

A700222 VMAC Crank Pulley Retrofit

For VMAC Systems V900127, V900117, V900115, V900108,
V900107, V900097, V900087

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Crank Pulley Retrofit Instructions for VMAC systems V900127, V900117, V900115, V900108, V900107, V9000097, V9000087

Changes and Revisions

Version	Revision Details	Revised by/date	Checked by/date	Reviewed by/date	Implemented
A	Engineering Release	RF June 17 2015	RD June 23 2015	CH June 23 2015	June 23 2015
B	ECN 15-088	RF July 21 2015	RD July 21 2015	CH July 21 2015	July 21 2015

Important Information



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



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

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



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

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General Information

Before You Start

Read this manual before attempting any mechanical work 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.**

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

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 or visit:

<http://vmacair.com/dealer-locator/>

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Introduction

Due to manufacturing variations with the GM Harmonic Balancer, it is possible for previous designs of the VMAC Crank Pulley to loosen off of the harmonic balancer. The VMAC Crank Pulley has since been redesigned with a larger mounting surface, and a stronger material to prevent this.

Tools Required

Special Tools Required

- OEM flywheel locking tool part number J42386.
- Pneumatic fan wrench removal set (such as Lisle 43300) or a manual fan pulley holder (such as KD3900)
- Liquid Loctite 242

Optional Tools

- Specialty tool (J 45059 : Angle Meter)

Part List

The A700222 kit includes:

Part Number	Description	Quantity
4800703	VMAC Crank Pulley	1
1520631	Crank Pulley Bolt M16 X 2.0 X 120 HHCS 10.9	1
1570233	Crank Pulley Washer 5/8 Washer Flat SAE	1

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Part 1: Removing the Crank Pulley

- Disconnect the battery terminals.
- Remove the air filter box, air intake tube and resonator box.
- Remove the engine fan (right hand thread).
- Remove tension from the VMAC belt (Figure 1.1)

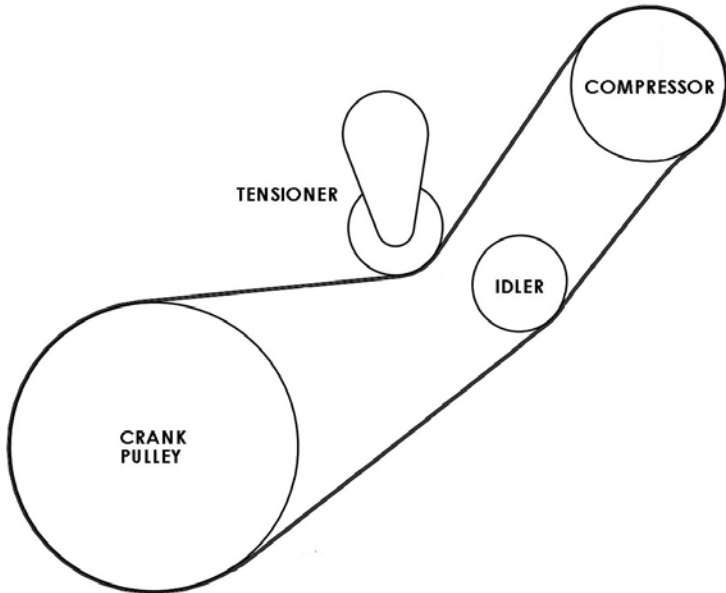


Figure 1.1 - VMAC Belt Routing



Belt routing may differ from one shown, use the routing shown in the installation manual for your system.

- Remove the crankshaft pulley center bolt.
- Inspect the OEM Harmonic Balancer per Part 2 of this manual

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Part 2: Inspecting the OEM Harmonic Balancer

Figure 2.1 is an example of what damage can be seen when there is a crank bolt failure. A raised edge can be seen where the VMAC Crank Pulley has worn into the OEM harmonic balancer.

It is possible that during the failure the VMAC crank pulley is free to wobble around on the mating surface which results in damage to the mating surfaces.



Figure 2.1 - Damaged Harmonic Balancer

- Visually inspect the Harmonic Balancer, do a tactile (finger nail) surface check.



If there is any form of surface damage that cannot be easily removed the OEM Harmonic Balancer needs to be replaced. See part 3 of this manual for the Harmonic Balancer Part Number

- Figure 2.2 shows what the mating surface of a new OEM Harmonic Balancer should look like. **Note the smooth mating surface.**



Figure 2.2 - New OEM Harmonic Balancer

- Surface imperfections may exist on the OEM Harmonic Balancer. Remove any surface burrs, so there is a clear mating surface for the VR crankshaft pulley.

The VMAC crank pulley is extremely sensitive to misalignment between the mating faces of the VMAC crank pulley and the OEM Harmonic Balancer.



