

Installation Manual for VMAC System V900080

Ford 2003.25 – 2005 6.0L

Power Stroke Diesel

Without Dual Alternators

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VMAC – Vehicle Mounted Air Compressors

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Fax: 1-250-740-3201

Installation Manual - Document #1930059

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Changes and Revisions

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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

System V900080

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	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

System V900080

1.1 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.

You should keep any parts that the instructions tell you to discard if you intend to return the vehicle to original condition.



This manual contains installation instructions that are specific to different model years. Make sure that you read these instructions before beginning installation to identify the sections that apply to your truck.

- ☐ Disconnect the ground cables from the batteries.
- ☐ Drain the engine coolant.
- ☐ Remove the intercooler tube from the passenger side of the cooler and the turbocharger, complete with clamps, rubber elbow and rubber bellows connector. Discard the tube.
- ☐ Disconnect the upper and lower radiator hoses from the radiator.
- ☐ Disconnect the coolant tank expansion hose from the top of the radiator.
- ☐ Remove the two upper fan shroud bolts. Carefully pry the fan shroud past the top radiator hose spigot and the fan hub. Remove the fan shroud and immediately place a piece of cardboard against the radiator to protect the cooling fins.
- ☐ Remove the four M10 bolts securing the rear fan stator (large plastic section with fins behind the fan) to the front of the engine.
- ☐ Release the plastic locating clip holding the fan clutch wiring harness on the fan stator and disconnect the wiring.

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- ☐ Remove the fan (right hand thread) and lift out the fan and stator together. Discard the stator.
- ☐ Remove the OEM belt and the belt tensioner-idler assembly.
- ☐ Remove the four nuts holding the glow plug relay bracket to the passenger side valve cover, remove the glow plug relay from the bracket and move it out of the way; discard the bracket.
- ☐ Free the wire harnesses on the passenger side valve cover by removing all of the plastic retainers from the valve cover studs so that the harnesses can be relocated.
- ☐ Disconnect the heater hose from the steel heater return pipe attached to the alternator support bracket. Remove the pipe, remove the rubber O-ring and discard the pipe.
- ☐ Put the O-ring on the replacement hose barb fitting and install it in place of the steel return pipe (Figure 1.1).

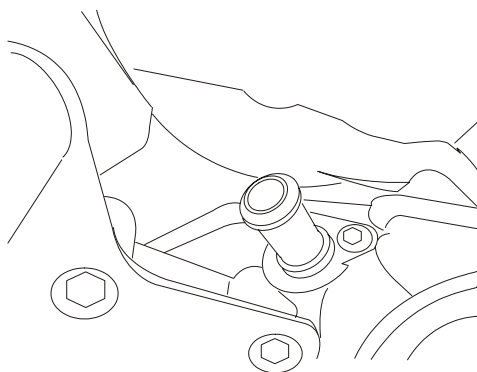


Figure 1.1

- ☐ Cut about 3 inches of the supplied heater hose and install on the replacement hose barb fitting. Make sure that the tightening mechanism of the hose clamp is not on the passenger side of the fitting, as it will interfere with the compressor bracket. Tighten the clamp.

- ☐ Install the replacement metal heater tube onto the short length of hose and orient the tube so the short length with the mounting tab is on the passenger side of the alternator and faces toward the firewall. Do not tighten the second clamp until the tube has been mounted to the compressor-alternator brace bracket.
- ☐ Remove the combined bolt/stud on the front of the valve cover directly below the alternator. Cut off the threaded upper section and install the modified bolt.
- ☐ If equipped, remove the padded sound-proofing liner on the underside of the engine hood.
- ☐ If equipped, remove the rubber deflector from the underside of the front radiator mount cross-member.
- ☐ On trucks built before 2005, remove the cross-member under the radiator immediately behind the front air dam.
- ☐ On trucks built before 2005, remove the passenger side battery and bend the horizontal tab on the passenger side battery tray upward to the vertical position (Figure 1.2). Install the battery.

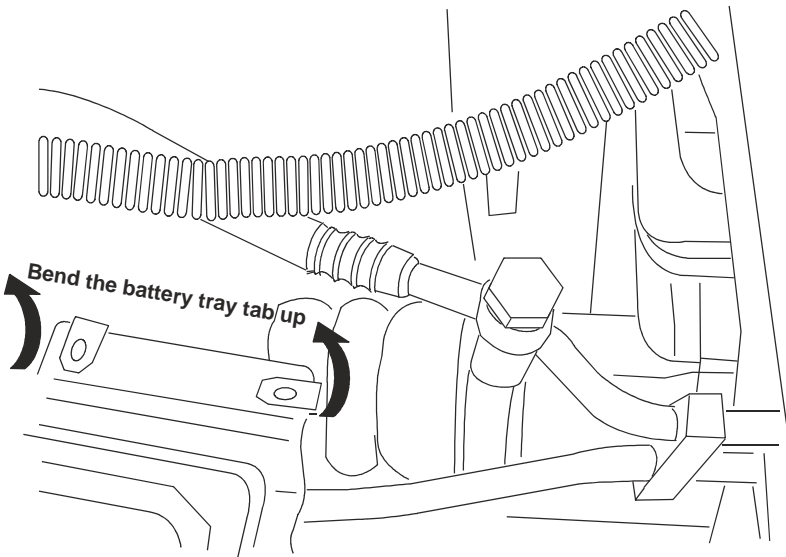


Figure 1.2

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- ☐ On trucks built after 2004.25, remove the ICP sensor from the passenger side valve cover. Install the sensor in the supplied banjo fitting and install the banjo, with copper seal, into the valve cover. Attach the electrical connector, position the fitting so that the sensor points toward the back of the engine and tighten the banjo fitting bolt.



Make sure that the OEM O-ring is on the sensor and do not lose the copper sealing gasket on the supplied banjo fitting. Make sure that the ICP sensor is properly sealed and tightened to prevent oil leaks, as improper installation and sealing can void OEM warranty.

- ☐ Remove the three nuts from under the passenger side fender liner and move the plastic vacuum reservoir out of the way.
- ☐ Remove the two passenger-side retaining bolts from the alternator.
- ☐ Clean the face of the OEM crankshaft pulley. Place the VR pulley over the OEM pulley, align the bolt holes and make sure that the pulley is sitting flush.
- ☐ Apply Loctite, install three M10 x 70mm bolts and flat washers and torque to specifications.

Part 2: Installing the Cooler, Bracket and Compressor

System V900080

2.1 Installing the Oil Cooler

2.1.1 2005 Model Year

- ☐ Apply Loctite, insert M10 x 90 mm bolts into the top of the two mount brackets (Figure 2.1) and place them over the cross-member that runs under the radiator. Make sure that the tubes and bolts fit between the cross-member and the rubber strip on the top of the cross-member.

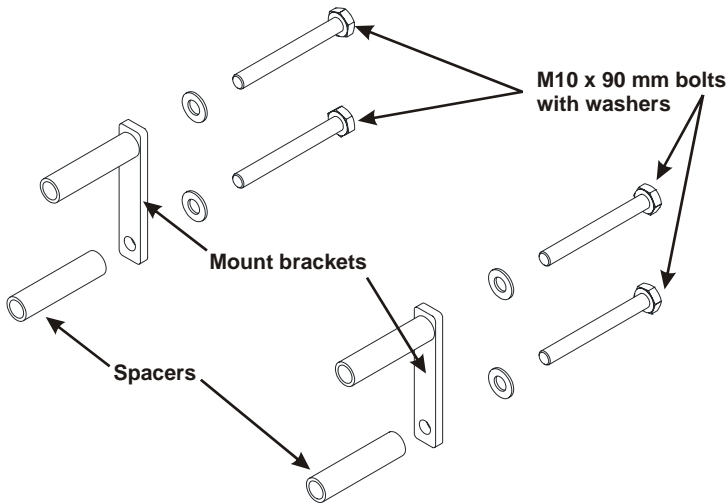


Figure 2.1

- ☐ Apply Loctite, insert bolts into the lower holes and install the spacers.
- ☐ Place the cooler in position so that the hose on the cooler can be easily installed on the lower radiator spigot and with the threaded fittings facing to the rear of the truck (Figure 2.2). Thread the four bolts into place; leave them loose enough that the cooler can move on the cross-member.

