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## **Installation Manual For VMAC**

**System V300006**

**2013 - 2015 Ram 2500-3500 Pickup, Cab & Chassis**

**2013 - 2015 Ram 4500-5500 Cab & Chassis**

**6.7L Cummins Diesel**

**[www.vmacair.com](http://www.vmacair.com)**



# Installation Manual for VMAC System V30006

2013 – 2015 Ram 2500-3500 Pickup, Cab & Chassis  
2013 – 2015 Ram 4500-5500 Cab & Chassis  
6.7L Cummins Diesel

<b>General Information</b> .....	<b>4</b>
Before You Start.....	4
Torque Specifications.....	4
Special Tools Required.....	4
Hose Information.....	4
<b>Important Safety Notice</b> .....	<b>5</b>
Safety Messages.....	5
Ordering Parts.....	5
<b>Warranty Registration</b> .....	<b>6</b>
<b>Part 1: System Identification, Warranty and Warnings</b> .....	<b>7</b>
<b>Part 2: Preparing for Installation</b> .....	<b>9</b>
<b>Part 3: Component Installation</b> .....	<b>13</b>
<b>Part 4: Installing the WHASP Tank</b> .....	<b>22</b>
Mounting the WHASP Tank .....	22
Mounting in an Enclosure or Body .....	22
<b>Part 5: Hose Requirements</b> .....	<b>24</b>
<b>Part 6: Connecting the Hoses</b> .....	<b>25</b>
<b>Part 7: Recommended Accessories</b> .....	<b>27</b>
Auxiliary Receiver Tank .....	27
Pressure Gauge .....	27
Pressure regulator and/or lubricator.....	27
<b>Part 8: Adding Oil to the System</b> .....	<b>28</b>
<b>Part 9: Installing the Control Components</b> .....	<b>30</b>
Installing the Control Panel .....	32
Connecting the Wiring.....	33
Installing the Throttle Control .....	35
Automatic Transmission: 68RFE.....	35
Automatic Transmission: Aisin AS69RC .....	36
Manual Transmission .....	36
<b>Part 10: Installing the Relay Harness</b> .....	<b>39</b>
<b>Part 11: Completing and Testing the Installation</b> .....	<b>45</b>
Before Starting the Engine Checklist .....	45
After Starting the Engine Checklist .....	46
Final Testing.....	48
<b>Part 12: Setup, Performance Testing and Adjustments</b> .....	<b>49</b>
Throttle Control Adjustment .....	50
<b>Part 13: Auxiliary Air Receiver</b> .....	<b>51</b>

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<b>Part 14: Accessory Products.....</b>	<b>52</b>
Eliminator Aftercooler.....	52
Filter Regulator Lubricator.....	52
Compressor Service Kits.....	52
Air Receiver Tanks.....	52
Hose Reel.....	52
Bulkhead Fittings.....	53
Hose Fittings.....	53
Remote Muffler Accessory Pack.....	53
<b>Part 15: Warranty Registration.....</b>	<b>54</b>
VMAC Dealer Information.....	54
Installer Information.....	54
Owner Information.....	54
Vehicle Information.....	54
Product Information.....	54
Submitted by.....	54

## Changes and Revisions

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			Mech.	Elec.			
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D	ECN 17-094 – Improved safety testing	MSP	N/A	AJH	GB	SA	28 June 2017
E	ECN: 22-009 Cap model year	MSP	N/A	N/A	N/A	N/A	13 May 2022

The information in this manual is intended for certified VMAC installers who have been trained in installation procedures and for people with mechanical trade certification who have the tools and equipment to properly and safely perform the installation. Do not attempt this installation if you do not have the appropriate mechanical training, knowledge and experience.

Follow all safety precautions for mechanical work. Any grinding, bending or restructuring operations for correct fit in modified trucks must follow standard shop practices.

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### **VMAC – Vehicle Mounted Air Compressors**

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# General Information

## Before You Start

Read this manual before attempting installation so that you can familiarize yourself with the components and how they fit on the vehicle. Identify variations for different engine models and different situations that are listed in the manual. Open the package, unpack the components and identify them.

## Torque Specifications

All fasteners must be torqued to specifications. Use manufacturers torque values for OEM fasteners. **Apply Loctite 242 or equivalent on all engine-mounted fasteners.** Torque values are with Loctite applied unless otherwise specified.

STANDARD GRADE 8 NATIONAL COARSE THREAD								
Size	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4
Foot-pounds (ft-lb)	9	18	35	55	80	110	170	280
Newton meter (N•m)	12	24	47	74	108	149	230	379

STANDARD GRADE 8 NATIONAL FINE THREAD						
Size	3/8		7/16	1/2	5/8	3/4
Foot-pounds (ft-lb)	40		60	90	180	320
Newton meter (N•m)	54		81	122	244	434

METRIC CLASS 10.9						
Size	M6	M8	M10	M12	M14	M16
Foot-pounds (ft-lb)	4.5	19	41	69	104	174
Newton meter (N•m)	6	25	55	93	141	236

## Special Tools Required

- M6 Hex Ball End Extended Socket
- Pneumatic fan wrench removal set (such as Lisle 43300) or a manual fan pulley holder (such as KD3900)

## Hose Information

Depending on other installed equipment, it might be necessary to move the air/oil separation tank from its intended location. The hoses used in VMAC compressor systems have a specific inner liner that is compatible with our compressor oil. Use of hoses other than those supplied or recommended by VMAC may cause compressor damage and may void your warranty. Please contact VMAC for replacement hoses and further information.

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# Important Safety Notice

The information contained in this manual is based on sound engineering principles, research, extensive field experience and technical information. Information is constantly changing with the addition of new models, assemblies and service techniques. If a discrepancy is noted in this manual, contact VMAC prior to initiating or proceeding with service. Current information may clarify the issue. Any person with knowledge of such discrepancies who performs service and repair assumes all risks.

Only proven service procedures are recommended. Anyone who departs from the specific instructions provided in this manual must first assure that their safety and that of others is not being compromised and that there will be no adverse effects on performance or the operational safety of the equipment.

VMAC will not be held responsible for any liability, injuries, loss or damage to individuals or to equipment as a result of the failure of any person to properly adhere to the procedures set out in this manual or standard safety practices. Safety should be your first consideration in performing service operations. If you have any questions concerning the procedures in this manual or require any more information on details that are not included in this manual, please contact VMAC before beginning repairs.

## Safety Messages

This manual contains various warnings, cautions and notices that must be observed to reduce the risk of personal injury during service or repair and the possibility that improper service or repair may damage the equipment or render it unsafe.



This symbol is used to call your attention to instructions concerning your personal safety. Watch for this symbol; it points out important safety precautions, it means, "Attention, become alert! Your personal safety is involved". Read the message that follows and be alert to the possibility of personal injury or death. Be alert; your safety is involved. While it is impossible to warn about every conceivable hazard, let good common sense be your guide.



This symbol is used to call your attention to instructions on a specific procedure that if not followed may damage or reduce the useful life of the compressor.



This symbol is used to call your attention to additional instructions or special emphasis on a specific procedure.

## Ordering Parts

To order parts, contact your VMAC dealer. Your dealer will ask for the VMAC serial number, part number, description and quantity. To locate your nearest dealer, call 1-800-738-8622 or online at [www.vmacair.com](http://www.vmacair.com)

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# Warranty Registration

The VMAC warranty form is located at the back of this manual. This warranty form must be completed and sent to VMAC at the time of installation for any subsequent warranty claim to be considered valid.

There are four ways warranty forms can be submitted to VMAC:

## Online

<http://vmacair.com/support/warranty/>

## Email

[tech@vmacair.com](mailto:tech@vmacair.com)

## Fax

(250) 740-3202

## Mail

VMAC - Vehicle Mounted Air Compressors  
1333 Kipp Road, Nanaimo, BC, Canada V9X 1R3



# Part 1: System Identification, Warranty and Warnings

Preparation for installation is very important. Missing a step or an item can cause problems in the installation or damage to components.

- Check off each item as it is completed so that you do not miss any preparation steps.**
- Check through the illustrated parts list, ensure that no components are missing, and that they are in the correct quantity. If any components are missing, have the system ID ready and call VMAC tech support at (888) 241-2289.
- Complete the warranty form. The VMAC warranty form is located at the back of this manual, as well as online at:

**<http://vmacair.com/support/warranty/>**

This warranty form must be completed and mailed or faxed to VMAC at the time of installation for any subsequent warranty claim to be considered valid.



***The System Identification Number Plate must be attached to the vehicle at the time of installation. This plate provides information that allows VMAC to assist in parts and repairs.***

- Mark and drill two 7/64-inch holes in an appropriate location, close to the compressor. Secure the plate with supplied self-tapping screws (Figure 1.1).



**Figure 1.1 – System Identification Plate**

- Install the VMAC belt routing diagram in a suitable location under the hood.

- As part of the installation process, ensure that the safety and operational instruction decal is affixed in an obvious location so that it can be seen by vehicle operators. A good spot for this is usually on the inside of the door or on the panel underneath the steering wheel (Figure 1.2).

**VMAC**  
VEHICLE MOUNTED AIR COMPRESSORS

This vehicle is equipped with a  
**VMAC Air Compressor System.**

**OPERATING INSTRUCTIONS**

**Daily Pre Start Check:**

1. Check oil level in tank.
2. Check drive belt system.
3. Check for leaks.

**Start Up Procedure:**

1. Ensure air system is depressurized.
2. Ensure all air outlets are CLOSED.
3. Place vehicle in Neutral or Park and engage park brake.
4. Start engine and bring to operating temperature.
5. Turn ON compressor.

**Shutdown Procedure:**

1. Ensure discharge valve is CLOSED.
2. Allow engine to idle for 1 minute.
3. Turn OFF compressor.
4. Wait for system to depressurize before restarting.

For Technical Support/Parts contact your VMAC Dealer  
To locate your nearest dealer call 1-800-738-8622 (250-740-3200)

4400644-A

**⚠ WARNING**  
**Always allow system to depressurize before restarting**

Figure 1.2 – Operating Instructions

- To alert any technicians that may service the vehicle, affix the servicing caution/contact label in the engine compartment near the hood latch in a visible location. Thoroughly clean the selected area before affixing the label (Figure 1.3).

**⚠**

**📖**

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**(250) 740-3200**

**This vehicle is equipped with a VMAC Air Compressor System. Call VMAC Technical Support for removal/installation information.**

4401017

Figure 1.3 – Service Label

## Part 2: Preparing for Installation

### NOTE

*Due the variety of service body designs and pickup box layouts, bulkhead fittings to pass the compressor discharge hose, oil return hose and scavenge line (PTFE tube) are not included in this system kit. VMAC recommends determining the location of the WHASP tank as a first step so that any bulkhead fittings and different hose or PTFE tube lengths can be ordered.*

### NOTE

*It is not necessary to remove the upper radiator hose to install this system, the hose is shown removed in some of the manual images for clarity.*

- OPTIONAL: Raise front of vehicle and support on jack stands.
- Disconnect the battery terminals and cover the posts.
- Remove the top two bolts from the radiator mounted fan shroud, and insert a protective sheet of cardboard between the radiator and the radiator fan (Figure 2.1).

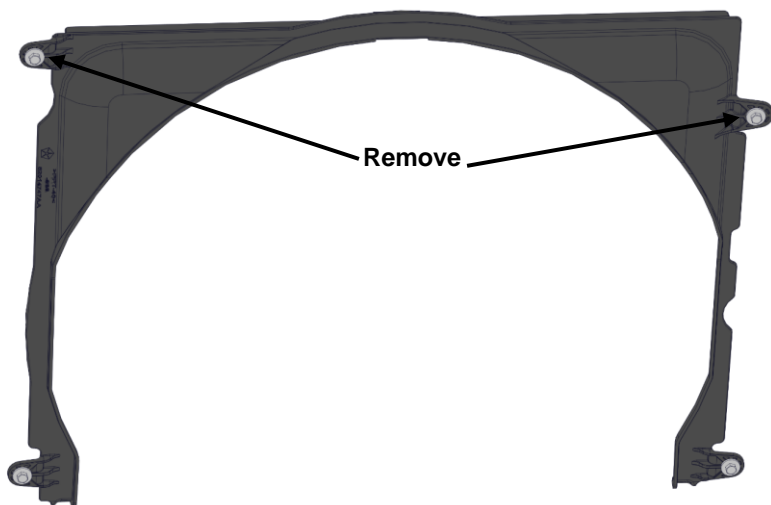


Figure 2.1 – Radiator fan shroud

- Remove the four nuts securing the engine mounted portion of the fan shroud to its support brackets (*two at the top, two are located near the harmonic balancer*).