The effect of misalignment between the two mating surfaces can be seen in Figure 2.3

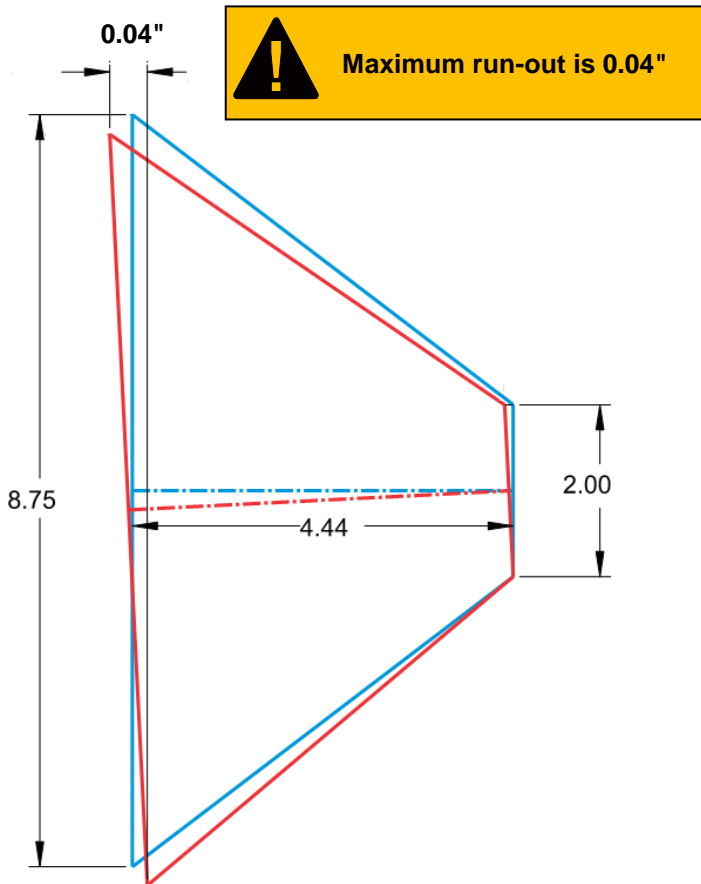


Figure 2.3 – Pulley Misalignment



A maximum misalignment across the 8.75" VMAC crank pulley face of 0.04" is allowable but to maximize belt life and minimize the chance of having a belt come off, this misalignment should be minimized.

Part 3: GM Harmonic Balancer Part Number



Changing the Harmonic balancer requires specialty tools and training, VMAC recommends the Harmonic Balancer replacement be performed by an authorized GM service center. To locate your nearest GM dealer visit <http://www.gm.com/vehicles/dealerLocator.html>

OEM Harmonic Balancer:

- GM part number = 19300488
- Description: Vibration Damper/Crankshaft Balancer



The part description changes depending on the vendor, but the part number is consistent.

Part 4: Installing the VMAC Crank Pulley

- Remove the starter motor and install the OEM flywheel-locking tool.
 - GM specialty tool (J 42386-A : Flywheel Holding Tool)
- Check the face of the OEM Harmonic Balancer, and remove any surface burrs, so there is a clear mating surface for the VR crankshaft pulley.



Surface imperfections on the OEM Harmonic Balancer need to be addressed before installation of the VMAC crank pulley. See part 2 of this manual

- Place the VR crankshaft pulley in position over the OEM pulley. Make sure that it fits flat against the OEM pulley.
- Completely coat the threads with **Blue 242 Loctite** and install the M16 x 120mm replacement VR crankshaft bolt (1520631), along with the supplied washer (1570233) **finger tight**. (Figure 4.1)



Figure 4.1 – M16x120 Fastener with Blue Loctite



Liquid Loctite 242 must be used to achieve correct torque on the crankshaft bolt as it functions as a thread lubricant, as well as a locking compound. Solid or Stick Loctite cannot be used.

- Rotate the VR crankshaft pulley counterclockwise until the lugs on the back of the pulley are tight against the sides of the OEM pulley lugs (Figure 4.2) and tighten the crankshaft pulley bolt sufficiently to hold the pulley in position



Ensure VR pulley does not move off OEM pulley face before tightening pulley bolt. Ensure pulley is rotated tight against the pulley lugs.

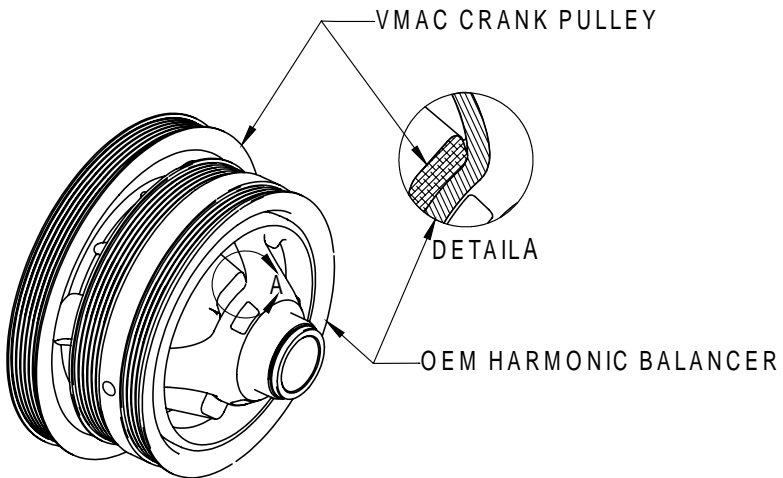


Figure 4.2



Do not use an impact tool to tighten pulley bolt. Use torque wrench and follow the recommended tightening sequence.

