Installation Manual for VMAC System V900126

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

VMAC – ***Vehicle Mounted Air Compressors***
Toll Free: 1-888-241-2289
Fax: 1-250-740-3201

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Changes and Revisions

Version	Revision Details	Revised by /date	Checked by /date	Reviewed by /date	Implemented
A	Engineering Release	KM 13 Jun 2013	SM 13 Jun 2013	DB 13 Jun 2013	13 Jun 2013
B	ECN 13-052; Updated figures	KM 25 Jun 2013	SM 25 Jun 2013	RD 25 Jun 2013	25 Jun 2013
C	ECN 13-013 (13-074 fan spacer)	SH 23 Jul 2013	SM 10 Sep2013	RD 10 Sep2013	12 Sep 2013

Important Information

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

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. Where possible use, rubber coated P-clips. Follow the routing suggestions in this manual and cover all hoses with the supplied plastic loom.

These instructions are a general guide for installing this system on standard production trucks and do not contain information for installation on non-standard trucks. This system may not fit special order models or those that have had other changes without additional modifications. If you have difficulty with the installation, contact VMAC.

The VMAC 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.

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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 truck. Identify variations for different model years and different situations that are listed in the manual. Open the package, unpack the components and identify them.

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	¾
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	¾
Foot-pounds (ft-lb)	40	60	90	180	320
Newton meter (N•m)	54	81	122	244	434

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

Special Tools Required

- Pneumatic fan wrench (Lisle 43300 or equivalent)
- #30 drill bit
- 6mm ball end hex driver
- Pop rivet gun

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.

Part 1: System Identification and Warnings

The System Identification Number Plate must be attached to the truck at the time of installation. This plate provides information which allows VMAC to assist in customer inquiries and the ordering of parts. Place the system identification number plate in an appropriate area, close to the compressor. Mark and drill two 7/64 inch holes then secure the plate with self-tapping screws.

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 truck operators (Figure 1.1).

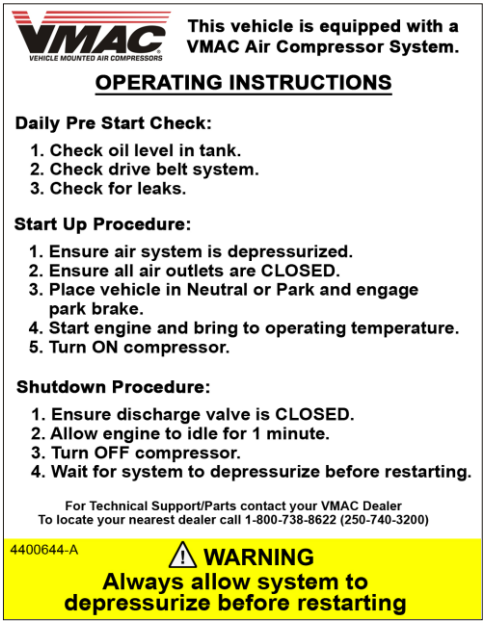


Figure 1.1

☐ 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 1.2)

Figure 1.2

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 1-888-241-2289.

Part 2: Preparing for Installation

Preparation for installation is very important. Missing an item can cause problems in the installation or even damage to components. Check off each item as it is completed so that you do not miss any preparation steps.

2.1 Preparing for Installation

☐ Disconnect battery leads and cover terminals to prevent electrical shorts.

☐ Support the front axle on axle stands and remove the front wheels.

☐ Remove the grille. First remove the upper cover (4x Christmas tree fasteners). Then remove the 4 upper bolts. Gently pull the grille forward and use a long flat screwdriver to gently pry between the mounting bosses on the grille and the tabs on the radiator support.

☐ Remove inner fender liners.

☐ Remove aesthetic engine covers (if equipped).

☐ De-burr the sharp front edge of the EGR crossover tube cover, above the OEM upper radiator hose, in the vicinity of the OEM Y-fitting.

☐ Remove the air cleaner assembly; note that there is an electrical connector near the base of the housing that can be difficult to access until the air cleaner is partially removed. Cover the intake tube to prevent entry of contaminants into the turbo.

☐ Drain the coolant. Note that the radiator drain ports use a 10 mm hex driver and are accessible from the front of the truck once the grille is removed.

☐ Remove the upper radiator hoses (save for use later).

☐ Remove the upper radiator hose support bracket from the cylinder head and clean any clear coat or foreign material from the mounting surface and the three tapped holes on the cylinder head, in front of the air intake tube.

☐ Remove the plastic EGR wiring harness clip from the stud on the front of the OEM intake tube (near the throttle body). This clip can be inverted to support the wiring harness above the stud.

☐ Disconnect the fan clutch wire and cut the tie securing the fan stator brace.

☐ Remove the 4 bolts from the radiator section of fan shroud.

☐ Remove the radiator section of fan shroud.

☐ Insert a protective sheet of cardboard between the radiator and radiator fan.

☐ Remove the 4 nuts securing the engine mounted portion of the fan shroud to its support brackets.

☐ Remove the upper driver's side fan shroud support bracket from the engine. This part may be discarded.

☐ Remove the fan (RH thread) and the engine portion of the fan shroud.

☐ Position the supplied template (5900247) on the fan shroud as shown in Figure 2.1.

- Insert (4X) supplied rivets through the holes at "A" and "B." DO NOT EXPAND RIVETS.
- Position the rivets at "A" on the outer rim of the fan shroud
- Position the rivets at "B" inside the mounting hole for the driver's side shroud support bracket.
- Gently clamp the template in position.
- Drill through the shroud with a #30 drill, using the holes at points "C" as a guide.
- Mark the shroud along the edges at "D" in preparation for cutting.

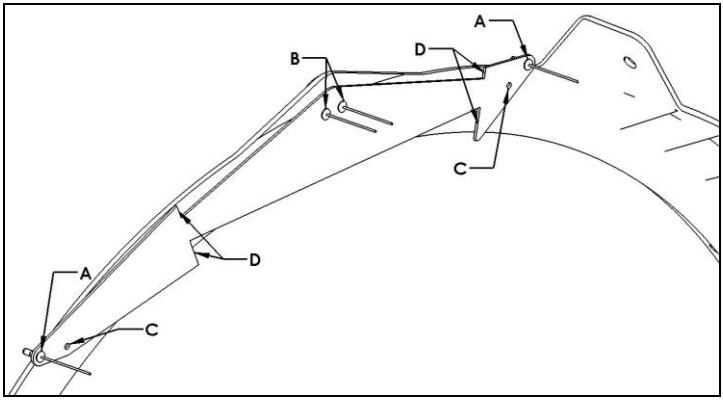


Figure 2.1

☐ Cut away the shroud section using the marks made with the template and the raised soft rubber lip as a guide (Figure 2.22.2).

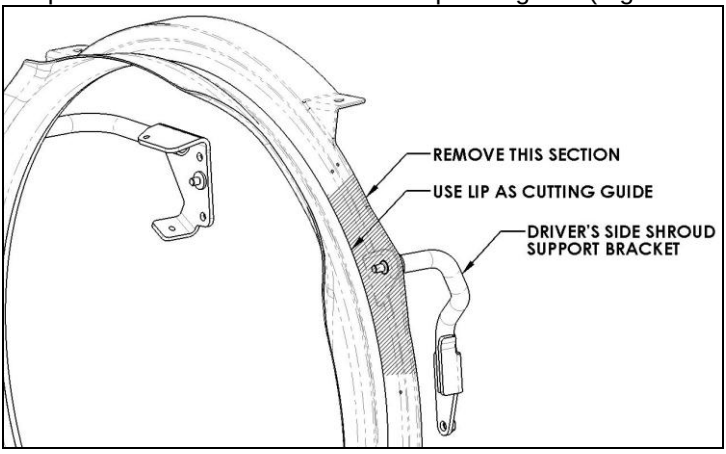


Figure 2.2

☐ Using the stiffener bracket as a template, mark and cut away 3 sections of the remaining soft rubber lip so the stiffener bracket feet sit directly on the hard plastic surface.

