action
COMPRESSOR (CONTINUED)		
Compressor system over-pressures **Fault:** **Compressor High Press Shutdown or safety relief valve**	Unload solenoid valve defective	Replace solenoid valve.
	Restricted or plugged bleed orifice	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.
	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 poppet not seating correctly.	Valve will need to be dis-assembled to check; consult with Service Department.
	Inlet valve piston is stuck in open position.	Check for proper operation with an auxiliary air source—replace or rebuild inlet valve.
	Compressor shaft seal is leaking	Replace shaft seal with available kit.
	Pressure transducer is malfunctioning	Check transducer for proper operation; replace if necessary and check controls.
	Defective safety valve	Replace safety valve.
	Plugged coalescer	Replace coalescer element.
No service air output (See also *Compressor will not build up pressure*)	If equipped, OSHA valve/velocity fuse, not functioning properly	Reset or replace OSHA valve.
	Minimum pressure/check valve is malfunctioning	Rebuild or replace check valve.
Low service air output (See also *Compressor will not build up pressure*)	Clogged compressor air filter	Check air filter. Replace if necessary.
	Solenoid valve sending continuous signal to inlet valve	Rebuild or replace solenoid valve if defective.
	Incorrect compressor speed	Adjust engine speed. Refer to ***Section 5.5.1, Adjusting the Engine Speed.***
	Minimum pressure/check valve is malfunctioning	Rebuild or replace check valve.
Compressor stalls	Idle speed is set too low	Adjust idle speed; consult factory.
Excess amount of oil in air discharge	Machine not on level surface	Move machine to level surface.

Continued on next page

6.2 TROUBLESHOOTING GUIDE

Fault/Malfunction	Possible Cause	Corrective Action
COMPRESSOR (CONTINUED)		
Excess amount of oil in air discharge (continued)	Compressor oil level too high	The correct oil level is is to the center of the sightglass.
	Scavenger system not operating	Inspect scavenger line for obstructions or leaks. Replace if necessary.
	Coalescer element plugged or damaged	Replace the coalescer element.
Excessive moisture in the compressed air	Moisture accumulating in air tank	Drain water from air tank (if applicable to installation).
System oil appears to be cloudy or milky	Excessive moisture in system oil; defective thermal valve	Check/replace thermal valve. Consult factory for assistance.

6.3 EXTREME CONDITION OPERATION

When operating in extreme cold or hot conditions, 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. Engine power and compressor air output will be reduced at high altitude or hot ambient temperatures.

Machine review and maintenance check schedules should be more frequent than the normal suggestions given in the ***Maintenance Schedule Tables (*****Table 5.3A**, and **Table 5.3B** in **Section 5*)***.

Become acquainted with the situation-adjusted 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 given in that manual.

6.3.1 HIGH MOISTURE CONDITION: EMULSIFICATION OF OIL IN ROTARY SCREW COMPRESSOR SYSTEMS

Consult the information in **Table 6.3A** for preventative and/or repair measures. If machine is operating in a high moisture environment, water contamination may persists after following the regular preventative maintenance schedule and standard operating procedures.

TABLE 6.3A HIGH MOISTURE CONDITION OPERATION

Symptom	Cause	Prevention / Corrective Action
Emulsification of oil in compressor system: • Compressor oil is milky white in color • Compressor oil is broken down and lacks lubricity. • Compressor oil may develop solid chunks or clumps	**Operating the compressor system for short periods of time:** • Short cycling prevents the temperature of the oil from attaining a high enough temperature capable of vaporizing the moisture droplets. **Operating the compressor system unloaded without air flow from the service line for long periods of time:** • This can keep the oil temperature from getting hot enough to vaporize the moisture droplets, preventing the moisture from being able to escape the system. Additionally, there is no path for the moisture to escape the system. **The thermal valve is faulty and activating the cooling fan too soon:** • This prevents the oil from attaining a high enough temperature capable of vaporizing the moisture droplets. **The air filter is saturated with water:** • This forces moisture to be ingested by the compressor. **Any of the above causes will be exacerbated in especially humid environments.**	**RECOMMENDED CHANGES:** If the problem is not corrected by standard operating practices and regular preventative maintenance, consider the following: • Raise the average temperature of the compressor oil. • Change the operating procedure to allow for the compressor oil temperature to reach 180 °F before discharging any air. If the compressor isn't discharging any air, it's not ingesting any potentially humid air. It will build pressure upon initial startup, but then it will run closed and allow it to heat up. **REPAIR/MAINTENANCE:** Refer to **Section 5** of the Operator's Manual for inspection, cleaning, and repair instructions. 1. Once the compressor oil becomes emulsified, it must be replaced along with the oil filter. Depending on the severity, other parts might also need to be replaced. 2. Check that the separator element is in good, working condition. 3. Check that the scavenge line is working properly. If the system is badly contaminated, Vanair® recommends a lube flush that will help clean out any remaining contamination throughout the system. Consult Vanair Service Department for lube flush instructions. Check the moisture drain frequently on the air tank reservoir, to alleviate moisture build-up.

6.3.2 COLD WEATHER OPERATION

Consult the information in **Table 6.3B** for preventative and/or repair measures. The Diesel Viper'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.

TABLE 6.3B COLD WEATHER OPERATION

Symptom	Cause	Prevention / Corrective Action
Water freezes in the fuel line Lubrication oil viscosity increases Diesel fuel turns to a gel-like consistency at temperatures around 0°F (-18°C)	**WATER** Water in the fuel can freeze at temperatures below 32°F (0°C), blocking fuel lines. At an extremely cold temperature, the viscosity of lubrication oil may increase and the torque of starter may exceed its permissible value, hindering proper starting. **GELLING** The diesel forms wax crystals when 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.	• Park the vehicle or equipment indoors when not in use. • Use a block heater or glow plugs. • Maintain the 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). • For additional engine precautions, consult the Engine Operator's Manual. • Vanair® recommends installation of the cold weather heater option kit. Consult Vanair for details. • Keep the fuel tank full to prevent condensation from forming inside the tank and lessen the chances of water getting in the fuel line. • The standard recommendation of 15W-40 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).

6.3.3 HIGH TEMPERATURE OPERATION

Consult the information in **Table 6.3C** for preventative and/or repair measures. Reduce load duty cycle to less than 60% when operating in ambient temperatures above 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. Consult the Engine Operator's Manual for fuel, lubrication oil and cooling requirements under extreme temperatures.

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 the engine,

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.

TABLE 6.3C HIGH TEMPERATURE OPERATION

Symptom	Cause	Prevention / Corrective Action
Overheating/high compartment temperatures Diminished engine performance	High ambient temperatures, confined spaces, soundproof cases and other reasons. Among these the most important factor is the temperature of the intake and cooling air.	• Extra care should be taken to keep the engine and air compressor clean and to not restrict the air flow around the unit. • Consult the Engine Operator's Manual for fuel, lubrication oil and cooling requirements under extreme temperatures. • At the minimum, all coolers, including air passage ways around the coolers, should be free of debris and dirt. The fan, driven by the engine, 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.

6.3.4 HIGH DUST CONTENT OPERATION

Consult the information in **Table 6.3D** for preventative and/or repair measures. When the machine is to be used in continuously dusty environments, special care must be taken with the engine's air cleaner and radiator.

TABLE 6.3D HIGH DUST CONTENT OPERATION

Symptom	Cause	Prevention / Corrective Action
Overheating System contamination Stalling	Machine components exposed to frequent or constant dust interaction, can result in diminished system performance, or machine cessation.	• The intake air must be cleaned with the air cleaner—inspect the air filter frequently for dust build-up and replace as needed. • Ensure that the radiator and oil cooler fins are kept clean to prevent overheating. • 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. • For extreme cases of high dust content environments, machine fluids may need to be replaced at more frequent intervals. Adjust maintenance schedule accordingly.

6.3.5 HIGH ALTITUDE OPERATION

Engine horsepower will decrease by 3.5% for every 1,000 feet over 6,000 feet increase in altitude. At high altitude overall unit performance will deteriorate, and care will need to be taken not to overload the engine.

SECTION 7: ILLUSTRATED PARTS LIST

7.1 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 form the Bill of Lading for the machine package, or from the compressor unit serial number plate. See ***Figure 7-1*** for location of machine package serial plate. Consult **Table 7A: Recommended Spare Parts List** on the next page for a listing of replacement parts.

VANAIR MANUFACTURING, INC.

10896 West 300 North

Michigan City, IN 46360

Telephone: (800) 526-8817

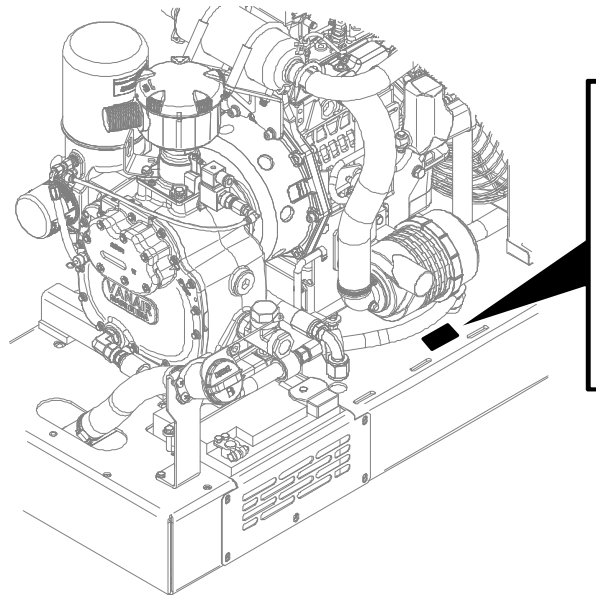
(219) 879-5100

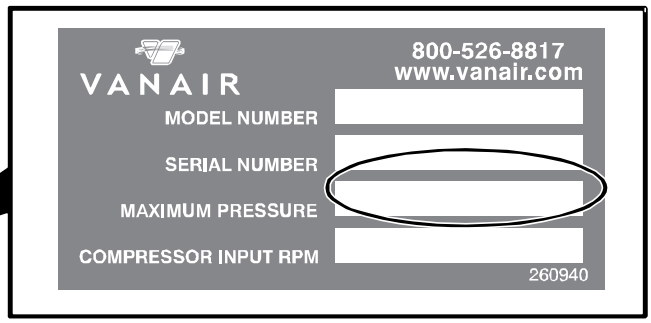
Service Fax: (219) 879-5335

Parts Fax: (219) 879-5340

Sales Fax: (219) 879-5800

www.vanair.com





NOTE

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

Figure 7-1: Machine Package Serial Number Plate Location

TABLE 7A: RECOMMENDED SPARE PARTS LIST

KEY NO.	PART NUMBER	DESCRIPTION	QTY
		ROUTINE/SCHEDULED MAINTENANCE ITEMS	
1	264626-1GAL	Vanguard Premium Oil (One [1] Gallon) [I]	1
2	273080	Element, Compressor Coalescing Air/Oil Separator Spin-on Style	1
3	266801	Element, Compressor Oil Filter	1
4	273673	Element, Compressor Air Filter	1
5	270764	Element, Engine Air Filter Replacement	1
6	RC77662	Filter, Engine Fuel	1
7	269136	Filter, Engine Oil	1
		KIT (FULL) MAINTENANCE ITEMS	
8	KIT1154	Kit, Maintenance for Engine Filters	1
9	KIT1212	Kit, Maintenance for Compressor - Initial 50 Hours	1
10	KIT1213	Kit, Maintenance for Compressor - Annual / 500 hours	1
		NON-ROUTINE MAINTENANCE ITEMS	
11	EN270451-007	Belt, Engine Replacement [II]	1
12	267306	Breaker, Circuit Replacement	1
13	260246	Relay, NO/NC Weatherproof with Resistor	1
14	263532	Fuse, A to 5A Tan	1
15	264316	Fuse, A to 25A Clear	1
16	264695	Fuse, Block 4-Way ATC	1
17	267880	Fuse, ATC 20A Yellow	1
18	[III]	Battery, Replacement	1
19	Consult Factory	Kit, Shaft Seal	1

[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] This belt replaces the engine alternator belt only. For full engine belt coverage, consult factory.

[III] Due to shipping regulations pertaining to lead acid batteries, Vanair recommends procuring a replacement battery from a localized source. Two possible replacement models include: BatteriesPlus® no. SLi96R, and NAPA battery no. BAT 7590.

