

Installation Manual for VMAC Systems V90085 and V91005

Ford F650-F750 – 2005 7.2L Caterpillar C7 Inter-cooled Diesel

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VMAC – Vehicle Mounted Air Compressors

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Fax: 1-250-740-3201

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Installation Manual for VMAC Systems V900085 and V910005
Ford F650-F750 2005 7.2L Caterpillar C7 Inter-cooled Diesel

Changes and Revisions

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d	ECN 07-024 connections	IB 08 Feb 2007	SH 12 Feb 2007	16 Feb 2007

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.

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 which have had other changes without additional modifications. If you have difficulty with the installation, contact VMAC.

The VMAC warranty form is located at the back of this manual. 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.

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.

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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. These instructions are for both the VR70 (V900085) and VR140 (V910005) systems. This manual should be read completely before attempting installation. 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	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	M8	M10	M12	M14	M16
Foot-pounds (ft-lb)	19	41	69	104	174
Newton meter (N•m)	25	55	93	141	236

Hose Coding

Different frame designations will affect the tank mounting position. If you have to move the tank, the lines may be too short. Measure the hose shortfall and order a *Hose Extender Kit*. The following table shows the color code used by VMAC to identify hose diameters.

Hose Diameter	Colour-Coded Label
1/4 inch	Yellow
5/16 inch	Orange
1/2 inch	Blue
5/8 inch	Blue
3/4 inch	Green
1 inch	Green

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Part 1: Preparing for Installation



This manual contains installation instructions for the VR70 system (V900085) and the VR140 system (V910005). There are differences in the installation. Make sure that you read these instructions before beginning the installation to identify the specific steps that apply to your system.

- Clean around the fuel filter, injection pump, turbocharger and air intake. Also clean the front of the engine to ensure that the bracket mounts properly.
- Disconnect the vehicle batteries and drain the cooling system.
- Cut off the plastic locking rings from the radiator hoses and remove the hoses, the steel tube that is part of the upper hose assembly and the hoses from the expansion bottle.



Be careful that you do not cut through the hose when you are cutting the rings, as the hoses will be reused.

- Remove the six bolts holding the expansion bottle in place, remove the expansion bottle, then replace and tighten the two OEM bolts in the front of the mounting bracket.
- Remove the air cleaner and all ducting, including between the turbocharger and the intake.
- Remove the driver side intercooler tube.



Cover the opening on the engine and the opening on the turbocharger with plastic covers or tape to protect them from contaminants.

- Remove the left air cleaner mounting bracket and the two front bolts on the right air cleaner mounting bracket.

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- Remove any small brackets that locate hoses and wiring in the front upper engine sector.
- Remove the OEM L-brackets securing the coolant expansion bottle hose to the cross-member under the engine.
- Remove the two steel fuel lines from the fuel filter that connect to the cylinder head and to the injection pump. Cap the openings immediately to prevent contamination.
- Remove the fuel filter assembly from the engine, including the bolt that clamps the oil fill tube. Store the fuel filter upright in a clean place to prevent fuel loss and contamination.
- Loosen the two lower oil fill tube mounting bolts.
- Clean excess paint and dirt from the engine where the fuel filter was mounted.
- Remove the fan.
- Clean the inside of the crankshaft pulley and remove the bolts securing it to the harmonic balancer. Do not rotate the crankshaft pulley as this may cause engine imbalance.
- Place the crank pulley adaptor spacer on the rear of the VR crank pulley with the lip on the pulley sitting correctly in the recess of the adaptor. Align the holes.
- Position the pulley and adapter on the front of the harmonic balancer with the pins in two of the crankshaft bolt holes.
- Place the OEM crank pulley bolt ring plate on the front of the VR crank pulley.
- Apply Loctite to the supplied M10 x 100 mm bolts, thread them into the pulley holes and torque them to specifications.

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Part 2: Installing the Tank and Hoses

2.1 Installing the Tank



Use Loctite on all bolts.

- Place the tank support brackets in position on the driver side of the frame, just behind the cross member mounting bolts.



If the tank cannot be mounted on the driver side frame rail, it can be mounted on the passenger side, but will require a hose extender kit (see the appropriate section in General Information).

- Set the first bracket 7 inches and the second bracket approximately 23 inches back from the cross-member mounting bolts in the frame (Figure 2.1).
- Remove the pinch bolts from the C-clamps, spread them slightly and fit them over the tank.
- Install the pinch bolts and tighten them enough to hold the C-clamps in place but still permit movement.
- Place the tank in position on the frame and thread the bolts through the C-clamps into the mounts, but do not tighten.



System V900085 has two bolts attaching each C-clamp to the bracket while system V910005 has four bolts.

- Adjust the tank so that the front of the tank is 6 inches from the front C-clamp (Figure 2.1). Rotate the tank so that the “UP” arrow points upward.
- Tighten the C-clamps.

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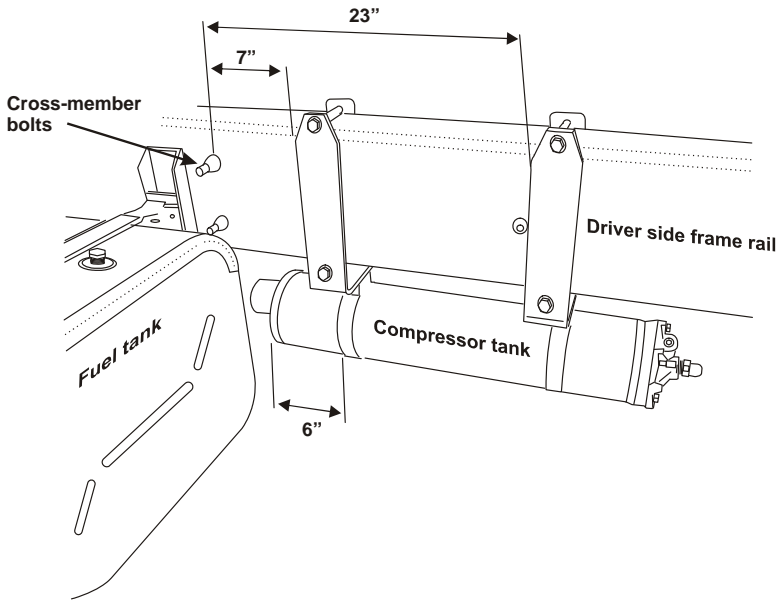


Figure 2.1

- Install the 1/4 and 5/16 inch steel lines, complete with hoses, into the matching fittings on the back of the tank, but do not tighten the fittings.
- Remove the two inner C-clamp bolts, place two double-tube insulated clamps over the tubes and fasten them in place along with the inside of the C-clamps (Figure 2.2).

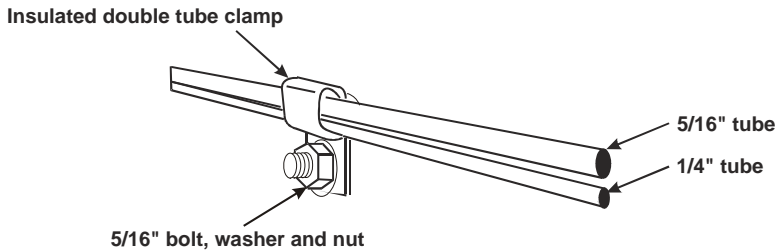


Figure 2.2

- Tighten all bolts
- Tighten the steel tube fittings on the back of the tank

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2.2 Connecting the Hoses

- On the **V900085** system, connect the straight ends of the 3/4 inch and the longest 1/2 inch hose to the matching fittings on the front of the tank, but do not tighten the fittings.
- On the **V910005** system, connect the straight ends of the 1-1/4 inch and the longest 5/8 inch hose to the matching fittings on the tank, but do not tighten the fittings.
- Route all the hoses together along the frame rail to the front of the vehicle. Fasten them together with nylon ties and secure them to the OEM support brackets that are located at regular intervals along the frame (Figure 2.3).
- On the **V900085** system, route the 1/2 inch hose from the tank along the frame to the cross beam at the rear of the cab, then over to the passenger side frame rail and up to the engine mount.