☐ Attach stiffener bracket to the fan shroud using the 2 drilled holes and supplied rivets as shown in Figure 2.3. Using the stiffener bracket as a template, drill and rivet each remaining hole individually before moving on to drilling and riveting the next hole. Start with the center bracket foot and work towards the ends of the bracket, alternating sides.

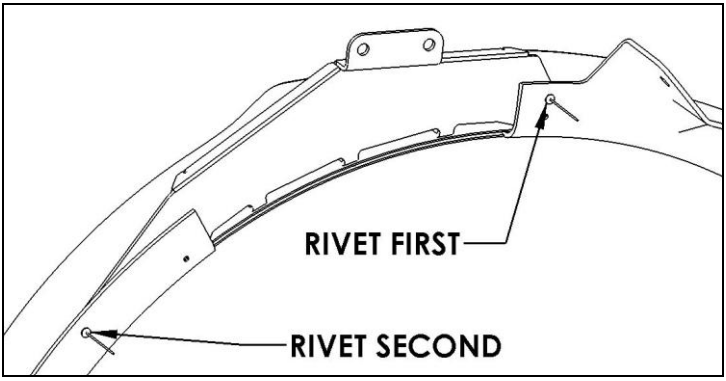


Figure 2.3

☐ Cut away the section shown in Figure 2.4 from the top surface of the fan shroud.

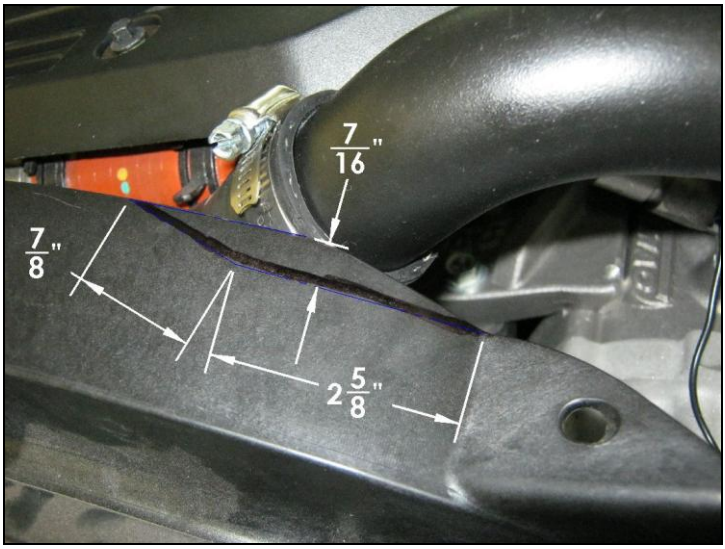


Figure 2.4

☐ Remove (4x) nuts securing fan body to fan clutch and remove fan body (Figure 2.5). Discard nuts.

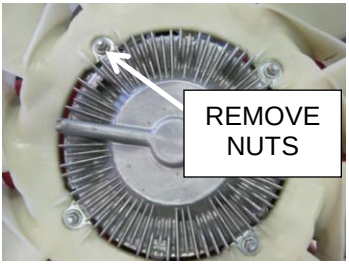


Figure 2.5

☐ Remove (4X) studs (Torx drive) from fan clutch (Figure 2.6). Discard studs.

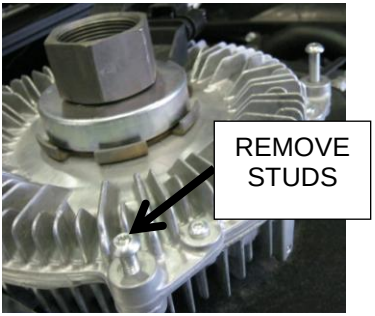


Figure 2.6

☐ Re-install fan body on fan clutch using the new spacer (Figure 2.7).

- Position new fan spacer on fan clutch.
- Position fan body on new fan spacer.

NOTE: Excess plastic from the molding process may need to be removed for proper fitment.

- Install supplied flange head bolts. Use blue Loctite.

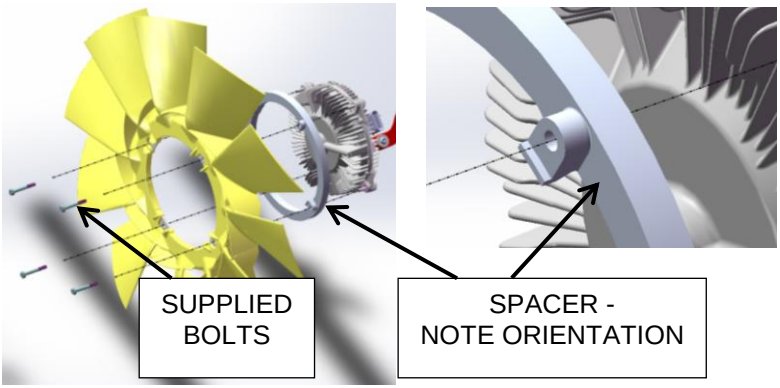


Figure 2.7

☐ Release the tension from the OEM accessory drive belt.

☐ Remove the OEM crank pulley bolts and save for use later.

☐ Remove the OEM crank pulley and scrape off the clear coat from the inside front face of the hub. Discard the locking plate.

☐ Remove the plug from the passenger side of the cylinder head (Figure 2.8). Save this plug as it will be re-used later. Use thread sealant on all connections, and install the supplied reducer bushing, pipe nipple, and tee fitting in the cylinder head port. Face the tee fitting towards the passenger side of the truck, and install the hose barb in the tee.

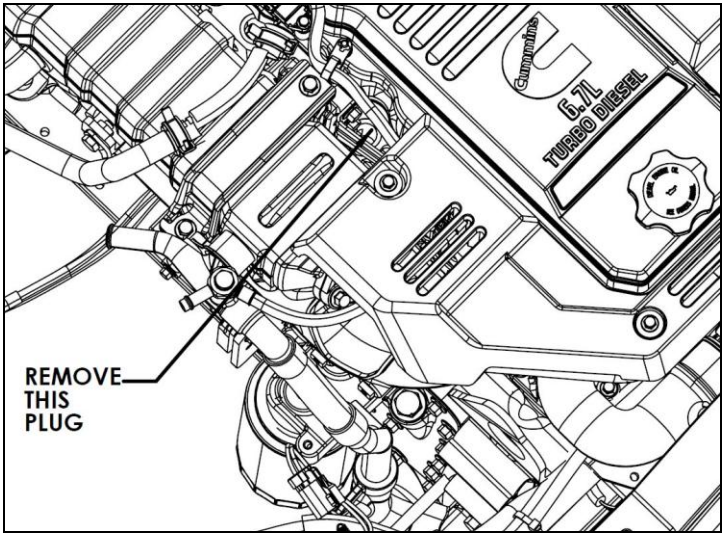


Figure 2.8

☐ Install 3/8” coolant hose on barb fitting and secure with 2200001 hose clamp. Route hose forward to fan shroud and then down toward the sway bar.

☐ Disconnect wiring clip and remove throttle body. Clean any old gasket material off of intake tube and throttle body surfaces.

☐ Reinstall throttle body in 90° rotated position using throttle body adapter and supplied gaskets and hardware per Figure 2.9. Note that the engraved arrow on the adapter points towards the front of the truck.