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

TABLE 7B: MACHINE OPTIONS LIST

KEY NO.	PART NUMBER	DESCRIPTION	QTY
1	032894	Aftercooler 12VDC	1
2	032895	Cold Weather 12VDC Pad	1
3	032905	Cold Weather 120VAC Pad	1
4	032939	Heater, Engine Block 120VAC	1
5	032896-030, 032896-060, 032896-120	Remote Control Module	1
6	032901	Bolt-on Fork Pockets	1

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

IMPORTANT

If additional spare parts are being stored for future use, ensure that they are stored in proper containers that allow for protection against contamination, and kept in a clean area of moderate temperature reading. For information on storing the machine package for periods of non-use, consult *Section 5.7.2, Long Term Storage*.

IMPORTANT

Use only approved 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!

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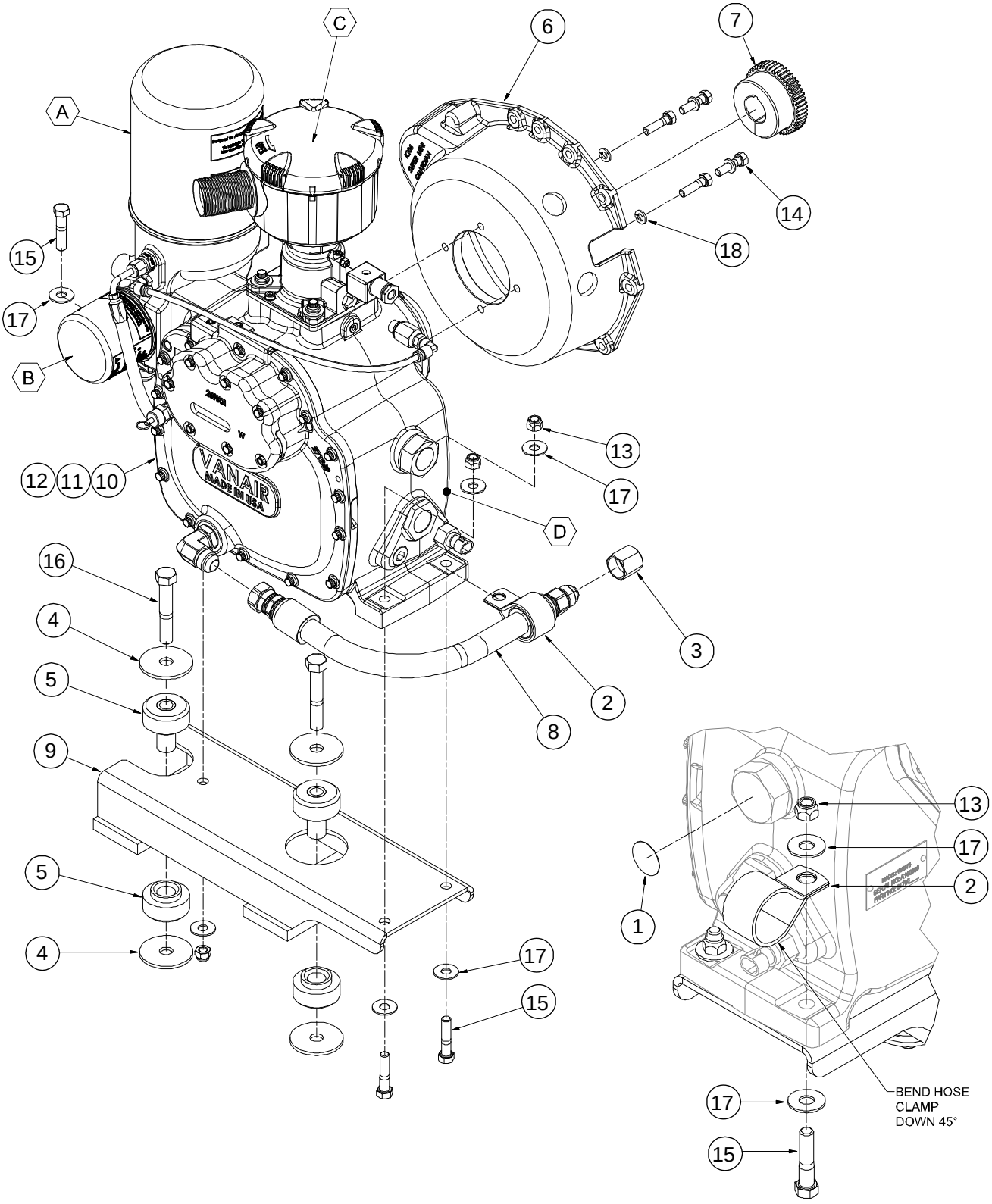
TABLE 7C: MAINTENANCE TRACKING LOG		
DATE	**DESCRIPTION OF MAINTENANCE**	**PART(S) REPLACED**

7.2 COMPRESSOR REPLACEMENT PARTS

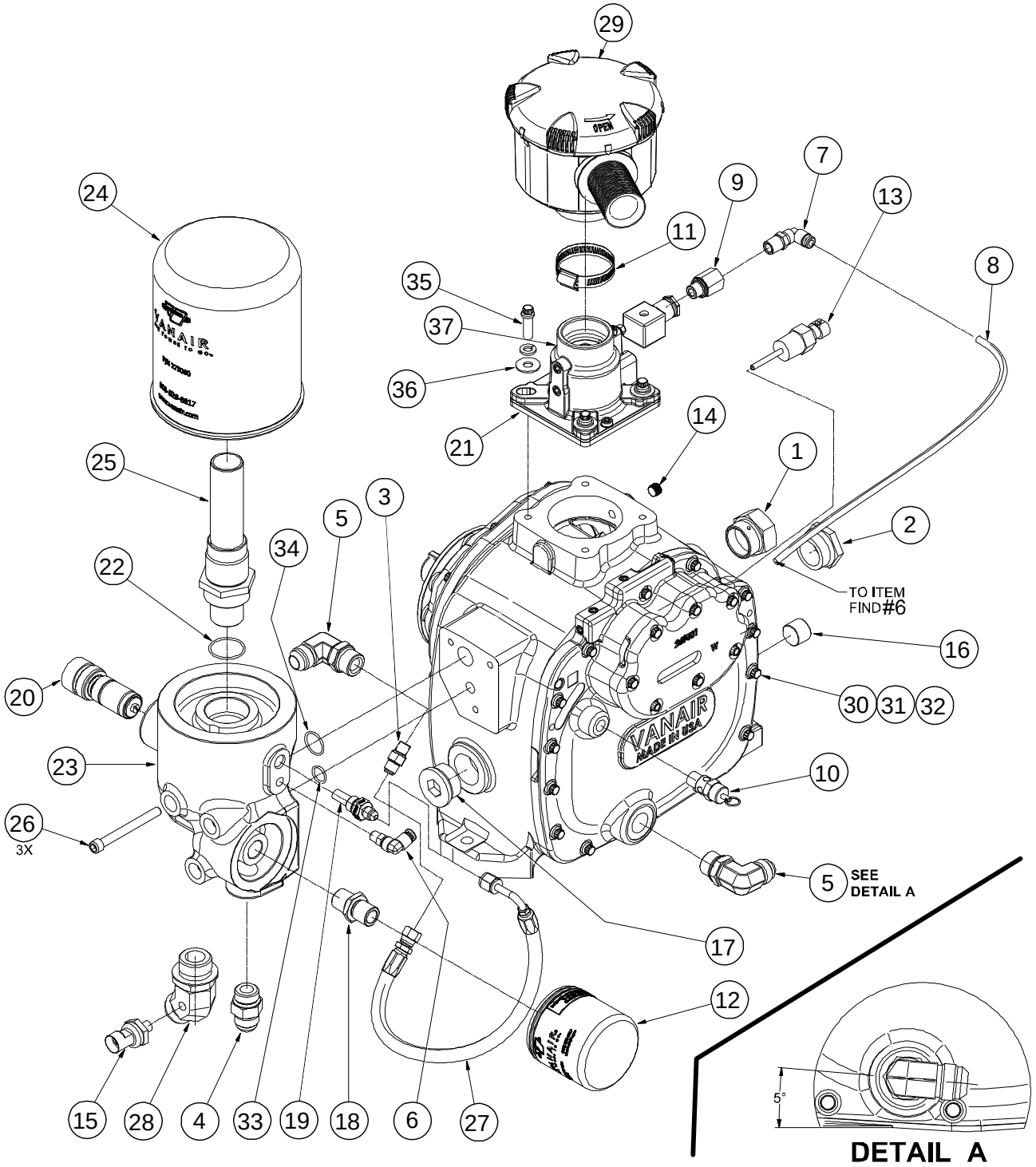


7.2 COMPRESSOR REPLACEMENT PARTS

ITEM	DESCRIPTION	PART NUMBER	QTY
1	DECAL, VANGUARD OIL FILL CAP 1”	263533-2	1
2	CLAMP, HOSE SUPPORT 1.50 ID	263812	1
3	CAP, JIC 5/8	264322-004	1
4	WASHER, SNUBBING RUBBER MOUNT	264829	4
5	MOUNT, RUBBER ARMOR PLATED 200# GREEN	272442	2
6	HOUSING, D902 AL W/STARTER COVER VM180	273483	1
7	HUB, COUPLING, 1.125 DIA. BORE	273559	1
8	HOSE, COMPRESSOR DRAIN (PART OF KIT 273968)	273968-001	1
9	SUPPORT, AIREND VA DIESEL VIPER	273970	1
10	AIREND & ATT, DIESEL VIPER	6180000	1
11	AIREND & ATT, VSE075GDSS240	6180001	1
12	AIREND & ATT, VSE075GDSS215	6180005	1
13	NUT, HEX LOCKING 3/8-16	825506-198	3
14	CAPSCREW, HEX GR8 5/16-18 x 1-1/4	829405-125	4
15	CAPSCREW, HEX GR8 3/8-16 x 1-3/4	829406-175	3
16	CAPSCREW, HEX GR8 1/2-13 x 3	829408-300	2
17	WASHER, FLAT 3/8	838206-071	6
18	WASHER, LOCK 5/16	838505-078	4
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE MACHINE SERIAL NUMBER.			

COMMONLY REPLACED PARTS			
ITEM	**DESCRIPTION**	**PART NUMBER**	**QTY**
A	ELEMENT, COALESCING (SEPARATOR)	273080	1
B	ELEMENT, OIL FILTER	266801	1
C	ELEMENT, AIR FILTER	273673	1
D	VANGUARD OIL	264626-1GAL	1

7.3 AIREND AND ATT



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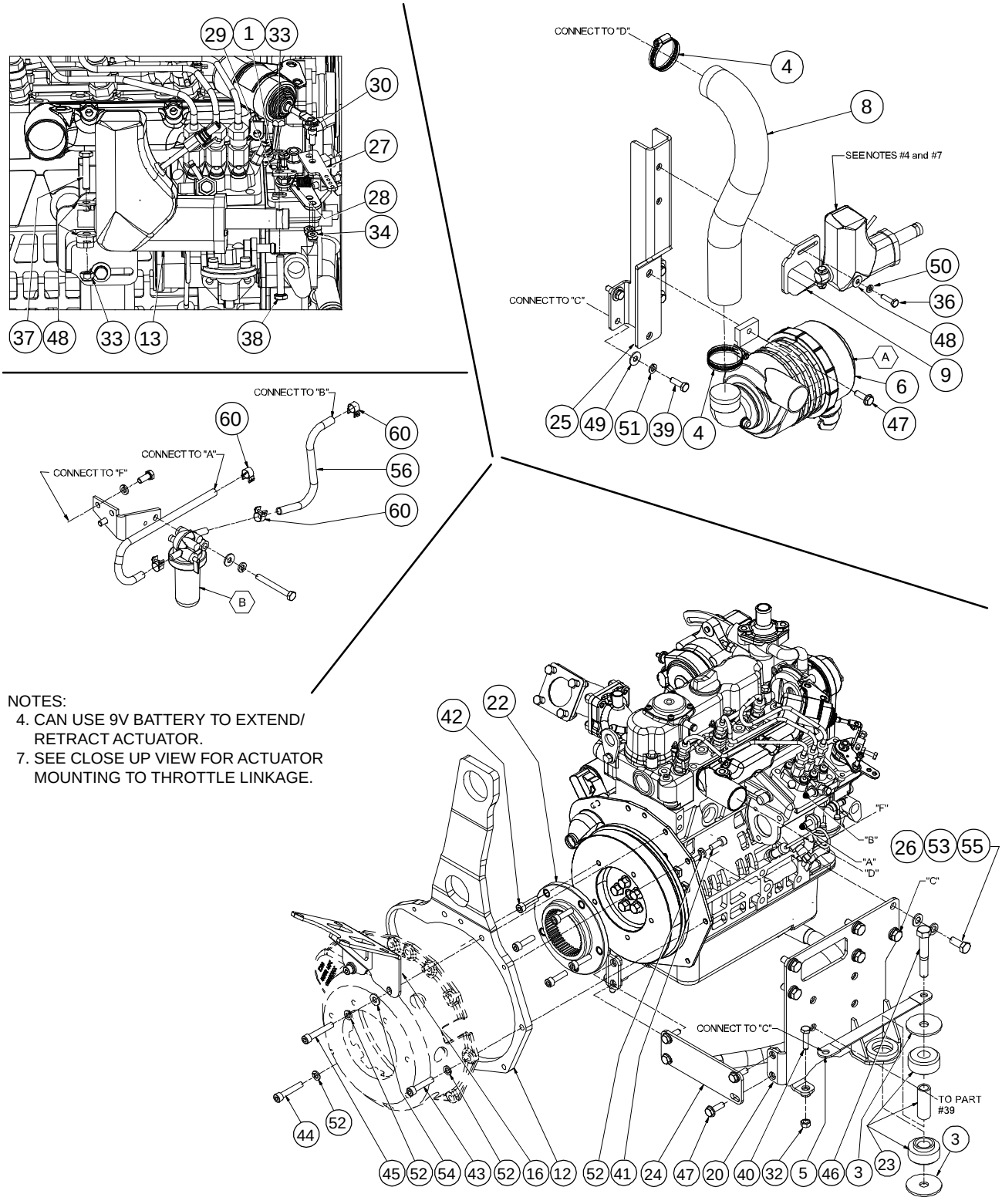
7.3 AIREND AND ATT