Select a route that will clear the exhaust and the turbocharger piping.

- When all the hoses have been routed and secured, tighten the fittings at the tank.

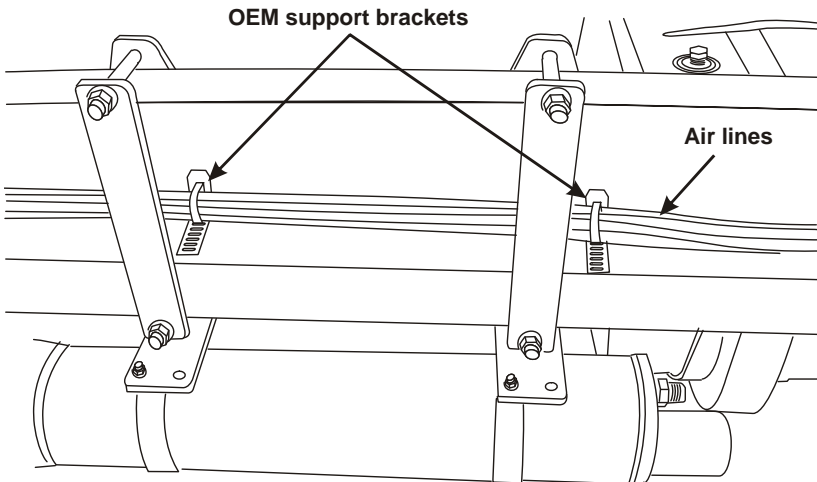


Figure 2.3

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Part 3: Installing the Cooler, Bracket and Compressor



Use Loctite on all bolts.

3.1 Installing the Oil Cooler

3.1.1 System V900085

- Install the OEM lower radiator hose (with HS40 and HS32 hose clamps) on the engine spigot but reverse the hose direction so that it faces to the rear of the truck. Leave the clamps loose.
- Install the supplied piece of heater hose to the small spigot on the top of the cooler and tighten the clamp.
- Place the cooler on the passenger side of the lower engine block (just in front of the oil filter) and fit the slot in the mounting plate over the engine lug.
- As the cooler is maneuvered into place, push the hose spigot on the top of the cooler into the OEM reversed hose (Figure 3.1).



Make sure that the 1 inch coolant tank hose that runs along the engine cross-beam is in the cut-out notch of the cooler back plate.

- Align the four mounting holes with the threaded holes in the engine, install the four M14 x 30 mm bolts and torque to specifications.

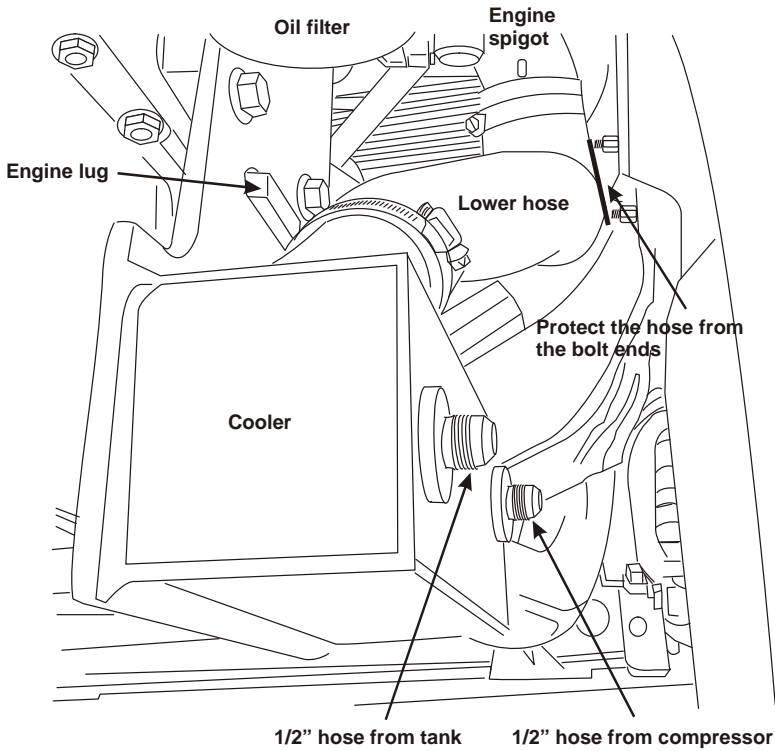


Figure 3.1

- Align the radiator hose to clear the engine frame cross beam bolts (Figure 3.1) and tighten the clamps.



Make sure that you provide sufficient clearance or cover the bolt ends so that the hose will not contact them. The hose will swell during engine operation.

- Install the supplied 90 degree rubber coolant hose between the radiator and the cooler, with the small end on the radiator and the large end on the cooler. Secure with hose clamps.
- Locate the heater supply hose that connects between the heater core and the back of the thermostat housing.
- Cut the hose 2 inches back from the connection at the thermostat housing and install the supplied T-connector.

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- Connect the hose from the cooler to the T-connector and secure all hoses with clamps.

3.1.2 System V910005

- Position the cooler on the forward part of the engine mount cross beam with the oil hose connections facing to the rear and align the holes in the cooler mounting bracket with the existing holes in the front of the cross beam (Figure 3.2).

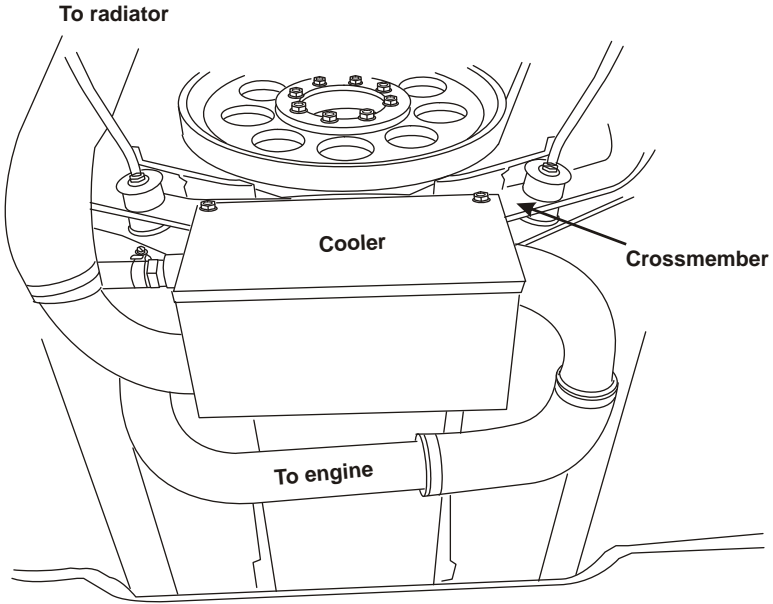


Figure 3.2

- Fasten the cooler in place with two M10 x 25 mm hex bolts, washers and Nylok nuts.
- Reverse the direction of the OEM lower radiator hose and connect it between the cooler and the water pump (Figure 3.3). Secure it with clamps.
- Install the supplied lower radiator hose between the cooler and the radiator, with the longest straight end attached to the radiator.

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- Rotate the hose as required to provide adequate clearance from the spring bolts.

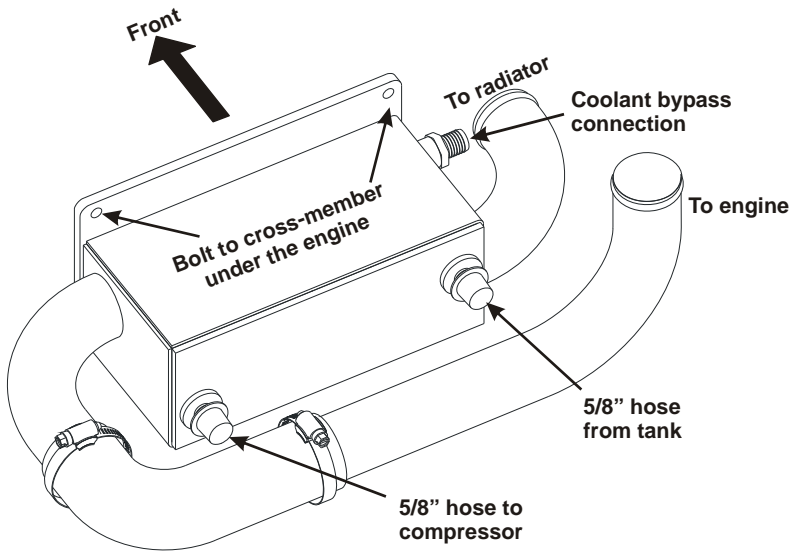


Figure 3.3

- Locate the heater supply hose that connects between the heater core and the back of the thermostat housing.
- Cut the hose 2 inches back from the connection at the thermostat housing and install the supplied T-connector.
- Connect the hose from the cooler to the T-connector and secure all hoses with clamps.