### NOTE

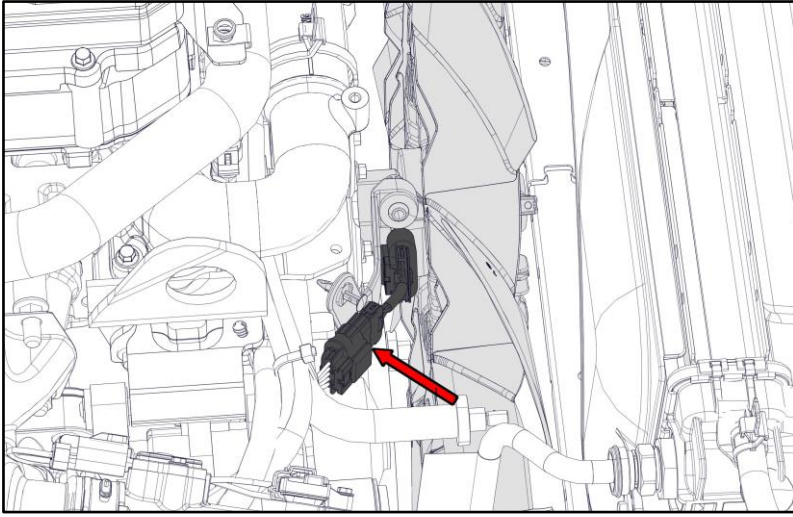
*Some images in this manual show the dual radiator cooling system, this compressor system is designed to work with both single and dual radiator vehicles.*

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- Disconnect fan electrical connector and the stator brace (Figure 2.2).



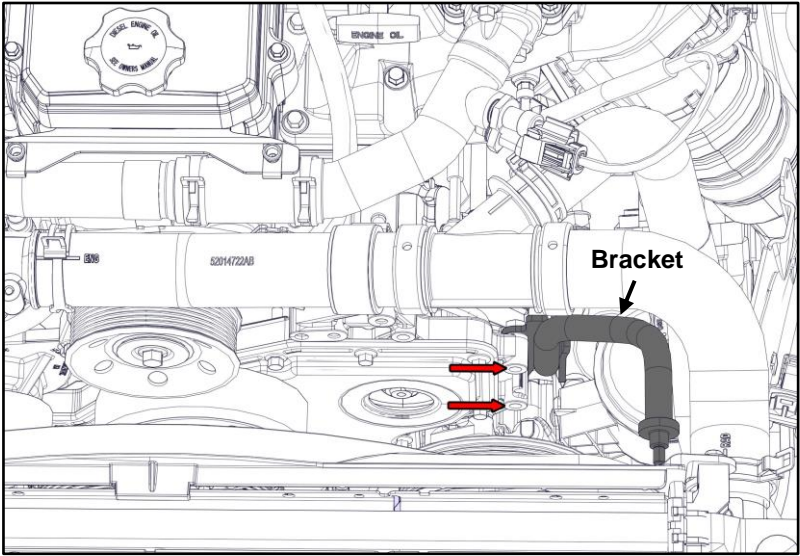
**Figure 2.2 – Radiator fan electrical connector**

- Remove the fan (right hand thread) and the engine mounted portion of the fan shroud.
- Remove the OEM FEAD belt. To ease removal of the FEAD belt, the tensioner can be removed.



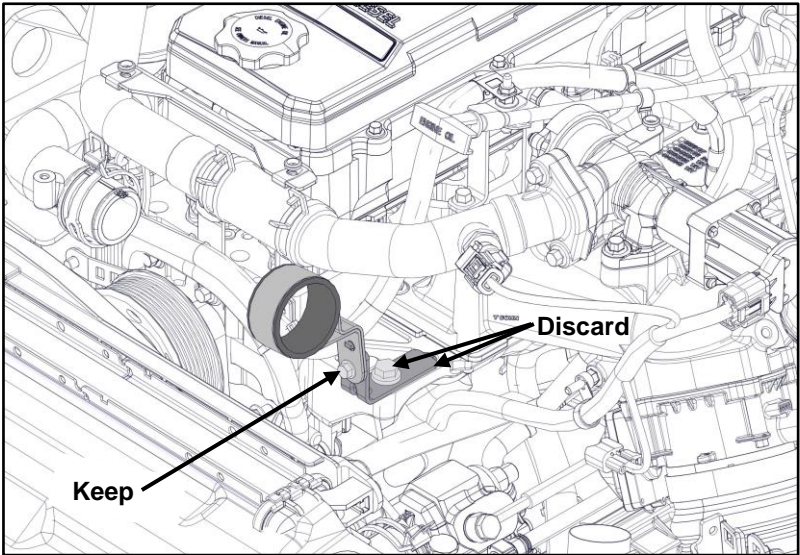
***It is recommended to keep the original belt with the vehicle, in the unlikely event of compressor failure, the VMAC supplied belt can be removed, and the OEM belt can be re-installed to allow the vehicle to operate.***

- Remove the two bolts and the upper driver's side shroud bracket, keep bracket and hardware for re-installation later (Figure 2.3).



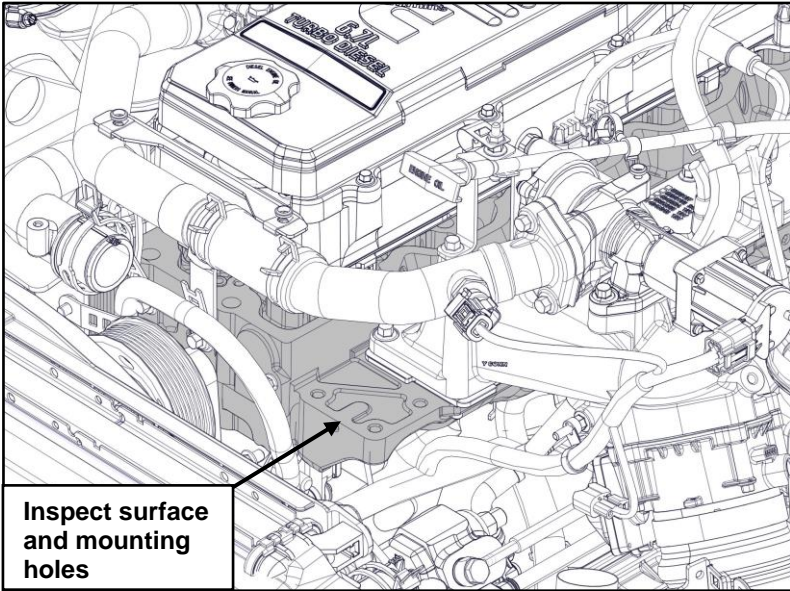
**Figure 2.3 – Shroud bracket**

- Remove the engine mounted portion of the upper radiator hose support bracket, discard the engine bracket and M10 mounting bolt, keep the M6 bolt for re-installation later (Figure 2.4).



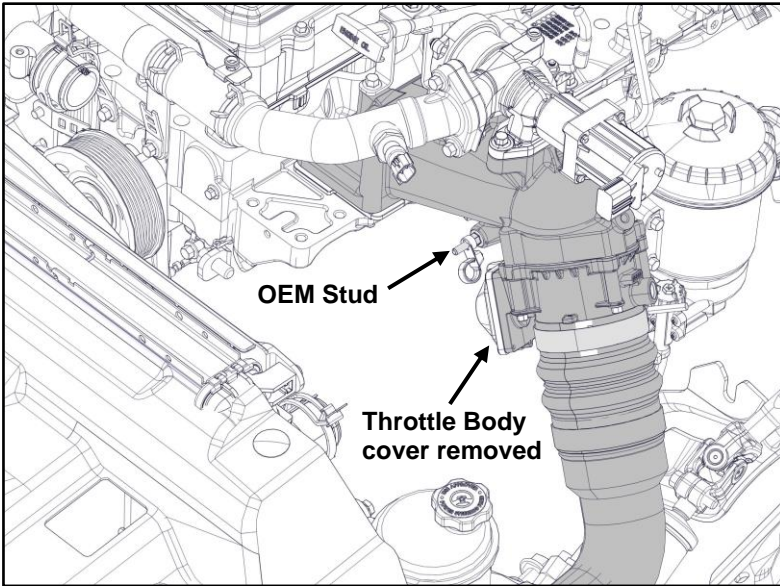
**Figure 2.4 – Radiator hose support bracket**

- Ensure mounting surface and the three M10 threaded holes are free of debris (Figure 2.5).



**Figure 2.5 – Compressor bracket mounting surface**

- Remove the wiring hold down, OEM stud and throttle body cover (if equipped) (Figure 2.6).



**Figure 2.6 – Throttle body cover removed**

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## Part 3: Component Installation

- Remove the idler from the VMAC main bracket.
- Install the two supplied M6 x 20 dowels into the main bracket (Figure 3.1).

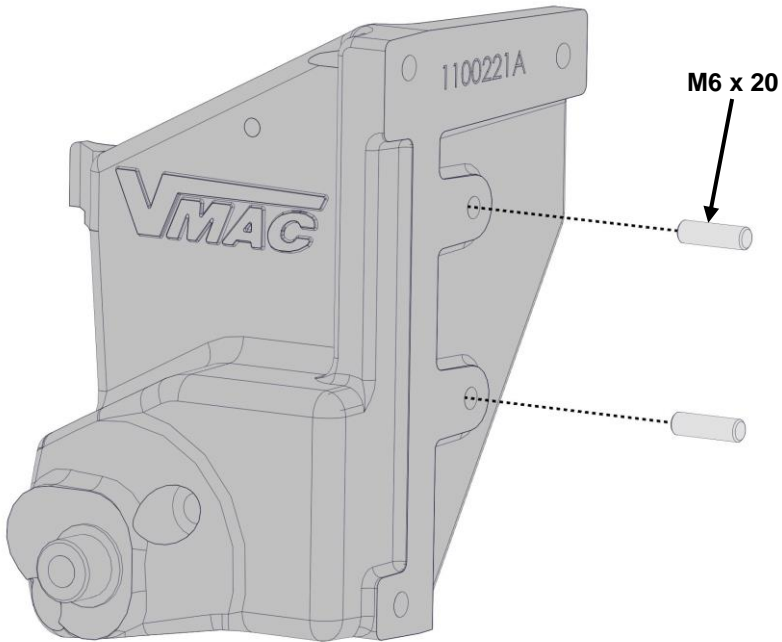


Figure 3.1 – Installing the Dowels



The dowels are used to locate the compressor during installation, failure to install the dowels may cause belt alignment issues.



*Ensure cap-plugs are installed on the system hoses so that contaminants do not get in the system. Take care when routing hoses, as a hose failure may damage the compressor.*

- Position the VMAC main bracket onto the driver's side of the engine in the location shown (Figure 3.2).
- Apply Blue Loctite to the three supplied M10 x 1.5 x 35 flange head bolts and install them finger tight through the holes in the top of the bracket into the matching holes on the engine. **Do not torque.** (Figure 3.2)
- Apply Blue Loctite to the two supplied M8 x 1.25 x 40 socket head bolts and install them finger tight through the holes in the front of the bracket into the matching holes on the engine timing housing. **Do not torque.** (Figure 3.2)
- Tighten the five bolts, but do not fully torque.
- Torque the three top M10 flange bolts to 41 ft-lb (Figure 3.2).
- Torque the two front M8 socket head bolts to 19 ft-lb (Figure 3.2).

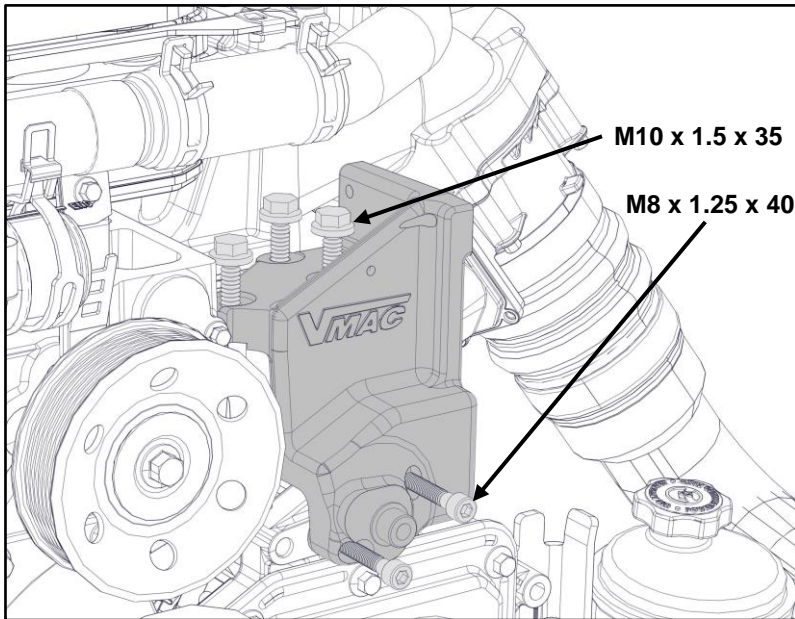


Figure 3.2 – Main Bracket Installation



Ensure blue Loctite is used on the bracket mounting fasteners.

