Installation Manual for VMAC System V900093

General Motors 2006 – 2007

Duramax Diesel 2500HD – 3500HD

System V900103

General Motors GMT900 2007 – 2010

Duramax Diesel 2500HD – 3500HD

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

Installation Manual - Document #1930105
VMAC System V900093
General Motors 2006 and 2007 Duramax Diesel 2500HD – 3500
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Changes and Revisions

Version	Revision Details	Revised by/date	Approved	Implemented
L	ECN 09-072	SL 16 June 2009	MH 16 Jun 2009	16 Jun 2009
M	ECN 09-081	SL 1 Oct 2009	PD 1 Oct 2009	1 Oct 2009
N	ECN 09-109	SL 27 Oct 2009	TG 27 Oct 2009	28 Oct 2009
P	ECN 10-041	SH 1 Sept 2010	SM 1 Oct 2010	6 Oct 2010

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 vehicles 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 to the truck. If you have difficulty with the installation, contact VMAC.

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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 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

Hose Information

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*.

Special Installation Notes

The following special tools are required:

- 36 mm 12 point 1/2 inch drive socket for removing the OEM crankshaft bolt
- crankshaft locking tool (GM #J-44643) or VMAC equivalent (Part #5900010)
- VMAC crankshaft pin extraction tool (Part #5900076)

The following additional materials are recommended:

- assorted sizes of fireproof protective plastic loom
- assorted lengths of nylon tie-straps

Part 1: Warranty and System ID

☐ Complete the warranty form. 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.

System Identification and Warnings

The System Identification Number Plate must be attached to the vehicle at the time of installation (Figure 1.1). This plate provides information that 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.

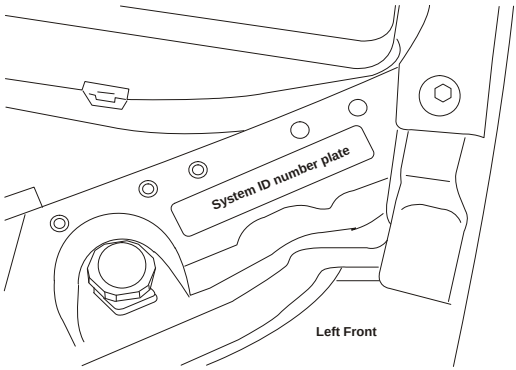


Figure 1.1

☐ 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 (Figure 1.2).

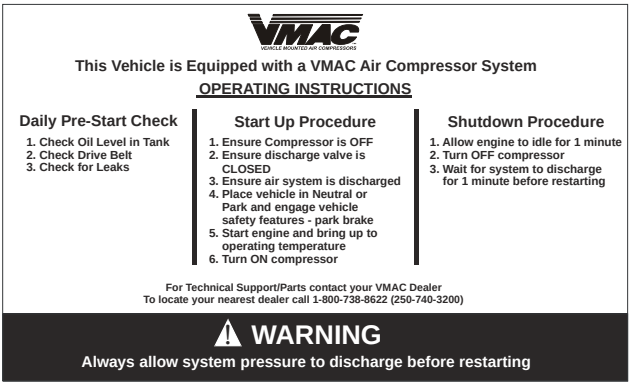


Figure 1.2

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

2.1 Preparing for Installation

Preparation for installation is very important. Missing an item can cause problems in the installation or even damage components. Check off each item as it is completed.

2.1.1 V900093 Automatic Transmission Trucks

☐ Locate the ECM in the engine compartment (Figure 2.1) and find all wires that are orange with a black stripe in the bottom connector. Use a digital voltmeter (***DO NOT USE A TEST LIGHT***) to determine which wire has 0 Volts in Park/Neutral and 12 Volts in all other gear selector positions with the ignition on. Mark the wire with a piece of tape and turn the ignition off.

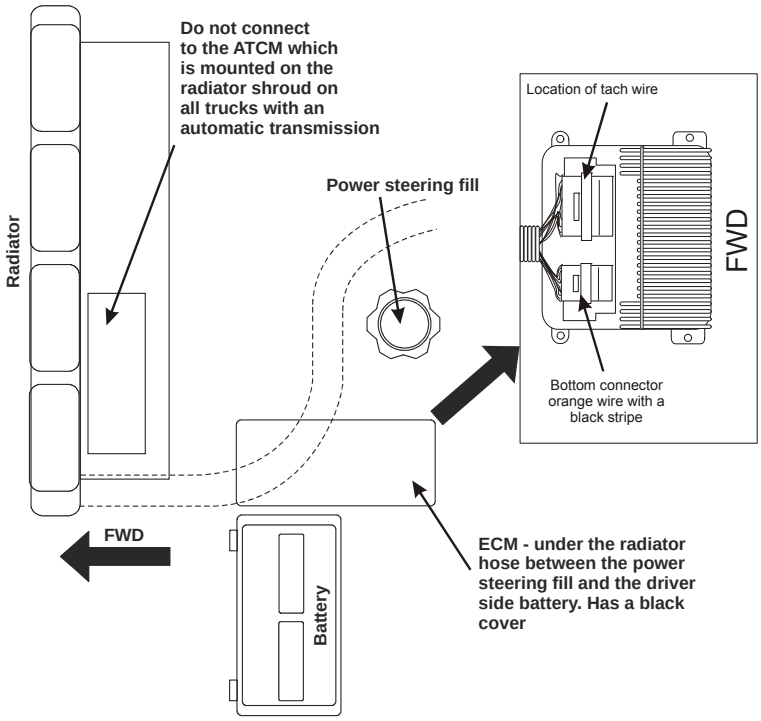


Figure 2.1

2.1.2 V900103 Automatic Transmission Trucks

☐ Locate the engine control module and connector ECMX2.

☐ Locate the three orange wires with a black stripe. Switch the ignition on and measure the voltage at the three wires. The correct wire will read 0 Volts in Park/Neutral and 12 Volts in all other gears

2.1.3 V900103 Tach Wire (CKP signal)

☐ Locate the white wire with a black stripe in the top ECMX1 connector at the engine control module.

☐ Start the engine and test for a constant 3 Volts at 600 RPM. If you have a multi-meter that can measure frequency, the reading will equal engine RPM.

2.1.4 V900093 Tach Wire (CKP signal)

☐ **For 2007 Classic:** Find the white wire with the black stripe in the top ECM connector (Figure 2.1). You can verify that you have the correct wire by checking for a constant 3 Volts with the engine idling at about 600 RPM. If your multi-meter can measure frequency, the reading will equal engine rpm.

☐ **For 2006 Models:** If there is a white wire with a black stripe in the top ECM connector (Figure 2.1), ensure that it is the correct wire by using the same verification process as for the 2007 Classic. Mark it with a piece of tape and turn the engine off.

If there is no white wire with a black stripe, find the three wires that are dark blue with a white stripe in the top connector. Use the same verification process as for the 2007 Classic to locate the correct wire. Mark it with a piece of tape and turn the engine off.

2.1.5 Preparing the Truck

☐ Disconnect the batteries.

☐ Drain the coolant.

☐ Remove the top radiator hose. Measure 10 inches from the engine end (around the curve) and mark the hose. Measure 1-3/4 inches from the radiator end and mark the hose. Cut the hose to length at the marks.