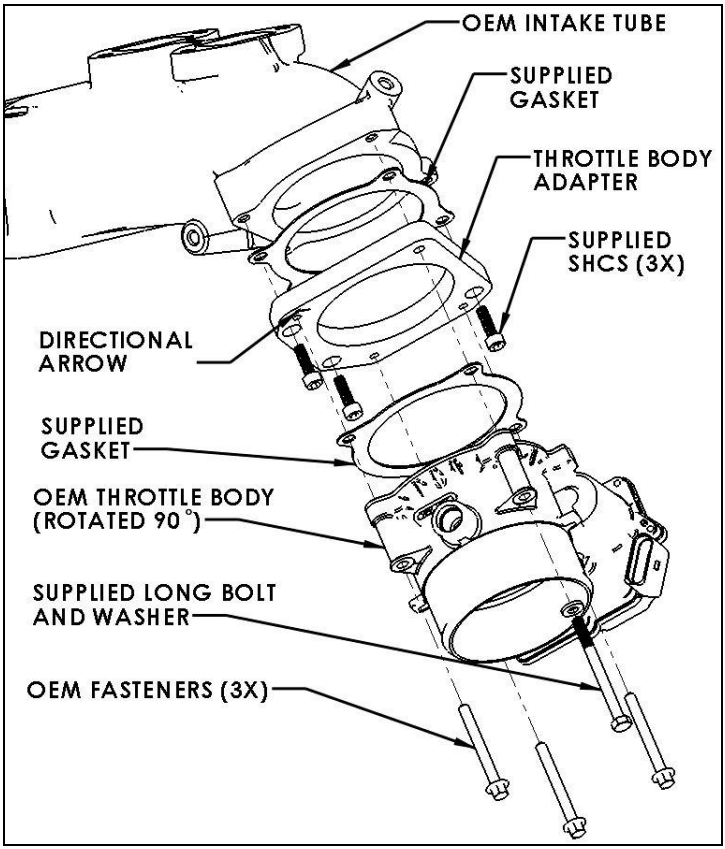


Figure 2.9

☐ Ensure the wiring for the throttle body is not pulled tight. It may be necessary to split open the OEM harness where the throttle body wires branch off, relieve the wires, and re-wrap the harness.

Part 3: Installing the Tank

The tank will mount on the passenger side of the vehicle between the two cab mounts.

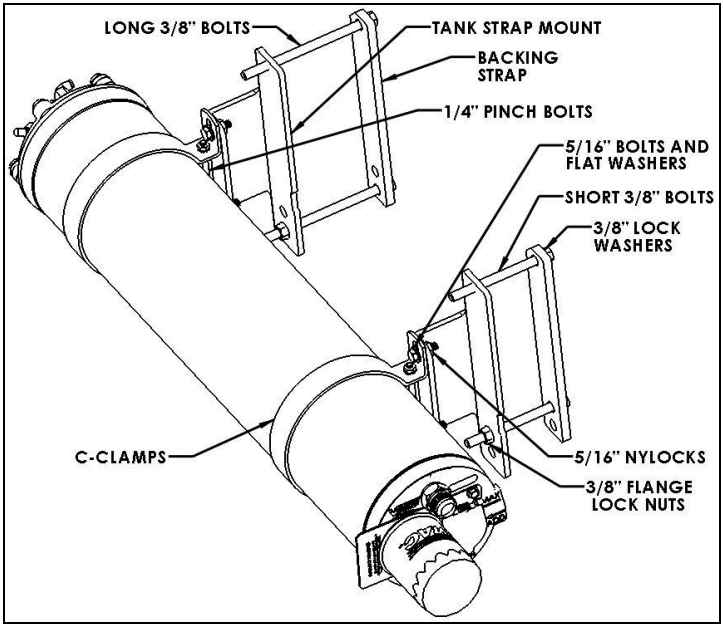


Figure 3.1

3.1 Assembling and Installing the Brackets

☐ Place the tank on a workbench with the front (oil filter end) of the tank to your left.

☐ Remove the two 1/4 inch pinch bolts from the C-clamps. Expand the clamps slightly and slide them over the front of the tank.

☐ Position the front clamp 7 inches from the filter end of the tank, and the rear clamp 24 inches from the filter end.

☐ Place the two formed tank strap mounts under the C-clamps with the ends with threaded holes facing you.

☐ Insert 5/16” bolts with flat washers through the bottom hole on each bracket. Install nylock nuts, but do not tighten.

☐ Install the 1/4 inch pinch bolts into the C-clamps so that the heads of the bolts face toward you, apply Loctite and install the nuts but do not tighten.

☐ Rotate the tank so that the directional arrow on the end of the tank is parallel to the workbench and faces toward you.

☐ Install a 3/4” fitting (not supplied) in the back of the tank.

☐ Insert 5/16” bolts with flat washers through the upper hole on each bracket. Install nylock nuts, but do not tighten.

☐ Check tank alignment and gently tighten the C-clamp bolts.

3.2 Installing the Tank Assembly

☐ Apply Loctite and insert 3/8” bolts through the tank flat bar backing straps and route the bolts over the top of the frame such that the flat bar is on the inside of the frame rail (Figure 3.1).

☐ Support the tank in position with the tank strap mounts on the outside of the frame rail. Thread the top 3/8” bolts into the tank strap mounts.

☐ Slide the tank assembly forward, positioning the front of the tank as close to the body mount as possible without making contact.

☐ Apply Loctite and loosely install the lower 3/8” tank strap bolts and nuts.

☐ Adjust the tank for the best fit. It may be necessary to re-position the clamps based on body mount and cross-member locations.

☐ Tighten all fasteners to specifications.

Part 4: Installing the Cooler and Compressor

4.1 Installing the Main Bracket and Compressor

☐ Place the OEM crank pulley on the front of the crankshaft and rotate it to align it with the locating pin. Route the belt as per (Figure 4.1) but leave the belt loose.

Do not tension the OEM belt before the OEM crank bolts are torqued.

☐ Place the VR pulley in front of the OEM crank pulley and align it with the locating pin. Ensure the OEM belt is routed around the OEM crank pulley before installing the VMAC crank pulley.

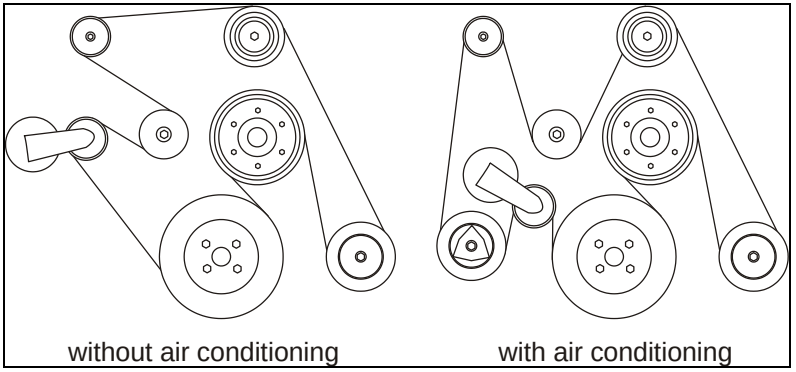


Figure 4.1

☐ Apply Loctite to the four OEM bolts and install them through the two pulleys into the crankshaft. Torque the crank pulley bolts to 69 ft-lbs.

☐ Check the OEM belt routing diagram for the correct installation (Figure 4.1).

☐ Remove idler and tensioner from VMAC main bracket.

☐ Apply blue Loctite to all main bracket fasteners

☐ Position VMAC main bracket as shown in Figure 4.2 and install (2) M10 bolts finger tight into cylinder head.

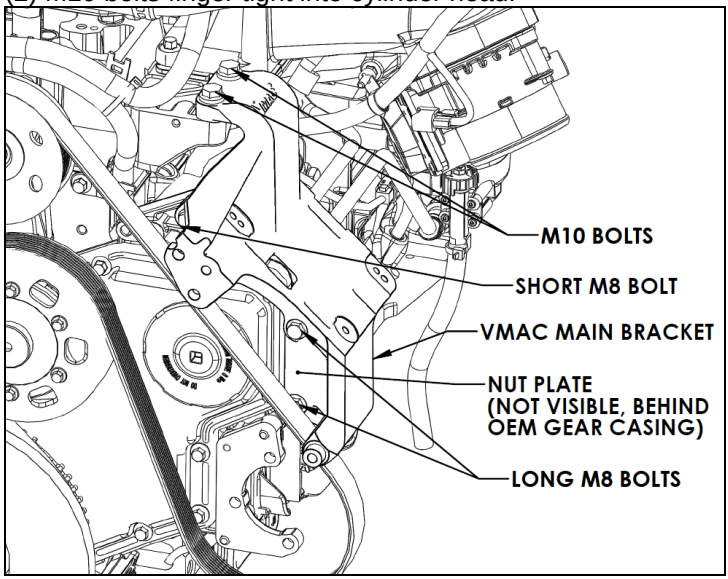


Figure 4.2 (some components omitted for clarity)

☐ Install short M8 bolt finger tight through main bracket into timing gear housing tapped hole.