ITEM	DESCRIPTION	PART NUMBER	QTY	ITEM	DESCRIPTION	PART NUMBER	QTY
1	CAP, OIL FILL W/VENT 1-5/16”	048063	1	20	VALVE, MIN PRESS INTERNAL PARTS VMI80	271079	1
2	SIGHTGLASS, O-RING TMBD 1-5/16”	260097-610	1	21	REGULATOR, INTAKE 85/150 ADHD	271701	1
3	CONNECTOR, O-RING 1/4 SAE x 1/4 JIC	260387-103	1	22	O-RING, VITON 1/16 DIA x 1.176 ID	272689	1
4	CONNECTOR, #10 MSAE x #10 MJIC	260387-109	1	23	MANIFOLD, AIR/OIL VMI80	272920	1
5	ELBOW, 90 DEG #10 MJIC x MSAE	260403-106	2	24	SEPARATOR, AIR/OIL SPIN ON 106CFM	273080	1
6	ELBOW, 1/4T x 1/8P PUSH-ON	261309	1	25	ADAPTER, AIR/OIL SEPARATOR M42 x M39	273081	1
7	ELBOW, 90 DEG PUSH-ON 1/4T x 1/4P	261310	1	26	CAPSCREW, HX SOC 5/16-18 x 3	273239	3
8	TUBING, PLASTIC 1/4 WHITE	261322	1	27	HOSE, ASSY 0.25 x 18 JIC SWV STR x JIC SWV90	273247	1
9	ADAPTER, FEMALE PIPE x BSPP 1/4	263748-004	1	28	ELBOW, 45 DEG MSAE #14 x MJIC #14 w 1/8 FNPT	273583	1
10	VALVE, RELIEF 200 PSI 1/4 NPT MALE	264232	1	29	FILTER, AIR 90 CFM 2”	273672	1
11	CLAMP, HOSE #28	265560	1	30	AIREND ASSY, VSE075GDSS193	6170000	1
12	FILTER, OIL 6” TANK	266801	1	31	AIREND ASSY, VSE075GDSS240	6170001	1
13	THERMISTOR, TEMP. 1/2 NPT	266844	1	32	AIREND ASSY, VSE075GDSS215	6170004	1
14	PLUG, PIPE HEX SOCKET 1/8” NPT	267258	1	33	O-RING, VITON .691 OD x .070	826502-015	1
15	TRANSDUCER, PRESSURE	267363	1	34	O-RING, VITON .941 OD x .070	826502-019	1
16	PLUG, PIPE 1/2 NPT HOLLOW HEX	267942	1	35	CAPSCREW, FERRY HD 5/16-18 x 1	828405-100	4
17	PLUG, SAE O-RING HOLLOW HEX #16	268081-010	1	36	WASHER, FLAT 5/16	838205-071	4
18	CONNECTOR, OIL FILTER VANIR ENCAPS	270037	1	37	WASHER, LOCK 5/16	838505-078	4
19	ORIFICE, STRAINER 0.030 #6 MSAE x #4 MJIC	271054	1				

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

7.4 ENGINE AND DRIVE PARTS (PART 1 OF 2)



NOTES:
4. CAN USE 9V BATTERY TO EXTEND/ RETRACT ACTUATOR.
7. SEE CLOSE UP VIEW FOR ACTUATOR MOUNTING TO THROTTLE LINKAGE.

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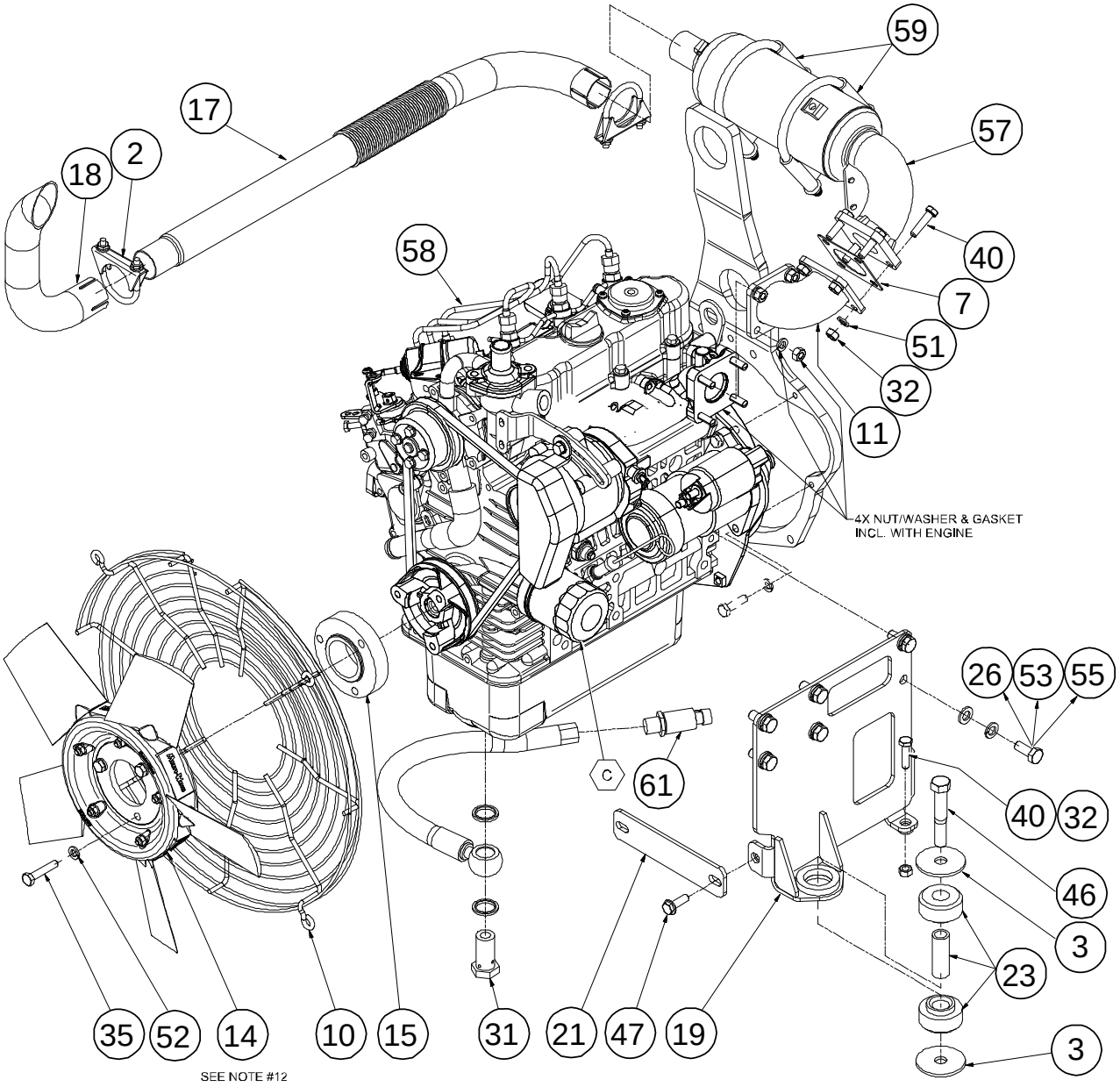
7.4 ENGINE AND DRIVE PARTS (PART 1 OF 2)

ITEM	DESCRIPTION	PART NUMBER	QTY	ITEM	DESCRIPTION	PART NUMBER	QTY
1	WASHER, NYLON FLAT 1/4	262704	3	33	NUT, HEX LOCKING 1/4-20	825504-145	2
2	CLAMP, EXHAUST 1-1/2	262906-150	2	34	NUT, HEX LOCKING #10-32	825702-083	2
3	WASHER, SNUBBING RUBBER MOUNT	264829	4	35	CAPSCREW, HEX 8mm 1.25 x 40	828008-040	3
4	CLAMP, HOSE #28	265560	2	36	CAPSCREW, HEX GR5 1/4-20 x 1	829104-100	2
5	STRAP, GROUND 8" W/ 3/8 HOLES	267498	1	37	CAPSCREW, HEX GR5 1/4-20 x 1-1/4	829104-125	1
6	FILTER, AIR 6" 90 DEG	269660	1	38	CAPSCREW, HEX GR5 1/4-20 x 1-1/2	829104-150	1
7	GASKET, MUFFLER REPLC KUBOTA D902	269961	1	39	CAPSCREW, HEX GR5 5/16-18 x 1	829105-100	4
8	HOSE, FLEX 1-3/4" I.D.	270698	1.5 FT	40	CAPSCREW, HEX GR5 5/16-18 x 1-1/4	829105-125	6
9	BRACKET, THROTTLE ADJ	272019	1	41	CAPSCREW, S.H. M8x1.25 x 20mm	829308-020	1
10	GUARD, FAN	272074	1	42	CAPSCREW, S.H. M8x1.25 x 30mm	829308-030	5
11	ELBOW, EXHAUST	272127	1	43	CAPSCREW, S.H. M8x1.25 x 40mm	829308-040	2
12	SPACER, COMPRESSOR	272158	1	44	CAPSCREW, S.H. M8x1.25 x 45mm	829308-045	1
13	ACUTATOR, LINEAR 2" STROKE, 30#, 12V	272160	1	45	CAPSCREW, S.H. M8x1.25 x 50mm	829308-050	2
14	FAN, 15.50" DIA PUSHER	272165	1	46	CAPSCREW, HEX GR8 1/2-13 x 3	829408-300	2
15	SPACER, FAN	272166	1	47	SCREW, SER WASH 5/16-18 x 1	829705-100	8
16	BRACKET, MUFFLER	272168	1	48	WASHER, FLAT 1/4	838204-071	4
17	EXHAUST, ENGINE OUT	272174	1	49	WASHER, FLAT 5/16	838205-071	4
18	ELBOW, EXHAUST OUT BACK	272211	1	50	WASHER, LOCK 1/4	838504-062	2
19	BRACKET, ENGINE STARTER SIDE	272228	1	51	WASHER, LOCK 5/16	838505-078	8
20	BRACKET, ENGINE THROTTLE SIDE	272229	1	52	WASHER, LOCK METRIC M8	838808-200	9
21	SUPPORT, ENGINE FRONT	272230	1	53	WASHER, LOCK METRIC M10	838810-220	12
22	FLANGE, COUPLING D902	272265	1	54	WASHER, FLAT METRIC M8	838909-180	2
23	MOUNT, RUBBER ARMOR PLATED 200 GREEN	272442	2	55	WASHER, FLAT METRIC M10	838910-220	12
24	SUPPORT, ENGINE REAR	272516	1	56	HOSE, FUEL LINE 5/16"	842315-031	2.0 FT.
25	SUPPORT, TOWER	272553	1	57	EXHAUST, KUBOTA (INCL. W/ ENGINE)	EN270396	1
26	CAPSCREW, HEX 10 MM 1.25 x 25 MM	272864	12	58	ENGINE DIESEL, 25 HP, HZ SHAFT	EN270451	1
27	BRACKET, THROTTLE EXTENSION	273300	1	59	U-BOLT, 3/8-16 x 3-1/2 WD x 5-1/16	FA270399	2
28	SPRING, EXTENSION THROTTLE	273302	1	60	CLAMP, HOSE, T-BOLT STYLE, 13mm SS	FA38355	4
29	BRACKET, ACTUATOR ROD	273307	1	61	DRAIN, ENGINE OIL	FI273012	1
30	CAPSCREW, S.H. 10-32 x 1/2 ZINC	273310	2	62	TIES, THERMAL STAINLESS	HA42205	4
31	HOSE, ENGINE DRAIN	274253	1	63	HEADER WRAP, HIGH TEMP 2" WIDE	PR81122	32 FT.
32	NUT, HEX 5/16-18	825205-273	6	64	OIL, DIESEL 15W-40	SE271475	4.0 QT

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

COMMON REPLACEMENT PARTS		
ITEM	**DESCRIPTION**	**PART NUMBER**
A	ELEMENT, AIR FILTER	270764
B	ELEMENT, FUEL FILTER	RC77662
C	ELEMENT, OIL FILTER	269136

7.4 ENGINE AND DRIVE PARTS (PART 2 OF 2)



NOTES:
4. CAN USE 9V BATTERY TO EXTEND/ RETRACT ACTUATOR
7. SEE CLOSE UP VIEW FOR ACTUATOR MOUNTING TO THROTTLE LINKAGE.
12. CONCAVE SIDE OF FAN BLADE FACES AWAY FROM ENGINE.
17. TORQUE: 221 IN-LBS.