3.2 Installing the Main Bracket and Compressor

- Install the 45 degree end of the replacement fuel hose to the fitting on the cylinder head. Position the fitting so that it points upward to clear the head and tighten the fitting.



You may have to grind the corner from the front engine lifting bracket to provide clearance for the fitting.

- Loosen the front cooling line to the air brake compressor and remove the clamp that secures it to the oil fill bracket.

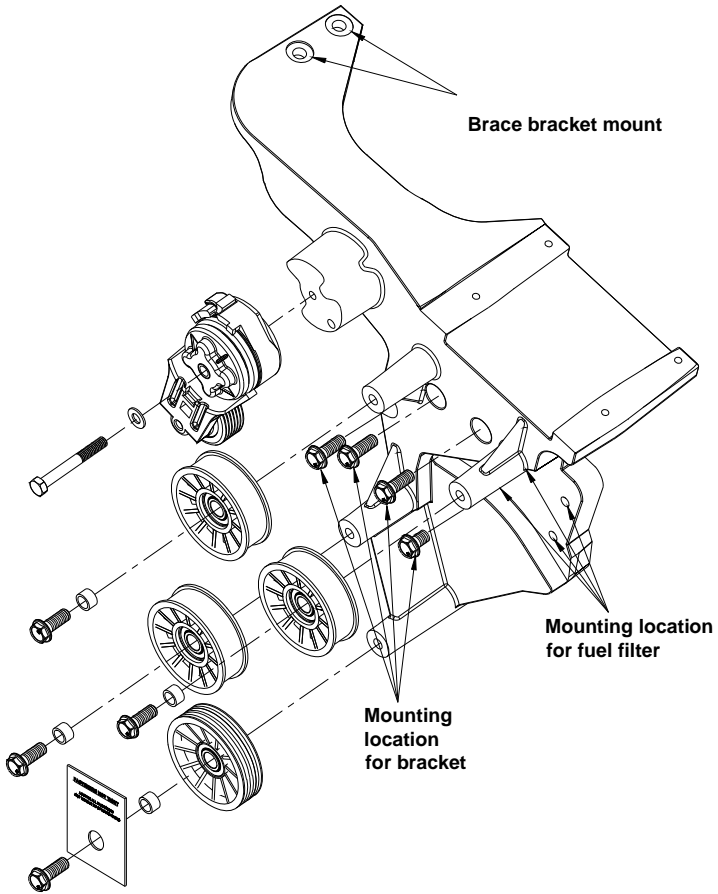


Figure 3.4

- Remove the idlers and tensioner from the main bracket (Figure 3.4). Place the main bracket in position on the front upper driver side of the engine timing cover and align the mounting holes.
- Adjust the air brake compressor cooling hose to clear the bracket and tighten the fitting.

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- Install three M10 x 60 mm and one M10 x 35 mm flange head bolts into the holes that originally held the fuel filter/primer pump assembly and hand-tighten.



Make sure that the passenger side section of the bracket is under the wiring harness and any hoses.

- On the passenger side, install the steel brace bracket on the two front bolt holes for the engine right side air cleaner bracket, with the machined section of the brace bracket on top of the OEM bracket and under the edge of the main bracket.
- Insert the two OEM air cleaner mount bolts into the holes that overlap the right side air cleaner bracket and two 3/8 x 1 inch supplied bolts through the two forward holes.
- On the **V900085** system, insert two M10 x 25 mm hex head bolts with flat washers through the top of the main bracket and thread them into the brace bracket.
- On the **V910005** system, place the compressor remote air filter mounting bracket over the VR bracket and insert two M10 x 30 mm socket head bolts with flat washers through the top of the main bracket and thread them into the brace bracket.
- Check the alignment of the brackets, snug the bolts down initially using the following sequence and check for proper fit, then tighten in the following sequence:
 - two upper brace to cast bracket bolts
 - four main casting bolts to the front of the engine
 - four brace bracket bolts to the cylinder head



During tightening, make sure that alignment is correct and there are no gaps. Do not use the bolts to force gaps to close, check and correct the reason for the gap.

- Tighten the air compressor coolant hose; with the hose tight against the front of the engine and clear of the OEM belt.
- Install the fan spacer and the fan. Torque to specifications.

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- Install the VR belt tensioner, the three back idlers to the upper posts of the bracket and the ribbed idler to the lower post.

3.2.1 V900085 Compressor Installation

- Place the compressor with adaptor plate (Figure 3.5) in position on the main bracket and align the holes in the plate with the threaded holes in the main bracket.

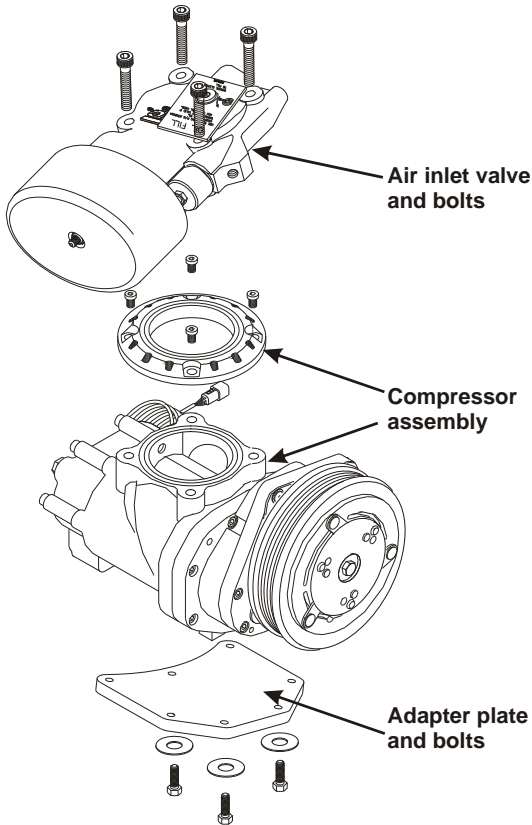


Figure 3.5

- Insert the four M8 socket head bolts through the adaptor plate, thread them into the main bracket and torque to specifications.

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3.2.2 V910005 Compressor Installation

- Remove the inlet valve from the compressor to provide access for fastening the compressor to the bracket (Figure 3.6).



Immediately cover the opening on the compressor to prevent contamination.

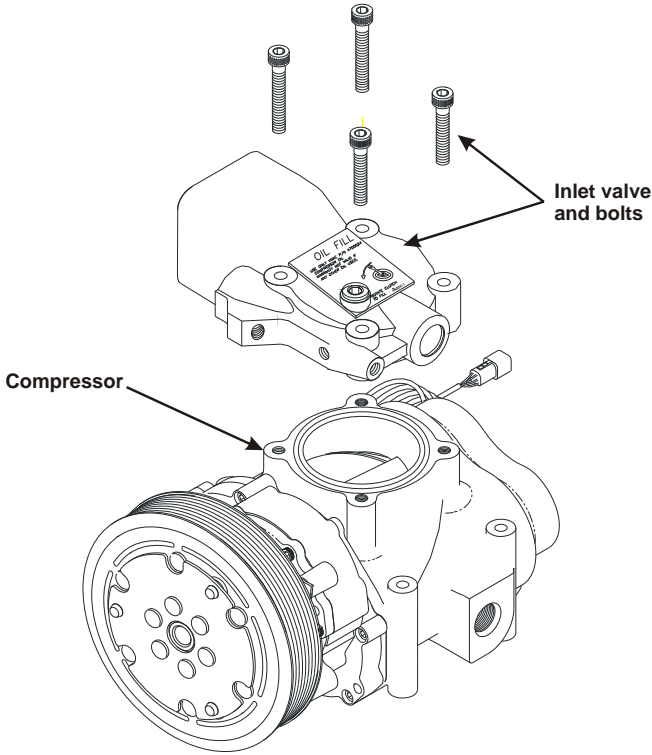


Figure 3.6

- Place the compressor in position on the adapter plate that is attached to the main bracket. Align the compressor mounting bolt holes with the holes in the adapter plate.
- Install the M8 x 100 mm bolts through the compressor mount holes and the adapter plate and thread them into the bracket. Tighten them down evenly and then torque them to specifications.