☐ Remove the air filter assembly.

☐ Remove the ATCM module from the top of the fan shroud and remove the upper fan shroud.

☐ Remove the three bolts from the fan stator, pull the fan stator forward and unscrew the fan nut. Remove the fan and stator together and discard the stator.

☐ Remove the air intake resonator chamber from the engine.

☐ Remove the OEM serpentine belt.

☐ Disconnect the wiring from the air conditioning compressor, remove the four retaining bolts and move the compressor out of the way.

Do not disconnect or damage the air conditioning lines

☐ Remove the top engine coolant tube from the thermostat housing and the top of the engine and remove the O-ring and thermostatic switch.

☐ Remove the wiring harness from the retaining clip on the driver's side of the engine and move it out of the way (Figure 2.2).

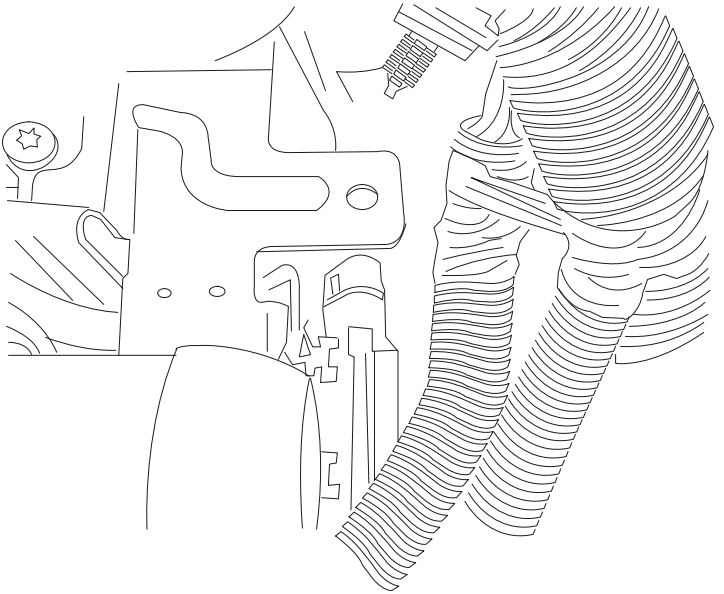


Figure 2.2

☐ If equipped, remove the battery splitter box and ground tab bracket from the back of the power steering pump and remove all the power steering pump bolts. Move the pump to one side but do not disconnect the hoses.

☐ If equipped, remove the ground jumper cable and the bracket from the splitter box and secure the box and connecting harness to the vehicle main electrical harness so that it is out of the way.

☐ Remove the two 10 mm bolts and two 10 mm nuts, then remove the OEM cast bracket that holds the air conditioning compressor and power steering pump. Keep the bolts.

☐ Remove the bolts holding the fan blades to the hub. Place the supplied 4-1/2 inch fan spacer on the hub and install the fan blades using the four supplied M8 bolts.

☐ Remove the skid plate from under the vehicle.

2.1.3 Installing the Crankpin and Pulley

☐ Install a crankshaft locking tool, remove the crank pulley bolt and remove the crank pulley. If you are using the VMAC tool:
- put the socket on the nut
- put the single-pin end of the tool on the front of the pulley with the locking tool hanging straight down
- put a short extension and long flex-bar on the socket
- turn the engine until the pin on the tool makes contact and the tool jams against the protruding center-piece of the cross-member under the front of the engine

☐ Remove the crankshaft pin using the VMAC extraction tool (Figure 2.3):
- fit the split end of the tool (on the end of the shaft) over the crankshaft pin and tap downward with the slide-hammer to make sure that it is seated correctly
- tighten the pinch bolt securely
- use the hammer action of the slider in an upward motion to remove the pin from the crankshaft

☐ Install the replacement crankshaft/harmonic balancer locating pin and tap it home using a brass drift and a small hammer. Ensure that the head of the pin is aligned with the crankshaft by twisting it into position with a crescent wrench (Figure 2.4).

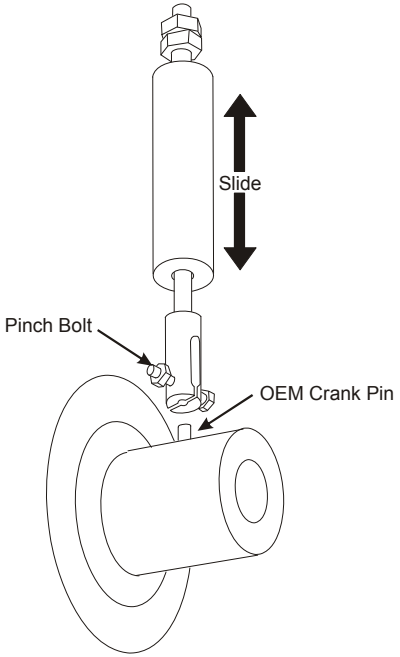


Figure 2.3

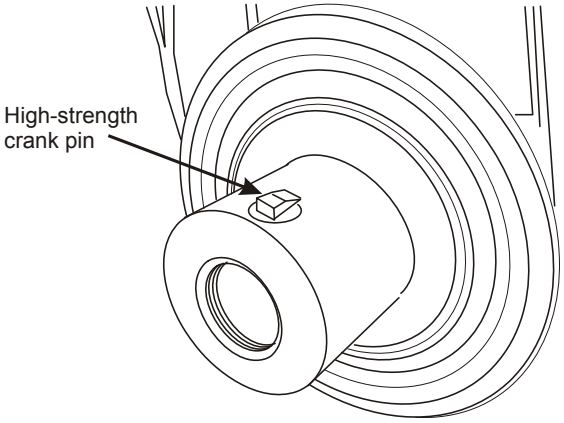


Figure 2.4

☐ Apply a light wipe of oil to the inside of the OEM crank pulley and install the pulley back onto the crankshaft.

☐ Place the VR crank pulley in position with the two roll pins on both sides of the counter balance weight of the OEM pulley (Figure 2.5).

☐ Thread the M18 x 100 mm center bolt with OEM washer into the crankshaft. Install an engine-locking tool and torque the center bolt to 250 ft-lbs (340 N.m).