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- ☐ Loosen the hose clamp on the hose on the cooler and connect the other end to the lower radiator spigot. Tighten the clamps.
- ☐ Connect the OEM hose from the engine to the fitting on the cooler and tighten the clamp. Check clearance at all steering positions and, if the hose does not clear the linkage, install the supplied metal connector at a suitable location in the hose.
- ☐ Adjust the cooler as required to provide a good fit with all hoses and tighten the mounting bolts.
- ☐ Connect the long piece of heater hose to the coolant bypass fitting on the cooler. Route the hose up the driver side of the radiator, under the air cleaner assembly and across the engine to the passenger side. Secure the hose as necessary with tie-straps.

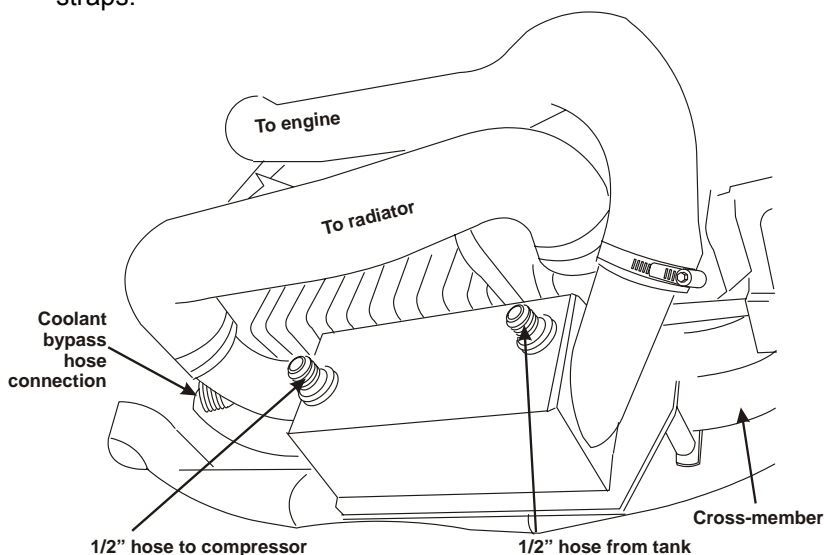


Figure 2.2

2.1.2 2003.25 to 2004 Model Years

- ☐ Measure 3-1/2 inches towards the passenger side of the cross beam from the passenger side power steering cooler support bracket and place the first cooler mount bracket at this location (Figure 2.3).

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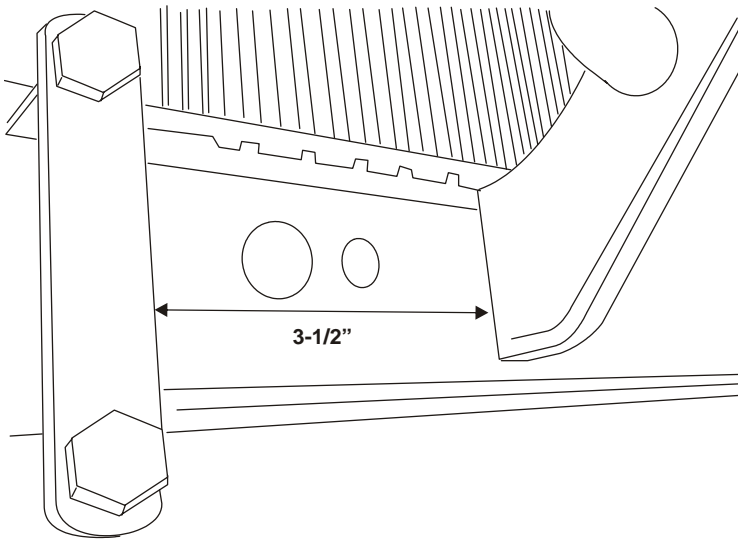


Figure 2.3

- ☐ Measure approximately 11 inches from the first bracket towards the driver side on the cross beam and place the second cooler bracket at this location.
- ☐ Place the oil cooler in position with the two threaded hose fittings facing towards the rear of the truck (Figure 2.4).
- ☐ Apply Loctite and thread M10 x 90mm bolts with 3/8 inch flat washers into the top and bottom mounting holes of the cooler.

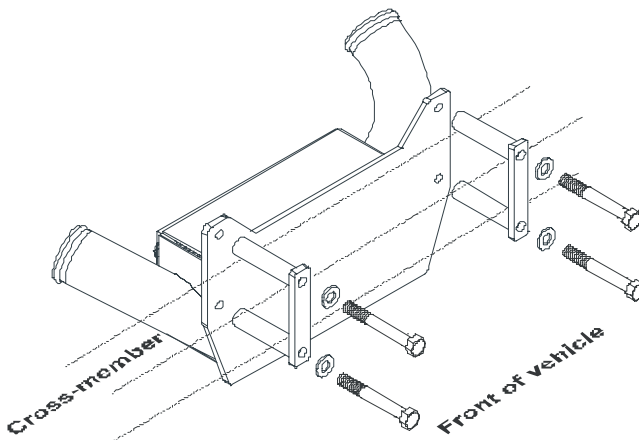


Figure 2.4

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- ☐ Measure 10 inches from the engine end of the lower radiator hose around the longest side of the bend (Figure 2.5). Cut the hose and discard the end that attached to the engine.

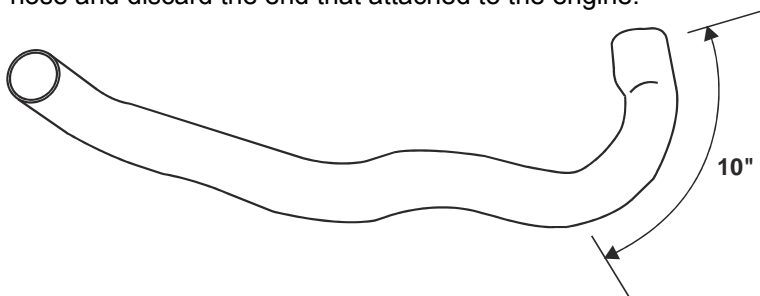


Figure 2.5

- ☐ Install the hose so that the end that previously connected to the radiator connects to the engine and install the other end on the cooler. Tighten the clamps.



The hose must be installed in the reverse position from the OEM installation.

- ☐ Place hose clamps on the supplied "U" shaped radiator hose and install it between the oil cooler and the lower radiator connection. Tighten the clamps.
- ☐ Connect one end of the longest supplied heater hose to the fitting on the passenger side of the cooler and secure the hose with a clamp. Route the hose up the front right side of the radiator, toward the back of the truck, behind the compressor up to the top of the engine. Secure the hose in place as required using tie-straps.
- ☐ Check for adequate clearance between the steering arm and the cooler hose with the steering in a full right-hand lock. Adjust the cooler or hoses for clearance if required. Tighten the cooler mounting bolts.
- ☐ If removed, install the cross-member.

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2.2 Installing the Main Bracket and Compressor

- ☐ Remove the idlers and belt tensioner assembly from the bracket (Figure 2.6).
- ☐ Route the air conditioning compressor wire harness under the oil line fitting on the front of the engine and around the raised, threaded mounting pad so that it is tight against the casting.
- ☐ Place the bracket on the front of the right-hand cylinder head and loosely install one bolt. Push the bracket against the front of the engine and make sure that it sits flat on the front of the engine.



Check the air conditioning wiring harness to make sure it is not trapped between the engine and the bracket. Also make sure that there is no interference at the valve cover or at the heater hose barb.

- ☐ Install three supplied M10 x 55mm flange lock bolts and secure the bracket in place, two at the top and one at the outer lower hole.