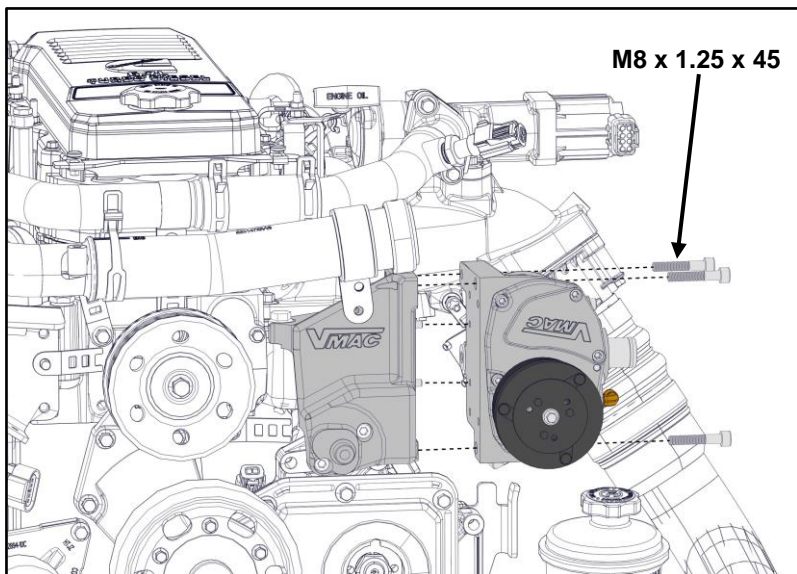
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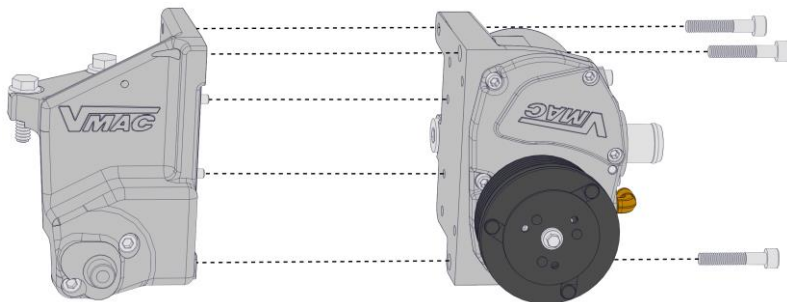
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- Position the compressor onto the main bracket, the two dowels fit into matching holes on the bottom of the compressor (Figure 3.3) (Figure 3.4).
- Apply blue Loctite to the three supplied M8 x 1.25 x 45 socket head bolts, fit two bolts through the top holes, and one bolt in the forward bottom hole in the compressor housing into the matching holes on the main bracket. Torque to 19 ft-lb (Figure 3.3) (Figure 3.4).



**Figure 3.3 – Installing the Compressor**



**Figure 3.4 – Installing the Compressor Detail View**



**Ensure blue Loctite is used on the compressor mounting fasteners.**

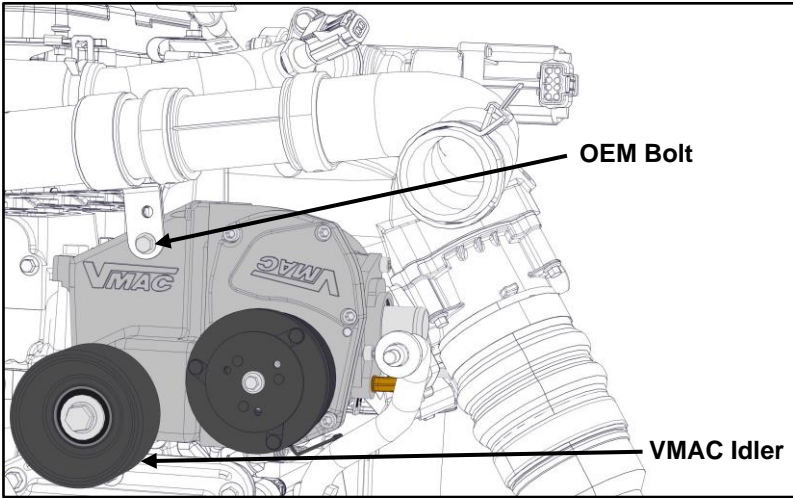
- Apply blue Loctite to the M10 bolt, and reinstall the washer and idler onto the bracket, torque to 41 ft-lb (Figure 3.5).

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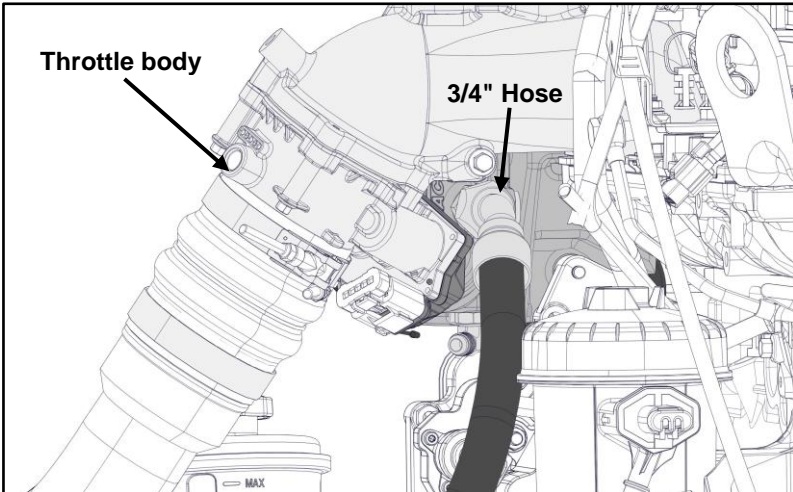
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- Apply blue Loctite to the factory M6 bolt and secure the radiator tube to the VMAC bracket, torque to OEM specifications (Figure 3.5).



**Figure 3.5 – Installing the Compressor**

- Apply high temperature split loom or equivalent hose protection to the 3/4" hoses, 3/8" hoses, and 1/4" PTFE tube.
- Install the 45° fitting on the supplied 3/4" hose to the matching fitting on the rear of the compressor, position the hose and the fitting so that it does not contact the throttle body, engine or other vehicle components (Figure 3.6).



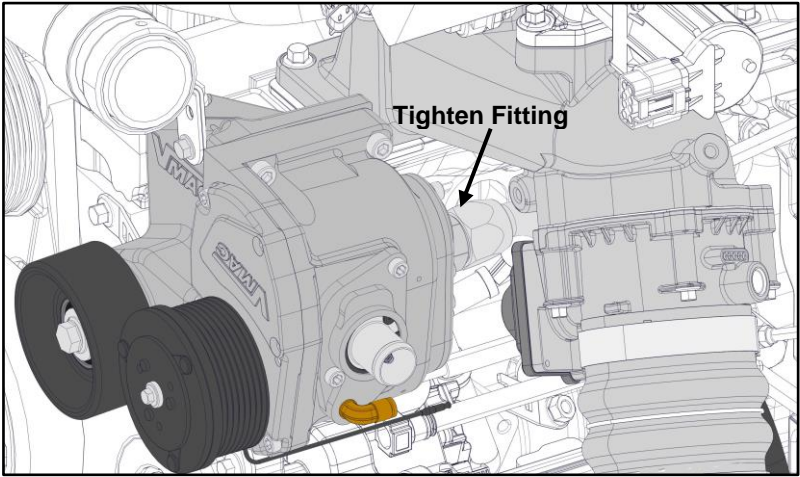
**Figure 3.6 – Discharge hose orientation**

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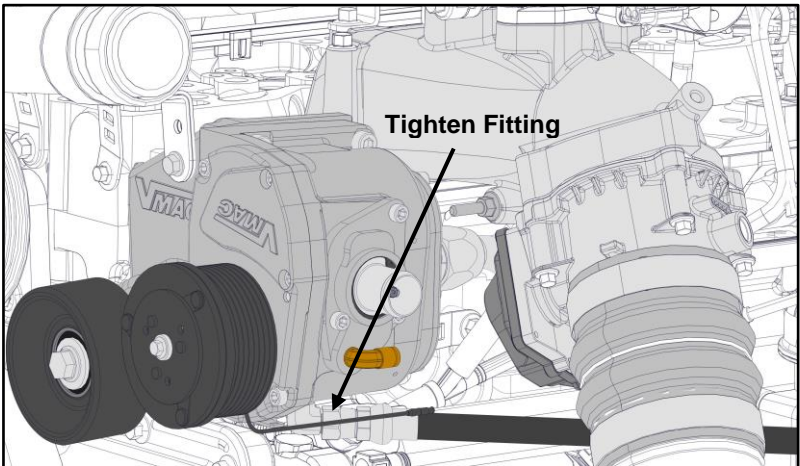
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- Use a 1-1/4" wrench to tighten the discharge fitting on the compressor, ensure the hose and fittings are kept in position during tightening (Figure 3.7).



**Figure 3.7 – Discharge hose fitting**

- Reinstall the OEM stud, wiring hold down and throttle body cover (if equipped) (Figure 2.6).
- Connect the straight fitting on the supplied 3/8" hose to the matching fitting on the side of the compressor, and use a 11/16" wrench to tighten the fitting (Figure 3.8).



**Figure 3.8 – Oil return hose fitting**

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- Connect one end of the 1/4" PTFE tube to the matching fitting on the top of the compressor (Figure 3.9).

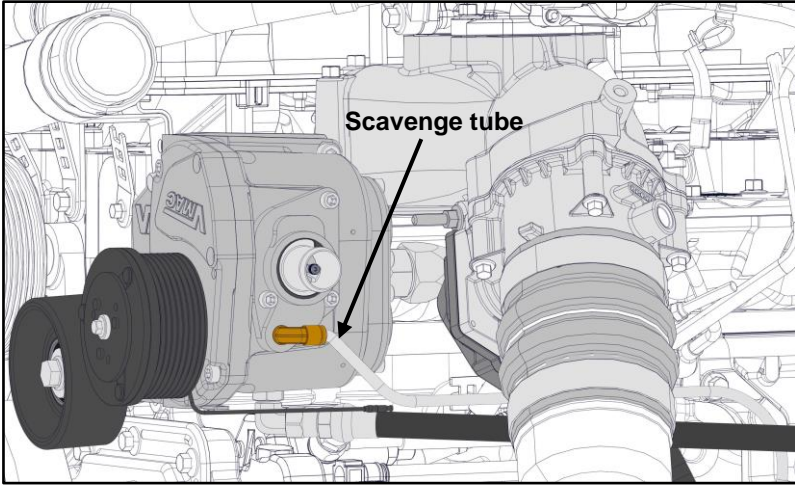


Figure 3.9 – Scavenge tube



*Use a flat blade screw driver to gently pry between the fitting and the Collet, lubricate and firmly push the tube into the fitting so that it fully seats past the internal O-ring (Figure 3.10).*

Ensure tubing is cut square, and that there are no sharp edges. Do not use side cutters as they will deform the tube.

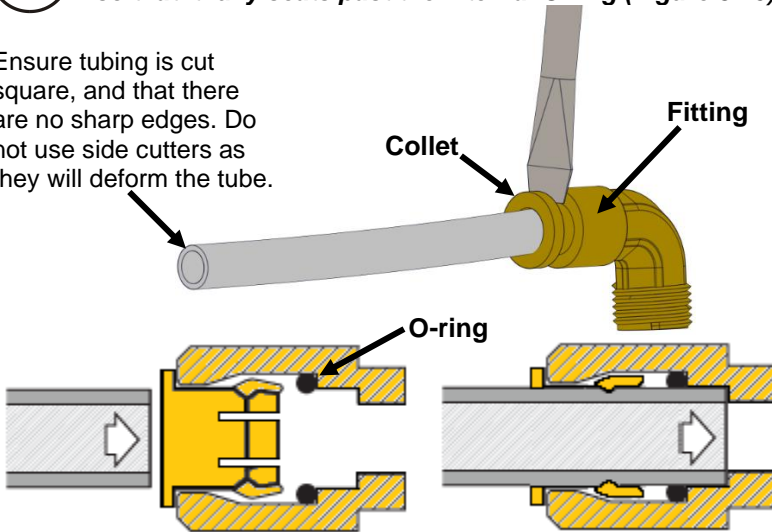


Figure 3.10 – Seating the tubing

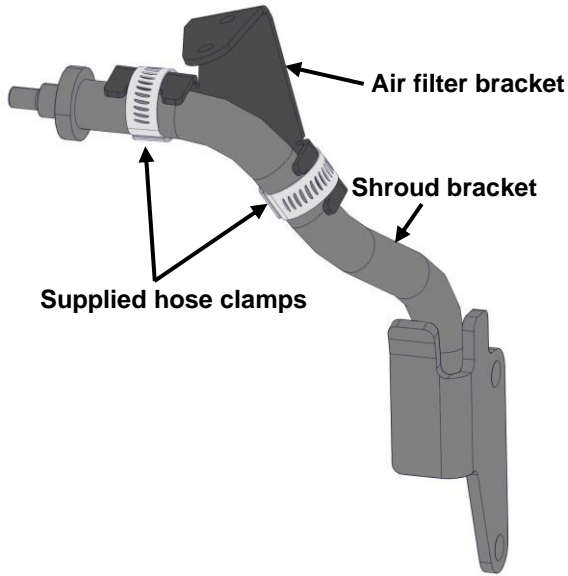
- Determine a suitable hose routing path for the hoses from the compressor to the rear of the vehicle, avoid hot components, sharp or moving components, leave the hoses hanging for now as they will be connected later on in the installation.