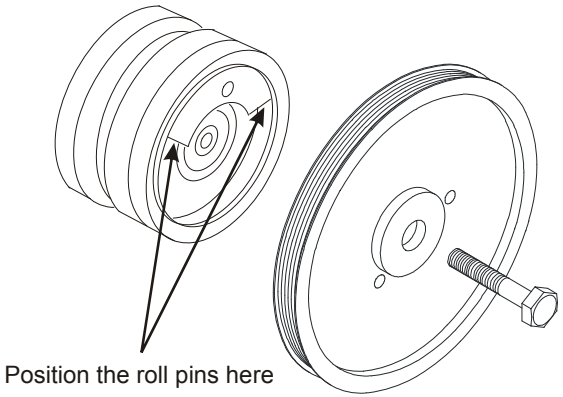
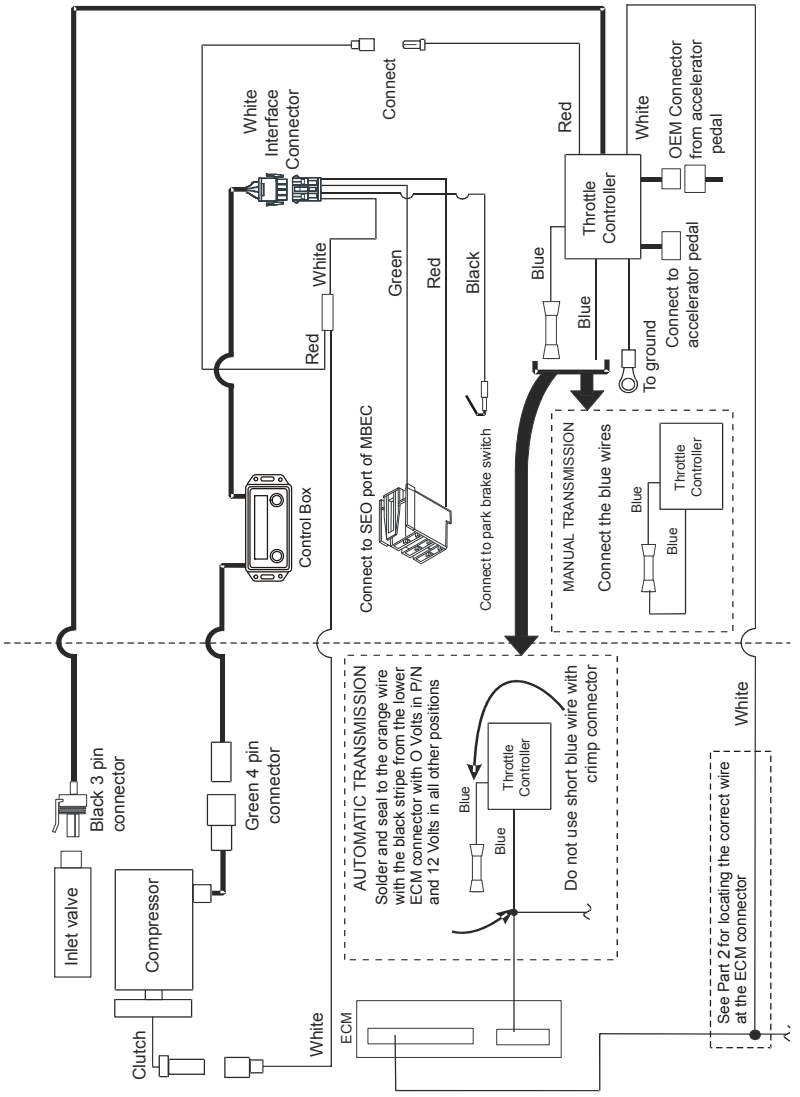
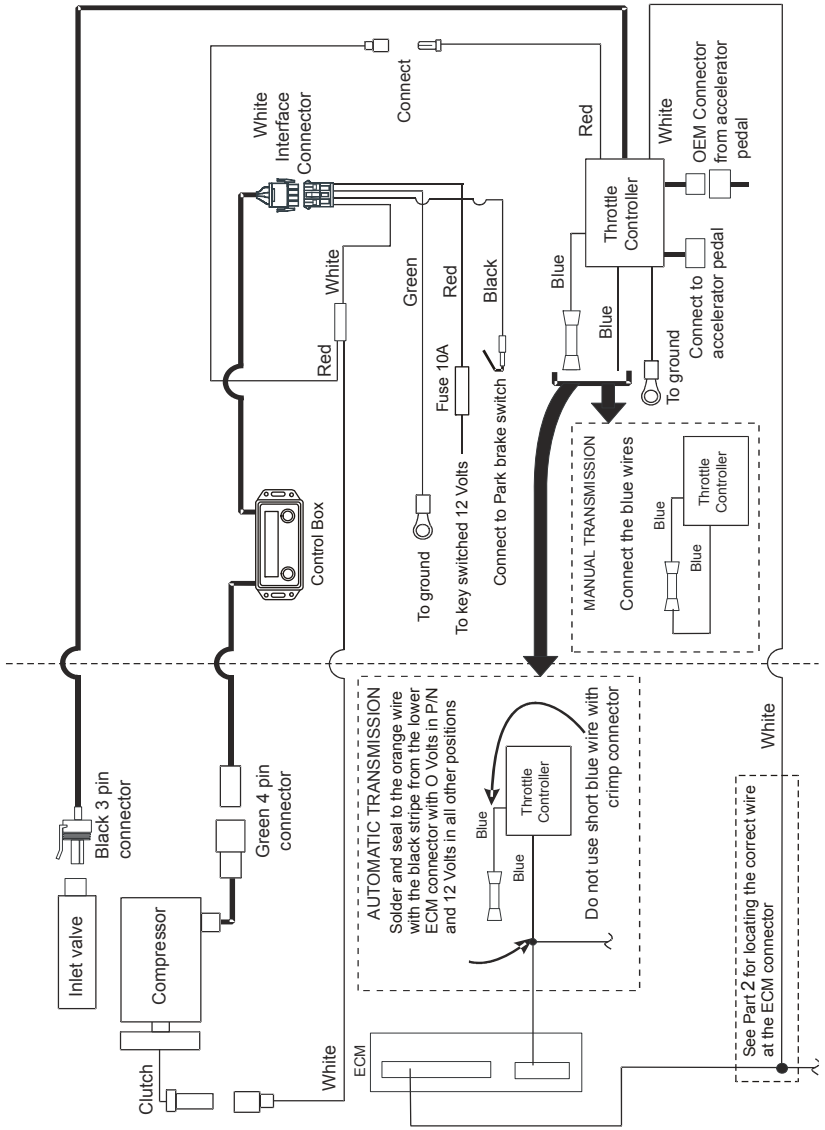


Figure 2.5

Part 3: Installing the Control Components



V900093 Wiring



V900103 Wiring

3.1 Installing the Components

☐ Install the control box where it will be accessible but will not be subject to damage, such as under the center of the dash above the transmission hump. Mark the position of the mounting holes, drill two holes and mount the control box with the wire harness coming out the bottom of the unit.

☐ Mount the throttle control under the dash near the steering column using plastic ties in a position where the harness connectors on the throttle control will reach the OEM accelerator connectors.

☐ Route the following wires into the engine compartment through a suitable OEM plug in the firewall. One location is the large wire harness plug behind the park brake:

- grey wire with a 3 pin black connector
- grey wire with a 4 pin green connector
- white wire with a plug connector
- white wire with no connector
- automatic transmission vehicles – blue wire with no connector

3.2 Connecting the In-cab Wiring

☐ Unplug the OEM cable from the accelerator pedal and plug it into the matching connector from the throttle control box. Plug the cable from the throttle control into the matching connector on the accelerator pedal.

☐ Connect the two white interface connectors together.

☐ Connect the red wire from the throttle controller to the red wire from the interface cable.

☐ Connect the ground wire from the throttle control to a good ground under the dash.

☐ Remove the connector from the park brake switch, connect it to the piggyback connector on the black wire from the interface connector and plug it back onto the park brake switch.

3.2.1 V900093 Power Connection (prior to 2008)

☐ Locate the Mid-Bussed Electrical Center (MBEC) under the instrument panel and left of the steering column (Figure 2.1).