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- Install the inlet valve and torque the socket head bolts to specifications.
- Install the 6-1/2 inch convoluted ducting hose between the air inlet valve and the remote air cleaner. Secure it with clamps.

3.3 Connecting the Hoses

- Route the hoses from the tank up into the engine compartment.



Do not connect the 5/16 and 1/4 inch hoses until the intercooler tube has been installed.

3.3.1 V900085 System

- Connect the 3/4 inch hose to the matching fitting on the compressor and tighten.
- Connect the 90 degree end of the 1/2 inch hose from the tank to the rear fitting on the cooler (Figure 3.1) and tighten the fitting.
- Connect the 90 degree end of the short 1/2 inch hose to the front oil cooler fitting. Route the hose over the engine, connect it to the matching fitting on the compressor and tighten the fittings.

3.3.2 V910005 System

- Connect the 45 degree end of the 1-1/4 inch hose and tighten to the matching fitting on the compressor and tighten the fitting.
- Connect the 5/8 inch hose from the tank to the fitting on the driver side of the cooler and tighten the fitting (Figure 3.3).
- Connect the remaining 5/8 inch hose between the passenger side fitting on the cooler and the matching fitting on the compressor and tighten the fittings.



Make sure that none of the hoses will interfere with moving parts or contact hot objects. Secure them with ties or clamps. Protect them where they might rub.

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3.4 Completing the Installation

- Mount the fuel filter assembly to the front of the main bracket using two M10 x 50 mm bolts in the upper location, one M10 x 30 mm bolt to the lower inner location and one M10 x 60 to the lower outer location. (Figure 3.7). Mount the oil fill tube in place at the same time with the supplied spacer. Make sure that you use a flat-head bolt next to the oil fill tube so that the cover on the tube can be easily removed.
- On the **V910005** system, install the coolant tube retaining bracket and tube clip to the lower right fuel filter mount location using an M10 x 60 mm socket head bolt.
- Rotate the T-fitting on the front of the fuel filter approximately 60 degrees clockwise (to about the 11 O'clock position) to clear the bracket and compressor.
- Route the fuel line from the cylinder head behind and under the compressor, install it on the T-fitting and tighten.
- Install the 90 degree end of the remaining replacement fuel hose onto the fitting on the injector pump. Angle the hose upward to clear the pump and engine block but do not tighten the fitting.
- Route the fuel line from the injector pump to the 90 degree fitting on the fuel filter and tighten the fitting on the fuel filter.
- Operate the fuel primer pump until fuel fills the new line and no more air bubbles out past the fitting on the injector pump. Tighten the fitting on the injector pump.



If you do not clear the air in the hose between the injector pump and the filter, air will enter the fuel system and the engine will not start.

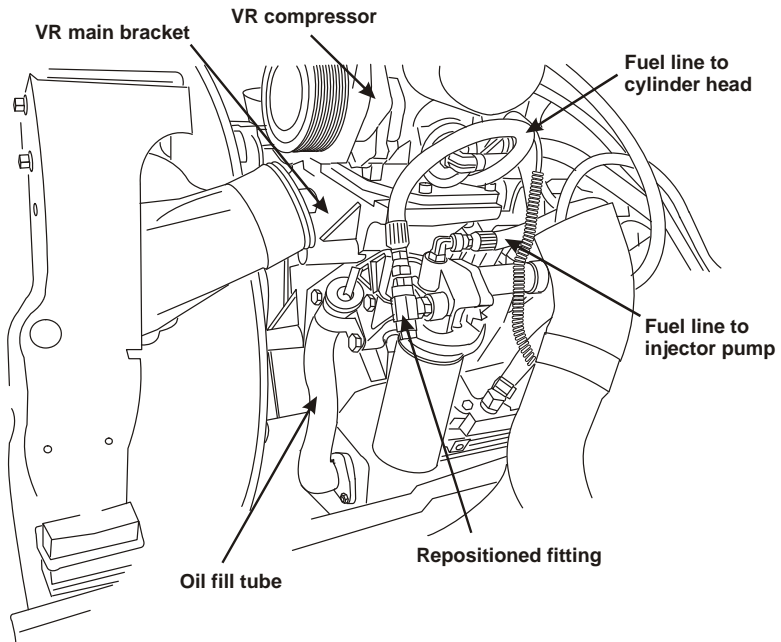


Figure 3.7

- Install all intercooler tubes and tighten the clamps.
- Route the 5/16 inch hose from the tank up to the compressor, connect it to the matching fitting and tighten the fitting.
- Route the 1/4 inch hose from the tank outside the intercooler tube, loop it around the back of the compressor, connect it to the matching fitting and tighten.
- Install the short, straight OEM bottom flex hose to the radiator fitting.
- Install the supplied steel coolant pipes and flex hoses onto the lower hose, around the outside of the intercooler connection, over the top of the fan shroud and to the thermostat housing (Figure 3.8 - viewed from the front of the engine).
- Adjust the tubes to provide clearance for the compressor clutch and secure with clamps.

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- Install the 1/2 inch aluminum block to the bottom coolant bottle mounting position on the radiator with two M8 x 30 mm bolts.

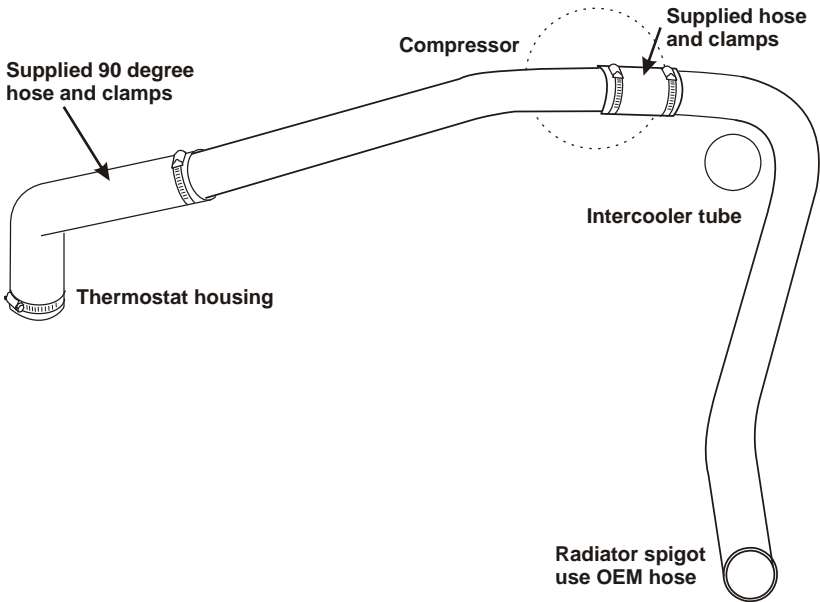


Figure 3.8

- Install the coolant expansion bottle to the lower block bracket with the OEM bolts. Attach the hoses, with the hose in the groove on the main bracket and away from all moving parts.
- Fit the upper extender bracket over the studs on the top mounting location. Secure the top of the bottle with two M8 x 16 mm bolts and serrated nuts.
- Attach a large insulated clip over the metal radiator hose and secure it to the bracket on the fuel filter mount.
- Fill the cooling system to manufacturer specifications.
- Check all wiring harnesses, hoses and other items to make sure that they are secure and will not contact any moving parts.