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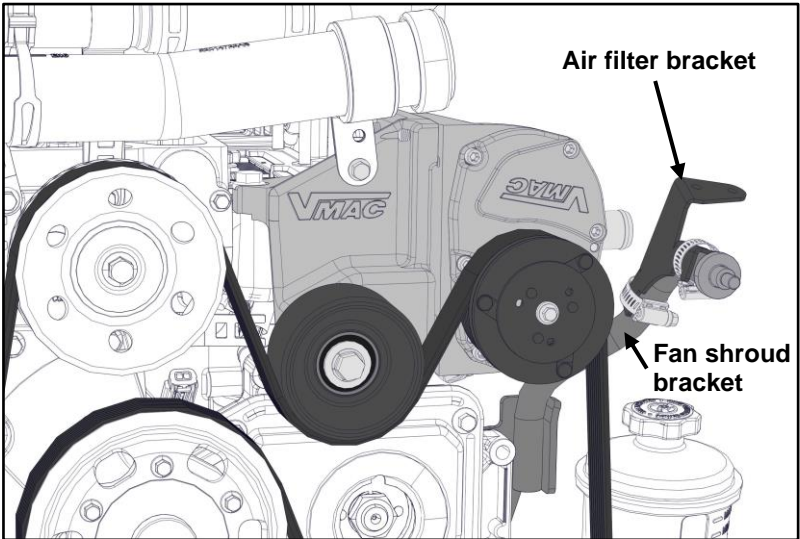
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- Install the air filter bracket onto the driver's side shroud bracket, and secure with the two supplied hose clamps (Figure 3.11)



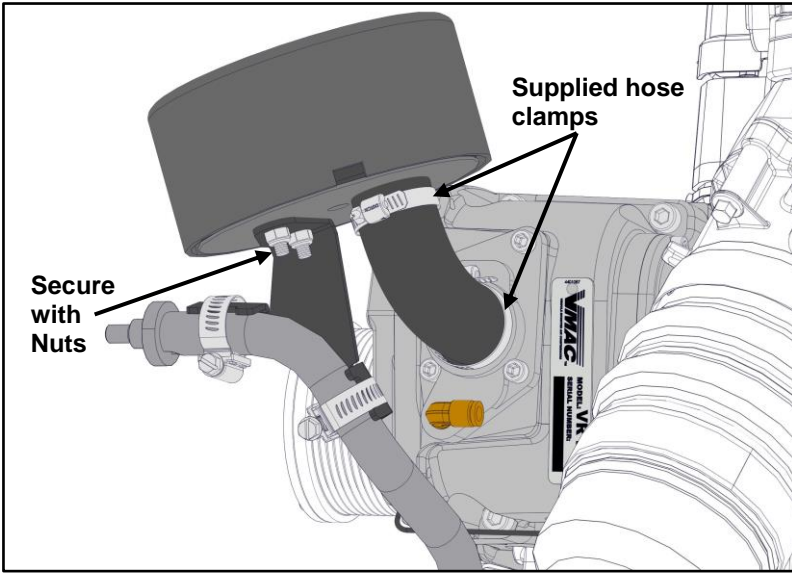
**Figure 3.11 – Installing the Compressor**

- Reinstall the fan shroud bracket onto the driver's side of the engine (Figure 3.12).



**Figure 3.12 – Air filter bracket**

- Install the supplied intake hose onto the compressor inlet and onto the spigot on the bottom of the air filter housing. Mount the air filter assembly to the bracket with the two nuts, and secure the hose with two supplied hose clamps (Figure 3.13).

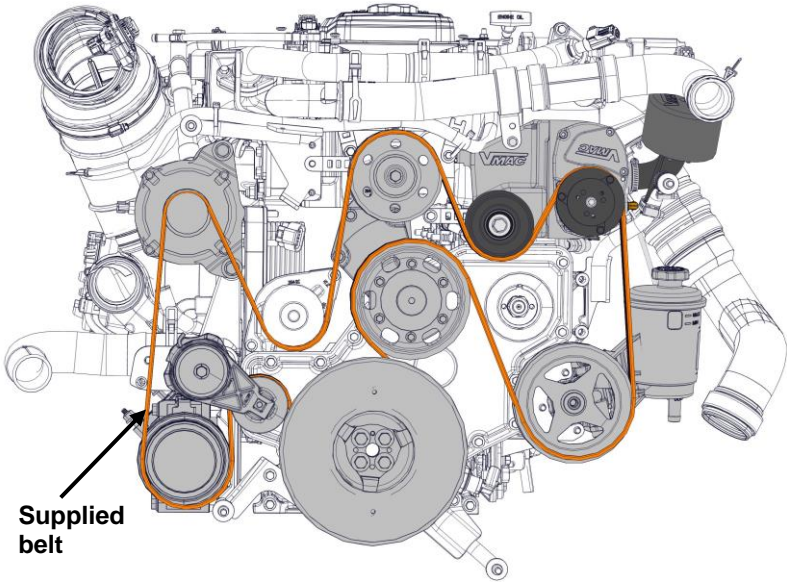


**Figure 3.13 – Installing air filter**



***Bend the upper radiator hose bracket as necessary to ensure adequate clearance between the radiator hose and the VMAC air filter cover.***

- Install the supplied belt, ensure belt is properly seated on all pulleys (Figure 3.14).



**Figure 3.14 – Belt Routing**



**Verify that no wiring, hoses, or other parts will be damaged by hot, moving, or sharp components.**

## Part 4: Installing the WHASP Tank



**Before drilling any holes confirm there are no wires, hoses or components on the other side of the panel which may be damaged.**

Determine a mounting location for the Waste Heat Air Separator Package (WHASP) **Ensure the following conditions are met:**

- adequate fresh air supply and venting for the cooling fan
- minimum 12" of clearance at the front of the cooling fan
- minimum 6" clearance at the rear of unit
- hose connections and wiring accessible
- mounted on a level surface
- impact protection
- oil level sight glass visible
- oil fill and drain ports accessible
- minimize the hose lengths to maximize performance

### Mounting the WHASP Tank

This system is designed for the WHASP tank to mount on the driver's side of the cargo bed. Refer to Figure 4.1 for mounting details.

Special consideration must be made to ensure the WHASP tank will be protected from damage, and to ensure that it has adequate ventilation.

In some cases, it may be necessary to fabricate a mounting bracket to position the tank in an appropriate location.

Secure the WHASP tank by bolting the mounting feet to the installation surface, use M8 or 5/16" Fasteners (not supplied, due to the potential variation of installation).

### Mounting in an Enclosure or Body

Mounting the WHASP tank in an enclosure will limit access to ambient air cooling air, restrict the escape of hot air from around the unit and will have an adverse effect on cooling.

Make sure that adequate ventilation is provided so the cooling system will function properly (e.g. a pull-out drawer).

It is not possible to make absolute recommendations regarding ventilation because of the widely differing circumstances that are possible. Duty cycle, ambient temperature and enclosure shape are some of the important variables.

Ideal ventilation will provide good airflow through the unit with no restrictions. Cool ambient air ducted to the cooler, and installing an exhaust fan to remove hot air is recommended.



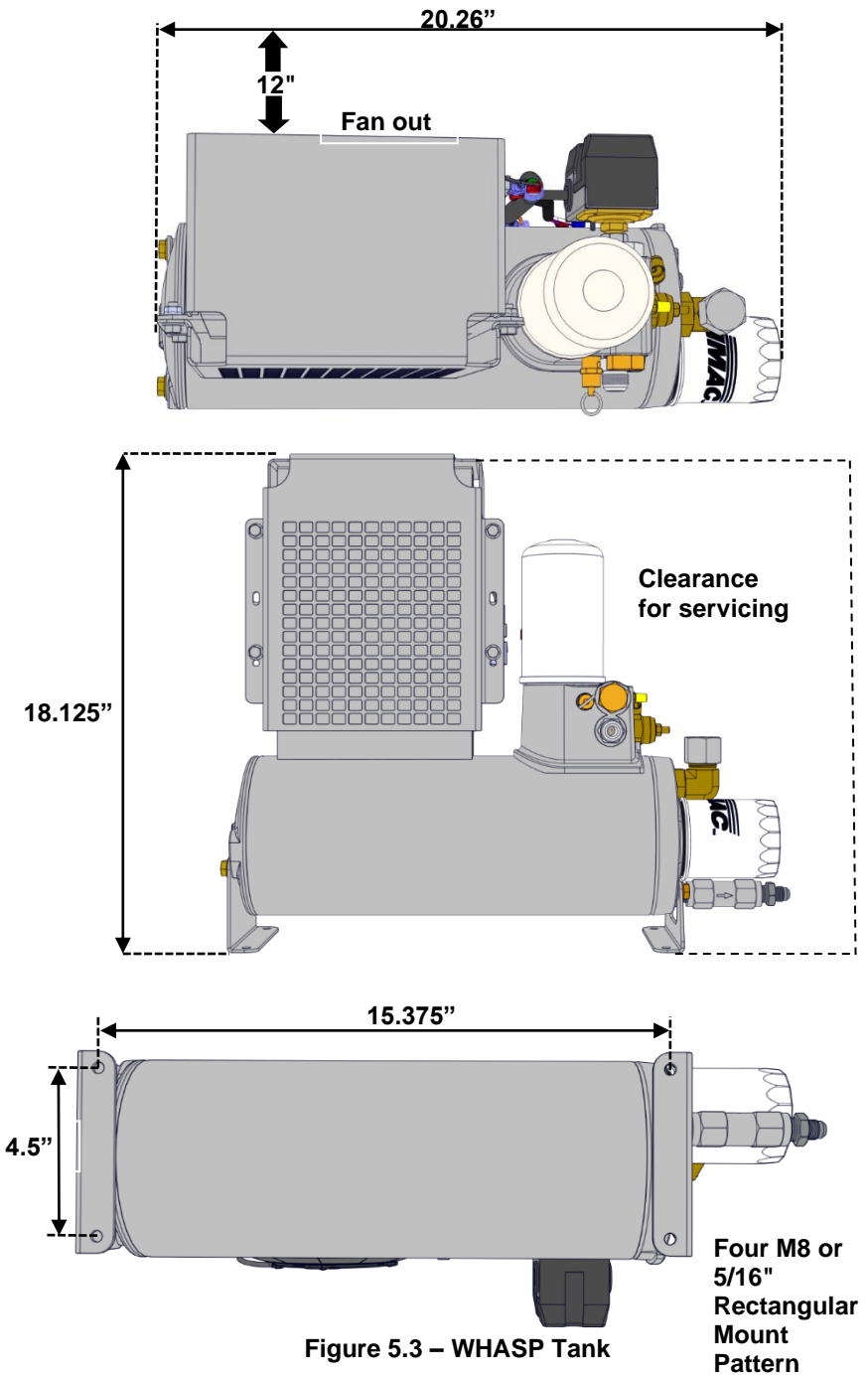


Figure 5.3 – WHASP Tank

## Part 5: Hose Requirements



VMAC Compressor oil will degrade rubber lined hoses, use only hoses with an AQP elastomer type liner. Contact VMAC Tech Support at 1-888-241-2289 for further information.

Only attempt to shorten the supplied hose if you have access to the necessary equipment to do so properly. **DO NOT** cut and splice the hose using hose clamps.

Three hoses are included with this compressor kit, the supplied 3/8" and 3/4" hoses have an AQP elastomer liner, and the 1/4" PTFE tubes are specifically designed to work with the compressor oil and operating temperatures.

Avoid using 90° fittings with sharp corners wherever possible, as they cause flow restrictions and negatively impact performance.

Based on the installation location of the cooler/separator tank these hose lengths may not be ideal. They can be shortened or replaced as necessary, or hose extenders can be used.