☐ Position nut plate behind timing gear housing and install long M8 bolts finger tight through main bracket and timing gear housing and into nut plate.

☐ Once all main bracket bolts are finger tight, torque bolts to specifications.

☐ Tension OEM drive belt.

☐ Install VMAC idler and tensioner using blue Loctite and torque bolts to specifications.

☐ Remove inlet valve from compressor and set aside.

☐ Install compressor on main bracket using blue Loctite and torque bolts to specifications. Note that a ball end 6mm hex driver is required to access some fasteners.

☐ Install VMAC drive belt per Figure 4.3.

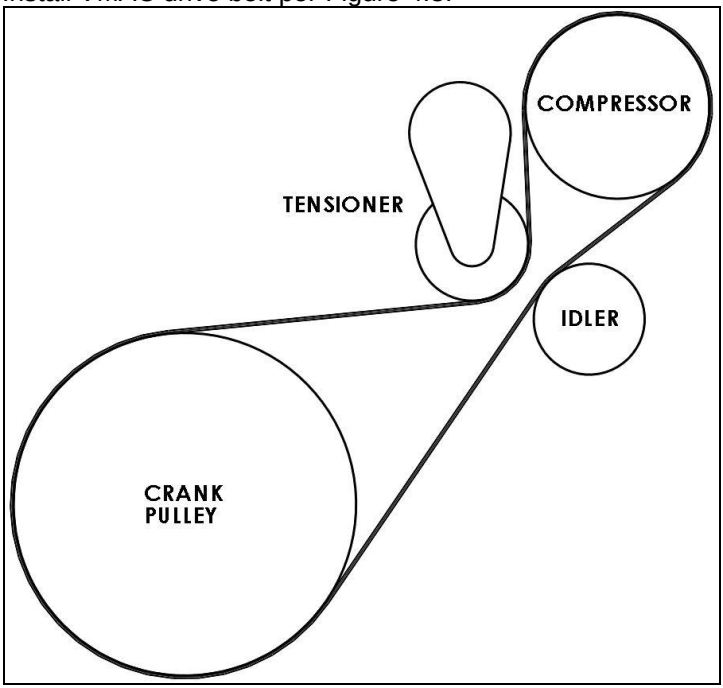


Figure 4.3

☐ Tension VMAC drive belt.

☐ Install inlet valve per Figure 4.4. Do not torque bolts yet.

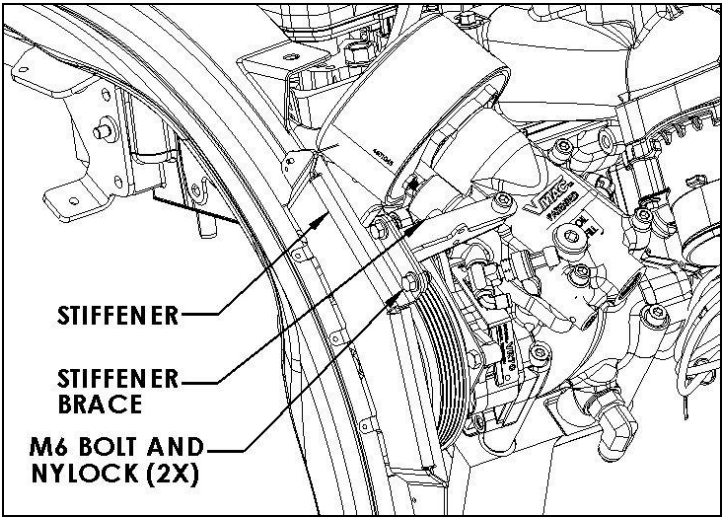


Figure 4.4 (some components omitted for clarity)

☐ Install supplied 1/4” plastic loom on the supplied 1/4” and 3/16” poly tubes

☐ Install 1/4” and 3/16” poly tubes in the matching fittings on the inlet valve.

☐ Route the tubes across the front of the engine, parallel to the OEM wiring, and under the thermostat housing spigot.

☐ Secure the tubes to the OEM wiring bundles, and route the tubes down, behind the alternator. Tube installation will be continued later.

☐ Install radiator fan and engine mounted portion of the shroud.

☐ Connect fan clutch wiring and attach fan stator brace with a nylon tie

☐ Remove protective cardboard from radiator and re-install radiator mounted portion of the fan shroud.

NOTE: Ensure the rubber flange on the engine mounted shroud is sitting evenly on the outside surface of the radiator mounted shroud.

☐ Connect fan shroud brace to fan shroud stiffener per Figure 4.4.

☐ Torque inlet valve bolts to specifications.

☐ Modify upper radiator hoses as follows

- Remove and discard OEM support bracket.
- Cut OEM shrink clamp and disconnect straight hose from Y fitting.
- Cut primary radiator hose (1 ¾" ID) 3" from radiator spigot end.
- Remove abrasion sleeve and cut secondary radiator hose (1 3/8" ID) per Figure 4.5.

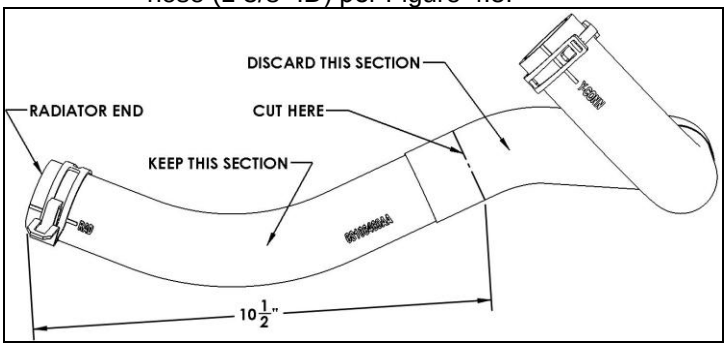


Figure 4.5

☐ Connect upper radiator hoses as follows:

- Reconnect the straight hose to the engine spigot and secure with the OEM spring clamp.
- Reconnect cut section of primary radiator hose to primary radiator spigot and secure with the OEM spring clamp.
- Install a 2200027 hose clamp and connect the short 1 ¾" OD end of 1720678 to the cut end of the primary radiator hose.
- Reconnect cut section of secondary radiator hose to secondary radiator spigot, rotate the hose to point at the secondary spigot on 1720678, and secure with the OEM spring clamp.
- Install a 2200026 hose clamp and connect the cut end of the secondary radiator hose to the secondary spigot.

- Install a 2200027 hose clamp and connect the end of the straight hose disconnected from the OEM Y fitting to the long end of 1720678.
- Position the hoses and tube so that they do not contact any other components and tighten the hose clamps.

☐ Secure radiator hoses with supplied hose clamps.

4.2 Installing the Oil Cooler

☐ Modify lower radiator hoses as follows

- Disconnect hose from engine spigot and discard OEM clamp.
- Loosen clamp securing the hose to the Y-fitting and rotate the hose to point the end removed from the engine spigot towards the ground.

☐ Install the cooler cross-member assembly.

- VMAC recommends not removing all sway bar bolts simultaneously, as re-installing the sway bar can be difficult.
- Loosen all 4 bolts securing the sway bar bushings to the frame.
- Install the cross-member mount brackets between the frame and sway bar bushings, but do not tighten bolts.
- Install the cooler bracket and radiator tube support bracket per Figure 4.6 or Figure 4.7. Note the different orientations detailed in Figure 4.8.