Tighten all fittings before adding oil to the system.

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- Install the VR compressor belt (Figure 3.9). On the V900085 system this is a 6-rib belt. On the V910005 system this is an 8-rib belt.

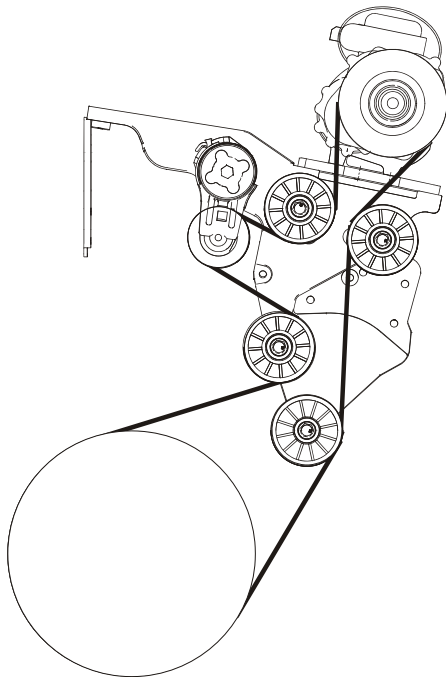


Figure 3.9

3.4.1 Engine Air Cleaner Installation

- Install the supplied air cleaner mounting bracket onto the pegs on the OEM passenger-side mounting bracket. Install the OEM bolts into the other end and tighten.
- Push the air cleaner-to-turbo connection into the rear of the air cleaner and rotate it into the approximate position to match the induction pipe from the front of the engine. Partially tighten the clamp, but leave it loose enough to adjust.
- Install the intake plastic duct to the turbo inlet and do not tighten.

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- Install the two shortest 3/8 inch bolts from the inside on the driver side of the bracket and install flat washers and Nylok nuts on the outside.
- Install the longer 3/8 inch bolts from the inside on the passenger side of the bracket and install flat washers and Nylok nuts on the outside. Tighten all bolts and clamps securely.

3.4.2 Air Cleaner Duct Modifications

- Cut the short, plastic air intake tube that attaches the air cleaner to the resonator (Figure 3.10). Discard the bent section.
- Install the air intake ducting, align for best fit, clamp all connections and tighten the intake mount plate.

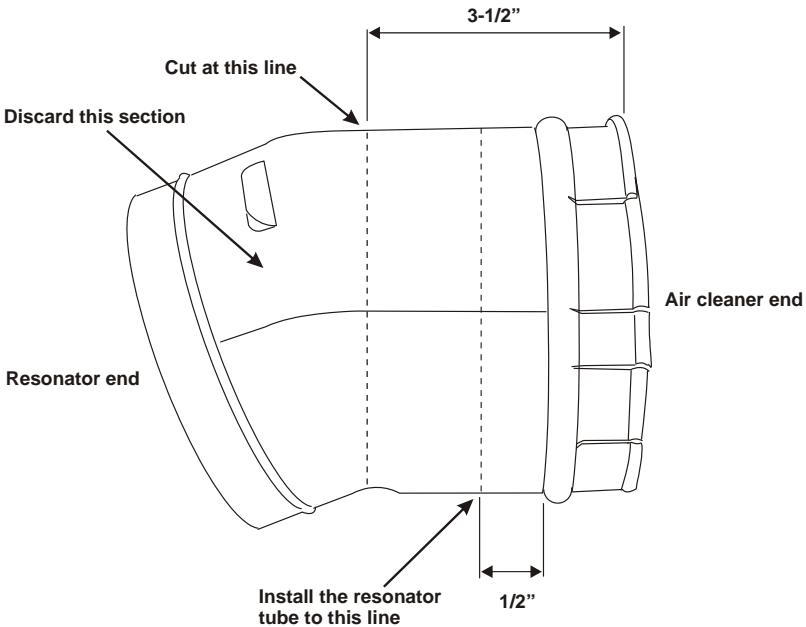


Figure 3.10

3.5 Adding Oil to the System

- Remove the fill plug from the air inlet control valve and pour oil into the oil fill hole on the inlet control valve using a funnel.



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

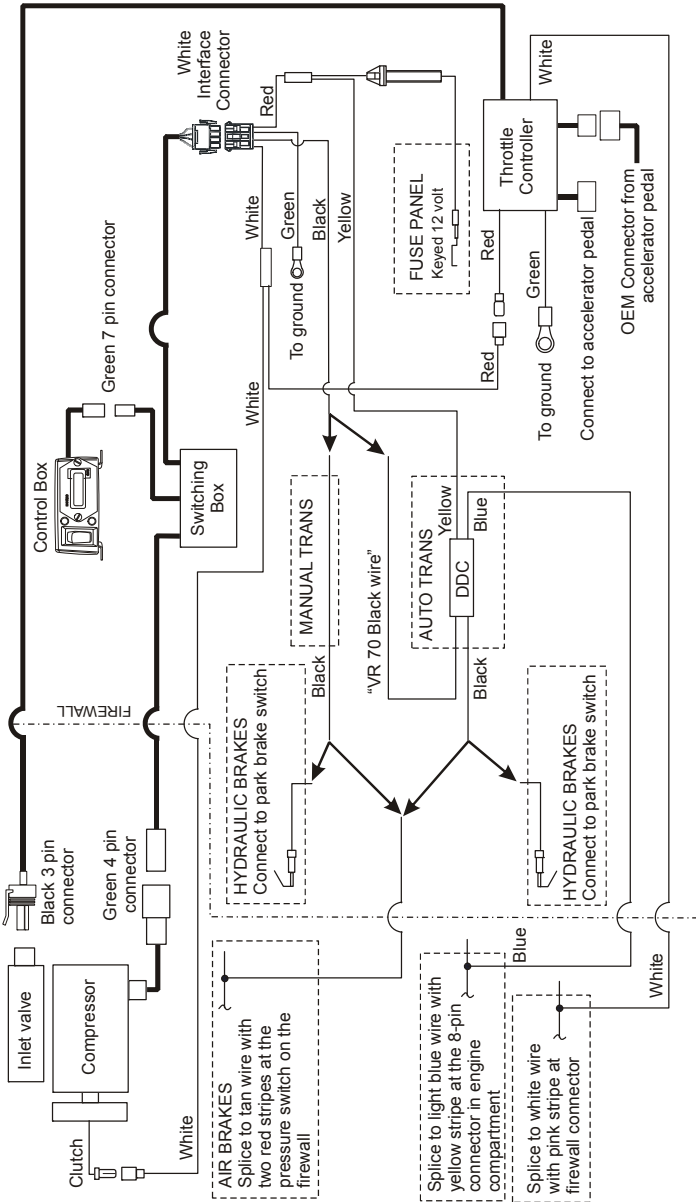
- Turn the compressor clutch clockwise with a ratchet and a 1/2 inch socket using the hex head bolt at the centre of the compressor clutch during the fill process.
- Allow 5 minutes for the oil to drain into the tank, check the level at the sight glass and continue adding oil until the level is correct.



Do not overfill the system, as this can flood the sight glass window and make the system appear empty.

- Install the fill plug in the inlet control valve and tighten it securely.

Part 4: Installing the Control Components



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4.1 Installing the Control Boxes

- Study the wiring diagrams and locate the wires on the components so that you are familiar with the connections.
- Mount the control box to the bottom of the center console on the dash using the supplied sheet metal screws (Figure 4.1).