VMAC recommends shortening these hoses as a preferred alternative to coiling up and securing the excess. **Shorter hose length will maximize system performance.**

### From compressor to WHASP Tank:

- 3/4" x 170"
- 3/8" x 170"
- 1/4" x 180"

**To prevent compressor failure or personal injury ensure that any hoses used are compatible with the VMAC compressor oil, temperatures and system pressures.**

- Eaton/Aeroquip hoses with an "AQP" type inner liner are required.
- OTC fittings are required for the VMAC supplied hose.
- Push-lock fittings are suitable if FC332 hose is used.
- If using Push-lock fittings, **DO NOT** use hose clamps as they will damage the hose and cause leaks.



***Bulkhead Fittings are available for purchase from VMAC to aid in routing hoses, see the accessory products page of this manual for more information.***

## Part 6: Connecting the Hoses



When routing hoses, ensure cap-plugs are installed so that contaminants do not get in the line. Take care when routing hoses, as a hose failure can damage the compressor and cause injury.

All hoses, tubes, and wires that are rerouted or shifted during installation must be secure so that they do not contact excessively hot areas or sharp edges. Use rubber coated P-clips wherever possible. Follow the routing suggestions in this manual and cover all hoses with plastic loom.

- Determine a suitable hose routing path for the hoses from the compressor to the WHASP tank, avoid hot components, sharp or moving components.
- The straight fitting on the 3/4" Compressor discharge hose connects to the #12 Male JIC fitting on the upper cooler tank (above the fan, air/oil inlet) (Figure 6.1).
- Depending on the specific installation, a 90° elbow may be required (Not supplied).
- The 90° fitting on the 3/8" Oil return hose connects to the #6 Male JIC fitting near the bottom of the oil filter end of the tank (oil return fitting) (Figure 6.1).

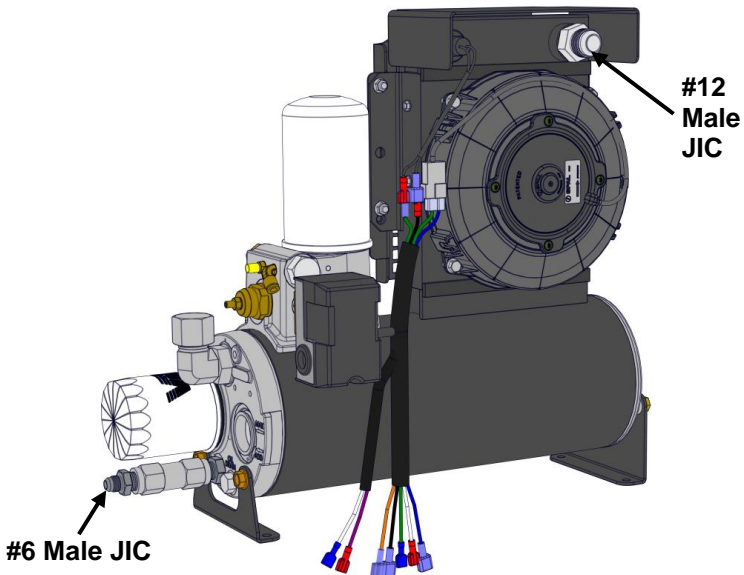


Figure 6.1 – WHASP Oil return and Air/Oil Inlet

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- Connect the 1/4" PTFE tube to the 90° quick-connect fitting on the WHASP tank (Figure 6.2).
- Connect the output fitting (#8 male JIC) to the remainder of the customer's air system (not supplied) (Figure 6.2).

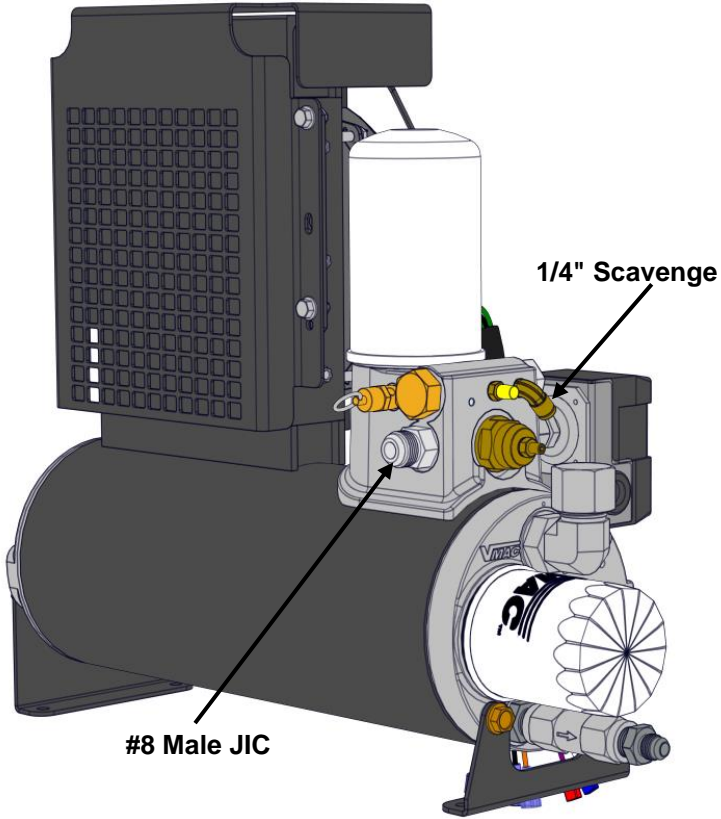


Figure 6.2 – WHASP Scavenge and Output connection



*It is recommended to use a receiver tank with this system, you must follow the instructions in this manual to prevent damage to the system.*



*90° Fittings are available for purchase from VMAC to aid in routing hoses, see the accessory products page of this manual for more information.*

# Part 7: Recommended Accessories

While the compressor system will function without the following accessories, VMAC strongly recommends their use for optimal performance.

## Auxiliary Receiver Tank

The separator/cooler tank (WHASP tank) automatically depressurizes on compressor shut-down to protect the compressor and clutch from damage that may occur if the compressor starts while pressurized. The use of a receiver tank provides a buffer so that tools may be used immediately upon system startup. The addition of a receiver tank will also reduce the frequency of clutch and system cycling.

For information on installing a receiver tank see the Air Receiver Tank section of this manual.

Receiver tanks are available for purchase through VMAC. See the Accessory Product page of this manual for more information.

## Pressure Gauge

While not critical to system performance, a pressure gauge is important for fine tuning the system and simplifies any potential troubleshooting.

Install a 200 PSI pressure gauge downstream of the VMAC tank outlet.

## Pressure regulator and/or lubricator

The compressor can produce air pressures up to approximately 150 PSI (1205 kPa). It is the responsibility of the user to know the pressure and air flow requirements of the tools powered by the air compressor system.

An appropriate air pressure regulator and lubricator can be externally installed to the outside of the pressure supply valve. Failure to regulate the air pressure may cause damage to the tool.

## Part 8: Adding Oil to the System



You must use the VMAC supplied and approved compressor oil in this system. Failure to use this special oil will result in damage to the compressor and will void your warranty.

Do not overfill the system. Overfilling the system with oil can flood the sight glass window and make the system appear empty.

- Remove the fill cap on the WHASP tank (above the sight glass).
- Using a funnel, pour oil into the tank until the oil level in the sight glass reaches the MAX line. **The system capacity is 4L.**
- Reinstall the fill cap and tighten securely. Ensure the fill port remains accessible as it will be necessary to check and top up the oil after first compressor start.

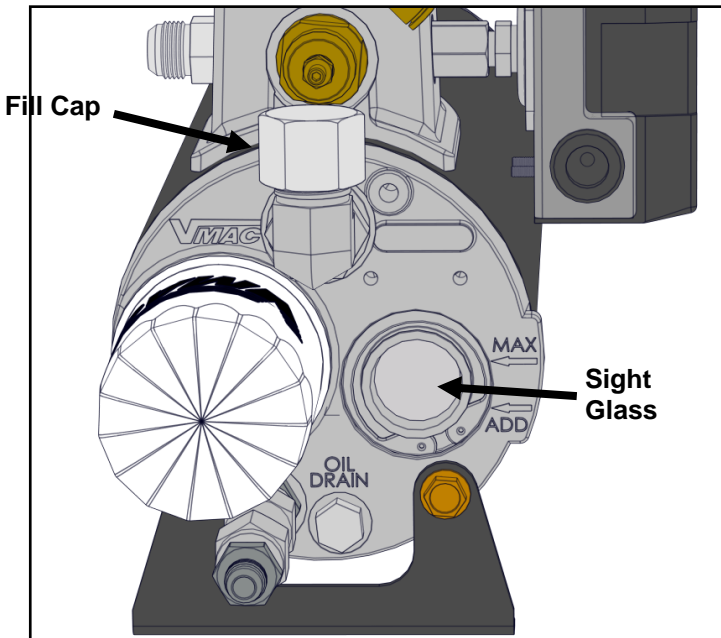


Figure 8.1

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# Part 9: Installing the Control Components

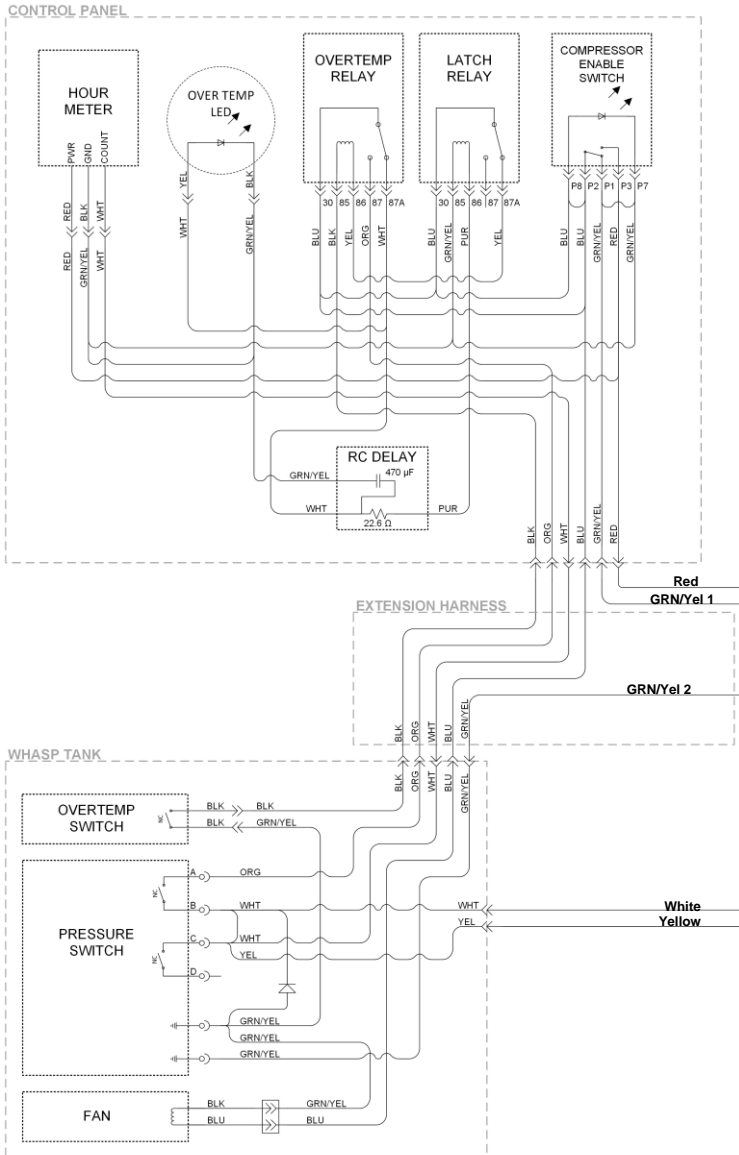
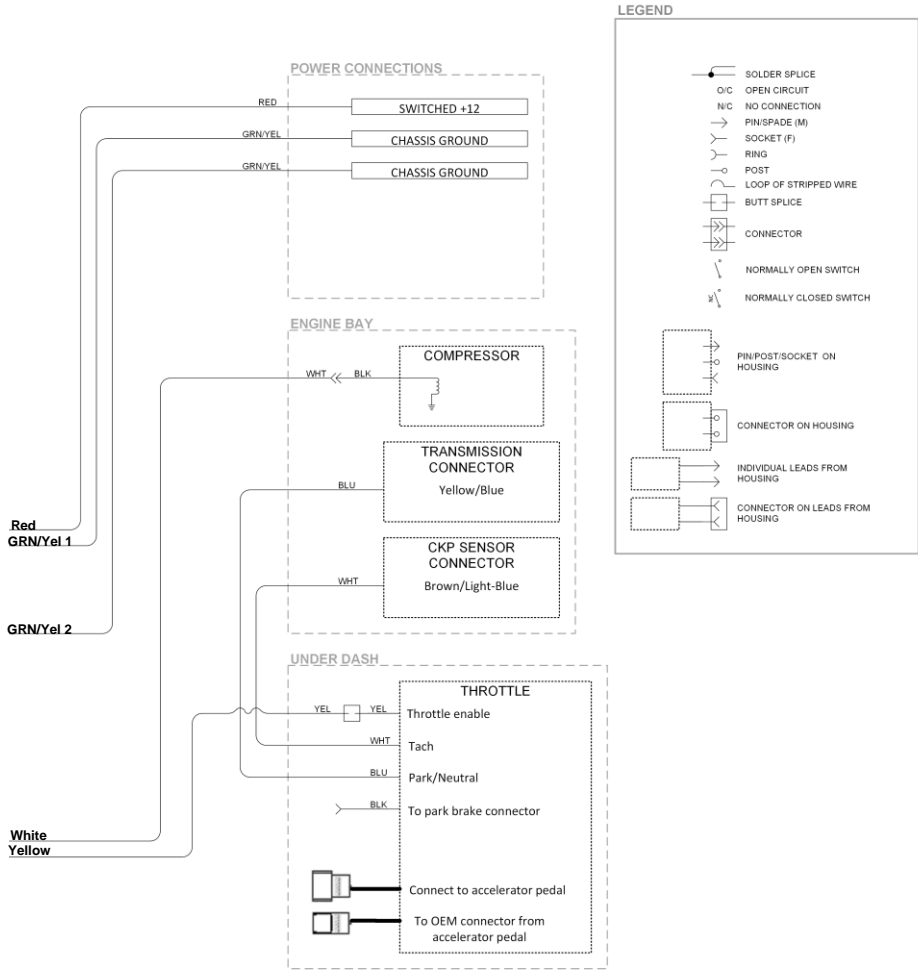