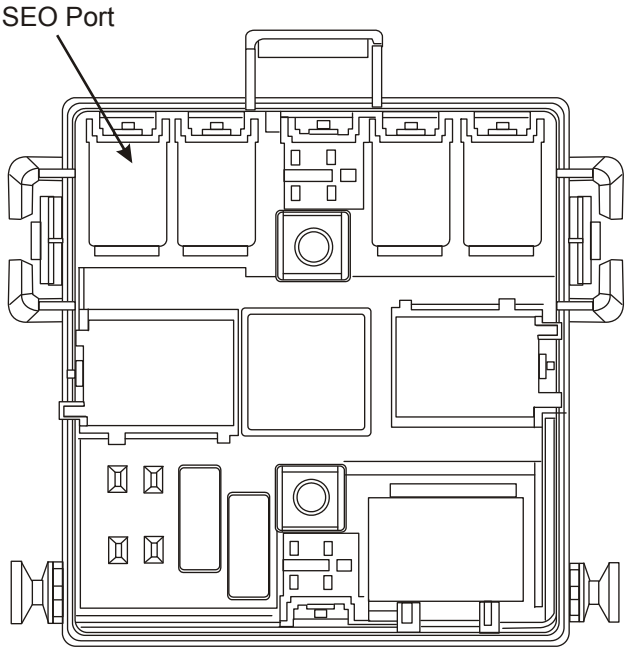


Figure 3.1

☐ Remove the cover and locate the SEO port. Connect the power and ground plug from the interface cable to the SEO port (Figure 3.2) and replace the cover.

If the connector in the SEO port already has a wire in location "C", you can splice the red wire into that wire or locate an alternate power source, such as the hot side of an ignition switch controlled fuse on the fuse panel.

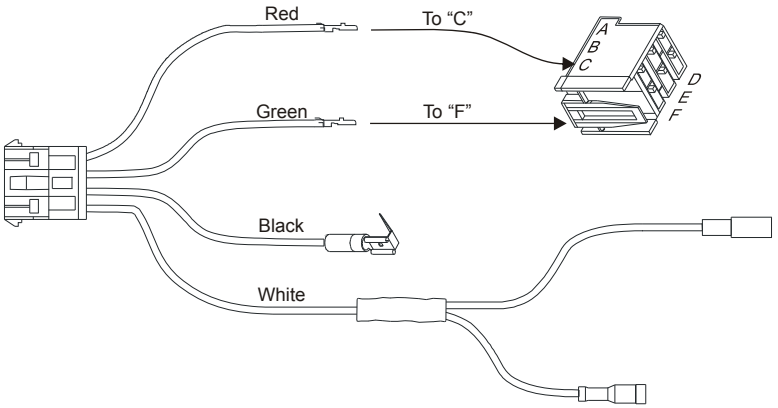


Figure 3.2

3.2.2 V900103 Power Connection (prior to 2008)

☐ At the fuse panel, locate fuse 42.

☐ Install the fuse tap on the fuse and install the fuse so that the tap is on the high (hot) side, not on the low (fused) side. With the fuse removed, this should read 12 Volts with the ignition switch in the ON position.

3.2.3 Power Connection 2008-2010 models

☐ Locate the electrical box on the firewall between the park brake and the steering column.

☐ Test the connections in the center of the electrical box to locate a source that provides 12 Volts with the ignition switch in the ON position.

3.3 Connecting the Under-hood Wiring

Cover all underhood wiring with plastic loom. Secure the harnesses with nylon ties and pull all excess wire back into the cab.

☐ Route the two grey wires and the white wire with the plug connector to the compressor. Connect the wires to the matching connectors at the compressor.

☐ Solder and seal the white wire from the throttle controller to the appropriate wire for the correct model year at the top ECM connector (located and marked during preparation). The preferred connection method is shown in Figure 3.3.

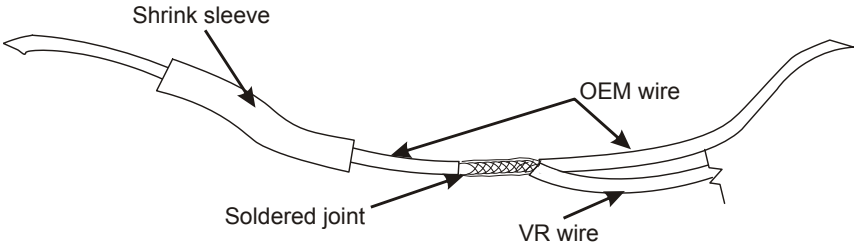


Figure 3.3

3.3.1 Automatic Transmission

☐ Solder the blue wire to the orange wire with a black stripe at the lower ECM connector (located and marked with tape in Part 2: Preparing for Installation) and seal the connection with shrink sleeve.

3.3.2 Manual Transmission

☐ Cut the long blue wire to approximately 6 inches, strip and crimp it to the short blue wire with the butt connector.

3.3.3 All Trucks

☐ Pull all excess wiring back into the cab, bundle the wiring together and tie it up out of the way under the dash.

☐ Replace all dash panels and other covers removed during installation.

Part 4: Installing the Tank and Hoses

4.1 Installing the Tank and Brackets

The tank will mount to the driver side frame rail between the two body mounts (Figure 4.1).

The rear tank bracket must be positioned to conform to variations in chassis configuration. This will affect the positioning of the rear C-clamp.

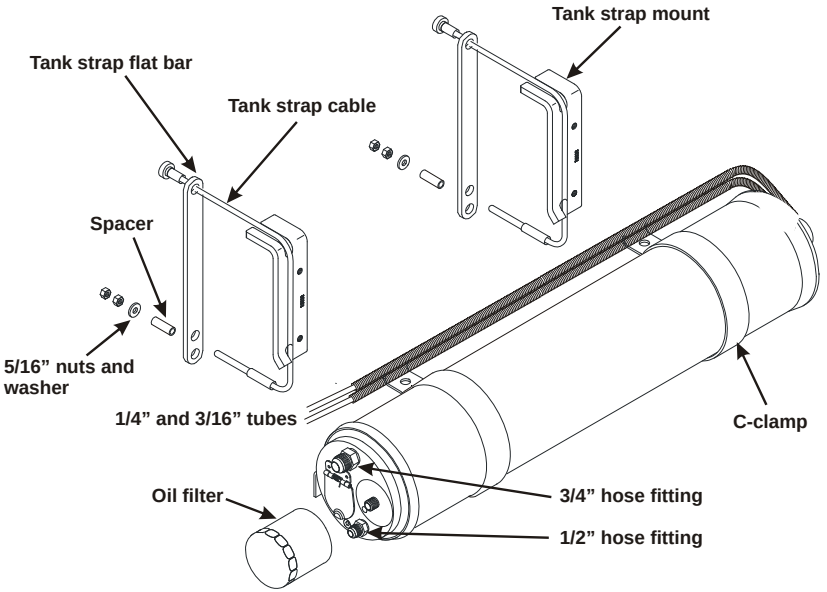


Figure 4.1

☐ Remove the oil filter from the front of the tank, fill it with compressor oil, cover it and place it out of the way.

☐ Place the tank on a work bench with the front (oil filter end) of the tank to your right.