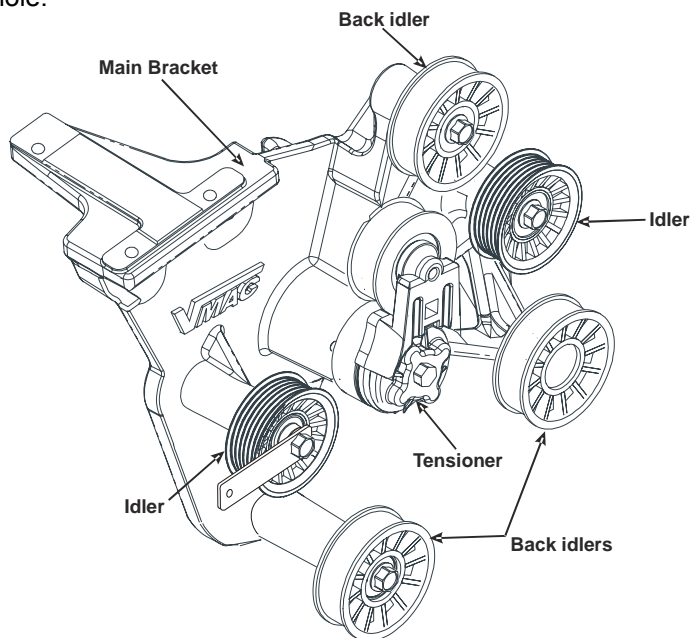


Figure 2.6

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- ☐ Install the M10 x 35mm flange head bolt to the lower inner-most attachment point. Hand-tighten all fasteners and check clearance again. Make any adjustments as required; then torque all fasteners to specifications.
- ☐ Install the OEM belt tensioner onto the location on the VR bracket and install the OEM belt (Figure 2.7).

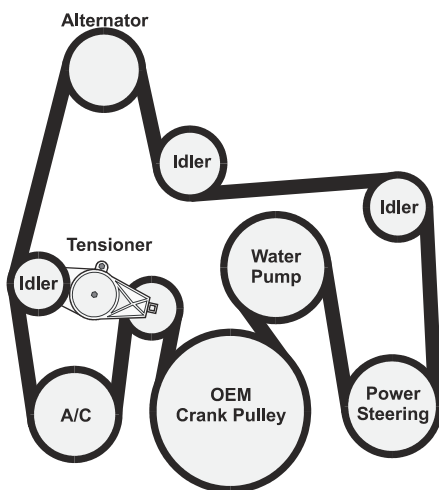


Figure 2.7

- ☐ Remove the air filter from the compressor inlet control valve.
- ☐ Remove the two socket head bolts and remove the support bracket from the inlet control valve.
- ☐ Rest the compressor on top of the mounting bracket.
- ☐ Adjust the position of the small air conditioning line as necessary to provide clearance for the compressor. The large air conditioning line will also have to be moved toward the passenger side to clear the compressor.



To prevent crimping or fracture of the pipe, use a pipe bending tool or bend the pipe in small increments. Do not allow the base of the pipe to twist in the canister.

- ☐ Thread the 90 degree elbow fitting of the shorter 1/2 inch oil return hose onto the elbow fitting on the underside of the compressor, but do not tighten.
- ☐ Route the straight end of the 3/4 inch hose over the valve cover and down the back of the engine. Thread the 45 degree end onto the fitting on the back of the compressor, but do not tighten.
- ☐ Insert the compressor mounting studs into the mounting bracket, with the 1/2 inch hose under the side of the alternator mount. Route the hose tightly over the top of the compressor between the inlet control valve and the drive pulley (Figure 2.8).



Remove any casting flashing from the alternator mounting bracket if it interferes with the compressor.

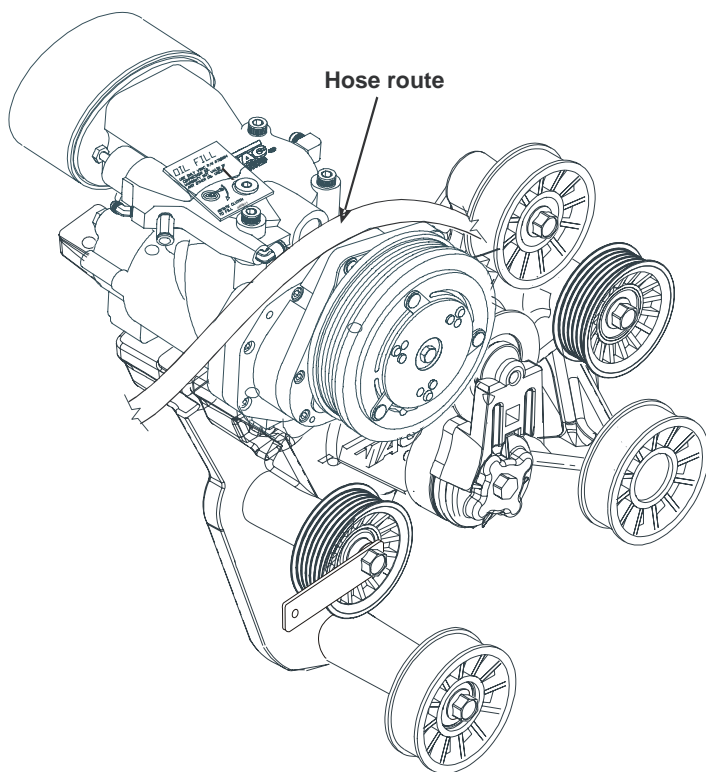


Figure 2.8

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- ☐ Apply Loctite, thread nuts onto the compressor studs and torque to specifications.
- ☐ Tighten the fitting on the 1/2 inch hose and allow the hose end to jam up against the alternator.
- ☐ Route the hose across the top of the compressor, down the fender and under the truck to the cooler. Connect it to the driver's side connection and tighten the fitting. Secure the hose as required with tie-straps to prevent it from contacting any moving parts.
- ☐ Angle the connector on the 3/4 inch hose up slightly and toward the engine to clear the oil dipstick and the oil fill tube. Tighten the fitting.



Slight adjustment of the dipstick tube may be required to clear the main air discharge hose.

- ☐ Install the plastic vacuum reservoir on the fender and tighten the nuts.
- ☐ Install the VR belt tensioner onto the mounting pad on the bracket. Use Loctite and torque the bolt to specifications.
- ☐ Attach each idler to the appropriate location (Figure 2.6). Use Loctite and torque all fasteners to specifications.



When installing the lower-outer idler, make sure that the turbocharger support bracket is installed between the bolt and the idler. Position it so that it points toward the passenger side when the bolt is tightened.

- ☐ Mount the glow plug module on the supplied bracket using the two 6mm bolts and OEM nuts; then install the assembly on the passenger side of the engine valve cover studs behind the engine oil fill tube. Use two OEM nuts to secure the bracket.
- ☐ Install the VR compressor belt (Figure 3.9).

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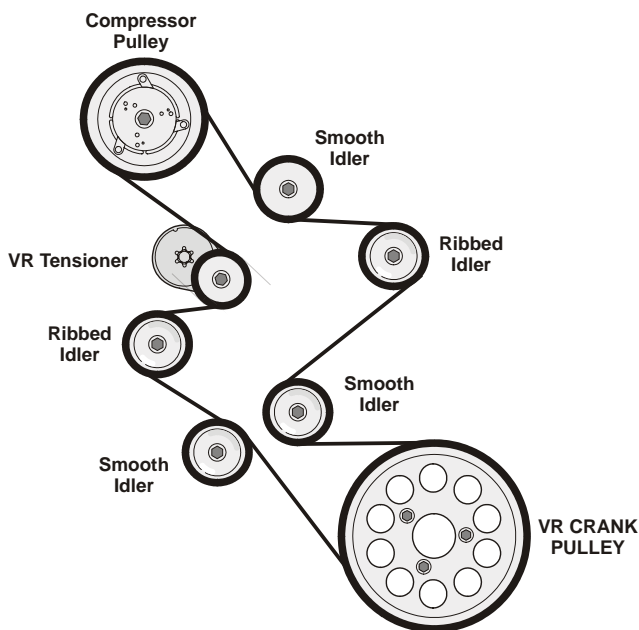


Figure 3.9

- ☐ Lower the fan past the compressor drive components and radiator into position, thread it onto the fan hub and tighten.
- ☐ Slide the fan shroud down past the radiator into position. Attach the shroud to the radiator using the original OEM bolts.
- ☐ Remove the front drivers side air intake bolt and install the fan wiring harness bracket over the adjacent stud (Figure 3.10).
- ☐ Install the air intake bolt through the fan wiring harness bracket and the supplied nut onto the OEM stud. Tighten all fasteners.
- ☐ Insert the fan wiring harness moulded connector into the bracket and tie strap in position using two ties. Make sure that the fan wiring is well clear of the fan and other moving components.