Figure 9.1 – Electrical schematic

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**Figure 9.1 – Electrical schematic continued**

# Installing the Control Panel

- Determine an appropriate location for the control panel and install the control panel using the four #10 holes (Figure 9.2). A mounting bracket may need to be fabricated (bracket and hardware not included with kit).

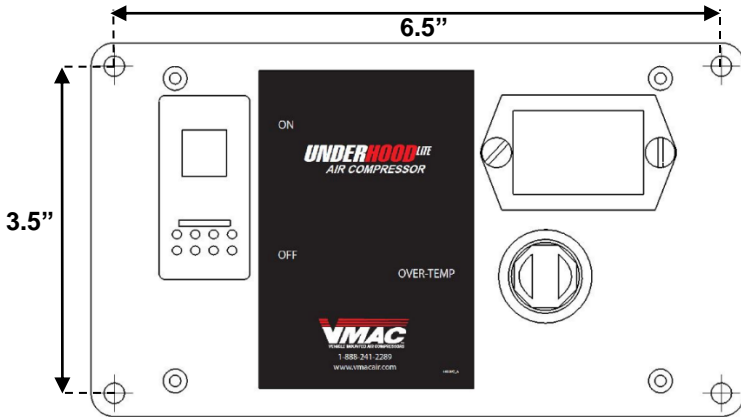


Figure 9.2 (dimensions in inches)



***The control panel is not weather-proof. It should be installed either inside the cab or inside a cabinet on the service body (if equipped).***

# Connecting the Wiring

Keep wires away from the park brake mechanism. Route wires clear of the steering column and pedals so they do not contact moving parts.

Before drilling holes, make sure that there are no OEM wires, hoses, or components where you will be drilling.

Do not use the dash support brackets or vehicle body panels for a ground point. To confirm you have a good ground, use an ohm meter to measure resistance between the ground point and the negative battery terminal, the resistance should be less than one ohm.

- Connect the red 14 AWG wire from the control panel to an auxiliary power connection rated for at least 20 amps (Figure 9.3)

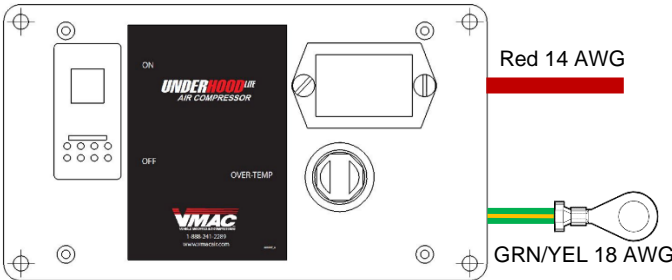


Figure 9.3 – Control panel connections



***If the vehicle is not equipped with a suitable 20 amp source please see part 10 of this manual.***

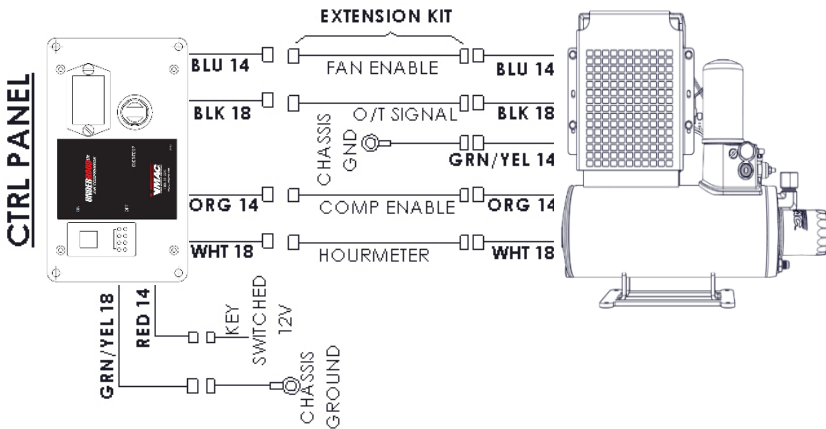


***Do not use a test light to probe for power on vehicle circuits, the increased current draw of the test light may damage components.***

Using the supplied extension wires, connect the four control panel wires to the respective WHASP tank harness wires. **Ensure you use the correct gauge wire.** Connect:

- Blue to Blue 14 AWG
- Orange to Orange 14 AWG
- Black to Black 18 AWG
- White to White 18 AWG

WHASP Tank		Control Panel		Description
Gauge	Colour	Gauge	Colour	
14	Blue	14	Blue	Fan Enable
18	Black	18	Black	Over-temp signal
14	Orange	14	Orange	Compressor Enable
18	White	18	White	Hour Meter



**Figure 9.4 – Control panel to WHASP**

- Run the white 14 AWG wire from the WHASP tank harness to the clutch on the compressor and connect it to the bullet connector on the clutch wire.
- Use the green/yellow wires to connect the control panel and tank harness to chassis ground.



**To confirm you have a good ground, use an ohm meter to measure the resistance between the ground point and the battery negative terminal. Resistance should be less than one ohm.**

# Installing the Throttle Control

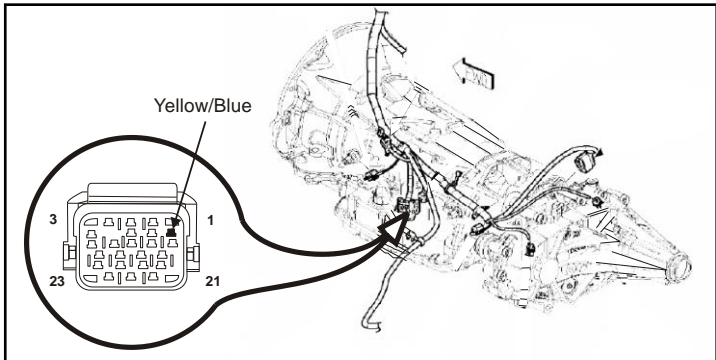


**Do not use butt-connectors for throttle connections, use solder and heat shrink.**

- Position the throttle controller under the dash, in a location where it will be protected from day-to-day abuse, but will still be accessible for making adjustments. Secure the controller in position with nylon ties.
- Use a grommet and route the Blue, and the White wire from the throttle controller through the firewall to the Engine Control Module.

## Automatic Transmission: 68RFE

- Locate the 23 pin connector as indicated by the arrow in the picture of the left side of the transmission (Figure 9.5) Solder and seal the long blue wire from the throttle control to the yellow wire with the dark blue stripe (Figure 9.5) Reconnect connector to the transmission. This wire should show 0 Volts in Park or Neutral and approximately 12 V in all other gear selections when tested with a multi-meter.



**Figure 9.5 – Park Signal Connector Location – 68RFE**



**Do not use a test light to probe for power on vehicle circuits, the increased current draw of the test light may damage components.**

## Automatic Transmission: Aisin AS69RC

- Route the long blue wire from the throttle control to the transmission range sensor on the driver side of the transmission above the oil pan (Figure 9.6) Solder and seal the blue wire to the yellow wire with the dark blue stripe at pin 9 on the connector.
- This wire should show 0 Volts in Park or Neutral and approximately 12 V in all other gear selections when tested with a multi-meter.

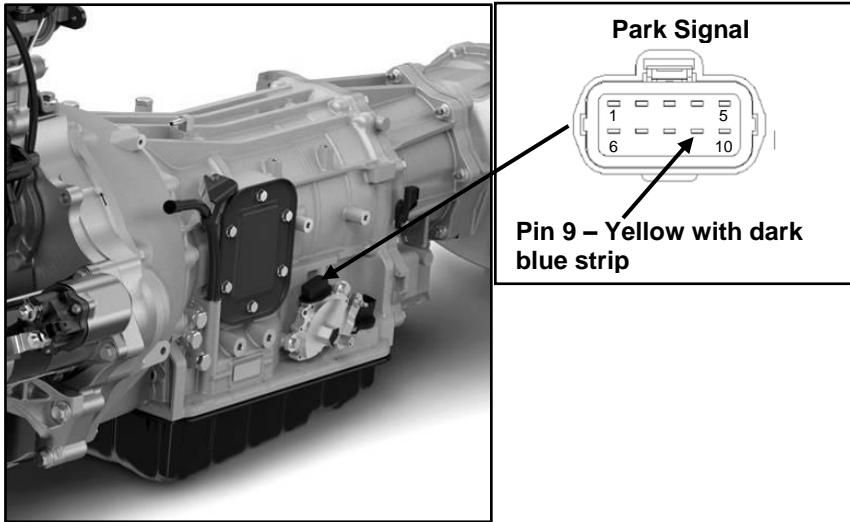


Figure 9.6 – Park Signal location – AS69RC

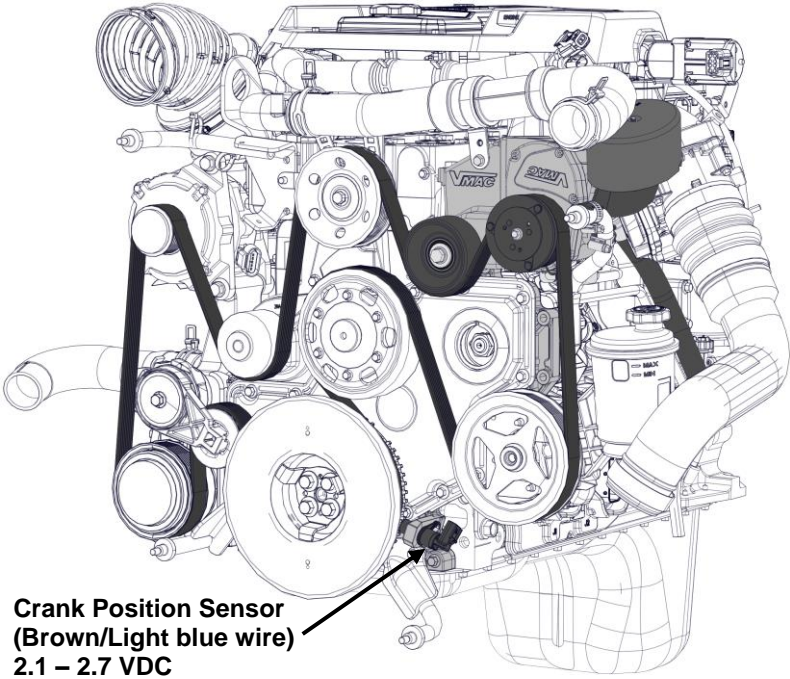


***Do not use a test light to probe for power on vehicle circuits, the increased current draw of the test light may damage components.***

## Manual Transmission

- Cut the long blue wire to about 6 inches, strip the end and connect it to the short blue wire with the crimp connector.

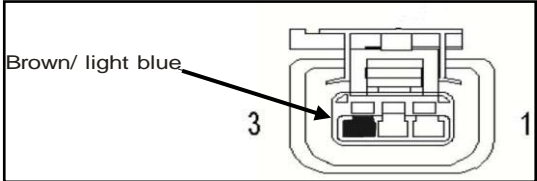
- Locate the crank position sensor on the front of the engine (bottom on the driver side) (Figure 9.7).