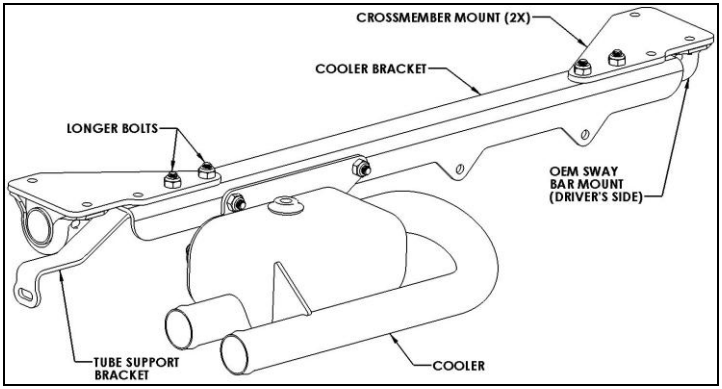


Figure 4.6 (2500/3500 Trucks)

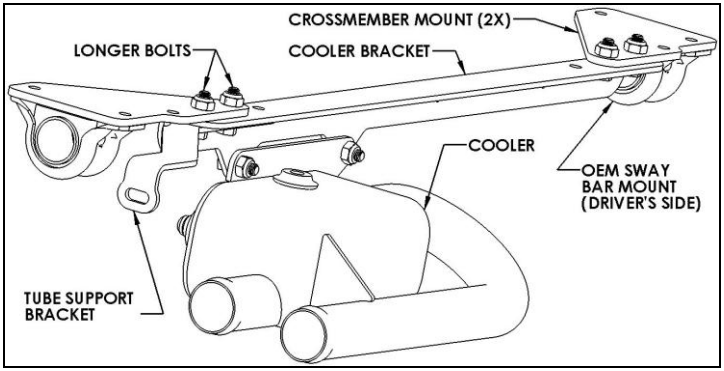


Figure 4.7 (4500/5500 Trucks)

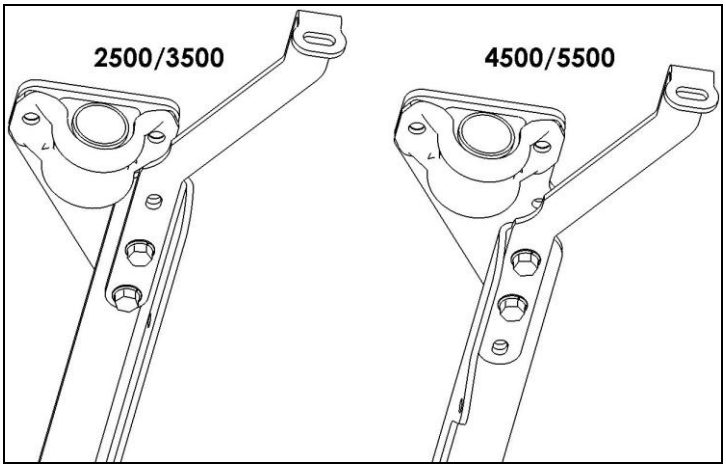


Figure 4.8

- On some installations, it may be necessary to cut the passenger side charge air cooler bracket for hose clearance. Cut the bracket straight across, flush with the bottom of the saddle bushing support. See Figure 4.9.

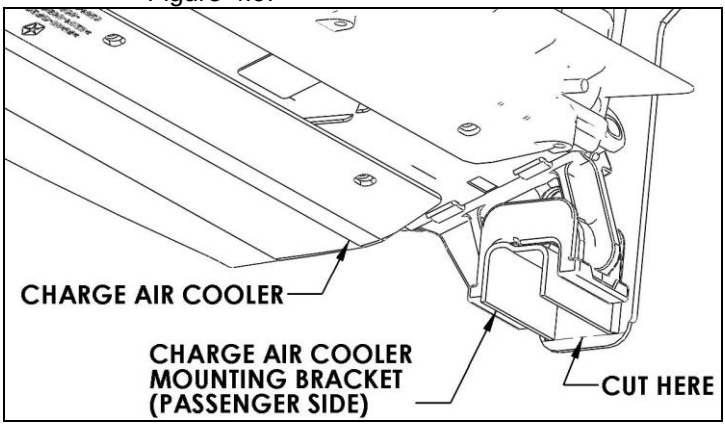


Figure 4.9

- Tighten all fasteners to specifications.

☐ Using thread sealant, install ¼" NPT elbow and barb fitting in port on top of cooler, pointing the barb towards the end of the long spigot.

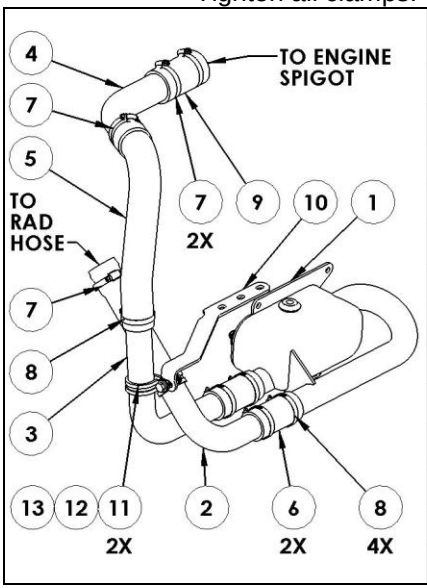
☐ Using thread sealant, install ½" NPT plug removed from the cylinder head (during section 2.1) into the port on the bottom of the cooler.

☐ Test fit cooler on cooler cross-member per Figure 4.6 or Figure and ensure 3/8" heater hose (routed during section 2.1) will fit on hose barb and will not interfere with the cross-member. Adjust orientation of elbow and barb fitting as necessary and install cooler. Tighten fasteners to specifications and connect and secure the 3/8" heater hose with a 2200001 hose clamp.

☐ Connect coolant hoses as follows:

- Refer to Figure 4.10
- Install hose clamps on hoses, but do not tighten until all hoses and tubes are installed.
- Connect the short end of 1720681 to the forward cooler spigot using a 1700612 coupler (2x 2200026 hose clamps)

- Connect the short end of 1720682 to the rear cooler spigot using a 1700612 coupler (2x 2200026 hose clamps)
- Connect the long end of 1720683 to the engine spigot using the 1710823 coupler (2x 2200027 hose clamps)
- Connect the expanded end of 1720681 to the OEM hose previously rotated to point towards the ground (1x 2200027 hose clamp)
- Connect the flared end of 1710824 to the short end of 1720683 (1x 2200027 hose clamp)
- Connect the long end of 1710824 to the long end of 1720682 (1x 2200026 hose clamp)
- Position hoses and tubes so they do not touch any OEM components or each other.
- Install P-clamps on steel coolant tubes per Figure 4.10 and secure clamps to support bracket with supplied nut and bolt.
- Tighten all clamps.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	9200498	WELDMENT, COOLER	1
2	1720681	TUBE, COOLANT, RAM	1
3	1720682	TUBE, COOLANT, RAM	1
4	1720683	TUBE, COOLANT, RAM	1
5	1710824	HOSE, COOLANT, RAM	1
6	1710825	HOSE, COOLANT, 1-3/4" X 4"	2
7	2200027	CLAMP, HOSE HS32	4
8	2200026	CLAMP, HOSE HS28	5
9	1710823	HOSE, COOLANT, RAM	1
10	1200708	BRACKET, SUPPORT, RADIATOR TUBE	1
11	2200212	CLAMP, STRAP 1.75	2
12	1520538	BOLT, HHCS, FLHD, M10 X 1.50 X 35	1
13	1560512	NUT, FLANGE PL, M10 X 1.5	1

Figure 4.10

☐ Disconnect the small rubber hose on the upper passenger side of the primary radiator. Fill the coolant system at the reservoir tank, using the disconnected hose as an air bleed. Once coolant is seen coming out of the hose and/or port on the radiator, re-

connect the hose and finish filling the reservoir to the marked level.

☐ Using thread sealant, install the supplied plug in the top of the tee fitting installed during section 2.1.