- Torque the VR crankshaft pulley bolt as per GM specifications. For your convenience, the specifications at the time of printing were:

- 1) Torque to 110 ft*lbs (150Nm)
- 2) Loosen 360 degrees
- 3) Torque 59 ft*lbs (80Nm)
- 4) Turn an additional 125 degrees
 - **Angle can be measured with GM specialty tool (J 45059 : Angle Meter)**

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- Remove the OEM flywheel-locking tool and install the starter motor.
- Install the VMAC VR belt (Figure 4.3) visually check belt alignment to make sure that it is correct.

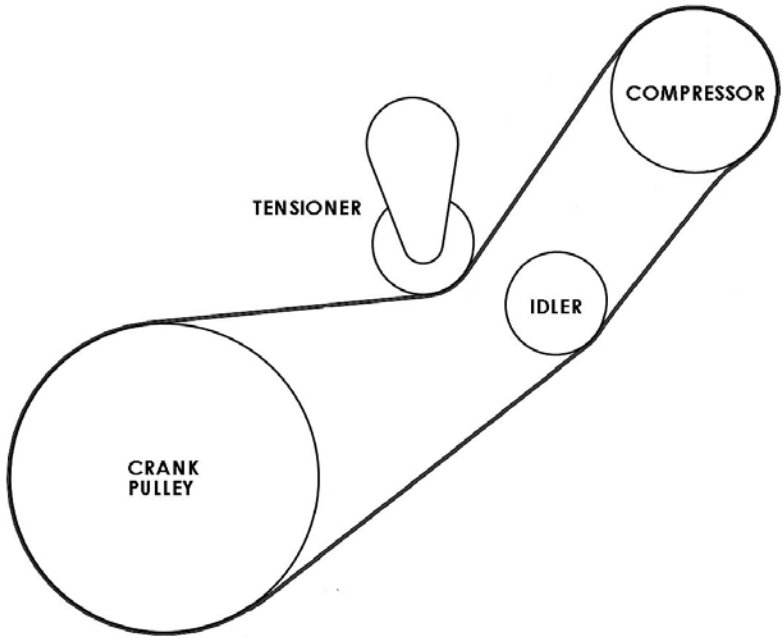


Figure 4.3 – VR belt routing



Belt routing may differ from one shown, use the routing shown in the installation manual for your system.

- Install engine fan.
- Install the air intake box mounting tray, air intake box, air intake tube and resonator box.
- Check all fasteners, clamps, fittings and retainers to make sure that they are tight and secure all OEM wire harnesses.
- Reconnect Battery.

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Part 5: Finishing the Installation

5.1 Before Starting the Engine Checklist

Ensure that the following has been completed:

- Check the coolant.
- Check the compressor oil level at the tank sight glass.
- Do a final inspection to make sure that everything has been completed and tightened.
- Perform a final belt alignment check.
- Check all wiring for security and protection. Make sure nothing is touching the compressor body.

5.2 Final Testing

Ensure that the following has been completed:

- Operate the system with an air tool for at least 1/2 hour (1 hour preferred).
- Road test the truck for approximately 14 miles (20 km).
- Watch the underhood operation to make sure that belts rotate properly, pulleys rotate smoothly and nothing is rubbing or contacting hot parts.
- Check all components, connections and fasteners once the engine is turned off and the system has cooled.
- Check the coolant level after the engine has been operated.
- Check the compressor oil level after the engine has been shut down and the oil level has had time to stabilize.

Part 6: Accessory Products

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.

	<p align="center">Eliminator Aftercooler</p> <p>Part Number A800070</p> <p>Removes up to 80% of moisture from compressed air. Quick installation, automatic drain and compact design</p>
	<p align="center">Filter Regulator Lubricator</p> <p>Part Number A700151</p> <p>Removes lubricants, water and dirt from the air stream. Adds atomized tool oil to lubricate tools. Reduces pressure for longer tool life.</p>
	<p align="center">Hose Reel</p> <p>Part Number A700007</p> <p>Secure, compact, retractable hose storage in a sturdy reel.</p>
	<p align="center">Air Receiver Tank</p> <p>Part Number A300010</p> <p>Thirty-five gallon capacity in a compact tank, complete with fittings and a gauge.</p>
	<p align="center">De-icer Kit</p> <p>Part Number A700031</p> <p>Insulated rope heater prevents freezing of lines and regulator.</p>
	<p align="center">Service Kits</p> <p>VR150 200 hour Part Number A700059 VR150 400 hour Part Number A700060</p> <p>VR70 200 hour Part Number A700019 VR70 400 hour Part Number A700020</p> <p>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</p>

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