**Crank Position Sensor  
(Brown/Light blue wire)  
2.1 – 2.7 VDC  
1000 Hz = 1000 RPM**

**Figure 9.7 – Crank Position Sensor Location**

- Solder and seal the white wire from the throttle control to the brown wire with a light blue stripe that is connected to the crank position sensor (Figure 9.8).



**Figure 9.8 - Crank Position Sensor, looking into front of connector**

- Remove the OEM connector from the park brake switch; connect the black wire with the piggyback connector from the interface cable to the park brake switch and the OEM connector to the piggyback connector.
- Unplug the cable from the foot pedal assembly and connect it to the throttle control.
- Connect the throttle control cable to the foot pedal assembly.
- Connect the green ground wire from the throttle control to a suitable ground point.
- Connect the yellow wire from the throttle control to the yellow wire coming from the WHASP tank.



***Keep wires away from the park brake mechanism. Route wires clear of the steering column and pedals so they do not contact moving parts. Before drilling holes, make sure that there are no OEM wires, hoses, or components where you will be drilling.***

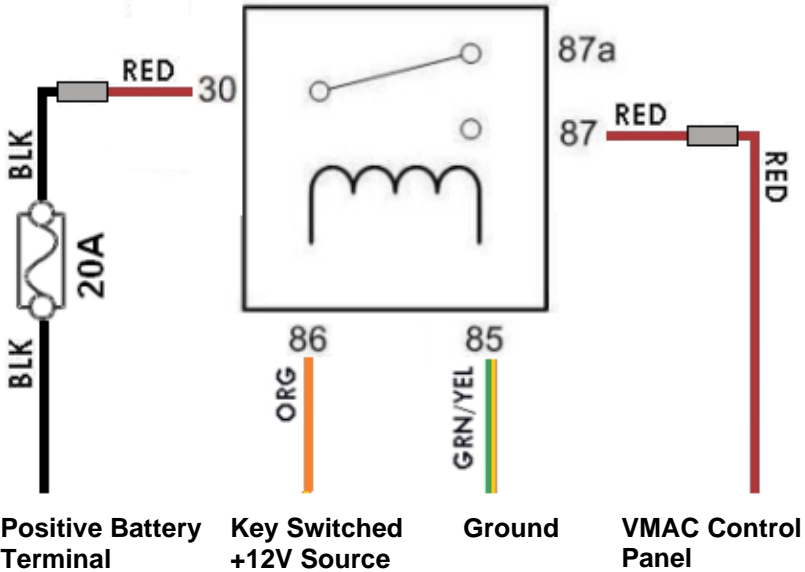


***Do not use the dash support brackets for a ground, use a suitable ground point. To confirm you have a good ground, use an ohm meter to measure the resistance between the ground point and the battery negative terminal. Resistance should be less than one ohm***



# Part 10: Installing the Relay Harness

If a key-switched source rated for 20 amps is not available, locate a low current key-switched 12-volt source and use the supplied relay harness to switch main battery power when the key is turned to run (Figure 10.1).



**Figure 10.1– Relay overview**

- Mount the relay harness on the driver's side of the engine bay, near the fuse box where it will be accessible for servicing and close to the main battery and protected from the elements.
- Connect the black wire with the 20amp fuse to the positive battery terminal.
- Connect the green with yellow striped wire on the relay module to chassis ground or the battery negative terminal.
- Route the red 14AWG wire from the control panel to the relay module.
- Solder and seal the short red wire on the relay module to the red 14AWG wire from the control panel.

- Locate the PDC (fuse box) under the hood of the truck (Figure 10.2).
- All PDC connectors are found on the bottom of the fuse box. Remove the fuse box from the bracket by simultaneously squeezing all four latches and pulling the fuse box up out of its bracket to access the underside (Figure 10.2).



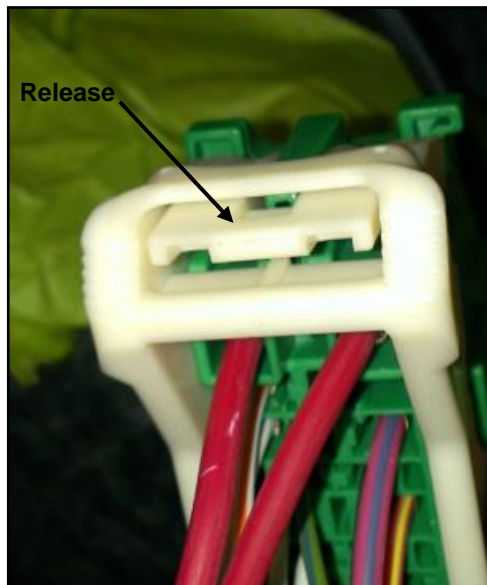
**Figure 10.2**

- Pull the fuse box up and to the passenger side of the truck (Figure 10.3).



**Figure 10.3**

- Locate the Green connector on the bottom of the fuse box, to remove this connector push on the release (Figure 10.4).



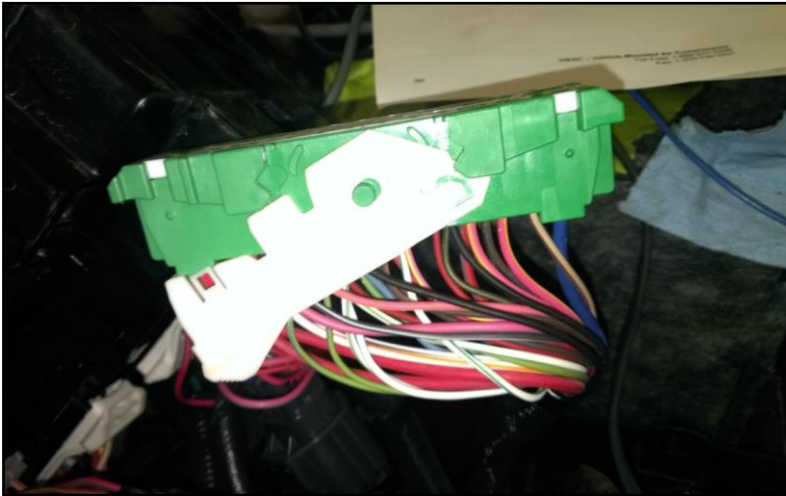
**Figure 10.4**

- While holding the release, pull the white lever down (Figure 10.5).



**Figure 10.5**

- The connector will pull out of the fuse box (Figure 10.6).

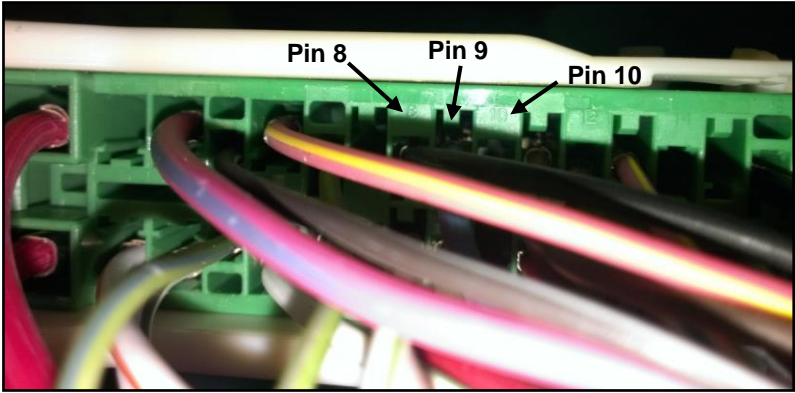


**Figure 10.6**



***Take care to ensure the wire is routed so that it will not be damaged by hot, moving, or sharp components.***

- There are numbers molded into the back side of the connector. Locate pin 9; it has a PINK wire with a YELLOW stripe. This is the key switched +12V wire (Figure 10.7).



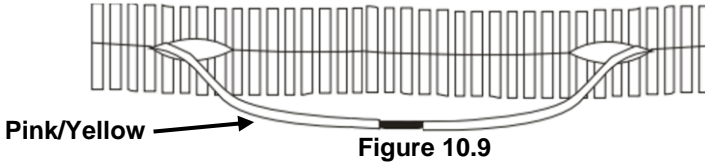
**Figure 10.7**

- Route the long red wire from the relay module into the bottom of the fuse box (Figure 10.8).

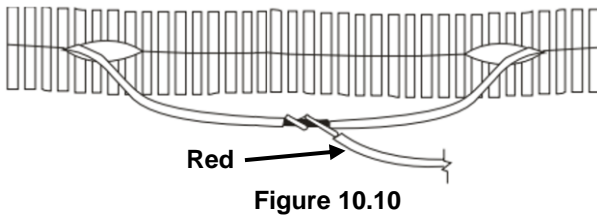


**Figure 10.8**

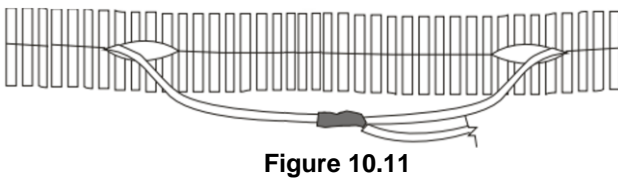
- Strip 3/4" of insulation off of the Pink wire with the Yellow stripe (Figure 10.9).



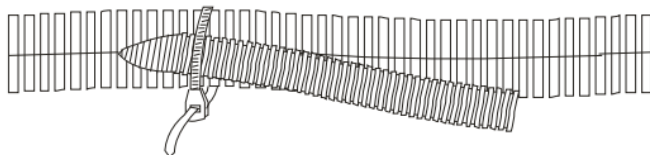
- Strip 1" of insulation off of the long red wire from the relay module and twist onto the bare section of the Pink/Yellow wire (Figure 10.10).



- Solder using 60/40 rosin core solder supplied. Apply heat to the bottom of the wire and put the solder on the top of the wire. Use the heat from the soldering iron to pull the solder through the twisted bundle (Figure 10.11).



- Cover the connection in electrical tape.
- Put the wires back into the OEM loom and wrap with electrical tape. Use 1/4" wire loom to cover the red relay harness wire (Figure 10.12).



- Install a new tie strap into the OEM wire harness (Figure 10.12).
- Re-install the fuse box into its holder.

# Part 11: Completing and Testing the Installation



***Lift the vehicle, ensuring the driven wheels are off of the ground. Support the vehicle securely with appropriately rated jack stands. Ensure there are no people around the vehicle before beginning the test.***

***If the vehicle fails the test, ensure the wiring to all of the connections are correct and secure. If additional assistance is required, contact your local VMAC dealer or call 1-888-241-2289 or 250-740-3200.***

- Check all wiring to ensure that it will not contact any hot or moving components and will not interfere with the operation of the truck. Secure all wiring with nylon ties and loom as required.
- Reinstall the radiator fan (right hand thread).
- Install the engine mounted fan shroud with the four OEM nuts.
- Connect the fan electrical connector, and secure the stator bracket to the engine brace.
- Remove cardboard and reinstall radiator mounted fan shroud with the two OEM bolts.
- Reconnect the battery.

## Before Starting the Engine Checklist

**Ensure the following has been completed:**

- Check that the compressor oil level at the tank sight glass is correct.
- Complete a final inspection of the installation to ensure everything has been completed.
- Perform a final belt alignment check.
- Check all wiring for security and protection. Ensure nothing is touching the compressor body.
- Ensure all of the compressor outlets are closed.
- Ensure the parking brake is engaged and the transmission is in "PARK".
- Start the engine.

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## After Starting the Engine Checklist

- Allow the vehicle to reach operating temperature.
- Turn on the compressor. The compressor clutch should engage, and the engine speed should increase in response to the throttle control. The vehicle's tachometer should read approximately 2,800 – 3,000 rpm.
- Allow the compressor to run for approximately 10 seconds.
- Turn off the compressor.
- Shut down the engine and check the compressor oil level. Add oil as necessary to bring the level to the "FULL" line in the sight glass and check for leaks.
- Ensure any stored air is drained from the system.
- Start the engine. Assistance may be required for the next steps.



***The following tests confirm that the drive disable system is working correctly. The drive disable system prevents the VMAC throttle from increasing engine rpm unless the transmission is in "PARK" and the park brake is engaged. 2 people are required to perform this safety test. 1 person must remain in the driver seat and be prepared to actuate the service (foot) brake if necessary. The second person will actuate the compressor switch and ball valve as necessary.***

- Install the VMAC Air Test Tool (P/N: A700052) with the 30 cfm (1/8 in) orifice installed and the ball valve closed.
- With the engine running and the vehicle in "PARK", release the parking brake.
- Turn on the compressor and open the ball valve. The clutch should engage, but engine speed should NOT increase.
- Close the ball valve.
- Turn off the compressor.
- Reapply the park brake.



***The steps marked with asterisks will be repeated.***

- \*With the engine running, Depress the service (foot) brake and shift the transmission out of "PARK".
- \*Turn on the compressor and open the ball valve. The clutch should engage, but engine speed should NOT increase.
- \*Close the ball valve.