4.3 Connecting the Hoses

☐ Remove the oil filter from the air/oil separator tank (AOST).

☐ Discharge hose

- Connect the 45° angled end of the ¾" hose to the fitting on the back of the compressor.
- Route the hose down and towards the transmission bell housing.
- Orient the 45° fitting to keep the hose away from any hot or moving parts.
- Install the bent discharge hose bracket on the bell housing bolt near the front driveshaft per Figure 4.11 and attach the hose to the bracket with the supplied clamp, bolt, and nut.

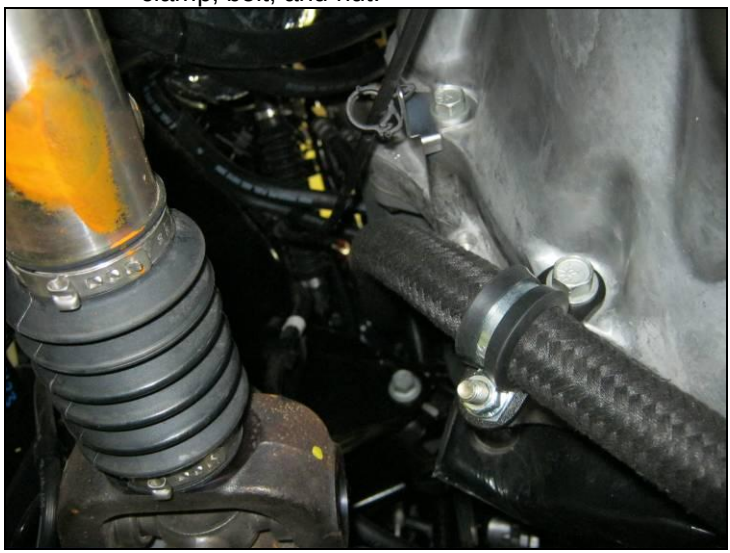


Figure 4.11

- Install the straight discharge hose bracket on the transmission fluid cooler line bracket per Figure 4.12

and attach the hose to the bracket with the supplied clamp, bolt, and nut.

Figure 4.12

- Route the hose between the lower suspension arm and the bottom of the frame.
- Install the 45° JIC elbow on the corresponding fitting on the separator tank.
- Connect the straight end of the hose to the 45° fitting.
- Tighten the fittings.

☐ Oil hoses

- Connect the straight fitting on the end of the short ½" hose to the fitting on the side of the compressor.
- Route the oil hose down the side of the engine and towards the oil cooler.
- Install a 45° JIC fitting on the driver's side port on the cooler and connect the 90° fitting to the 45° fitting (the 45° fitting may not be necessary on all installations).
- Orient the fittings to keep the hose away from the sway bar and steering components.
- Connect the 45° end of the longer ½" hose to the corresponding fitting on the separator tank.
- Route the hose forward, along the base of the frame.
- Install a 45° JIC fitting on the passenger side port on the cooler.

- Connect the straight end of the hose to the 45° fitting on the cooler.
- Orient the fittings to position the hoses so they will not touch any moving or hot parts and tighten the fittings.
- Secure hoses using nylon ties. Heavy duty ties are supplied for securing the long oil hose to the bottom of the frame.

☐ System pressure and scavenge poly tubes

- Route the tubes and loom partially routed during section 4.2 from the alternator towards the solenoid near the passenger side battery.
- Route the tubes back towards the firewall along the OEM wiring bundle and down towards the frame.
- Route the tubes over the suspension link mount, over the body mount, and back to the tank.
- Ensure tubes are clear of any moving, sharp, or high temperature components.
- Secure tubes with cable ties.
- Connect the tubes to the matching fittings on the rear of the tank, trimming any excess tube in the process. Use proper soft tubing cutters or a utility knife to cut tubing, as typical side cutters will deform the tubing which can cause leaks.

☐ Perform a check of all hoses to ensure they did not shift when the fittings were tightened.

☐ Apply a light coat of compressor oil to the rubber seal on the oil filter and install the oil filter on the tank. Note the installation instructions on the filter body.

4.4 Completing the Installation

☐ Install air filter housing and connect all wiring and ducting.

☐ Install aesthetic engine covers (if applicable).

☐ Trim the passenger side inner fender.

- 2500/3500 installations trim per Figure 4.13.
- 4500/5500 installations trim per Figure 4.14.

- The fender can be heated (with a heat gun) and formed instead of cut if debris entry into the engine bay is a concern.

Figure 4.13 (2500/3500 Trucks)

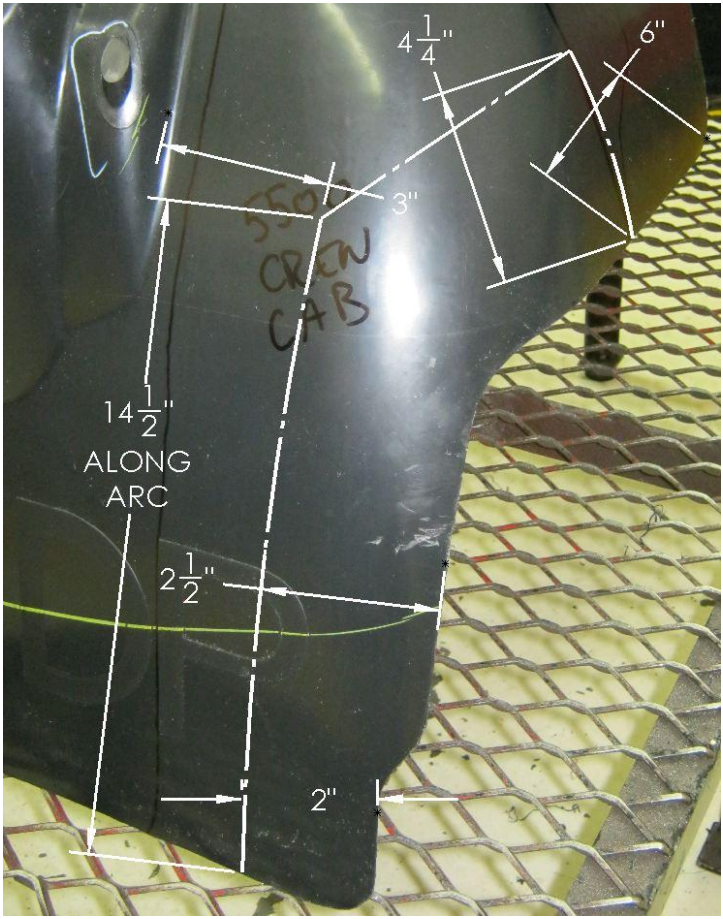


Figure 4.14 (4500/5500 Trucks)

☐ Install the inner fenders.

- VMAC recommends completing the electrical installation before re-installing the inner fenders.

☐ Install the wheels.

☐ VMAC recommends installing mud flaps behind the front wheels to reduce the potential of road debris damaging the tank.

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. Where possible use rubber coated P-clips. Follow the routing

suggestions in this manual and cover all hoses with plastic loom.

4.5 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.

☐ Remove the plug or open the outlet of the tank.

☐ Remove the bolt securing the fan shroud brace to the inlet valve and pull the fan shroud forward to access the compressor clutch bolt per Figure 4.15.