☐ Remove the two 1/4 inch clamp bolts from the C-clamps. Expand the clamps slightly and slide them over the front of the tank. Position the front clamp about 5-1/2 inches from the front of the tank to the front of the clamp and the rear clamp about 24 inches from the front of the tank.

☐ Place the two L-shaped tank strap mounts under the C-clamps with the right-angle ends facing you and hanging over the edge of the work bench.

☐ Apply Loctite and thread 5/16 x 1/2 inch bolts with flat washers into the bottom hole on each bracket, but do not tighten.

☐ Install the 1/4 inch clamp bolts into the C-clamps so that the heads of the bolts face toward you and install the nuts.

☐ Rotate the tank so that the directional arrow on the end of the tank is parallel to the work bench and faces toward you check the distance of each C-clamp from the ends of the tank and tighten the clamp bolt on the front clamp so that it grips the tank securely. Leave the back clamp loose enough so that the position can be adjusted.

☐ Apply Loctite and insert 5/16 x 1/2 inch bolts through the C-clamps and thread them into the mount brackets.

☐ Center the bolts in the C-clamp slots and tighten them.

☐ Apply Loctite pipe thread sealant and install a 90 degree fitting to the outlet on the tank. Tighten it to about the eight O'clock position for testing, then reposition as required for operational connections (Figure 4.2).

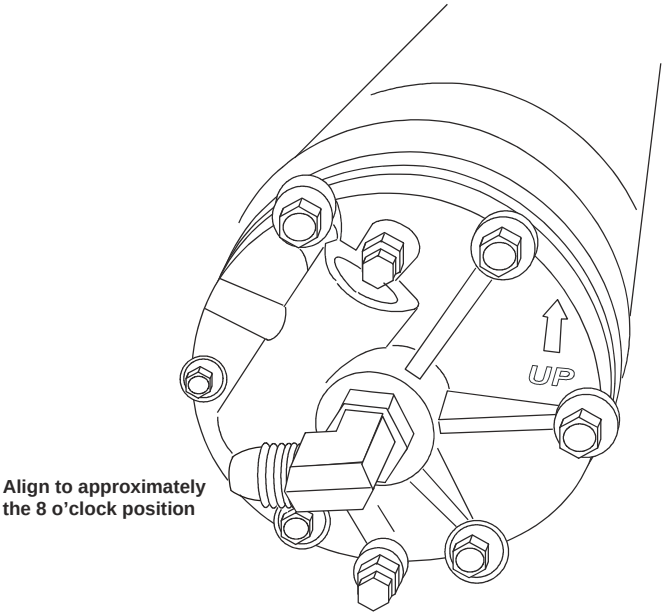


Figure 4.2

☐ Push the insulated tube clips toward the tank to provide clearance for the mounting cables.

4.2 Installing the Tank Assembly

☐ Remove the three clips holding the wire harness on the outside of the driver's side frame rail.

☐ Remove the front park brake cable guide from the frame and leave it attached to the cable.

☐ Remove the brake line from the clips locating it to the top inside of driver frame rail and remove the clips. Bend the brake line slightly inward away from the frame to provide clearance for the rear tank mount

☐ Insert the threaded ends of the cable straps through the end hole on each of the bar straps.

☐ Place the bar straps in position on the inside of the frame, one in front of the transmission cross-member and one behind, with the

cable straps over the top of the frame. Do not pinch the brake line with the backing strap or cable. Carefully bend the brake lines as required to clear the backing straps and cables.

Depending on chassis configuration, the rear clamp backing strap may have to be positioned either in front of or behind the electronic brake module on the inside of the frame. Select the best location once the tank is in position.

☐ Place the tank assembly under the driver side of the vehicle, then lift the tank assembly and support it in position so the tops of the two tank strap mounts fit over the top of the frame rail. Make sure that that the wire harness is outside the mounts and is not pinched between the mounts and the frame.

☐ Wrap the two tank cable straps around the tank strap mounts. Make sure that they fit in the upper and lower cut-outs of the tank strap mounts (Figure 4.4).

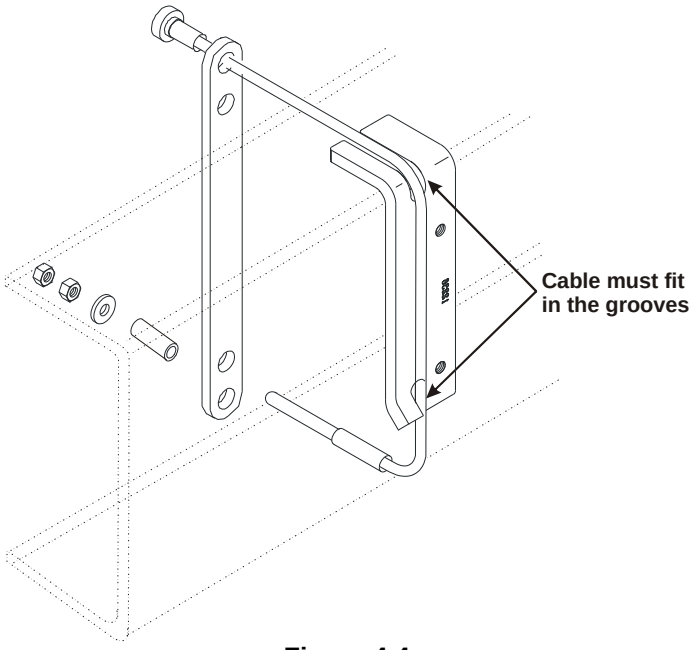


Figure 4.4

☐ Insert the threaded end of the cable through one of the lower holes on the tank strap flat bars. Select the appropriate hole that best matches the frame of the vehicle. If necessary, use the supplied spacers over the threaded end to provide for proper tightening.

☐ Place a 5/16 inch flat washer and nut on each tank cable strap and tighten just enough to hold the tank in place but loose enough to allow the tank to be positioned along the frame.

☐ Slide the tank rearward on the frame as necessary to provide clearance for attaching the hoses.

☐ Attach the swivel fittings to the front of the tank but do not tighten them until the hoses are attached at both ends and are properly routed.

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.

☐ Route the straight end of the 3/4 inch hose from the engine compartment over the body mount to the tank.

☐ Route the longest 1/2 inch hose from the engine compartment outside the body mount to the tank.

☐ Connect both hoses to the matching swivel fittings on the tank, but do not tighten them.

☐ Locate the OEM hole in the lower frame section next to the transmission cross-member and Insert an M8 x 25 mm bolt through the hole.

☐ Place the supplied flat bracket on the bolt and fasten the bracket in place with an 8 mm serrated nut so that it points outward toward the driver's side.

☐ Place the OEM park brake cable bracket on top of the flat bracket and fasten it in place with the OEM bolt.

☐ Position the brackets so that it pulls the cable down enough to clear the tank and brackets. Tighten all the fasteners.

Part 5: Installing the Main Bracket and Compressor

5.1 Installing the Cooler

☐ Remove and discard the coolant fill hose plastic alignment clips from the OEM bottom radiator hose.

☐ Cut and discard 8-1/2 inches of straight hose from the lowest section of the radiator hose.

☐ Connect the cooler spigots to the cut ends of the lower radiator hose so that the cooler is between the radiator and engine with the oil connection fittings toward the engine (Figure 5.1). Tighten the hose clamps.