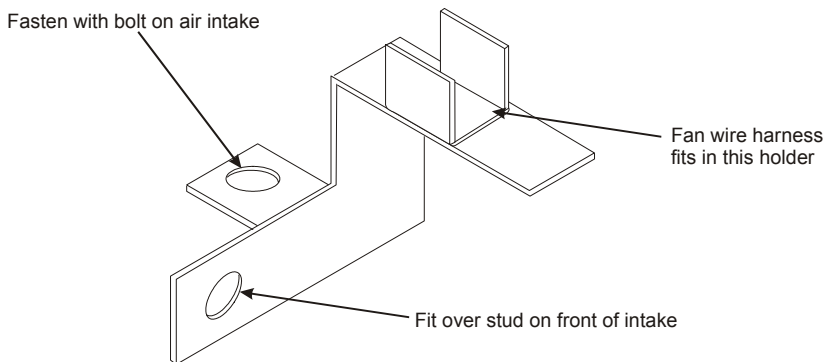


Figure 3.10



Adequate clearance between the fan and plastic harness is essential as the fan will flex forward.

Part 3: Installing the Tank and Hoses

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3.1 Assembling the Tank and Brackets

The tank (Figure 3.1) will mount to the passenger side frame rail between the body mounts.

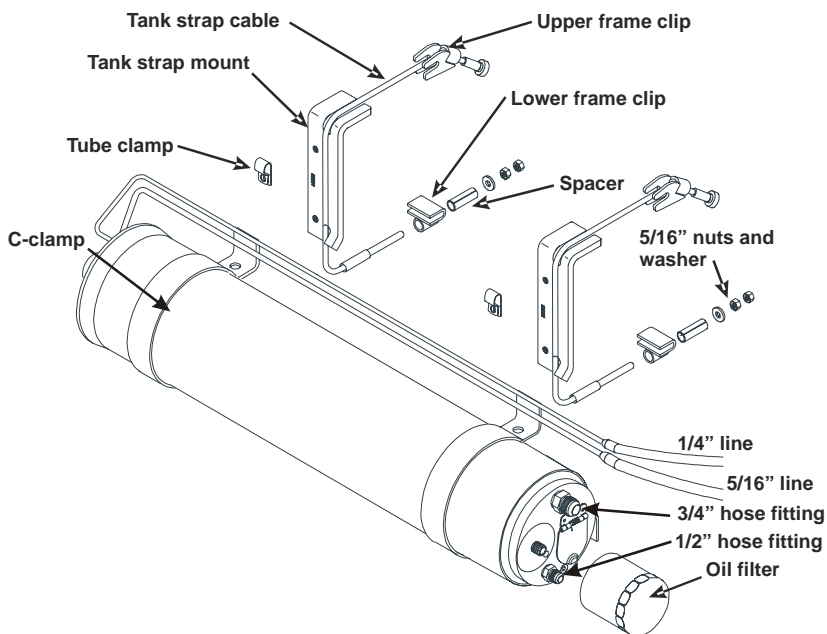


Figure 3.1

- ☐ Place the tank on a work bench with the front (oil filter end) of the tank to your left and remove the oil filter.
- ☐ 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 rear clamp near the back end of the tank and the front clamp approximately 14 inches from the rear clamp.

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- ☐ 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. Leave the C-clamps loose enough so that they can be repositioned on 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.
- ☐ Rotate the tank so that the directional arrow on the end of the tank is parallel to the work bench and faces toward you.
- ☐ Thread the 1/4 and 5/16 inch fittings on the steel lines to the matching fittings on the back end of the tank, but do not tighten the fittings. Route the lines along the top of the tank across the two C-clamps.
- ☐ Place the two insulated tube clips over the steel lines and align them with the top C-clamp mounting holes (Figure 3.2). Apply Loctite and insert 5/16 x 1/2 inch bolts through the clips and the C-clamp and thread them into the mount brackets. Slide the tank all the way down on the tank mount brackets (away from you) and tighten the mounting bolts.
- ☐ Tighten the 1/4" and 5/16" fittings on the back of the tank, then bend the two securing P-clips outward just enough to provide clearance between the lines and the tank mount brackets for the cable straps.
- ☐ Install a 3/4 inch fitting (not supplied) in the back of the tank.

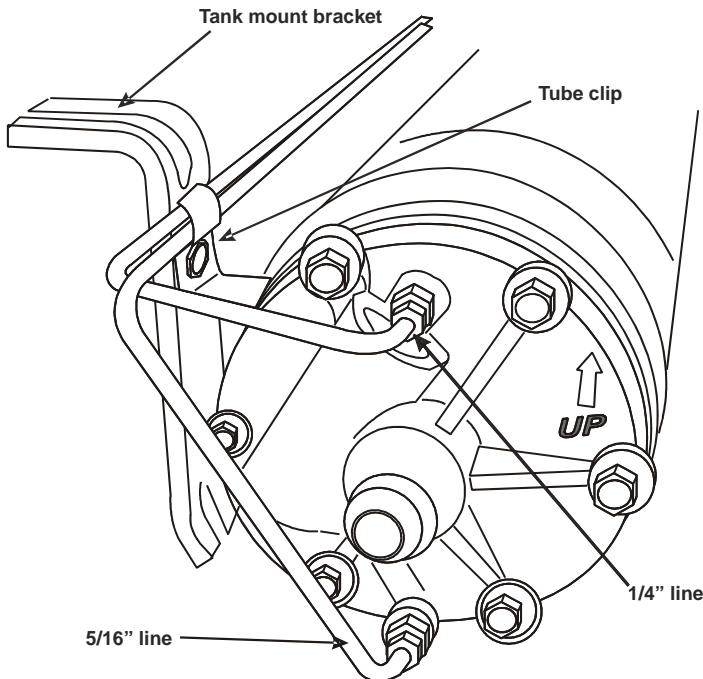


Figure 3.2

3.2 Installing the Tank

- ☐ Insert the cable straps through the tubes of the upper frame clips.
- ☐ Pass the cable strap upper frame clips over the passenger side frame from the outside. Position the straps in front and behind the transmission support cross-member
- ☐ Support the tank and L-bracket assembly in place on the outside of the frame between the cab mounts, with the short part of the L-bracket over the top of the frame.
- ☐ Route the cable straps through the grooves on the tank mount brackets, behind the steel lines and under the frame (Figure 3.3). Adjust the straps and tank brackets as necessary for a good fit on the frame. Set the mount brackets as far apart as possible.

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- ☐ Install the frame clips, spacers (if necessary for narrow frames), flat washers and nuts. Tighten the nuts just enough to hold the tank in position between the two body mounts.



A wider U-clip is provided to accommodate trucks where the tank must be mounted on a double frame section.

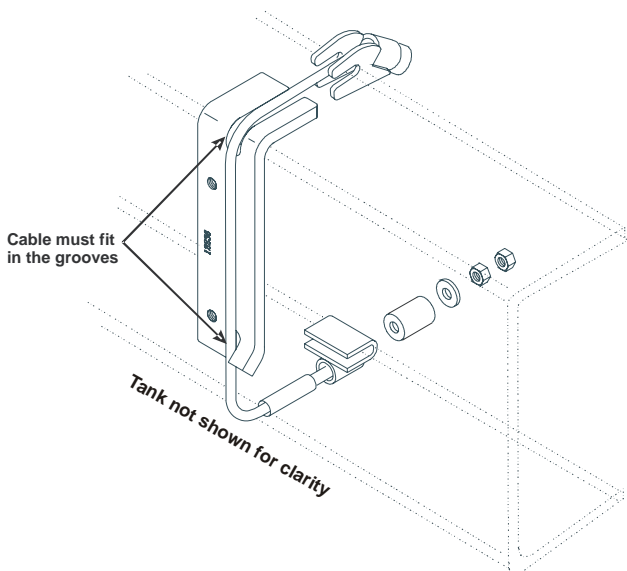


Figure 3.3

- ☐ If necessary, reposition the tank on the frame to provide adequate clearance for hose connections and filter installation. When the tank is correctly positioned, tighten the securing cable retaining nuts until the cables pull tight and snug around the frame. Do not over-tighten.
- ☐ Install a second 5/16 inch nut and tighten it securely against the first to act as a locknut.
- ☐ Check the alignment of the tank to ensure that the directional arrow on the back points "up". Tighten the C-clamp pinch bolts, then tighten the lower 5/16 inch bolts.