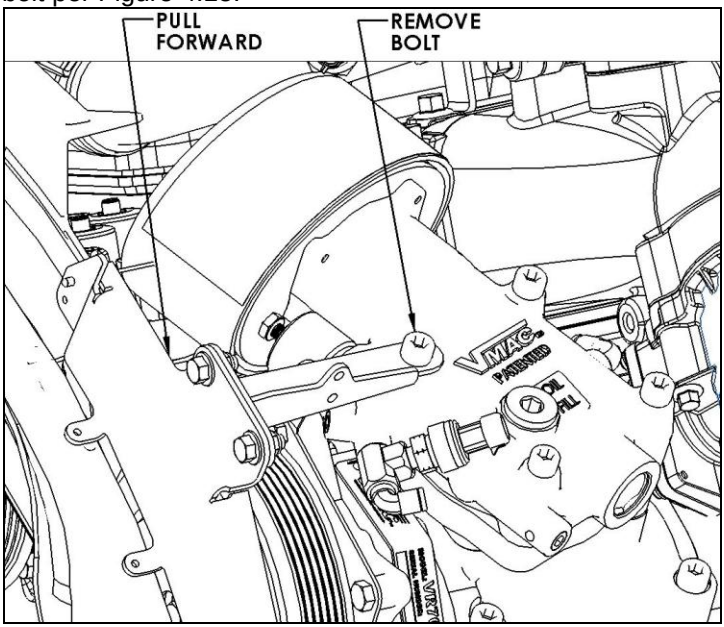


Figure 4.15

☐ Remove the plug from the fill port on the compressor inlet valve and slowly pour oil into the opening using a funnel.

☐ Rotate the clutch clockwise during filling to speed up the filling process.

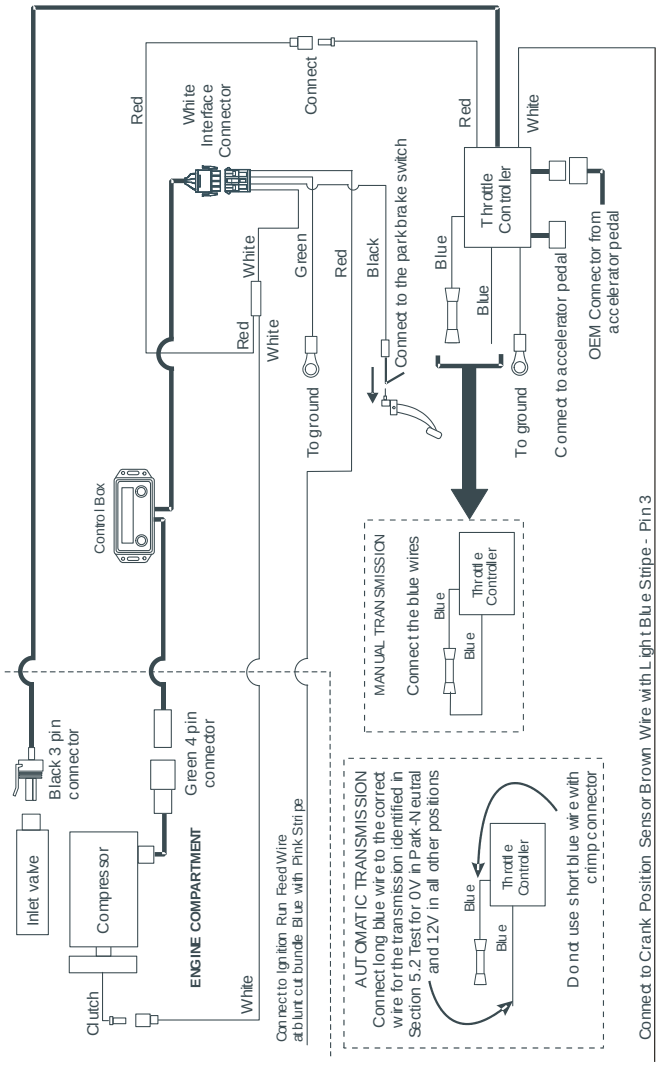
☐ Continue adding oil until the level is correct.

☐ Install the fill plug in oil fill fitting and tighten it securely.

☐ Re-install the fan shroud brace and torque the inlet valve bolt to specifications

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

Part 5: Installing the Control Components



5.1 Installing the Control Box and Throttle Control

☐ Remove the plastic trim panel from the doorsill and the kick panel on the driver's side.

☐ Mount the control box on the floor beside the driver's seat. Use the bracket as a template, drill three 3/32 inch holes through the cab floor and fasten the bracket to the floor of the cab using three #8 pan head screws, (supplied with VR control box). Fasten the control box onto the bracket using the four screws, washers and nuts.

☐ Route the cables from the control box along the doorsill, under the trim panel, behind the kick panel and up under the dash. Replace the doorsill trim and the kick panel.

☐ Mount the throttle control under the dash to the right of the steering column so that the connectors will easily reach the accelerator pedal. Secure it in place with ties.

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 wire bundles where you will be drilling.

5.2 Connecting the Wiring

☐ Unplug the cable from the foot pedal assembly and connect it to the throttle control box. Connect the throttle control box cable to the foot pedal assembly.

☐ Connect the interface harness to the matching connector from the control box.

☐ Attach the two green wires with the ring connectors to a good ground under the dash.

☐ Route the following wires into the engine compartment:

- white wire with the blue bullet connector
- white wire from the throttle control

- the gray wire with the green four pin connector
- the gray wire with the black three pin connector
- the long blue wire (automatic transmission only)

☐ Insert all of the engine compartment wires (except the long blue wire) into a plastic loom and route them from the firewall, along the driver's side fender, across the top of the radiator to the compressor. Connect them to the matching connections at the compressor.

☐ Connect the gray wire with the green four pin connector to the matching connector at the compressor.

☐ Connect the gray wire with the black three pin connector to the matching connector at the compressor.

☐ Connect the white wire with the bullet connector to the compressor clutch.

☐ Locate the crank position sensor on the front of the engine (bottom on the driver side). (Figure 5.1).

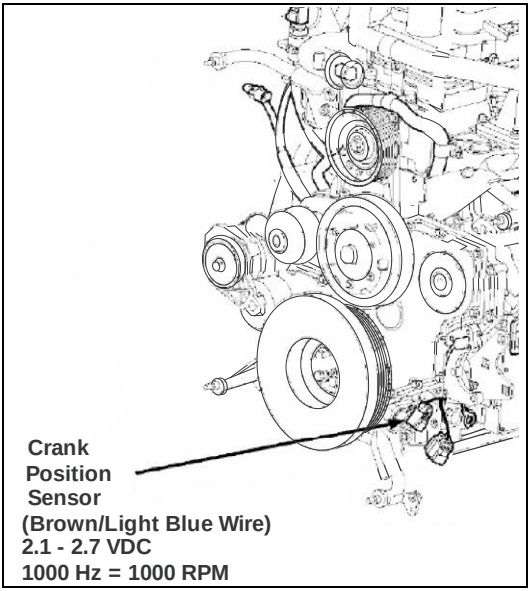


Figure 5.1 – Crank Position Sensor Location

☐ 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 5.2).

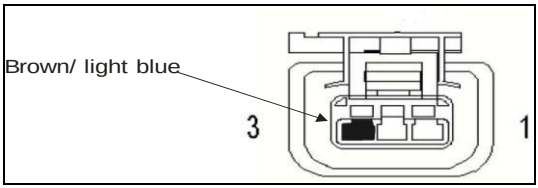


Figure 5.2 - Crank Position Sensor, looking into front of connector

☐ 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.

5.2.1 Automatic Transmission: 68RFE

☐ Locate the 23 pin connector as indicated by the arrow in the picture of the left side of the transmission (Figure 5.3). Solder and seal the long blue wire from the throttle control to the yellow wire with the dark blue stripe (Figure 5.3). 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.

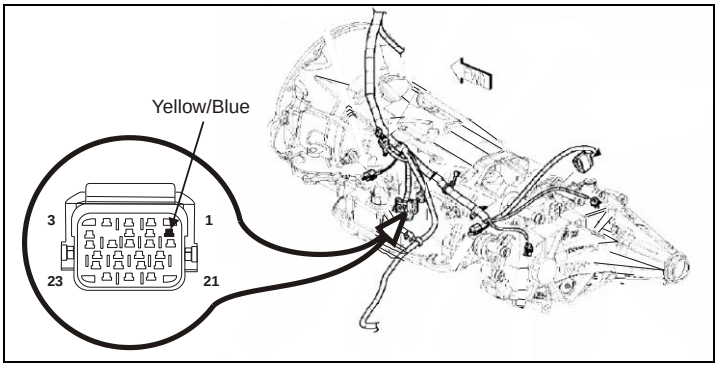


Figure 5.3 – Park Signal Connector Location – 68RFE

5.2.2 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 5.4). 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.