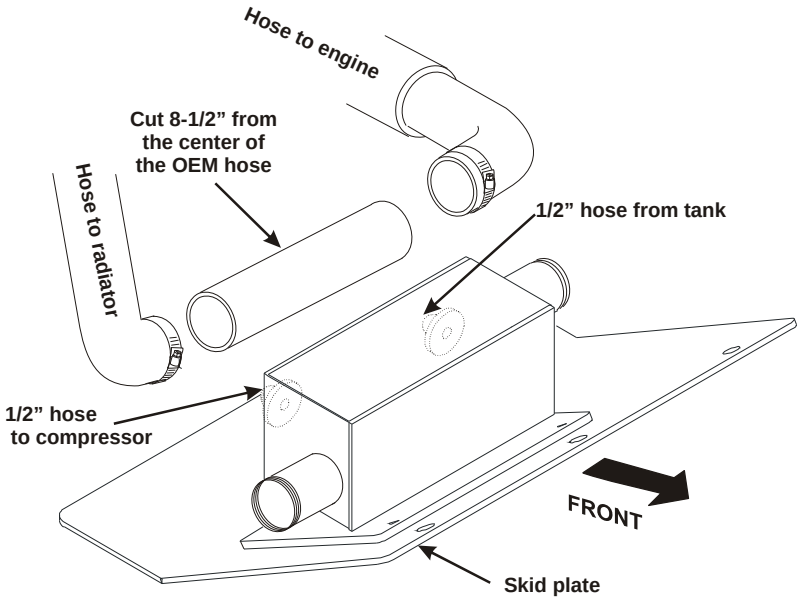


Figure 5.1

☐ Route the 1/2 inch hose from the tank outside the body mount to the cooler and connect it to the driver's side fitting.

☐ Install the skid plate using the OEM bolts.

☐ Align the holes in the skid plate with the threaded holes on the cooler mounting plate and fasten the cooler in place with four 5/16 inch bolts and flat washers.

☐ Connect the 90 degree end of the short 1/2 inch hose to the passenger side fitting on the cooler. Tighten the fittings at the cooler.

Connecting the 90 degree ends of the cooler hoses can be done easily from above.

5.2 Installing the Main Bracket

☐ Place the replacement metal coolant tube (Figure 5.2) in position with the upper bracket facing the front of the truck so that it will fasten to the rear passenger-side air conditioning compressor mount with the OEM fastener.

If the truck does not have air conditioning, use the supplied spacer and bolt to fasten the bracket to the rear passenger-side air conditioning compressor mount on the VR main bracket.

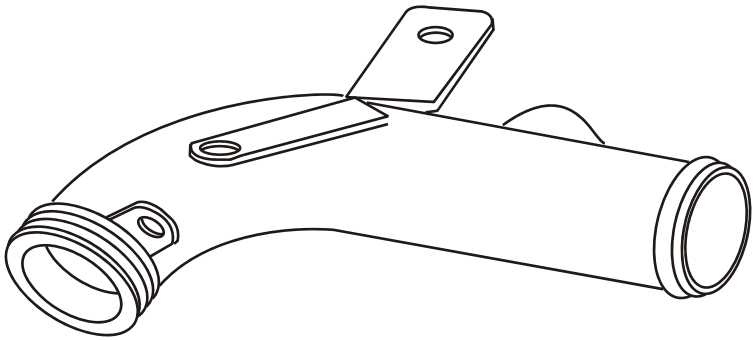


Figure 5.2

☐ Install the OEM O-ring and thermostatic switch from the top engine coolant tube to the replacement tube and insert it into the thermostat housing. Make sure that the O-ring is properly seated.

☐ Remove OEM hose that connects to the thermostatic switch and install the supplied thermostatic switch tube and hose clamps.

☐ Remove the belt tensioner assembly and the idlers from the VR main bracket (Figure 5.3).

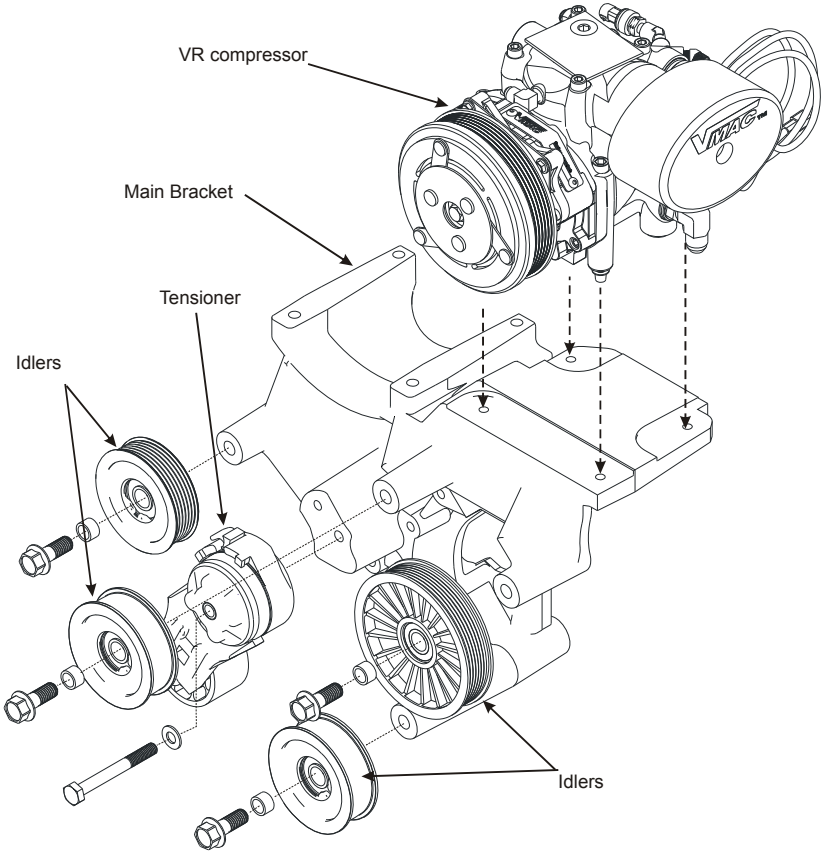


Figure 5.3

☐ Place the VR bracket on the front of the engine over the two OEM 10 mm studs that held the OEM cast bracket in place.

☐ Place the pump in position and thread in the three front 10 mm bolts. Hand-tighten the middle bolt but leave the two outer bolts loose.

☐ Pull the bracket forward to reach the rear power steering pump bolts. Align the two holes in the loose OEM locating bracket with the two threaded holes in the VR cast bracket and thread in two 10 mm bolts but do not tighten them, as this will pull the pump out of alignment if there is a gap between the OEM locating bracket and the VR cast bracket.

☐ Make sure that the rear bracket sits flat on the mount pad of the VR casting. If necessary, pivot the power steering pump upwards or downwards on the front center bolt until the rear bracket sits flat on the VR bracket mount pad.

☐ Tighten the two rear 10 mm bolts first, then the three front bolts.

☐ Apply Loctite and install both OEM 10 mm nuts and one supplied 10 x 100 mm socket head bolt and one supplied 10 x 75 mm socket head bolt to secure the VR bracket to the engine (Figure 5.4).

Check the fit of the bracket against the engine to make sure that it sits flat and has no obstructions.