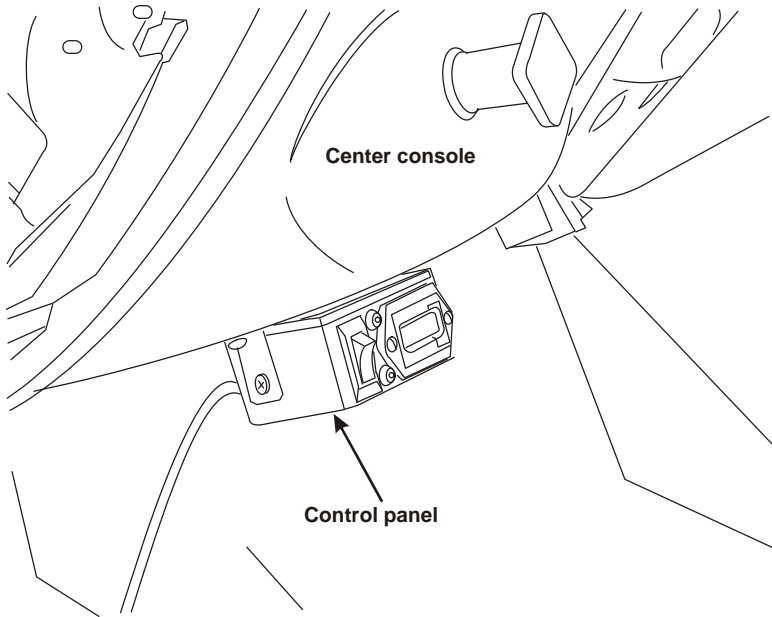


Figure 4.1

- Mount the switching box under the dash to the right of the fuse panel using nylon ties (Figure 4.2).
- Mount the throttle control box under the dash to the right of the steering column (Figure 4.3) using nylon ties.

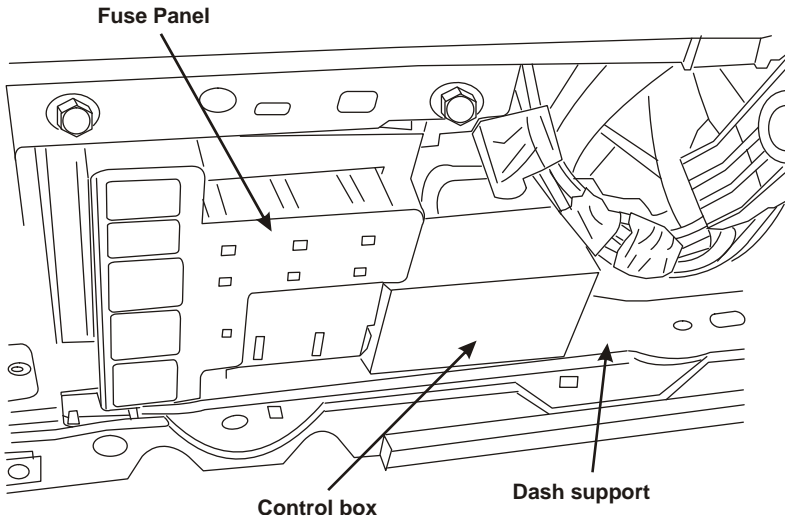


Figure 4.2

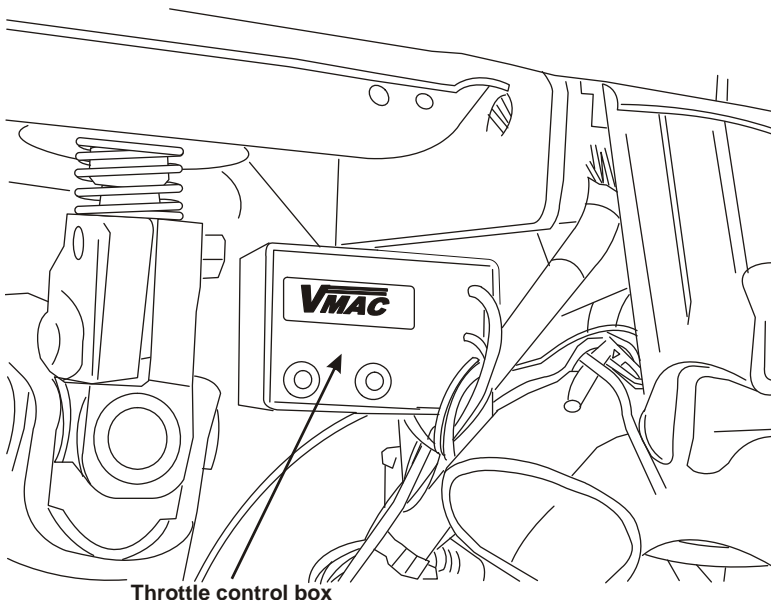


Figure 4.3

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- Locate the black plastic firewall plug to the left of the steering column and drill a 3/4-7/8 inch hole in the plug to route the wires into the engine compartment (Figure 4.4).

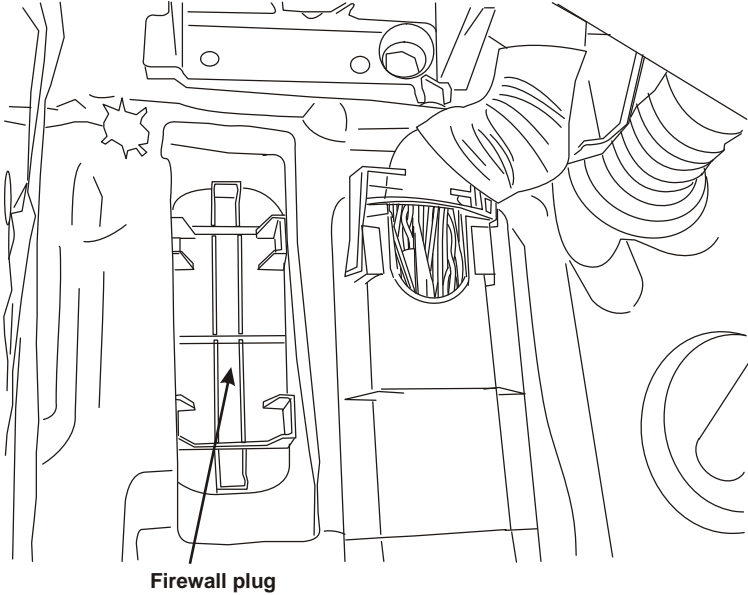


Figure 4.4

- Plug the white interface connector into the matching connector from the switch box.
- Route the following wires over the steering column, through the hole in the plastic firewall plug and into the engine compartment:
 - grey wire with the black pressure transducer connector from the throttle control
 - grey wire harness with the small green four-pin temperature probe connector from the control unit
 - single white compressor clutch wire from the interface connector
 - white wire from the throttle control box
- Secure all of the wiring under the dash so that it does not interfere with any moving parts.

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4.2 Connecting the Wiring Harnesses

- Attach the green ground wire from the interface connector and the green wire from the throttle control box to an OEM ground bolt on the dash above the data link connector (Figure 4.5).

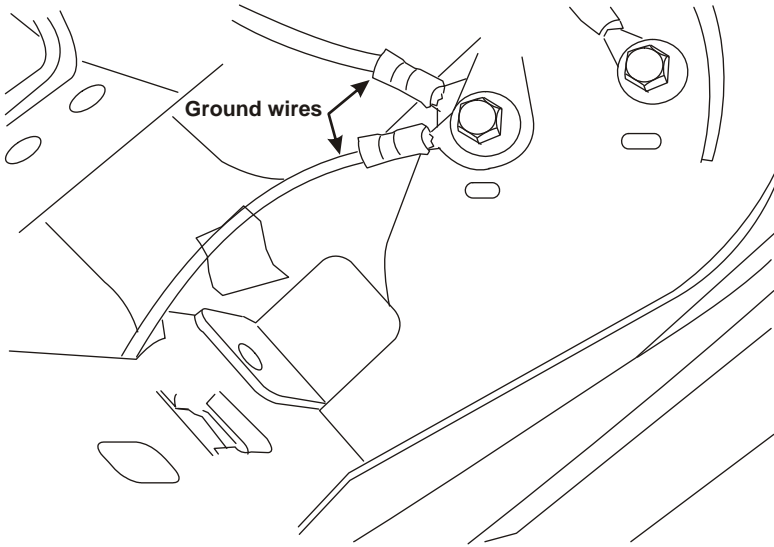


Figure 4.5

- Connect the red wire from the interface cable to the red wire at the throttle control box.
- Remove the OEM connector from the throttle pedal, connect the wiring from the throttle control box to the throttle pedal and the OEM connector to the matching plug from the throttle control box.
- Locate the key-switched 12V OEM wire under the dash. The wire is grey with a light blue stripe (Figure 4.6).