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- \*Turn off the compressor.
- \*Drain any accumulated air from the system.
- \*Shift the transmission into “PARK”.
- Repeat the steps marked with asterisks for all transmission selector positions, returning the gear selector to “PARK” after each gear is tested.



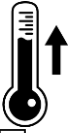
***Engine speed should not increase unless the vehicle is in “PARK” or “NEUTRAL”.***

- Drain any air that may have accumulated during the previous tests.
- Ensure the parking brake is engaged.
- Turn on the compressor and open the ball valve.
- Release the park brake. The engine speed should drop to base idle.
- Reapply the park brake. The engine speed should increase as soon as the park brake is engaged.
- Close the ball valve, allow the system to build to full pressure and the engine speed to return to VMAC base idle.
- Turn the compressor off and shut down the engine.
- Drain any accumulated air from the system.

# Final Testing

Ensure that the following has been completed:

- Operate the system with an air tool for at least 1 hour.



**It is possible to overheat the compressor system if the air tool exceeds the compressor's CFM capacity. Ensure a minimum of 60 PSI of air pressure is maintained during tool operation. See part 12 of this manual for testing instructions.**

- Road test the vehicle for approximately 14 miles (20 km).
- Watch the UNDERHOOD operation to make sure that belts rotate properly, pulleys rotate smoothly and nothing is rubbing or contacting hot parts.
- Check all components, connections and fasteners once the engine is turned off and the system has cooled.
- Check the compressor oil level after the engine has been shut down and the oil level has had time to stabilize.

# Part 12: Setup, Performance Testing and Adjustments

This system requires minimal adjustment. The maximum system pressure is adjusted via the pressure switch on the tank, and the output is adjusted with the throttle control. Refer to the owner's manual for specific instructions on how to adjust the system.

You can test the system operation using the tools that will be operated by the system or you can test operations using a .125" (1/8") orifice in the outlet to simulate tool use (Figure 12.1).

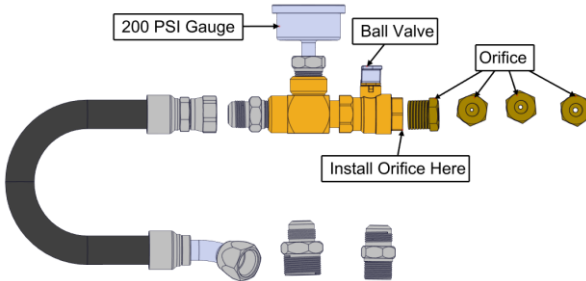
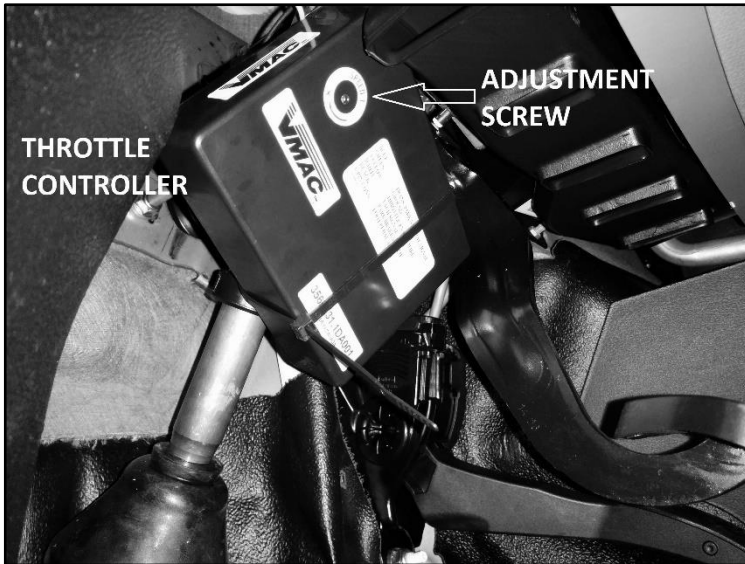


Figure 12.1

- Install the test tool at the air receiver tank. If the truck is not equipped with an air receiver tank, install the test tool at the system outlet. If you are using the VMAC test tool, the appropriate orifice size is .125" (1/8").
- Make sure that the ball valve is closed.
- Place the transmission in park and fully apply the park brake.
- Allow the engine to run until it is at operating temperature.
- Operate the air compressor system until the oil is warm.
- Observe the pressure gauge. Pressure should be approximately 150 psi.
- Open the ball valve on the test tool and observe the engine tachometer. Engine speed should increase to high idle of 3000 RPM. The pressure on the gauge should be 90 - 120 psi.
- Close the air valve slowly to allow the system pressure to rise. When the pressure reaches the pressure switch set-point of 150 PSI, the system will disengage the compressor clutch and drop the engine to base idle.
- Once the system pressure is at maximum, slowly open the ball valve on the test tool until the pressure on the gauge begins to drop. Engine speed should ramp up to high idle when the pressure drops approximately 40 PSI below the pressure switch set-point.

# Throttle Control Adjustment

Locate the VMAC throttle controller. It is typically installed under the dash, near the park brake pedal. Figure 12.2 shows an example of throttle control mounting, actual installation may vary.



**Figure 12.2 – Throttle control**

Adjustment is made by turning the screw, turn the screw counter-clockwise to decrease engine speed, or clockwise to increase engine speed.

Engine RPM adjustments may be made so that the amount of air delivered by the system matches the requirements of the tools or equipment that you will be using.

- If the system is cycling on and off rapidly when using a particular tool, the engine speed is likely higher than necessary for that tool. Try turning the engine speed down and observe the performance.
- If the system is unable to “keep up” with a specific tool the engine speed is too low. Try increasing the engine speed gradually, until the desired performance is obtained.



***The VMAC control system is designed such that the user cannot increase the engine speed beyond a safe level. Adjusting the engine speed is a low risk activity.***

# Part 13: Auxiliary Air Receiver



Pressure in the auxiliary tank will not be relieved when the compressor system blows down. This is normal operation. Prior to performing any service work on the system, relieve the pressure in the auxiliary tank

If you intend to use an auxiliary air receiver with this system you must observe the following installation procedure to prevent damage to the system

A reservoir tank, or air receiver tank provides a buffer for the tool to give the compressor time to react by increasing the engine speed and producing air. It also has the advantage of lowering the duty cycle of the compressor system.

If the plumbing downstream from the compressor is tight (has no leaks), a six gallon air receiver is adequate. If you use an auxiliary air tank with this system, the line to the auxiliary tank must be installed as high as possible (not in the bottom of the tank) to prevent water from filling the line.

Failure to observe these requirements will result in damage to the system.

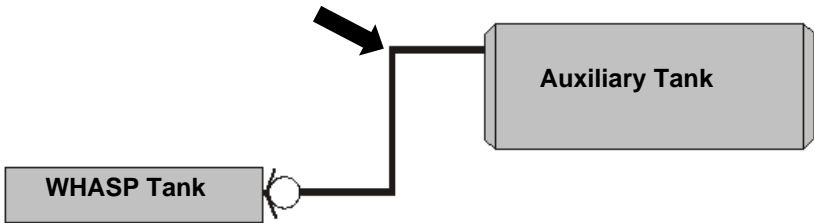


Figure 13.1



*The VMAC WHASP tank has a built-in check valve at the outlet port, so an additional check valve is not required for use with an auxiliary air receiver. Use of an additional check valve may cause erratic performance.*

# Part 14: Accessory Products

These accessory products for your VR compressor system are available from VMAC. For more information or to order these products, call 1-800-738-8622 or email [sales@vmacair.com](mailto:sales@vmacair.com).

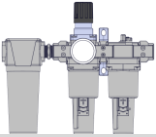
## Eliminator Aftercooler



**Part number: A800070**

Removes up to 80% of moisture from compressed air. Quick installation, automatic drain and compact design

## Filter Regulator Lubricator



**Part number: A700151**

Removes lubricants, water and dirt from the air stream. Adds atomized tool oil to lubricate tools. Reduces pressure for longer tool life.

## Compressor Service Kits



**200 Hour - Part number: A700219**

Includes compressor oil, oil filter and air filter.

**400 Hour - Part number: A700220**

Includes compressor oil, oil filter, air filter, blow-down muffler, and pressure relief valve.

## Air Receiver Tanks



**35 Gallon - Part number: A300010**

35 Gallon capacity in a compact tank, complete with fittings and a gauge.

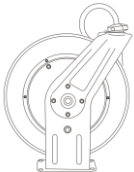
**10 Gallon - Part number: A300047**

10 Gallon capacity in a compact tank, complete with fittings and a gauge.

**6 Gallon - Part number: A300045**

6 Gallon capacity in a compact tank, complete with fittings and a gauge.

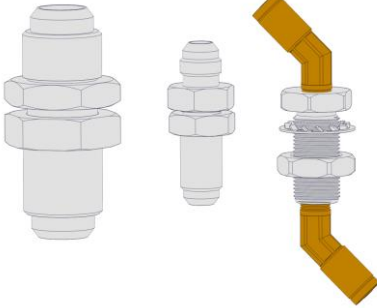
## Hose Reel



**Part number: A700007**

Secure, compact, retractable hose storage in a sturdy reel.

## Bulkhead Fittings



### All Bulkheads - Part number: 3801095

Bulkhead fittings are available for purchase from VMAC, these are used for passing the system discharge, oil, and scavenge hoses through panels

### 3/4" Bulkhead- Part number: 4900170

Used for passing the 3/4" system discharge hose through panels.

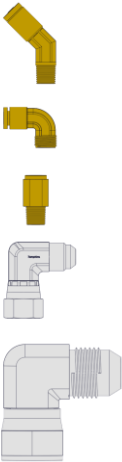
### 3/8" Bulkhead- Part number: 4900209

Used for passing the 3/8" system oil hose through panels.

### 1/8" Bulkhead- Part number: 5000178

Used for passing the 1/4" system scavenge tube through panels.

## Hose Fittings



### 45° 1/4" Fitting - Part number: 5000158

45° Quick connect fitting for the 1/4" PTFE tube.

### 90° 1/4" Fitting - Part number: 5000020

90° Quick connect fitting for the 1/4" PTFE tube.

### Straight 1/4" Fitting - Part number: 5000012

Straight Quick connect fitting for the 1/4" PTFE tube.

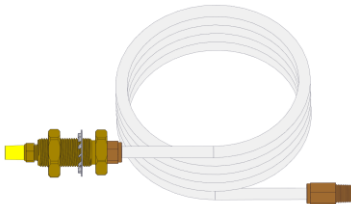
### 90° 3/8" Fitting - Part number: 4900117

90° Fitting for the 3/8" Oil Return Hose.

### 90° 3/4" Fitting - Part number: 4900043

90° Fitting for the 3/4" Compressor Discharge Hose.

## Remote Muffler Accessory Pack



### Part number: A700224

The A700224 WHASP remote mount muffler kit is designed to relocate the blowdown muffler to an external location. This is recommended for applications where the WHASP tank will be located inside of a van or service body, the remote mounted muffler will reduce cabin noise when the compressor blowdown operates, and will ensure that any oil vapor will be safely discharged outside of the vehicle.

### VMAC – Vehicle Mounted Air Compressors

Toll Free: 1-888-241-2289

Fax: 1-250-740-3201

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# Part 15: Warranty Registration

This form must be **fully** completed and returned to VMAC at the time of installation. Warranty may be void if this form is not received by VMAC within **30 days** of installation.



VMAC's Warranty policy and registration can be viewed online at: [www.vmacair.com/warranty](http://www.vmacair.com/warranty)

## VMAC Dealer Information

Company Name: \_\_\_\_\_

City: \_\_\_\_\_ State / Province: \_\_\_\_\_

## Installer Information

Company Name: \_\_\_\_\_

City: \_\_\_\_\_ State / Province: \_\_\_\_\_

Installation Date: \_\_\_\_/\_\_\_\_/\_\_\_\_  
Day Month Year

## Owner Information

Company Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State / Province: \_\_\_\_\_

Zip/Postal: \_\_\_\_\_ Phone #: (\_\_\_\_) \_\_\_\_ - \_\_\_\_

Email Address \_\_\_\_\_

## Vehicle Information

Year: \_\_\_\_\_ Make: \_\_\_\_\_

Vehicle Identification Number: \_\_\_\_\_

Unit #: \_\_\_\_\_

## Product Information

System Identification Number: **V** \_\_\_\_\_

Compressor Serial Number: **P** \_\_\_\_\_

Throttle Control Serial Number: \_\_\_\_\_

WHASP Tank Serial Number: \_\_\_\_\_

## Submitted by

Name: \_\_\_\_\_ Contact: \_\_\_\_\_

**VMAC – Truck Mounted Air Compressors**

Toll Free: 1-888-241-2289

Fax: 1-250-740-3201

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Manufactured by



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