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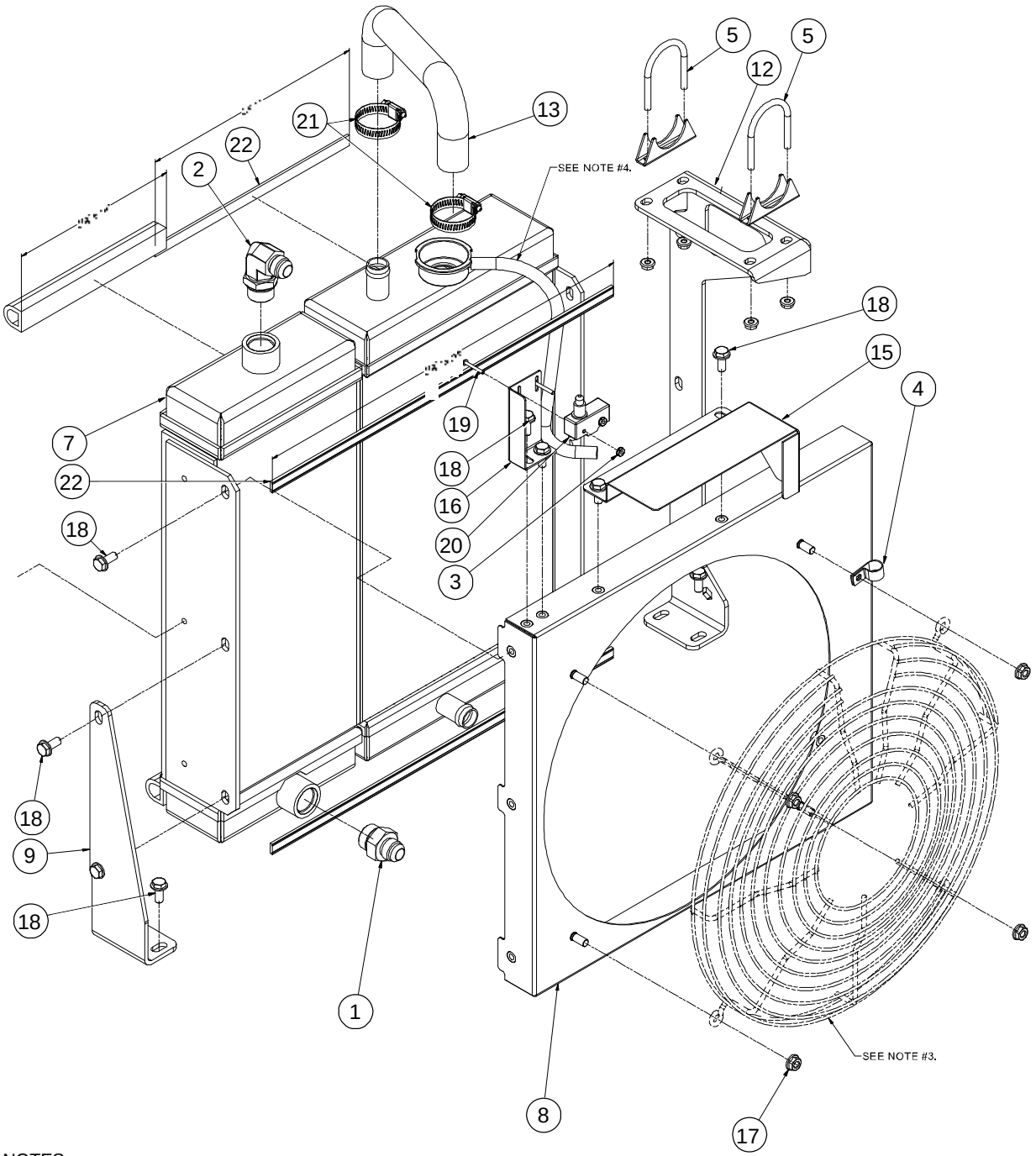
7.4 ENGINE AND DRIVE PARTS (PART 2 OF 2)

ITEM	DESCRIPTION	PART NUMBER	QTY	ITEM	DESCRIPTION	PART NUMBER	QTY
1	WASHER, NYLON FLAT 1/4	262704	3	33	NUT, HEX LOCKING 1/4-20	825504-145	2
2	CLAMP, EXHAUST 1-1/2	262906-150	2	34	NUT, HEX LOCKING #10-32	825702-083	2
3	WASHER, SNUBBING RUBBER MOUNT	264829	4	35	CAPSCREW, HEX 8mm 1.25 x 40	828008-040	3
4	CLAMP, HOSE #28	265560	2	36	CAPSCREW, HEX GR5 1/4-20 x 1	829104-100	2
5	STRAP, GROUND 8” W/ 3/8 HOLES	267498	1	37	CAPSCREW, HEX GR5 1/4-20 x 1-1/4	829104-125	1
6	FILTER, AIR 6” 90 DEG	269660	1	38	CAPSCREW, HEX GR5 1/4-20 x 1-1/2	829104-150	1
7	GASKET, MUFFLER REPLC KUBOTA D902	269961	1	39	CAPSCREW, HEX GR5 5/16-18 x 1	829105-100	4
8	HOSE, FLEX 1-3/4" I.D.	270698	1.5 FT	40	CAPSCREW, HEX GR5 5/16-18 x 1-1/4	829105-125	6
9	BRACKET, THROTTLE ADJ	272019	1	41	CAPSCREW, S.H. M8x1.25 x 20mm	829308-020	1
10	GUARD, FAN	272074	1	42	CAPSCREW, S.H. M8x1.25 x 30mm	829308-030	5
11	ELBOW, EXHAUST	272127	1	43	CAPSCREW, S.H. M8x1.25 x 40mm	829308-040	2
12	SPACER, COMPRESSOR	272158	1	44	CAPSCREW, S.H. M8x1.25 x 45mm	829308-045	1
13	ACUTATOR, LINEAR 2” STROKE, 30#, 12V	272160	1	45	CAPSCREW, S.H. M8x1.25 x 50mm	829308-050	2
14	FAN, 15.50” DIA PUSHER	272165	1	46	CAPSCREW, HEX GR8 1/2-13 x 3	829408-300	2
15	SPACER, FAN	272166	1	47	SCREW, SER WASH 5/16-18 x 1	829705-100	8
16	BRACKET, MUFFLER	272168	1	48	WASHER, FLAT 1/4	838204-071	4
17	EXHAUST, ENGINE OUT	272174	1	49	WASHER, FLAT 5/16	838205-071	4
18	ELBOW, EXHAUST OUT BACK	272211	1	50	WASHER, LOCK 1/4	838504-062	2
19	BRACKET, ENGINE STARTER SIDE	272228	1	51	WASHER, LOCK 5/16	838505-078	8
20	BRACKET, ENGINE THROTTLE SIDE	272229	1	52	WASHER, LOCK METRIC M8	838808-200	9
21	SUPPORT, ENGINE FRONT	272230	1	53	WASHER, LOCK METRIC M10	838810-220	12
22	FLANGE, COUPLING D902	272265	1	54	WASHER, FLAT METRIC M8	838909-180	2
23	MOUNT, RUBBER ARMOR PLATED 200 GREEN	272442	2	55	WASHER, FLAT METRIC M10	838910-220	12
24	SUPPORT, ENGINE REAR	272516	1	56	HOSE, FUEL LINE 5/16”	842315-031	2.0 FT.
25	SUPPORT, TOWER	272553	1	57	EXHAUST, KUBOTA (INCL. W/ ENGINE)	EN270396	1
26	CAPSCREW, HEX 10 MM 1.25 x 25 MM	272864	12	58	ENGINE DIESEL, 25 HP, HZ SHAFT	EN270451	1
27	BRACKET, THROTTLE EXTENSION	273300	1	59	U-BOLT, 3/8-16 x 3-1/2 WD x 5-1/16	FA270399	2
28	SPRING, EXTENSION THROTTLE	273302	1	60	CLAMP, HOSE, T-BOLT STYLE, 13mm SS	FA38355	4
29	BRACKET, ACTUATOR ROD	273307	1	61	DRAIN, ENGINE OIL	FI273012	1
30	CAPSCREW, S.H. 10-32 x 1/2 ZINC	273310	2	62	TIES, THERMAL STAINLESS	HA42205	4
31	HOSE, ENGINE DRAIN	274253	1	63	HEADER WRAP, HIGH TEMP 2” WIDE	PR81122	32 FT.
32	NUT, HEX 5/16-18	825205-273	6	64	OIL, DIESEL 15W-40	SE271475	4.0 QT

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

COMMON REPLACEMENT PARTS		
ITEM	**DESCRIPTION**	**PART NUMBER**
A	ELEMENT, AIR FILTER	270764
B	ELEMENT, FUEL FILTER	RC77662
C	ELEMENT, OIL FILTER	269136

7.5 COOLING SYSTEM (PART 1 OF 2)



NOTES:
3. WIRE GUARD IS INSTALLED ON ENGINE ASSEMBLY AND MOUNTS TO COOLER SHROUD WHEN BOTH COMPONENTS ARE SET IN PLACE.
4. HOSE SUPPLIED WITH COOLANT RECOVERY TANK.