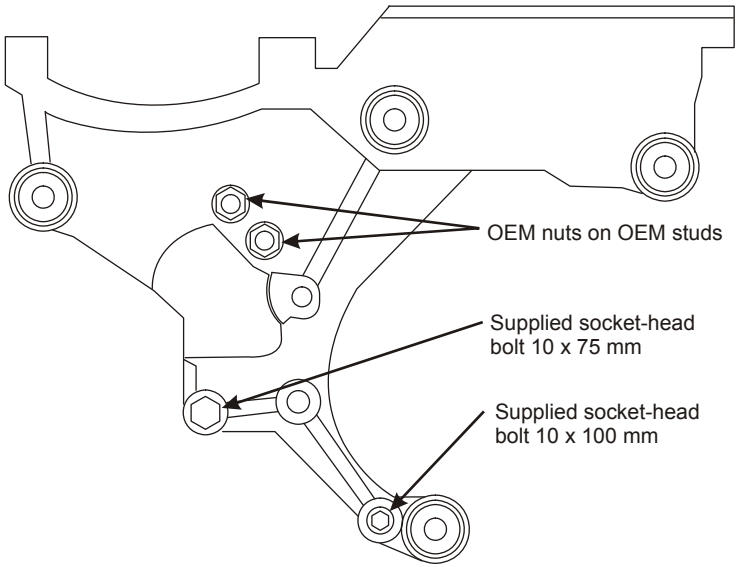


Figure 5.4

☐ Tighten the nuts and bolts evenly and then torque them to specifications.

☐ Install the air conditioning compressor and connect the wiring.

☐ Install the OEM belt and then the VR drive belt (Figure 5.5).

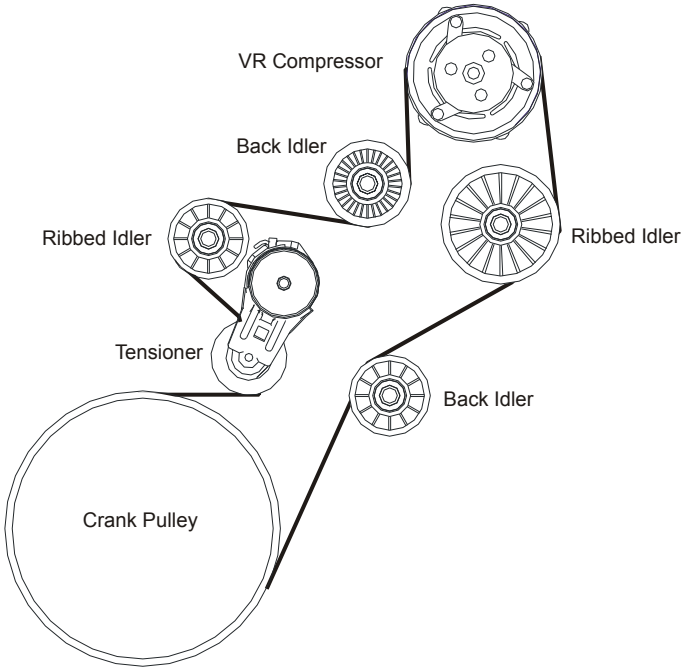


Figure 5.5

☐ Remove the compressor inlet valve and cover the opening to protect the compressor.

☐ Place the compressor on the mounting bracket.

☐ Apply Loctite and install one M8 x 120mm bolt in the rear right mounting hole.

☐ Apply Loctite and install the three M8 x 110mm bolts in the remaining mounting holes. Tighten down all four bolts evenly and torque to specification.

☐ Re-install the compressor inlet valve.

If the bolts used to attach the inlet valve to the air end are installed incorrectly major damage to the air end can occur.

It must be noted that most systems use two different length bolts in the inlet valves. The longer bolts go in the two holes closest to the air filter and the two shorter bolts go in the holes furthest away from the air filter (figure 5.6).

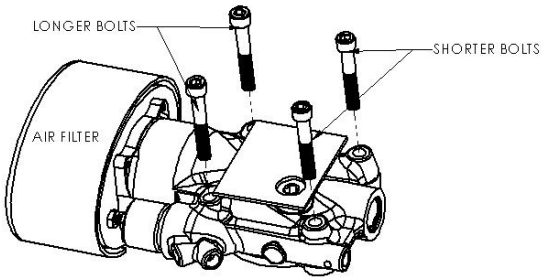


Figure 5.6

Never use an impact wrench to install inlet bolts. The torque spec for inlet bolts is 19 ft lbs.

☐ Remove the two OEM driver side upper rocker arm cover bolts (Figure 5.7).

Do not remove the OEM bushings holding the cover down.

☐ Move the electrical components and tie strap them out of the way as required.

☐ Apply Loctite to the M6 x 35mm bolts and the M8 nut and install the strut support (Figure 5.7). Torque the two M6 bolts to 71 in-lbs.

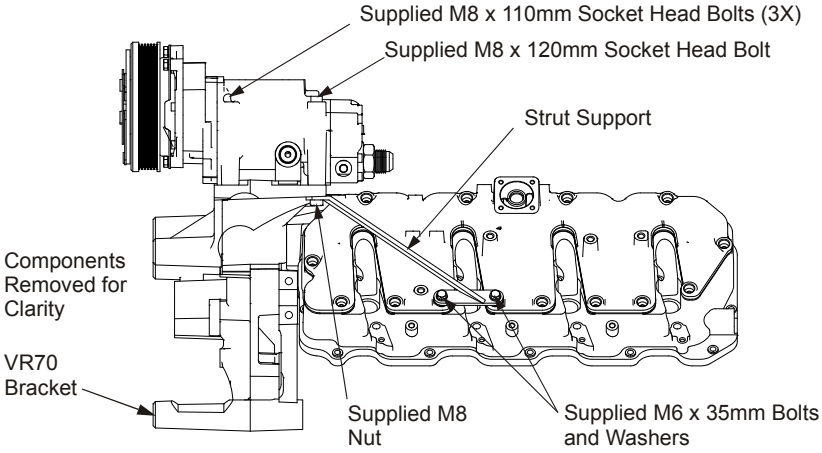


Figure 5.7

☐ Apply Loctite and install the VR tensioner and the idlers on the bracket. Torque the fasteners to specifications.

5.3 Connecting the Hoses

☐ Route the short 1/2 inch hose from the cooler up in front of the steering box and connect the straight end to the fitting on the side of the compressor. Tighten the fittings at both ends of the hose.

☐ Connect the 45 degree end of the 3/4 inch hose fitting to the fitting on the back of the compressor but do not tighten until all hose routing is completed. Loop it so that it forms a smooth curve. The hose will run close to the booster, but must be routed so that it does not rub on the booster. Tighten the fittings at both ends of the hose.

No part of the 3/4 inch hose can be higher than the compressor. If it is, the system will not function correctly. Make sure that the hose does not rest on any engine wire harness or other components behind the compressor that could be damaged by heat.

☐ Insert the 1/4 and 3/16 inch tubes into the fittings on the back of the tank and cover them with high temperature loom. Route them through the frame up to the compressor and connect them to the matching fittings on the compressor inlet valve.