3.3 Connecting the Hoses

- ☐ Route the 3/4 inch hose from the back of the compressor down from the engine, around the cab mount and connect it to the matching fitting on the compressor. Tighten the fitting.
- ☐ Connect the straight end of the longest 1/2 inch hose to the front tank fitting. Route this hose over the frame rail and around the steering components to the driver side fitting on the cooler. Tighten both ends.
- ☐ Route the 1/4 and 5/16 inch hoses up into the engine compartment.



Check the hose routing to make sure that the hoses do not contact exhaust components or interfere with moving components. Protect the hoses from abrasion and damage by securing them with nylon frame clamps or ties and protective plastic loom on contact points.

- ☐ Fill the filter with compressor oil and install it on the tank. Tighten the filter 3/4 turn after the gasket contacts the base.

3.4 Filling the System with Oil

- ☐ Remove the two remaining socket head bolts from the air inlet valve on the compressor and remove the inlet valve.
- ☐ Pour the supplied oil into the compressor. Turn the compressor clutch clockwise to speed oil flow to the tank.



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.

- ☐ Allow a few 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.



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

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3.5 Completing the Installation

- ☐ Replace the air inlet valve and install the two outside socket head bolts, but do not tighten.
- ☐ Connect the 1/4 and 5/16 inch lines to the matching fittings on the air inlet valve. Tighten the fittings.
- ☐ Fasten the heater return tube to the bracket with the supplied bolt, nut and washer, then install the compressor support bracket between the air inlet valve and the alternator mount. Install the socket head bolts into the compressor and the OEM bolts into the alternator bracket. Torque the four air inlet bolts to specifications first, then the two alternator bolts.
- ☐ Install the compressor air filter.
- ☐ Install one end of the supplied T-connector in the OEM heater hose.
- ☐ Cut a suitable length of supplied heater hose and install onto the other end of the heater supply tube. Connect it to the other end of the T-connector.
- ☐ Cut the heater hose from the oil cooler to length for best fit and connect it to the T-connector. Tighten all clamps.



Make sure that the hose does not contact the OEM belt or any of the idlers or other moving parts. This is a very close fit. Secure the hose with ties to prevent it from moving during operation.

- ☐ Install the intercooler tube bellows on the passenger side connection of the cooler. Push the bellows over the ribs on the cooler spigot as far as possible and tighten the clamp.
- ☐ Remove the staples securing the OEM clamp to the elbow connector that connect to the turbocharger.
- ☐ Install the supplied intercooler tube on the bellows connection. Make sure that the rib inside the bellows is in the groove on the intercooler tube and snug the clamp to hold it in position.

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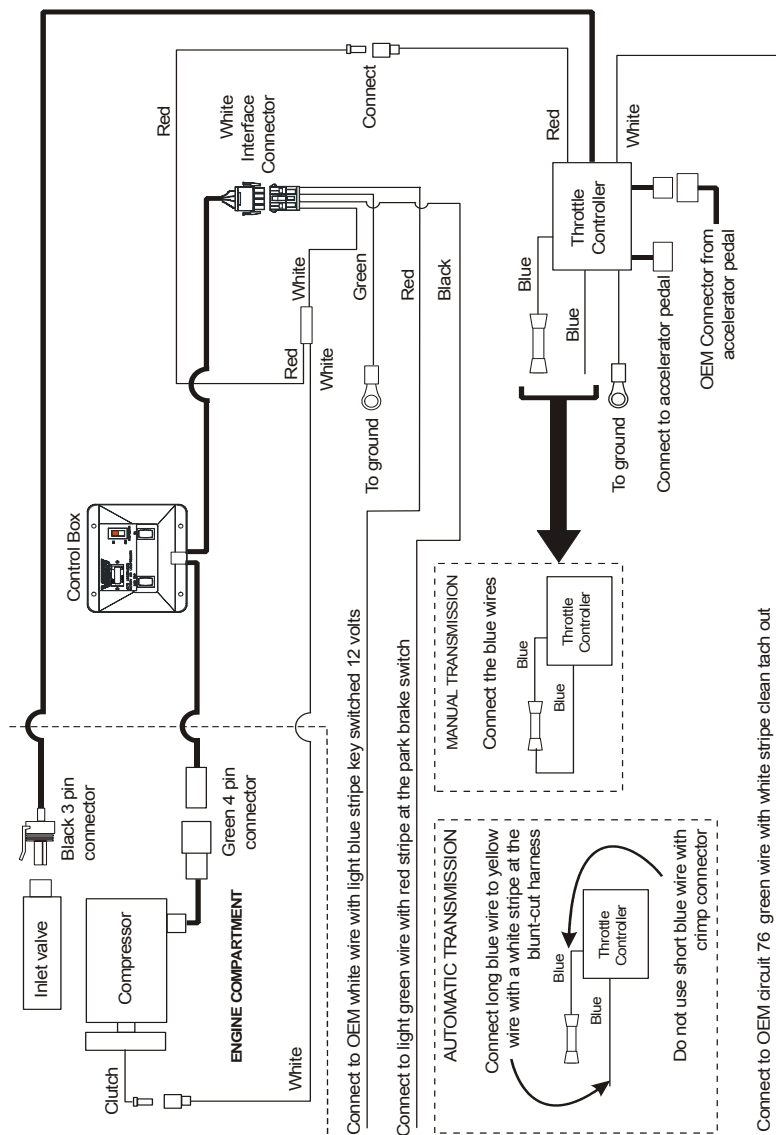
- ☐ Install the OEM elbow between the intercooler tube and the turbocharger (with the OEM clamp installed but loose) and rotate the elbow for best alignment with the intercooler tube and the clamp for best tightening position. Mark the position on the connector, tube and the clamp.
- ☐ Remove the elbow, position the clamp to the marks and install new staples to hold the clamp in position.
- ☐ Install the elbow onto the turbo connection and insert the VMAC intercooler tube into the connector. Make sure that the rib on the elbow is in the groove on the tube and that the alignment provides best fit.
- ☐ Torque all intercooler tube clamps to 9 ft lbs (12 Nm).



Make sure all that parts are fitted correctly, stapled and clamps torqued to specifications, as high boost pressures can blow the connections apart.

- ☐ Secure the intercooler tube in position using the supplied clamp and fasteners to the support bracket located on the idler of the main bracket. Make sure that the intercooler tube clears the compressor clutch and all other engine and body components.
- ☐ Connect the upper radiator hose and expansion hose to the fittings on the radiator and release or tighten the clamps.
- ☐ Fill the cooling system with the recommended coolant.