This is a blunt-cut wire in a bundle attached to the wires coming from the data-link connector. Fuse number is 102 (20 A) in the power distribution box.

- Crimp the red key switched 12V wire from the interface harness to the OEM wire using a butt-connector.

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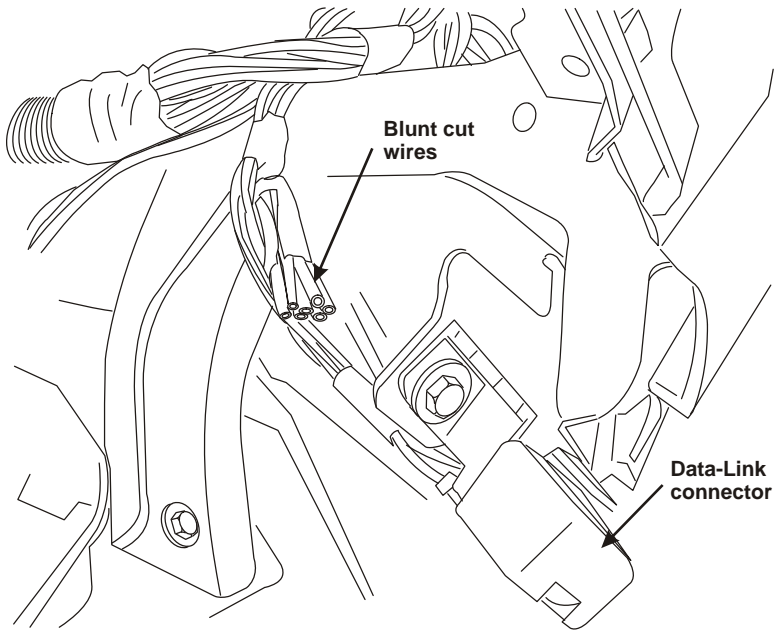


Figure 4.6

- Secure all of the wiring under the dash so that it does not interfere with any moving parts.
- Route the white wire to the middle connector on the driver's side of the firewall in the engine compartment (Figure 4.7).
- Cut back the wrap around the wire harness and find the white wire with a pink stripe. Without cutting the wire, remove enough insulation to wrap the white tach wire around it. Solder the joint and seal it with silicone wrap or electrical tape.
- Route the remaining wires coming through the firewall to the compressor and attach them to the matching connectors on the compressor.
- Ensure that all engine compartment wires are away from hot spots and moving parts. Protect them with plastic loom and secure them with nylon ties.

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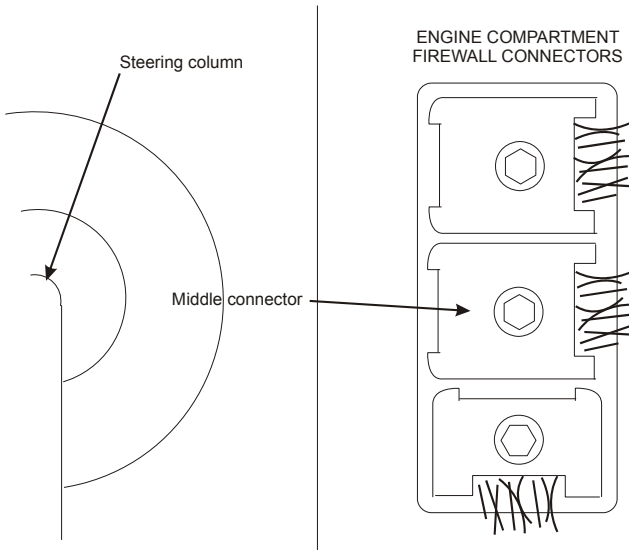


Figure 4.7

- Connect the long black jumper wire with the piggyback spade connector to the black wire at the interface connector. Tape this connection.

4.2.1 Vehicles with Automatic Transmissions

- Mount the Drive Disable Circuit (DDC) under the dash near the throttle control using nylon ties.
- Connect the black wire with the male spade connector from the DDC to the black wire with the female spade connector at the interface cable.
- Connect the yellow wire from the DDC to the yellow wire at the interface cable.
- Solder the black wire to the wire at the air brake pressure switch that is tan with two red stripes and protect the connection with electrical tape.



Identify the transmission type as either WTEC MD or Allison 2000/2400. These transmissions will have different connections. Pay careful attention to the following information.

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- Locate the connectors near the front dash panel between the engine and the driver's side wheel well (Figure 4.8). There will be one connector on trucks with the 2000/2400 transmission and two connectors on trucks with WTEC MD transmission.

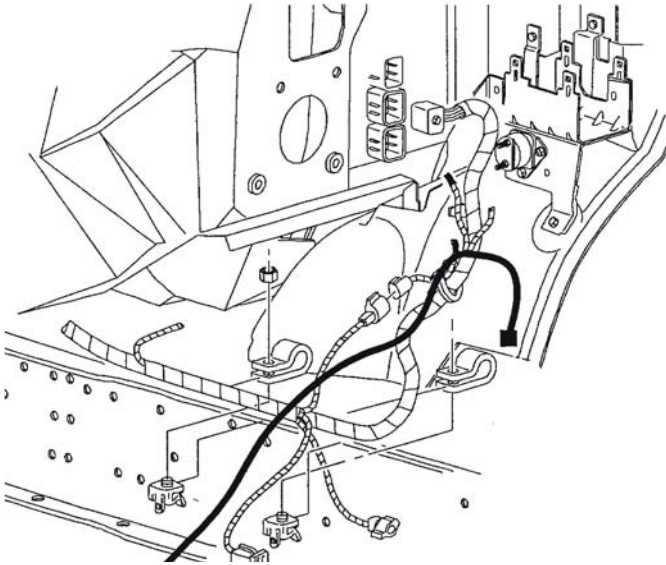


Figure 4.8

- Identify the connector in Figure 4.9 that matches the transmission type. Note that there are two connectors on vehicles with WTEC transmissions; use the 7205 connector.

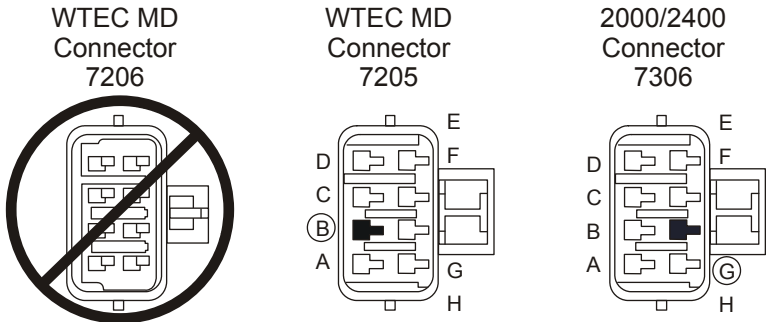


Figure 4.9

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- For WTEC MD transmissions, locate pin “B” on connector 7205 (Figure 4.9). It will be a light blue with yellow stripe wire. Do not use connector 7206. Probe the wire and confirm 0 Volts in Neutral and 12 Volts in all other gears. Solder the blue wire to this wire and protect the connection with electrical tape.
- For 2000/2400 transmissions, locate pin “G” in connector 7306 (Figure 4.9). It will be a yellow with black stripe wire. With the engine running, brake pedal pressed, and wheels blocked, probe the wire and confirm 0 Volts in Neutral and 12 Volts in all other gears. Mark this wire for identification. With the batteries disconnected, solder and seal the blue wire to this wire.

4.2.2 Vehicles with Hydraulic Brakes

- Route the black wire with the piggyback connector under the floor mat to the park brake and remove the cover from the park brake assembly.
- Remove the OEM connector from the park brake switch (Figure 4.10), connect the wire with the piggyback connector to the park brake switch and install the OEM connector to the piggyback connector.
- Replace the cover.