☐ Secure all hoses together and in place using plastic ties at regular intervals along the frame, other harnesses or the cross-member so that they do not touch exhaust parts or any moving parts.

☐ Apply a light coat of oil to the gasket and install the filter on the tank. Tighten the filter an additional 3/4 – 1 turn after the gasket contacts the base. Adjust the swivel fittings and hoses on the tank as necessary to provide clearance for the oil filter. Tighten the swivel fittings and hose fittings.

☐ Reposition the tank on the frame (if necessary) and tighten the cable clamps. Thread a second nut on each cable and tighten it against the first nut to act as a lock.

5.4 Completing the Installation

☐ Open the harness securing clips and reposition the harness so that when the harness clip is pushed into the hole in the L-bracket, the harness will be clear of the 3/4 inch compressor hose.

☐ Tie the wire harness back from the compressor hose using nylon ties to ensure that it will not touch the hose.

☐ Install the supplied radiator hose (with connector) to the top coolant pipe and the modified top radiator hose with the short end to the radiator and the long end to the connector (Figure 5.8). Tighten the hose clamps. The hose may require slight modifications to clear the compressor, drive pulley and belt.

☐ Place the supplied fan spacer in position and install and tighten the fan.

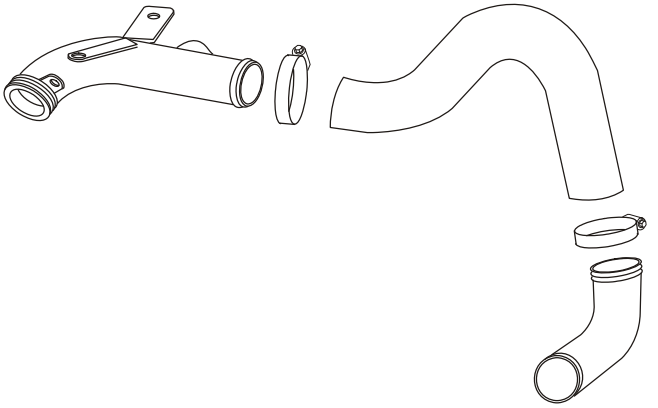


Figure 5.8

☐ Place the upper fan shroud in position. Place the PTM module 3 inches down from the top of the fan shroud and mark the position of the top and outer mounting holes on the shroud.

☐ Remove the shroud and drill 1/8 inch holes in the marked positions. Install the fan shroud and secure the PTM module using the supplied self-tapping screws.

☐ Install the air intake resonator chamber.

☐ Install the supplied P-clamp over the intercooler tube. Install the supplied bracket over the mounting stud behind the intercooler tube with the bracket facing the intercooler tube. Pull the intercooler tube toward the bracket and fasten the P-clamp to the bracket. This provides additional clearance between the intercooler tube and the main discharge hose.

☐ Fill the cooling system with the approved coolant to the correct level.

☐ Connect all wiring that was disconnected in preparation and install any other OEM parts that were removed.

☐ On all trucks except the GMT900, remove and discard the hood liner.

☐ Route the two grey wires and the white wire with the plug connector across the engine to the compressor. Connect the wires to the matching connectors at the compressor.

5.5 Adding Oil to the System

You must use the VMAC supplied 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 fill plug from the air inlet control valve and pour oil into the oil fill hole on the inlet control valve using a funnel. 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, then check the level at the sight glass at the front of the tank. Continue adding oil until the level is correct.

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

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

Part 6: Finishing the Installation

6.1 Before Starting the Engine Checklist

Make sure that the following have been completed:

☐ Check the vehicle coolant.

☐ Check the compressor oil level.

☐ 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.

6.1.1 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.

☐ Push the “ON” button on the control box. The green LED should come on and you should hear the compressor clutch engage.

☐ Release the park brake. The green LED should flash, the display should read “PARK BRAKE” and the compressor clutch should disengage. Apply the park brake again; the green LED should go out and the hours will be displayed.

☐ For trucks with automatic transmissions, 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 vehicle 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.

6.2 After Starting the Engine Checklist

Make sure that the following have been completed:

6.2.1 Completing the Safety Test

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.

☐ 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 Operational Tests for All Trucks

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

☐ Road test the vehicle 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.

If you see unusual belt fluctuations during initial operation, stop the engine and move the tensioners back and forth, then restart the engine. Belt fluctuations should stop within the first 30 minutes of operation.

☐ Check all components once the engine is turned off and the system has cooled.

☐ Check the vehicle coolant after the vehicle reaches operating temperature.

☐ Check the compressor oil level after the vehicle 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 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 6.1).

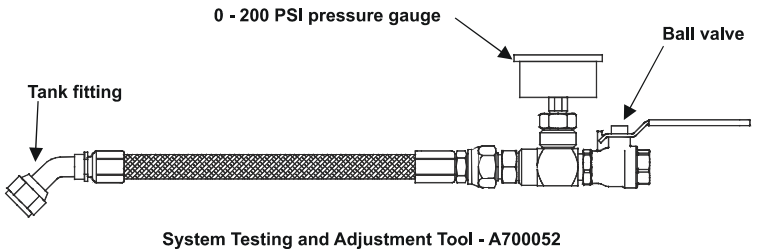


Figure 6.1

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 vehicle to run until the engine 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 (See the owner's manual for adjustment procedures).
7. Open the ball valve on the test tool and observe the engine tachometer. Engine speed should increase to about 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 ramp-up when air pressure drops to approximately 140 psi.

6.5 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 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.

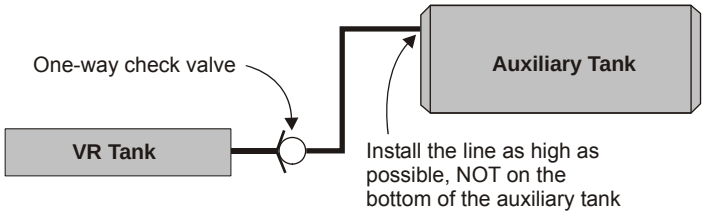
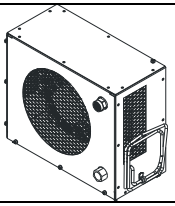
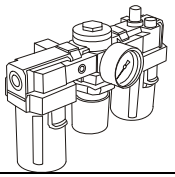
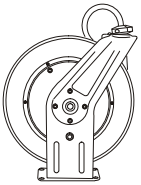
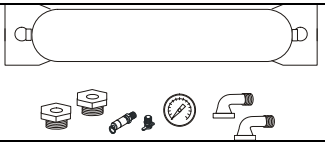
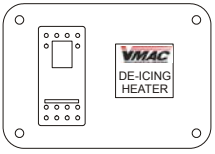


Figure 6.2

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 toll free 1-888-241-2289 or local 250-740-3200.

	**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.
	**Hose Reel** **Part Number A700007** Secure, compact, retractable hose storage in a sturdy reel.
	**Air Receiver Tank** **Part Number A300010** Thirty-five gallon capacity in a compact tank, complete with fittings and a gauge.
	**De-icer Kit** **Part Number A700031** Insulated rope heater prevents freezing of lines and regulator.
	**Service Kits** **VR140 200 hour Part Number A700059** **VR140 400 hour Part Number A700060** **VR70 200 hour Part Number A700019** **VR70 400 hour Part Number A700020** 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