System V900080

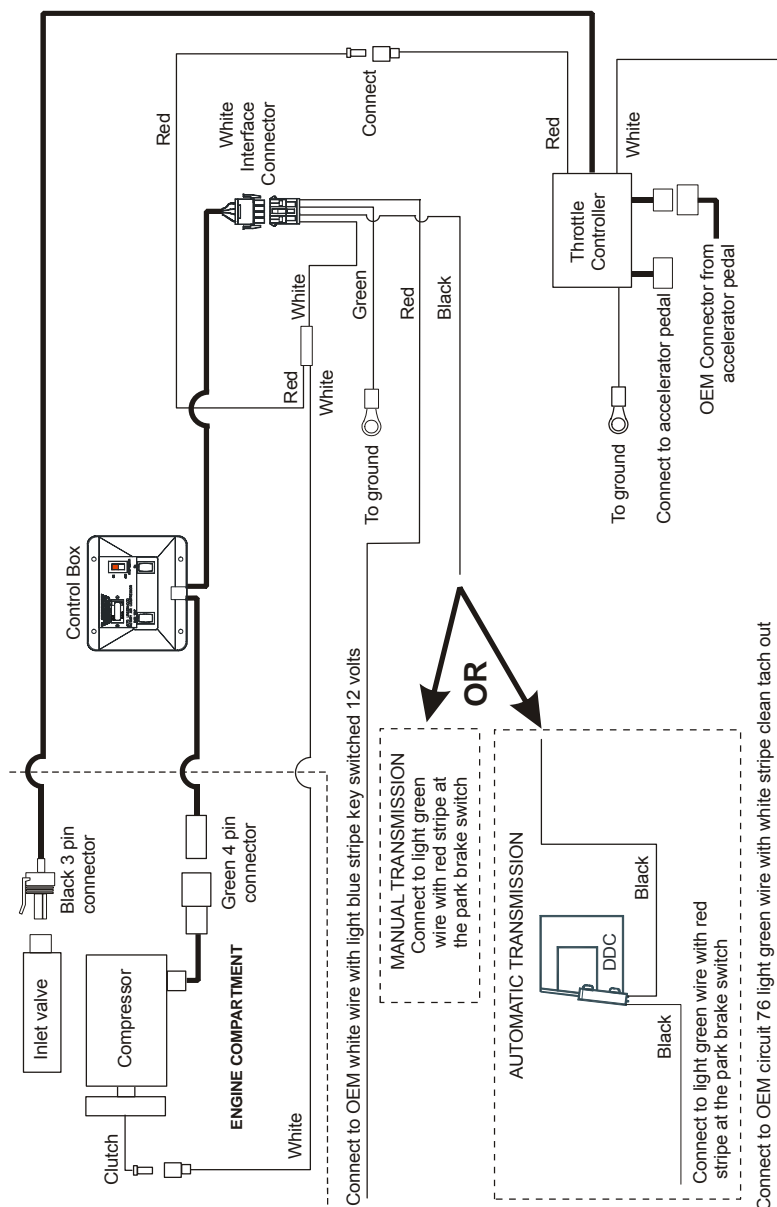


2005 Model Year Wiring

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2003-2004 Model Year Wiring

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4.1 Installing the Components

- ☐ Remove the driver-side plastic door frame base panel and the plastic molding ahead of the base panel. Mount the control box to the floor using the supplied sheet metal screws (Figure 4.1).
- ☐ Route the wire harness under the floor covering, along the inside of the door where it will be covered by the trim piece and up under the dash. Place the floor covering back into position and replace the inside left kick panel.



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

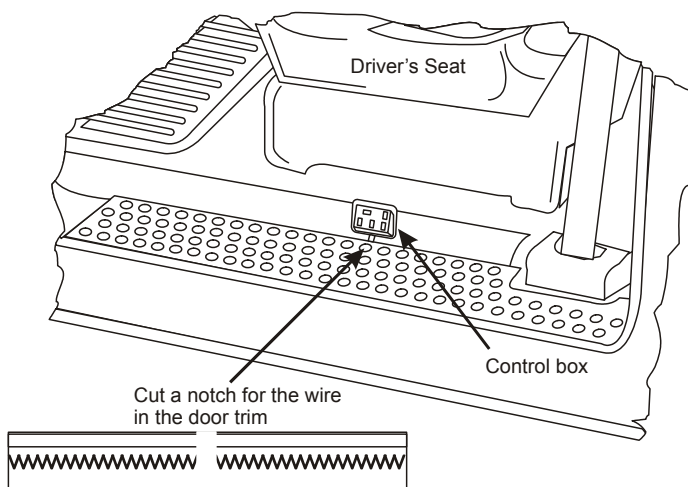


Figure 4.1

- ☐ Cut a notch in the edge of the trim piece through the saw-tooth section just inside the edge of the trim so that the wire is not cut when the trim is installed. Replace the door trim piece.
- ☐ Remove the trim panel from under the dash.
- ☐ Tie-strap the throttle control box to the dash support bracket on the right of the steering column, behind the diagnostic connector or to the bottom metal dash frame just behind the removable panel, with the adjusting screws facing out

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4.1.1 2003-2004 Model Years with Automatic Transmission

- ☐ Apply the park brake and shift the transmission into the lowest forward gear.
- ☐ Apply Loctite to the set-screw and mount the magnetic actuator to the transmission arm under the dash (Figure 4.2).



Do not pinch or damage the orange shift indicator harness during installation.

- ☐ Locate the OEM hole under the dash on the support near the transmission arm (Figure 4.3).
- ☐ Using a 1/2 inch socket wrench, install and remove the screw for the magnetic switch bracket in the hole to tap threads in the hole.
- ☐ Mount the switch bracket to the frame under the dash. Note the location of the rectangular washer, the hole is offset to provide more clearance (Figure 4.4).

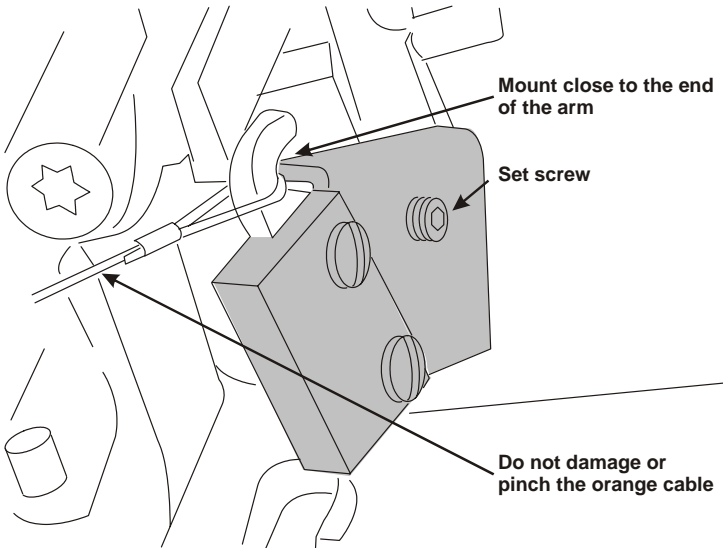


Figure 4.2

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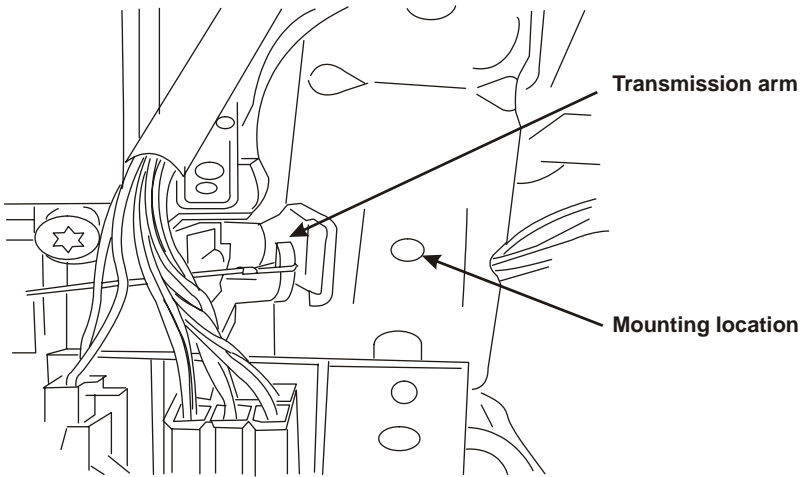


Figure 4.3

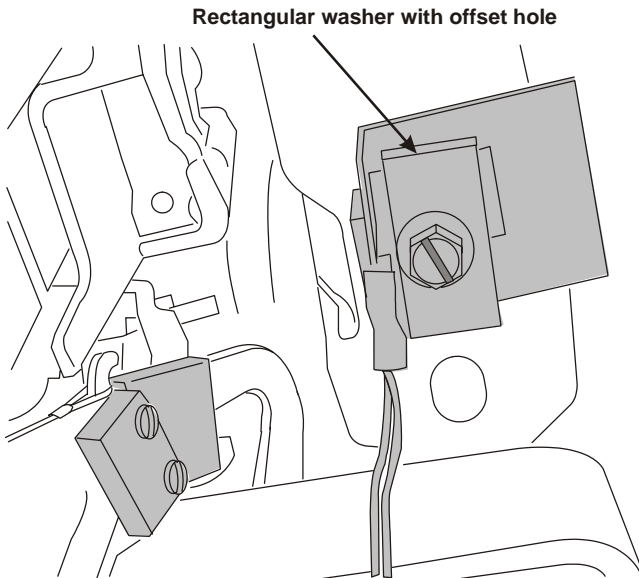


Figure 4.4

- ☐ Slide the bracket all the way to the right. Use a screwdriver to hand-tighten the screw as a socket will push the bracket to the left.