4.2.3 Vehicles with Air Brakes

- Route the black wire into the engine compartment through the firewall.
- Splice the black wire to the tan wire with two red stripes at the air brake pressure switch on the firewall (Figure 4.11). Seal the splice with electrical tape.



Figure 4.10

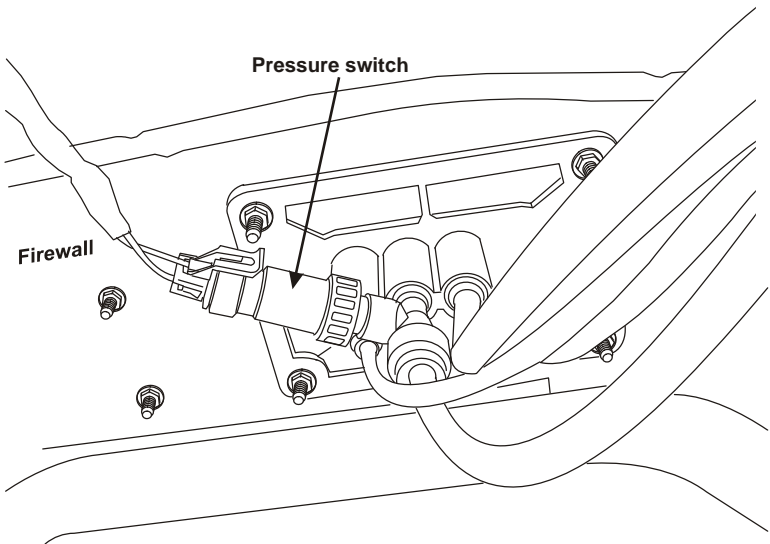


Figure 4.11

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4.3 Testing the Safety Circuit

- Connect the batteries.



On trucks with air brakes, you will have to run the engine until the air brake system is up to operating pressure then shut-down the engine before testing the system.

- Place the automatic transmission in Park or Neutral 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.
- Turn the control box switch to the “ON” position. The green light should come on and you should hear the compressor clutch engage.
- Release the park brake. The green light should go out and the compressor clutch should disengage. Apply the park brake again and the light should come on and the clutch should engage.
- Shift the automatic transmission out of Park or Neutral. The light should go out and the compressor clutch should disengage. Check all gear selector positions to make sure that the light does not come on unless the selector is in Park or Neutral.



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 1-800-738-8622 or 250-740-3200.

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Part 5: Finishing the Installation

5.1 Before Starting the Engine Checklist

Make sure that the following have been completed:

- Check the coolant.
- Check the compressor oil level.
- Do a final inspection to make sure that everything has been connected and tightened.
- Perform a final belt alignment check.
- Check all wiring for security and protection.

5.2 After Starting the Engine Checklist

Make sure that the following have been completed:

- Road test the truck for approximately 14 miles (20 km)
- Watch the underhood operation to make sure that belts rotate properly and nothing is rubbing or contacting hot parts.
- Check all components once the engine is turned off and the system has cooled
- Check the coolant after the engine reaches operating temperature.
- Check the compressor oil level after the engine has been shut down and the oil level has had time to stabilize.

5.3 Setup, Performance Testing and Adjustments

This system has been adjusted at the factory for general operation. If your tests indicate that adjustment is necessary, 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 5.1).

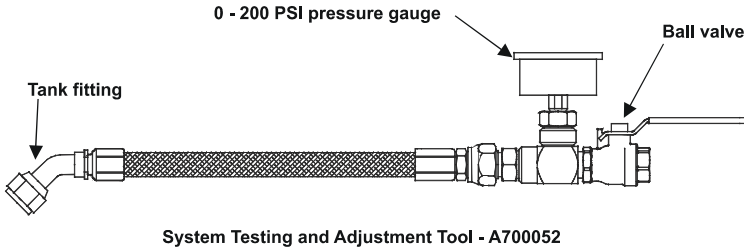


Figure 5.1

1. Install the test tool in the tank outlet fitting.
2. Make sure that the ball valve is closed.
3. Place the manual transmission in neutral or the automatic 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 about 1,800 - 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 ramp-up when air pressure drops to approximately 140 PSI.

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5.4 System Identification and Warnings

The System Identification Number Plate must be attached to the truck at the time of installation (Figure 5.2). This plate provides information which allows VMAC to assist in customer inquiries and the ordering of parts. Mark and drill two 7/64 inch holes, then secure the plate with self-tapping screws.

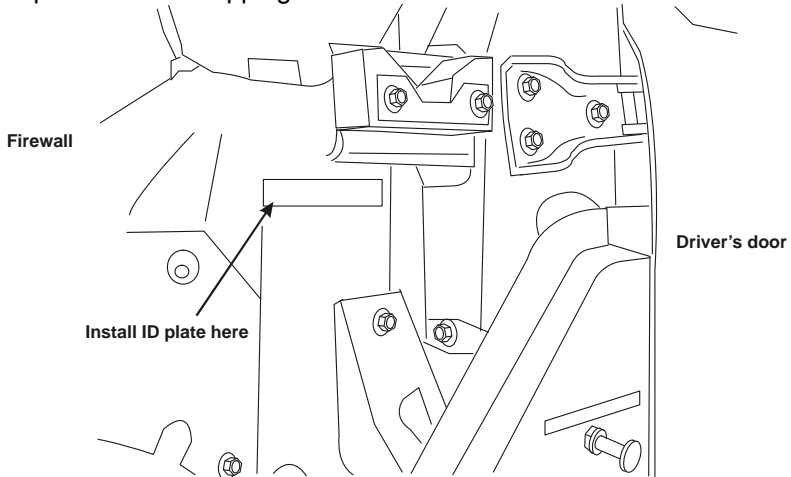



Figure 5.2

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 5.3).



This Vehicle is Equipped with a VMAC Air Compressor System

OPERATING INSTRUCTIONS

<p>Daily Pre-Start Check</p> <ol style="list-style-type: none">1. Check Oil Level in Tank2. Check Drive Belt3. Check for Leaks	<p>Start Up Procedure</p> <ol style="list-style-type: none">1. Ensure Compressor is OFF2. Ensure discharge valve is CLOSED3. Ensure air system is discharged4. Place vehicle in Neutral or Park and engage vehicle safety features - park brake5. Start engine and bring up to operating temperature6. Turn ON compressor	<p>Shutdown Procedure</p> <ol style="list-style-type: none">1. Allow engine to idle for 1 minute2. Turn OFF compressor3. Wait for system to discharge for 1 minute before restarting
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For Technical Support/Parts contact your VMAC Dealer
To locate your nearest dealer call 1-800-738-8622 (250-740-3200)

⚠ WARNING

Always allow system pressure to discharge before restarting

Figure 5.3

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5.5 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 (part #3600078) to prevent blow back from the auxiliary tank to stop moisture from entering the VMAC tank (Figure 5.4).

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.

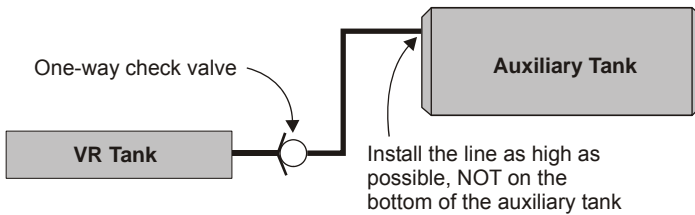
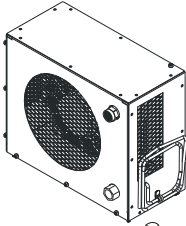


Figure 5.4

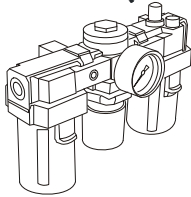
Accessory Products from VMAC

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.



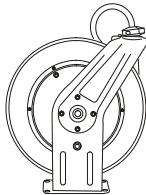
Eliminator Aftercooler

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.



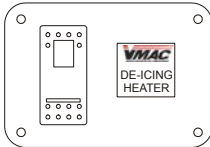
Air Receiver Tank

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



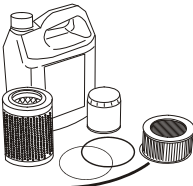
De-icer Kit

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



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