6020127ID_r0_1of2

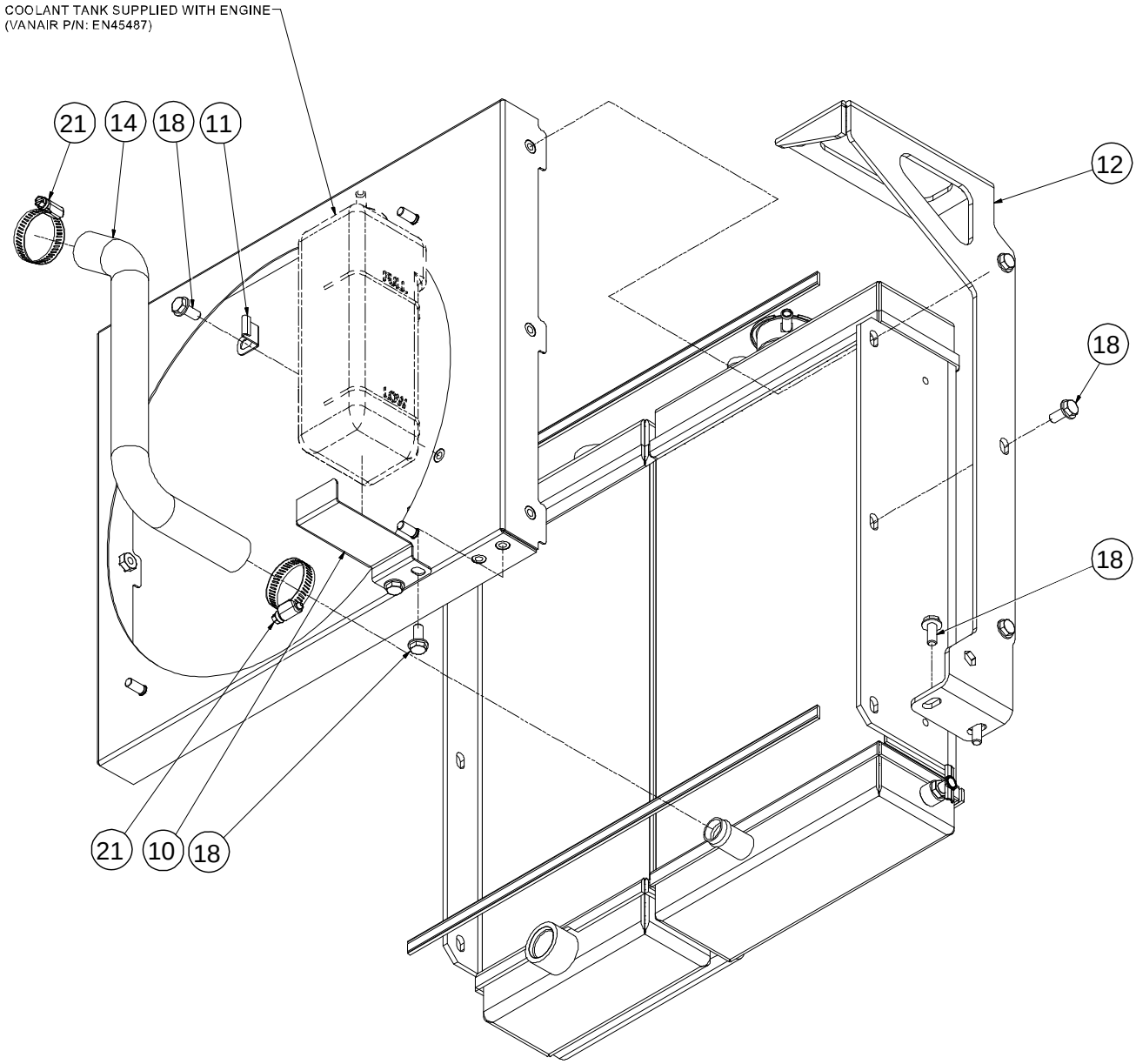
7.5 COOLING SYSTEM (PART 1 OF 2)

ITEM	DESCRIPTION	PART NUMBER	QTY
1	CONNECTOR, #12 MSAE x #10 MJIC	260387-110	1
2	ELBOW, 90 DEG #10 MJIC x #12 MSAE	260403-131	1
3	NUT, HEX #6-32 KEPS	261595-632	2
4	CLAMP, HOSE SUPPORT .50	261837	1
5	CLAMP, EXHAUST 1-1/2	262906-150	2
6	SEAL, RUBBER “D” TRIM-LOK 1” x 1”	264138	1.375 ft
7	COOLER, ENGINE/COMPRESSOR	270843	1
8	SHROUD, COOLER	272169	1
9	BRACKET, COOLER SUPPORT BACK SIDE	272171	1
10	BRACKET, COOLANT TANK MTG BOTTOM	272172	1
11	BRACKET, COOLANT TANK MTG CLIP	272173	1
12	BRACKET, COOLER / EXHAUST SUPPORT	272797	1
13	** HOSE, RADIATOR TOP	272816ID	1
14	** HOSE, RADIATOR BOTTOM	272817ID	1
15	BRACKET BELT GUARD	272996	1
16	BRACKET, HOOD SWITCH	273289	1
17	NUT, HEX FLANGE 5/16-18	825305-283	4
18	SCREW, SER WASH 5/16-18 x 0.75	829704-075	17
19	SCREW, MACHINE #6-32 x 1	831600-100	2
20	SWITCH, HOOD SAFETY NO/NC 15A-125V. AC	CO81774	1
21	CLAMP, HOSE, #20, 1.75DIA.	FA47720	4
22	GASKET, SEAL AND TRIM	PR35734	5.063 ft

******* *Made from EN271127.*

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

7.5 COOLING SYSTEM (PART 2 OF 2)



NOTES:
3. WIRE GUARD IS INSTALLED ON ENGINE ASSEMBLY AND MOUNTS TO COOLER SHROUD WHEN BOTH COMPONENTS ARE SET IN PLACE.
4. HOSE SUPPLIED WITH COOLANT RECOVERY TANK.

6020127ID_r0_2of2

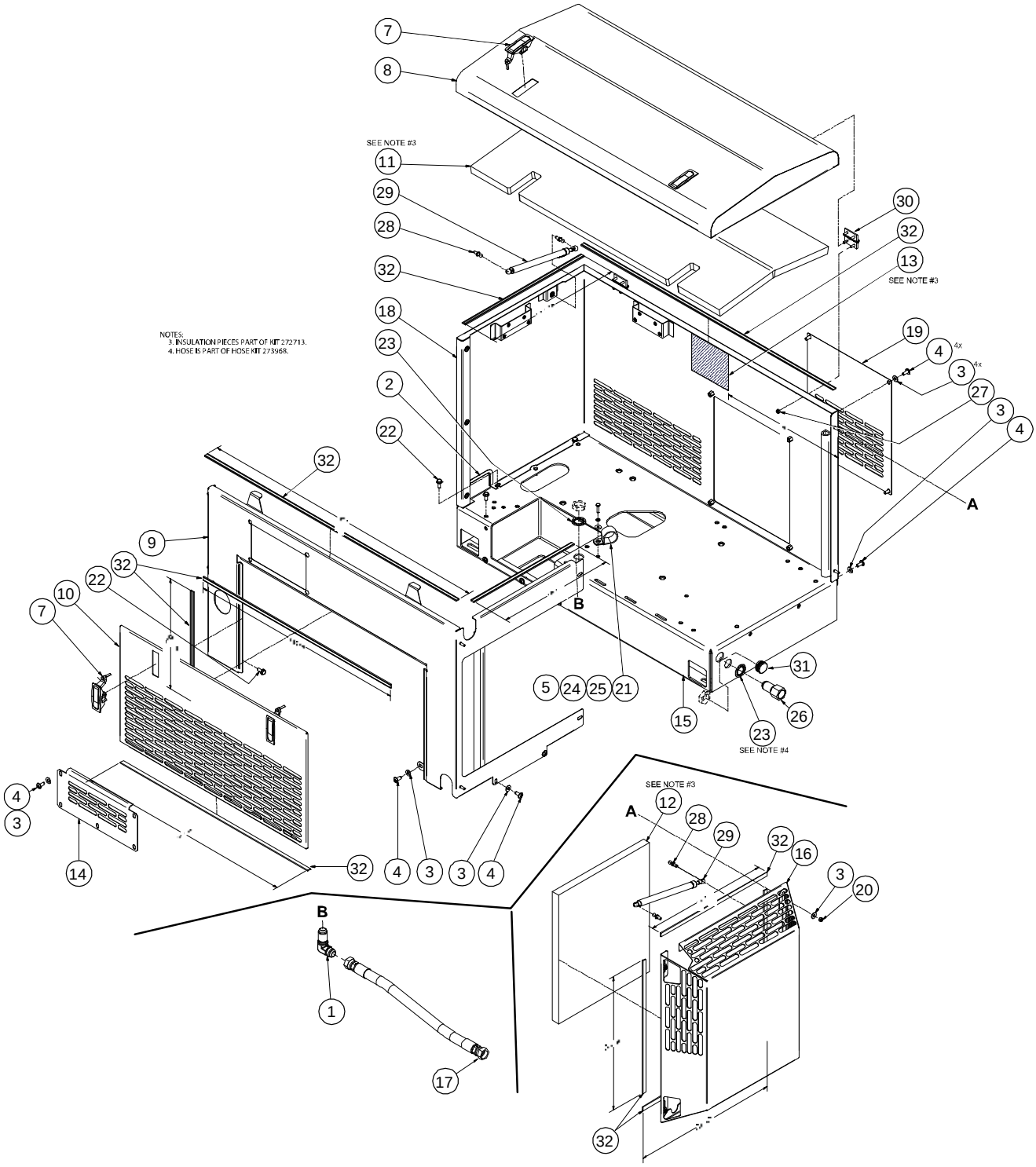
7.5 COOLING SYSTEM (PART 2 OF 2)

ITEM	DESCRIPTION	PART NUMBER	QTY
1	CONNECTOR, #12 MSAE x #10 MJIC	260387-110	1
2	ELBOW, 90 DEG #10 MJIC x #12 MSAE	260403-131	1
3	NUT, HEX #6-32 KEPS	261595-632	2
4	CLAMP, HOSE SUPPORT .50	261837	1
5	CLAMP, EXHAUST 1-1/2	262906-150	2
6	SEAL, RUBBER “D” TRIM-LOK 1” x 1”	264138	1.375 ft
7	COOLER, ENGINE/COMPRESSOR	270843	1
8	SHROUD, COOLER	272169	1
9	BRACKET, COOLER SUPPORT BACK SIDE	272171	1
10	BRACKET, COOLANT TANK MTG BOTTOM	272172	1
11	BRACKET, COOLANT TANK MTG CLIP	272173	1
12	BRACKET, COOLER / EXHAUST SUPPORT	272797	1
13	** HOSE, RADIATOR TOP	272816ID	1
14	** HOSE, RADIATOR BOTTOM	272817ID	1
15	BRACKET BELT GUARD	272996	1
16	BRACKET, HOOD SWITCH	273289	1
17	NUT, HEX FLANGE 5/16-18	825305-283	4
18	SCREW, SER WASH 5/16-18 x 0.75	829704-075	17
19	SCREW, MACHINE #6-32 x 1	831600-100	2
20	SWITCH, HOOD SAFETY NO/NC 15A-125V. AC	CO81774	1
21	CLAMP, HOSE, #20, 1.75DIA.	FA47720	4
22	GASKET, SEAL AND TRIM	PR35734	5.063 ft

******* *Made from EN271127.*

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

7.6 CANOPY AND FRAME PARTS



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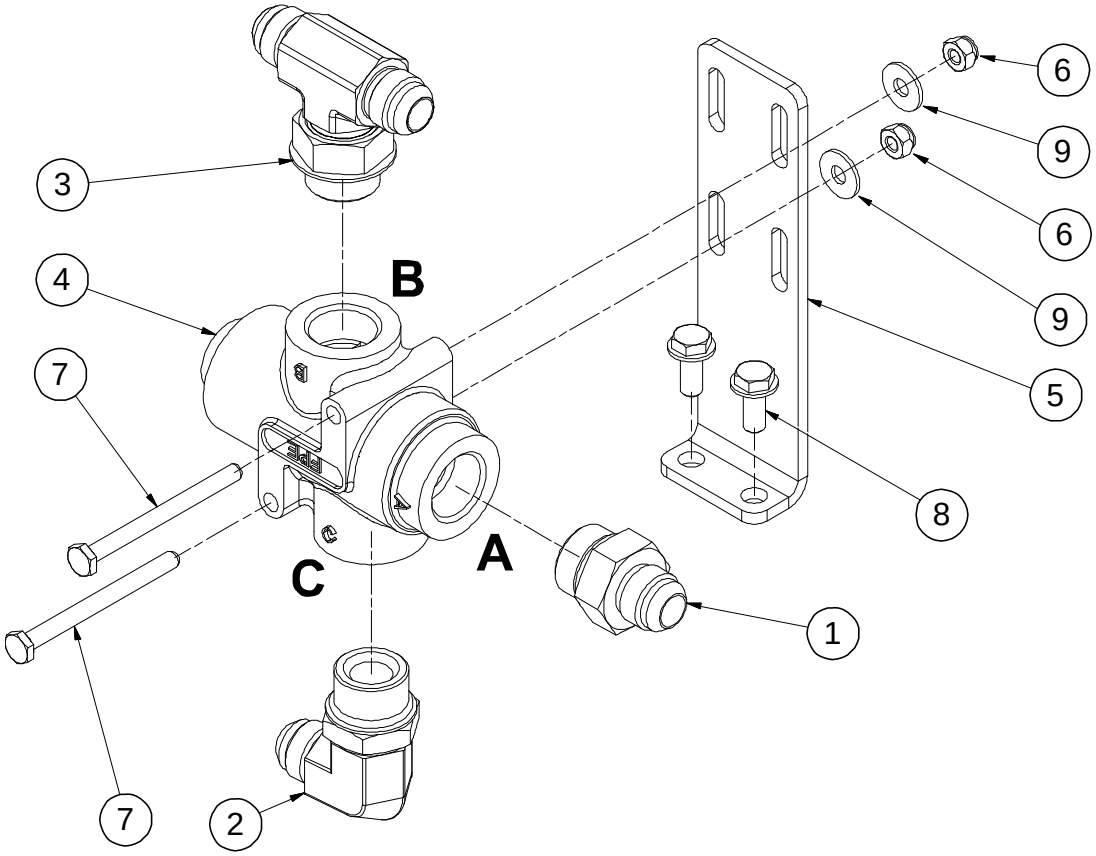
7.6 CANOPY AND FRAME PARTS