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- ☐ Shift the transmission back into park, being careful not to hit the switch.
- ☐ Slide the switch to the magnet and align the two pieces. This alignment does not need to be perfect and the magnet and switch should not quite touch (Figure 4.5). Tighten the screw with a screwdriver.



To prevent damage to the switch, check the spacing between the magnet and switch while holding the shift lever as far past the PARK position as it will go.

- ☐ Connect an Ohmmeter to the two black wires from the magnetic switch. In park, there should be less than 2 Ohms resistance. In all other gears, the resistance must be greater than 20 M-Ohms.
- ☐ If you do not have an Ohmmeter, connect 12 volts to one wire and a test light probe to the other. The light should be on in park and off in all other gears.



An improperly operating safety interconnect (DDC) can result in inadvertent truck movement during operation.

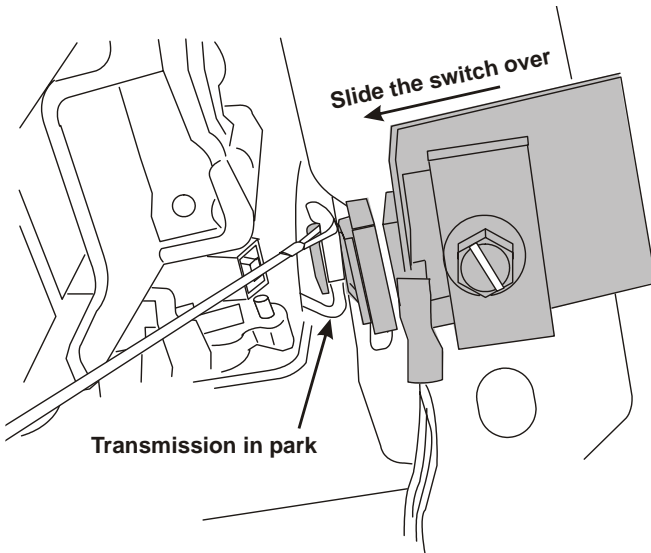


Figure 4.5

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4.2 Connecting the Under-hood Wiring

- ☐ Make a slit or cut a small cross in a harness boot or other firewall plug and pass the following wires from the cab into the engine compartment:
 - small gray harness with the green connector
 - small gray harness with the black connector
 - white wire with a bullet connector
- ☐ Route all of the wires along the engine and firewall to the compressor and connect them to the matching connectors on the compressor. Cover the wires with plastic loom and secure them to OEM harnesses and other objects with nylon ties.



Avoid the turbocharger and other hot or moving parts.

4.3 Connecting the In-cab 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 white four-wire interface connector to the matching white plug on the harness from the control unit.
- ☐ Connect the green “ground” wires from the throttle control box and the interface connector to the dashboard ground point above the diagnostic connector (Figure 4.6).
- ☐ Connect the red wire from the interface connector to the red wire with the matching connector from the throttle control box.
- ☐ Connect the red “key switched 12V” wire to the OEM white wire with a light blue stripe (CCT #294) under the dash above the OEM diagnostic connector (Figure 4.6) using a butt connector.

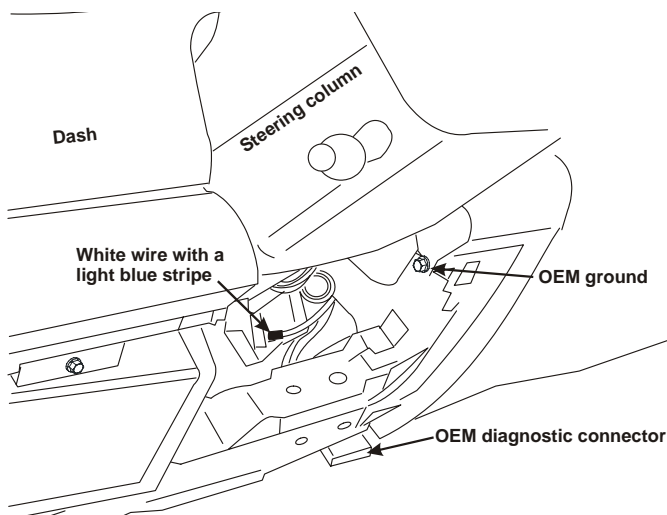


Figure 4.6

- ☐ Solder and seal the white “OEM Clean Tach out” wire from the throttle control box to the green wire with a white stripe (CTO – Ford CCT #76) in the bundle of blunt cut wires near the park brake (Figure 4.7).

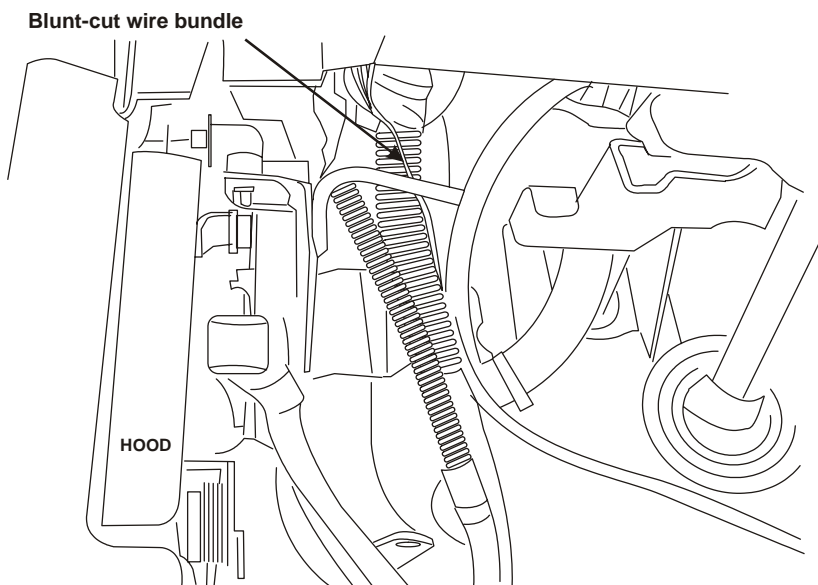


Figure 4.7

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4.3.1 2005 Model Year Manual Transmission

- ☐ Solder and seal the black wire from the interface connector to the green with red stripe wire at the park brake (Figure 4.8).
- ☐ Cut the long blue wire to approximately 6 inches, strip and crimp it to the short blue wire with the butt connector.

4.3.2 2005 Model Year Automatic Transmission

- ☐ Solder and seal the black wire from the interface connector to the green with red stripe wire at the park brake (Figure 4.8).
- ☐ Tie up the short blue wire at the throttle control box.
- ☐ Solder and seal the long blue wire from the throttle control box to the yellow wire with a white stripe in the blunt-cut bundle beside the park brake under the dash (Figure 4.7).

4.3.3 2003-2004 Model Year Manual Transmission

- ☐ Solder and seal the black wire from the interface connector to the green with red stripe wire at the park brake (Figure 4.8).

4.3.4 2003-2004 Model Year Automatic Transmission

- ☐ Solder and seal the black wire from the DDC to the green with red stripe wire at the park brake (Figure 4.8).
- ☐ Connect the remaining black wire from the DDC to the black wire from the interface connector.

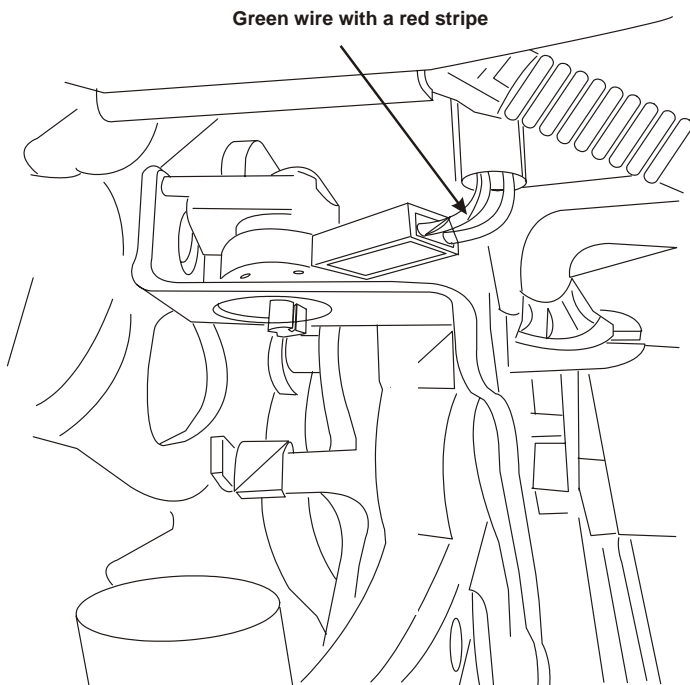


Figure 4.8

4.4 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 and connect the batteries.