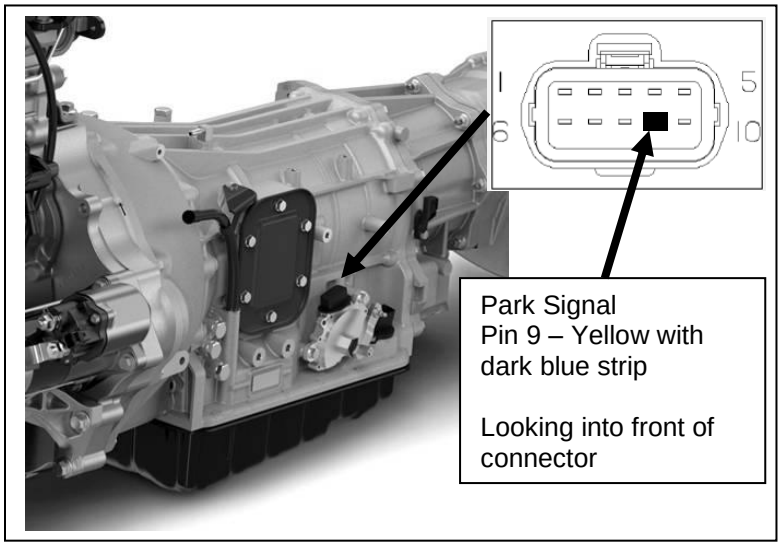


Figure 5.4 – Park Signal location – AS69RC

5.2.3 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.

5.2.4 Connecting to Key Switch 12V Supply

☐ Locate the cigarette lighter (power outlet) at the instrument panel or power outlet console.

☐ With the plastic panel off from below the drivers wheel, you can reach in behind the lighter and pull the slack from the lighter wires that are plugged into it. Unwrap the black loom and locate the blue wire with the pink stripe.

☐ Solder and seal the red ignition switched 12 Volt wire from the interface harness to the blue wire with the pink stripe.

5.3 Completing and Testing the Installation

☐ 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.

☐ Install the air box in its original mounting position. Secure the air box and connect the intake ducting.

☐ Connect the batteries.

5.3.1 Safety Test

☐ Place the automatic transmission in Park or manual transmission in neutral and apply the park brake. Turn the ignition key “ON” but do not start the engine.

☐ Check the control box to see if there is a number showing in the hour-meter. If there is no display, there is no power to the control box.

☐ Press the “ON” button. The green light should come on and you should hear the compressor clutch engage.

☐ Release the park brake. The green light should flash and the compressor clutch should disengage and flash **PARK BRAKE**. Apply the park brake again and press the “ON” button. The light should come on and the clutch should engage.

☐ On automatic transmission trucks, the engine must be running to complete the final step in the safety test. This will be done after the pre-start checks have been completed.

☐ Turn the ignition key “OFF”.

If the truck fails the test, check the wiring to make sure that all the connections are correct and secure. If you require additional assistance, contact your local VMAC dealer. Call 1-888-241-2289 or 250-740-3200.

Part 6: Finishing the Installation

6.1 Before Starting the Engine Checklist

Make sure that the following have been completed:

☐ Check the coolant.

☐ Check the compressor oil level at the tank sight glass.

☐ Do a final inspection to make sure that everything has been completed and tightened.

☐ Perform a final belt alignment check.

☐ Check all wiring for security and protection. Make sure nothing is touching the compressor body.

6.2 After Starting the Engine Checklist

Place the truck in a safe operating position and block the wheels. Ensure that there are no people around the truck before beginning the test.

Make sure that the following have been completed:

6.2.1 Automatic Transmission Trucks

☐ Ensure all compressor outlet valves are closed.

☐ With the engine running, engage the park brake; place your foot firmly on the brake pedal.

☐ Start the compressor and let the truck ramp up to 1800 rpm and then drop down to 1000 rpm. Shift the truck into gear. The engine should go to idle.

☐ Repeat this test in all gear selector positions to make sure that the engine does not idle up unless the selector is in Park or Neutral.

6.2.2 All Trucks

☐ Operate the system with an air tool for at least 1/2 hour (1 hour preferred).

☐ Road test the truck 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 coolant level after the engine has been operated.

☐ Check the compressor oil level after the engine has been shut down and the oil level has had time to stabilize.

6.3 Setup, Performance Testing and Adjustments

This system has been adjusted at the factory for general operation. If your operation requires different settings, 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 an orifice in the outlet to simulate tool use (Figure 6.1).

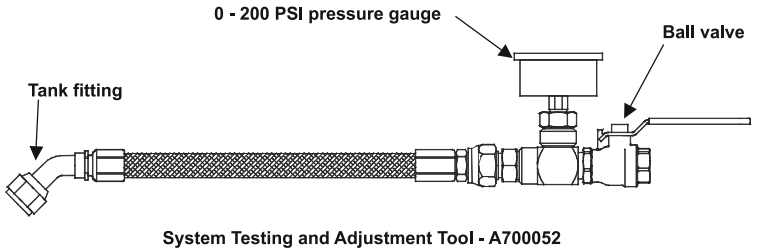


Figure 6.1

1. Install the test tool in the tank outlet fitting. If you are using the VMAC test tool, use the correct orifice fitting (small hole for VR70, large hole for VR150).

2. Make sure that the ball valve is closed.
3. Place the transmission in park and fully apply the park brake.
4. Allow the engine to run until it is at operating temperature.
5. Operate the air compressor system until the oil is warm.
6. Observe the pressure gauge. Pressure should be approximately 150 psi.
7. Open the ball valve on the test tool and observe the engine tachometer. Engine speed should increase to 1,800 to 2,200 RPM.
8. Close the air valve slowly to allow the system pressure to rise.
9. 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 start to increase when air pressure drops to approximately 140 PSI.

6.4 Auxiliary Air Receiver

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.

The line from the VMAC tank to the auxiliary air receiver must have a one-way check valve installed to prevent blow back from the auxiliary tank and to stop moisture from entering the VMAC tank (Figure 6.2).

The line to the auxiliary tank must not be installed in the bottom of the tank, but must be installed as high as possible to prevent water from entering the line.

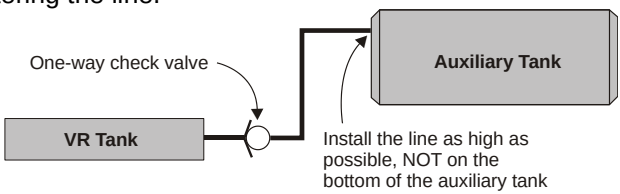
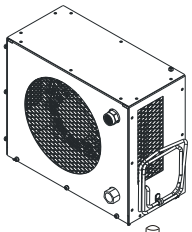


Figure 6.2

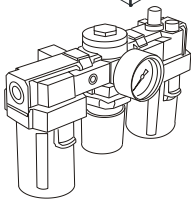
Accessory Products from VMAC

The following accessory products for your VR compressor system are available from VMAC. For more information or to order these products, call 1-800-738-8622.



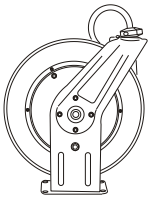
Eliminator Aftercooler

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



Filter Regulator Lubricator

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



Hose Reel

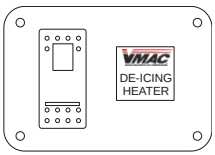
Secure, compact, retractable hose storage in a sturdy reel.

Air Receiver Tank

Thirty-five gallon capacity in a compact tank, complete with fittings and a gauge.

De-icer Kit

Insulated rope heater prevents freezing of lines and regulator.



Service Kits

Using OEM service products will extend the life of your system. Includes oil, filters, seals and O-rings. 200 hour and 400 hour service interval kits are available

VMAC – ***Vehicle Mounted Air Compressors***
Toll Free: 1-888-241-2289
Fax: 1-250-740-3201