ITEM	DESCRIPTION	PART NUMBER	QTY
1	BULKHEAD, 90 DEG. 3/4	250006-058	1
2	TRIM-LOK, 1/8 GROOVE	261228	1 FT
3	WASHER, NYLON 5/16-18	262943	22
4	SCREW, TRUSS HD 5/16-18 x 3/4 SS	262945	18
5	CLAMP, HOSE SUPPORT 1.50 ID	263812	1
6	SEAL, RUBBER “D” TRIM-LOK 1” x 1”	264138	3.375 FT
7	LATCH, SENTRY PANEL	267124	4
8	HOOD, CANOPY	272250	1
9	PANEL, OPEN SIDE	272253	1
10	DOOR, FRONT ACCESS	272257	1
11	INSULATION, ACOUSTICAL FOAM, HOOD	272713-001	1
12	INSULATION, ACOUSTICAL FOAM, BAFFLE	272713-002	1
13	INSULATION, HEAT SHIELD	272713-006	1
14	PANEL, REMOVABLE BATTERY ACCESS DIESEL VIPER VANAIR	273468	1
15	PLATFORM, VIPER DIESEL VANAIR	273469	1
16	BAFFLE, SHROUD	273709	1
17	HOSE, AIR OUT LOWER	273968-008	1
18	PANEL, REAR SIDE	274299	1
19	PLATE, OIL FILTER ACCESS	274302	1
20	NUT, HEX LOCKING 1/4-20	825504-145	4
21	CAPSCREW, HEX GR5 1/4-20 x 1	829104-100	1
22	SCREW, SER WASHER 5/15-18 x 0.75	829705-075	6
23	WASHER, LOCK INTERNAL 1”	837414-100	2
24	WASHER, FLAT 1/4	838204-071	1
25	WASHER, LOCK 1/4	838504-062	1
26	BULKHEAD, 3/4 FNPT x #12 MJIC	862012-075	1
27	NUT, LOCK M6 x 1.0 PITCH	FA55272	8
28	STUD, BALL, .39 DIA. x .55LG.	FA58724	4
29	GAS SPRING, 6 STROKE, 20#	HA72205	2
30	HINGE, 2” x 2”, BLACK	HA88014	2
31	PLUG, PLASTIC, 1-3/8 DIA., RIBBED BLACK	PR273179	1
32	GASKET, SEAL AND TRIM	PR35734	24.022 FT

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

7.7 COMPRESSOR THERMAL CONTROL



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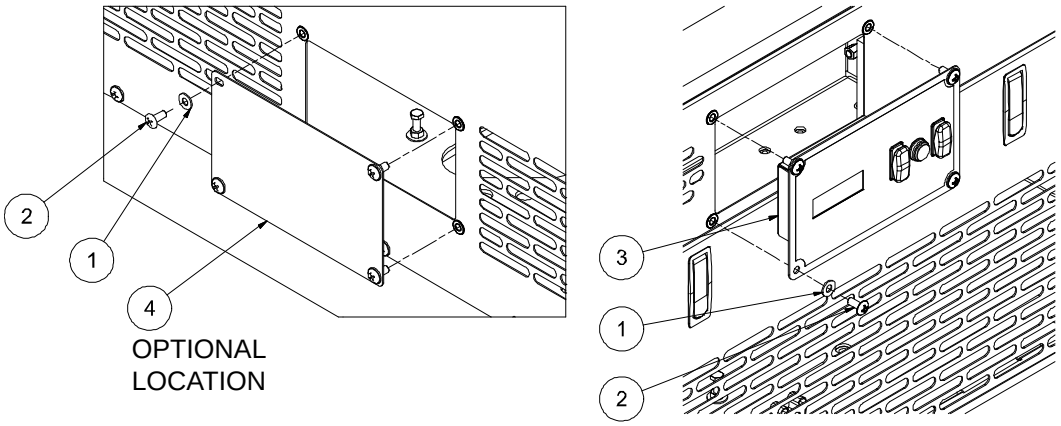
7.8 INSTRUMENT PANEL



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7.7 COMPRESSOR THERMAL CONTROL

ITEM	DESCRIPTION	PART NUMBER	QTY
1	CONNECTOR, #12 MSAE x #10 MSAE	260387-110	1
2	ELBOW, 90 DEG #10 MJIC x #12 MSAE	260403-131	1
3	TEE, JIC/JIC/SAE 5/8 x 3/4	263749-009	1
4	VALVE, THERMAL 180 DEGREE ALUM BODY 3/4 SAE FPE	273480	1
5	BRACKET, SUPPORT THERMAL VALVE	273548	1
6	NUT, HEX LOCKING 1/4-20	825504-145	2
7	CAPSCREW, HEX GR5 1/4-20 x 3	829104-300	2
8	SCREW, SER WASH 5/16-18 x 0.75	829705-075	2
9	WASHER, FLAT 1/4	823204-071	2

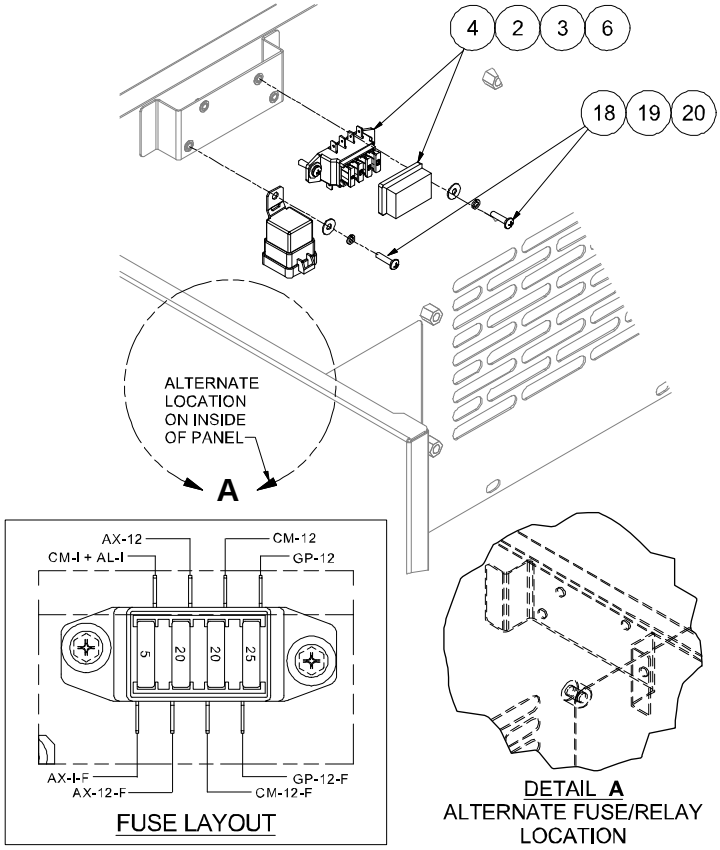
PLEASE NOTE: WHEN ORDERING PARTS, INDICATE MACHINE SERIAL NUMBER.

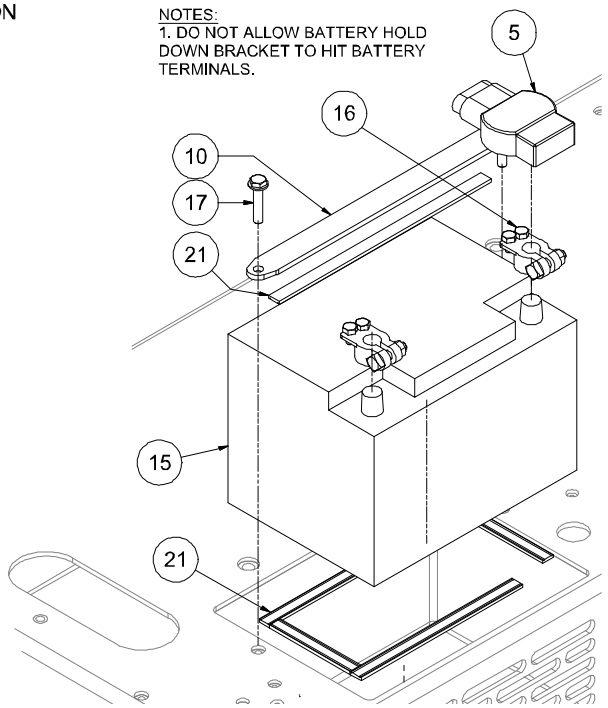
7.8 INSTRUMENT PANEL

ITEM	DESCRIPTION	PART NUMBER	QTY
1	WASHER, NYLON 5/16-18	262943	8
2	SCREW, TRUSS HD 5/16-18 x 3/4 SS	262945	8
3	MODULE, CONTROL AUTO SPD CTRL	272527	1
4	PLATE, COVER INST. OPENING	272535	1

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

7.9 ELECTRICAL SYSTEM





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7.9 ELECTRICAL SYSTEM

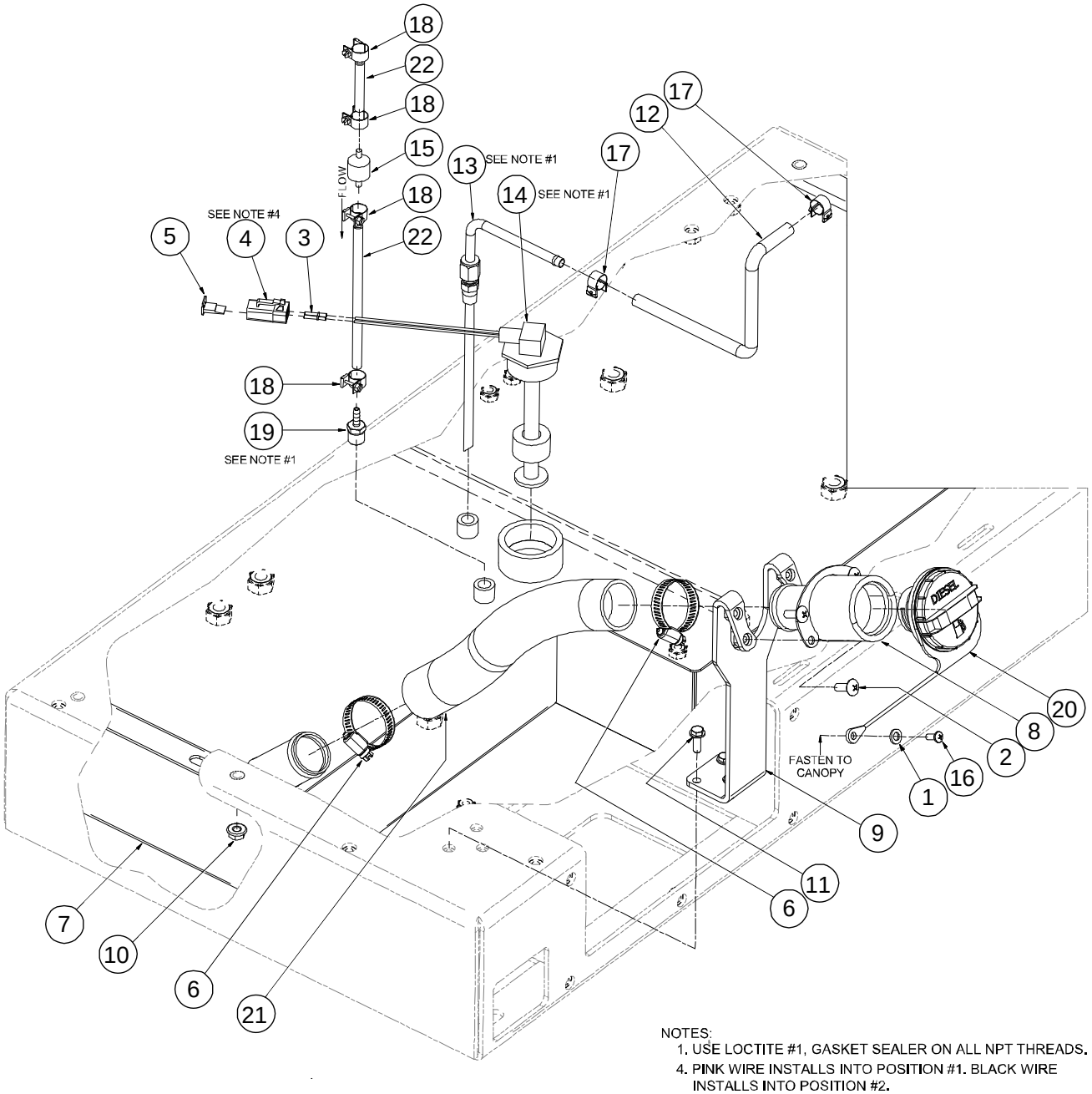
ITEM	DESCRIPTION	PART NUMBER	QTY
1	RELAY, NO/NC WEATHERPROOF w/RESISTOR	260246	1
2	FUSE, ATO 5 AMP TAN	263532	1
3	FUSE, ATO 25 AMP CLEAR	264316	1
4	FUSE, BLOCK 4-WAY ATC	264695	1
5	INSULATOR, BATTERY TERM RED 466	267208	1
6	FUSE, ATC 20 AMP YELLOW	267880	2
7	WEDGELOCK, W4S	268907	1
8	PLUG, SEALING	269055	4
9	CONNECTOR, DTP06-4S	269415	1
10	BRACKET, BATTERY HOLD DOWN	272213	1
11	WD, DIESEL VIPER	272618	1
12	HARNESS, DIESEL VIPER	272621	1
13	CABLE, BATTERY NEGATIVE	272735	1
14	CABLE, BATTERY POSITIVE	272736	1
15	* BATTERY, 12V LEAD-ACID AUTOMOTIVE 600 CCA	273937	1
16	TERMINAL, BATTERY POST	273940	2
17	SCREW, SER WASH 5/16-18 x 1.5	829705-150	2
18	SCREW, MACHINE #10-32 x 3/4	831702-075	3
19	WASHER, FLAT #10	838202-045	3
20	WASHER, LOCK #10	838502-047	3
21	GASKET, SEAL AND TRIM	PR35734	2.740 ft