4.4.1 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.

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- ☐ 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.
- ☐ On trucks up to 2005, shift the automatic transmission out of Park. 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.
- ☐ On 2005 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 1-800-738-8622 or 250-740-3200.

Part 5: Finishing the Installation

System V900080

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



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:

5.2.1 2005 Model Year Trucks

- ☐ On automatic transmission trucks, with the engine running, engage the park brake; place your foot firmly on the brake pedal, shift the automatic transmission out of Park and into gear.
- ☐ Turn the switch on the control box to the “on” position. The green light will come on and the compressor will engage, but the engine will not idle up. Turn the switch off.
- ☐ Repeat this test in all gear selector positions to make sure that the engine does not idle up unless the selector is in Park.

5.2.2 All Trucks

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

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- ☐ 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).

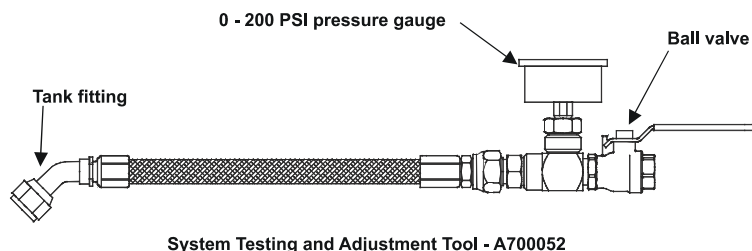


Figure 5.1

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.

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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 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.

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.

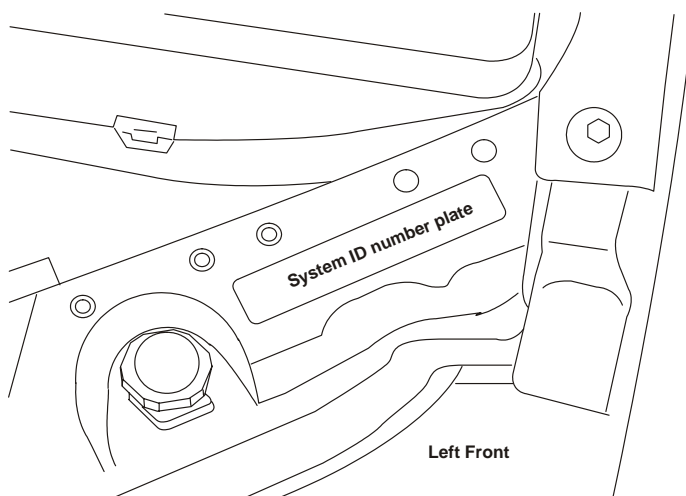


Figure 5.2

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).

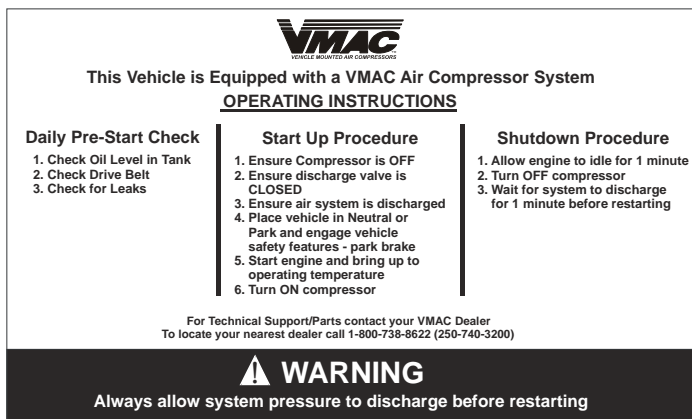


Figure 5.3

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.

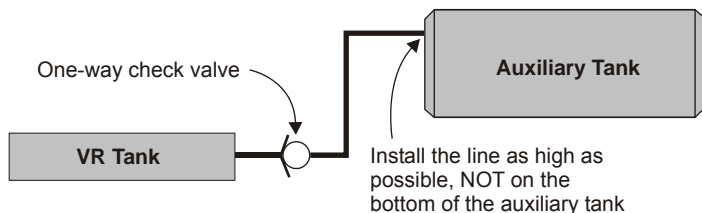


Figure 5.4

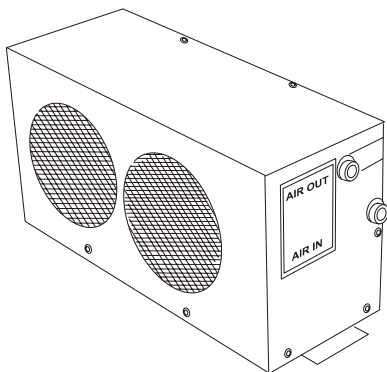
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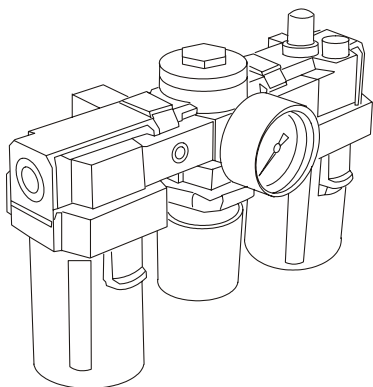
Accessory Products from VMAC

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.



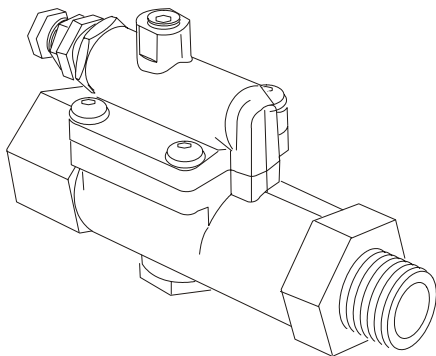
D51 Air Dryer

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.



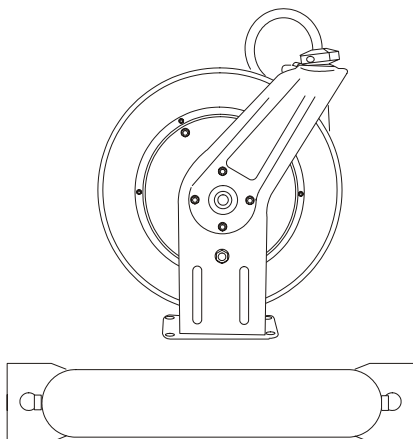
Auxiliary Tank Valve

Equalizes pressure between storage tanks and the VR tank. Built-in check valve. No electrical connections or adjustments required.

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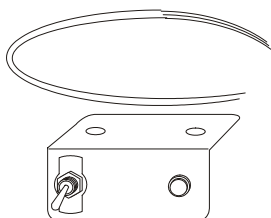
Hose Reel

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



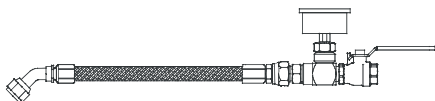
Air Receiver Tank

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



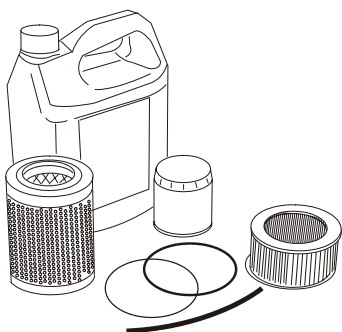
De-icer Kit

Insulated rope heater prevents freezing of lines and regulator.



System Testing Tool

Simulates tool use to provide for accurate system adjustments. Orifice fittings included for both VR70 and VR140 systems.



VR 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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