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

*** NOTE**

See page 34 (Key No. 18) for battery recommendations.

7.10 FUEL TANK ASSEMBLY



NOTES:
1. USE LOCTITE #1, GASKET SEALER ON ALL NPT THREADS.
4. PINK WIRE INSTALLS INTO POSITION #1. BLACK WIRE INSTALLS INTO POSITION #2.

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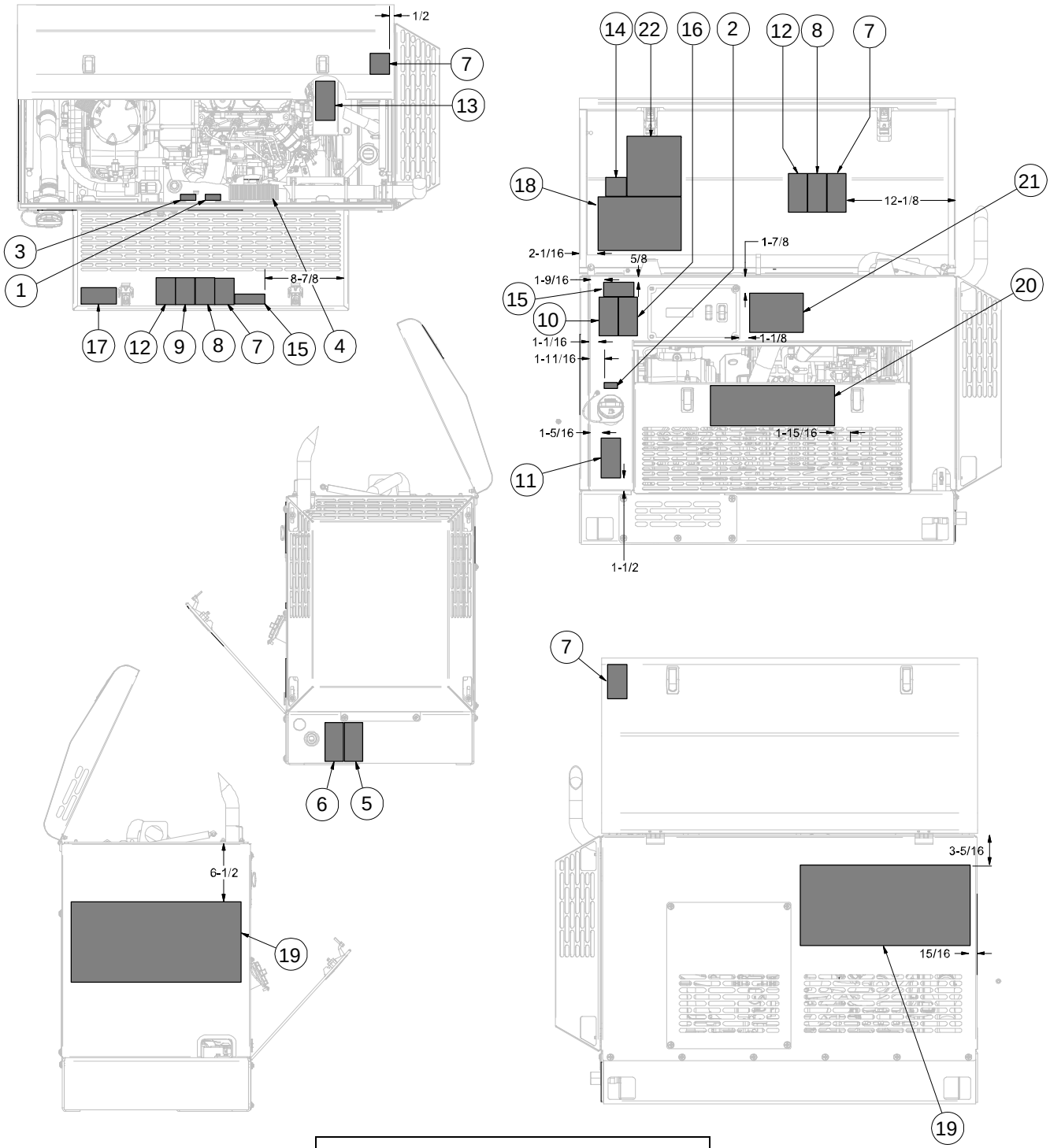
7.10 FUEL TANK ASSEMBLY

ITEM	DESCRIPTION	PART NUMBER	QTY
1	WASHER, NYLON FLAT 1/4	262704	1
2	SCREW, TRUSS HD 1/4-20UNC x 3/4 LG S.S.	262953	4
3	TERMINAL, DEUTSCH 0462-201-16141	263582	2
4	PLUG, DEUTSCH DT06-2S	268902	1
5	WEDGELOCK, DEUTSCH W2S	268903	1
6	CLAMP, HOSE, #24, 1”-2” DIA.	270493	2
7	TANK, FUEL 9 GALLON	272236	1
8	NECK, FUEL FILL DIESEL TETHERED, NO VENT	272855	1
9	SUPPORT, FUEL NECK	272865	1
10	NUT, NEX FLANGE 5/16-18	825305-283	4
11	SCREW, SER WASH 1/4-20 x 0.75	829704-075	3
12	HOSE, FUEL LINE 5/16” x 18” LG.	842315-031	1.5 FT
13	TUBE, FUEL PICK UP	A1270398	1
14	SENDER UNIT, FUEL LEVEL, 5.50 LG	CO22750	1
15	VALVE, CHECK INLINE 3/16 TUBING	CO273306	1
16	SCREW, PHILLIPS PAN HEAD #10-32 x 1/2” LG. SS	FA33542	1
17	CLAMP, HOSE, T-BOLT STYLE, 13mm SS	FA38355	2
18	CLAMP, HOSE, T-BOLT STYLE, 10M	FA91153	4
19	PUSH-ON, MALE ADAPTER, 1/4 MALE x 3/16 PUSH	FI92363	1
20	CAP, DIESEL VENTED TETHERED	HA271677	1
21	HOSE, 1-1/2 DIA. FUEL x 12-1/2” LONG	TU269928	1.04 FT
22	HOSE, 3/16 DIA. HT, FUEL x 30 LG.	TU28641	2.5 FT

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

7.11A DECALS (LOCATION)



WARNING

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

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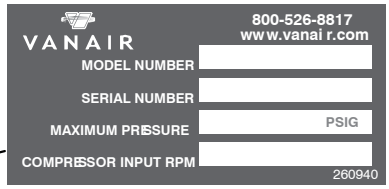
7.11B DECALS (IDENTIFICATION)

1

2

3



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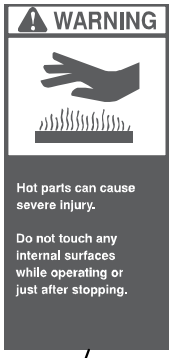

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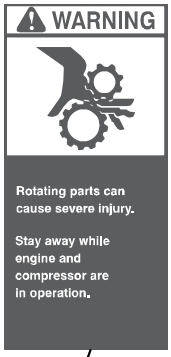

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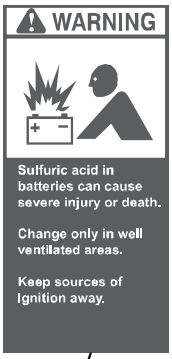

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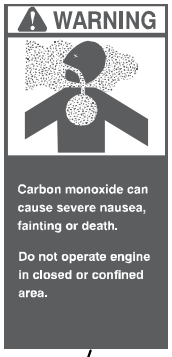

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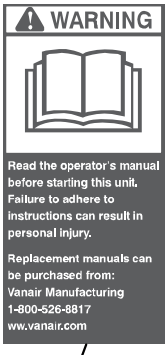

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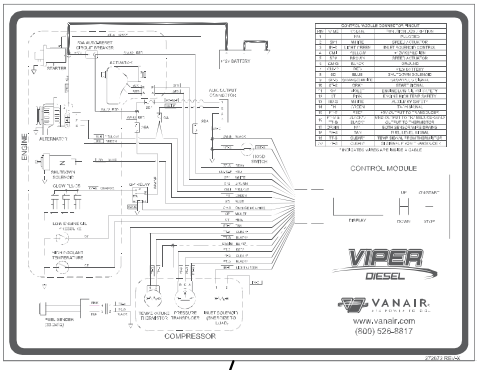
17



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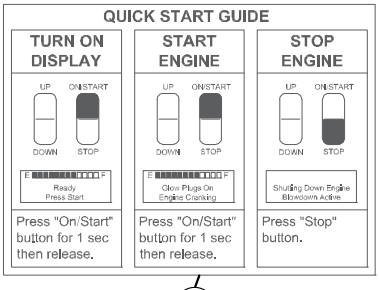
19 & 20



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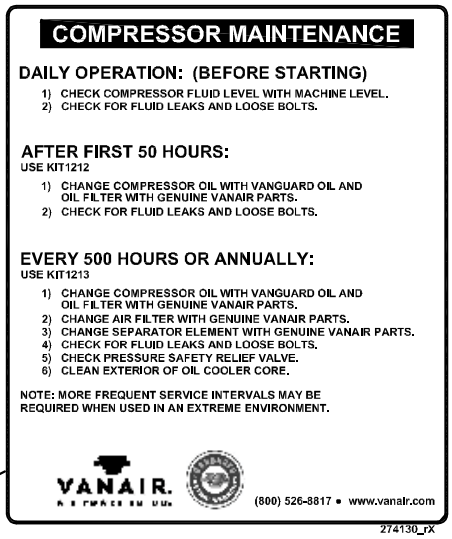

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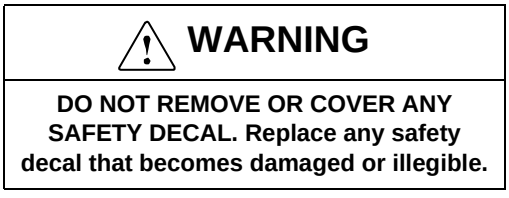

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7.11C DECALS (PART NUMBERS)

ITEM	DESCRIPTION	PART NUMBER	QTY
1	DECAL, ENGINE OIL DRAIN		1
2	DECAL, DIESEL FUEL ONLY		1
3	DECAL, COMPRESSOR OIL DRAIN		1
4	PLATE, SERIAL VANAIR	260940	1
5	DECAL, CONNECT AIR HOSE	261885	1
6	DECAL, DO NOT USE AIR	261886	1
7	DECAL, HOT PARTS	264372	3
8	DECAL, ROTATING PARTS	264374	2
9	DECAL, SULFURIC ACID	264375	1
10	DECAL, CARBON MONOXIDE	264376	2
11	DECAL, EXPLOSIVE FUEL	264377	1
12	DECAL, WARNING PLUGS	264378	2
13	DECAL, WARNING FAN GUARD	264383	1
14	DECAL, WARNING ELECTRIC TAMPER	271510	1
15	DECAL, CAUTION AUTO-START	272041	3
16	DECAL, READ MANUAL	272424	2
17	DECAL, ROTARY SCREW OIL	272501	1
18	DECAL, WIRING DIAGRAM	272672	1
19	DECAL, VIPER DIESEL LARGE	272850-001	2
20	DECAL, VIPER DIESEL SMALL	272850-002	1
21	DECAL, QUICK START GUIDE	273312	2
22	DECAL, MAINTENANCE VANAIR DIESEL VIPER	274130	1

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

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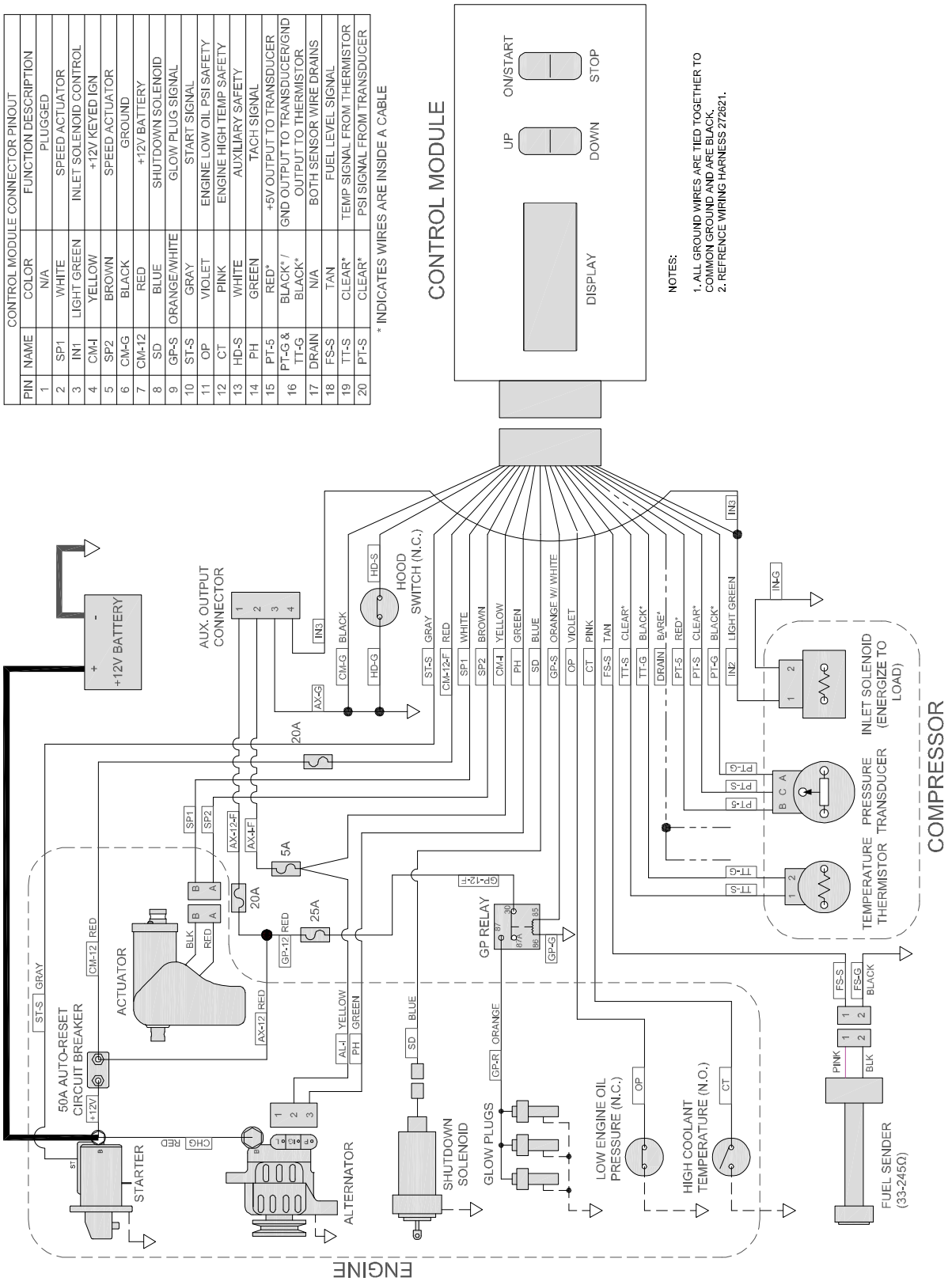
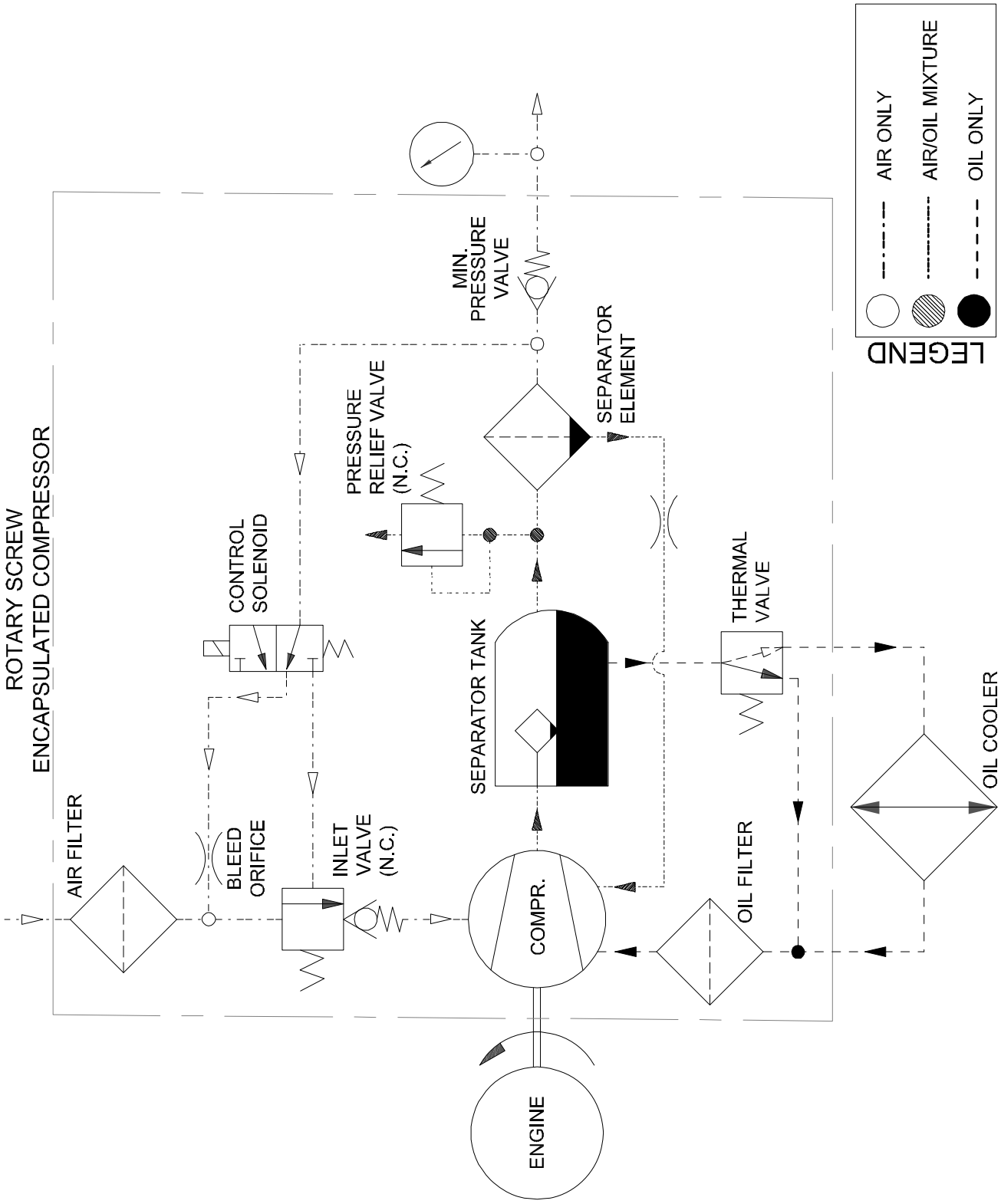
7.12 WIRING DIAGRAM



272618_r8

7.13 SCHEMATIC FLOW DIAGRAM



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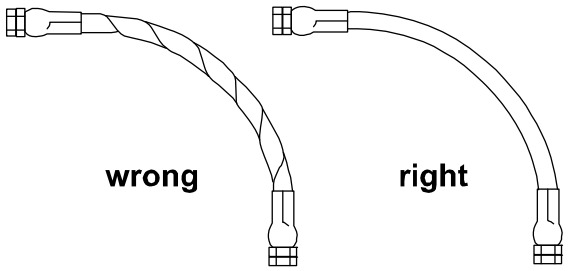
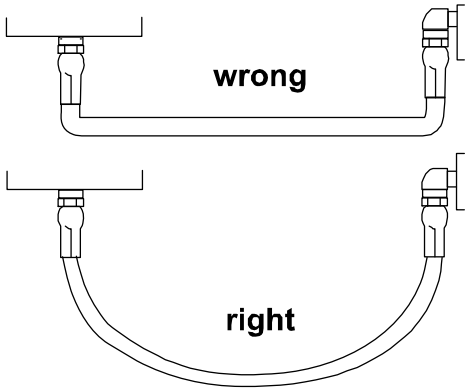
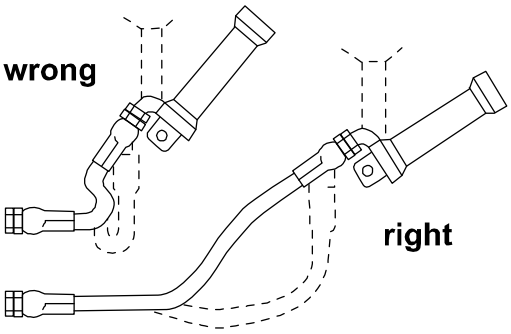
7.14 HOSE INSTALLATION GUIDE



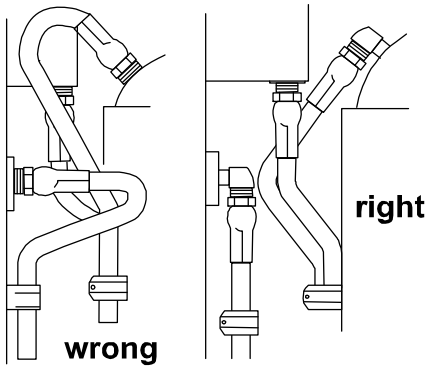
1. Hose is weakened when installed in twisted position. Pressure in twisted hose tends to loosen fitting connections. Design so that machine motion produces bending rather than twisting.



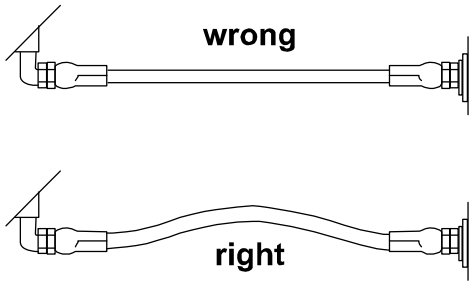
2. Ample bend radius should be provided to avoid collapsing of line and restriction of flow.



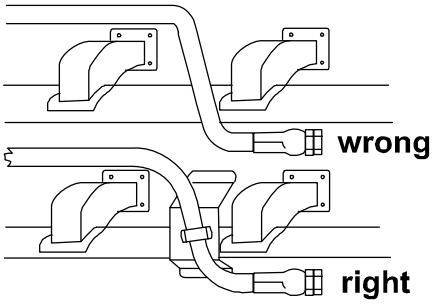
3. Exceeding minimum bend radius will greatly reduce hose assembly life.



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



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



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

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