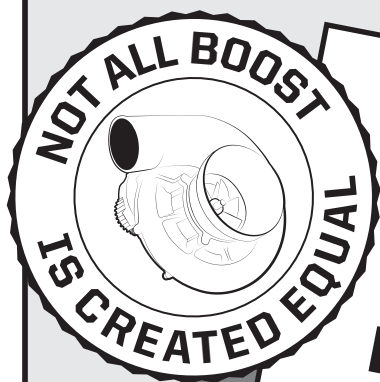


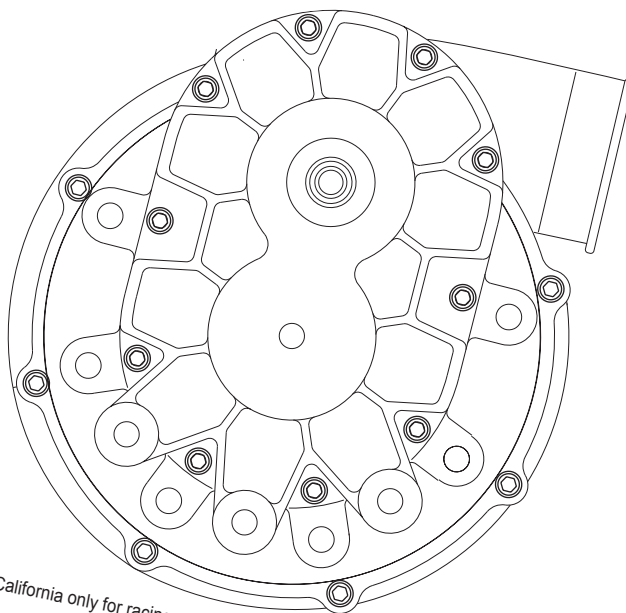


GM LS SWAP

EFI, PASS. SIDE MOUNT*

Supercharger System Installation Instructions

(For use with 1999-2013 GM Truck FEAD)



*Legal in California only for racing vehicles which may never be used or registered or licensed for use upon a highway.



ENGINEERING, INC

1650 Pacific Avenue, Channel Islands, CA 93033-9901 • Phone (805) 247-0226
Fax: (805) 247-0669 • www.vortechsuperchargers.com • M-F 7:00 AM - 3:30 PM (PST)

FOREWORD

This manual provides information on the installation, maintenance and service of the Vortech supercharger kit expressly designed for this vehicle. All information, illustrations and specifications contained herein are based on the latest product information available at the time of this publication. Changes to the manual may be made at any time without notice. Contact Vortech Engineering for any additional information regarding this kit and any of these modifications at (805) 247-0226 7:00am-3:30pm PST.



Take note of the following before proceeding:

1. Proper installation of this supercharger kit requires general automotive mechanic knowledge and experience. Please browse through each step of this instruction manual prior to beginning the installation to determine if you should refer the job to a professional installer/technician. Please contact your dealer or Vortech Engineering for possible installers in your area.
2. This product was designed for use on stock (un-modified, OEM) vehicles. The PCM (computer), engine, transmission, drive axle ratios and tire O.D. must be stock. If the vehicle or engine has been modified in any way, check with Vortech prior to installation and use of this product.
3. Use only premium grade fuel with a minimum of 91 octane (*R+M/2*).
4. Always listen for any sign of detonation (*knocking/pinging*) and discontinue hard use (*no boost*) until problem is resolved.
5. Vortech is not responsible for any clutch, transmission, drive-line or engine damage.

Exclusions from Vortech warranty coverage considerations include, but not limited to:

1. Neglect, abuse, lack of maintenance, abnormal operation or improper installation.
2. Continued operation with an impaired vehicle or sub-system.
3. The combined use of Vortech components with other modifications such as, but not limited to, exhaust headers, aftermarket camshafts, nitrous oxide, third party PCM programming or other such changes.

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TABLE OF CONTENTS

FOREWORD	ii
TABLE OF CONTENTS	iii
IMPORTANT NOTES	iv
TOOL & SUPPLY REQUIREMENTS	v
PARTS LIST	vi
1. MOUNTING BRACKET & SUPERCHARGER INSTALLATION	1
2. DRIVE BELT & MANUAL TENSIONER INSTALLATION	5
3. DISCHARGE DUCT & BYPASS VALVE INSTALLATION	7
4. UPPER RADIATOR HOSE ELBOW INSTALLATION	11
5. FINAL CHECK	13

NOTICE

This product is protected by state common law, copyright and/or patent. All legal rights therein are reserved. The design, layout, dimensions, geometry, and engineering features shown in this product are the exclusive property of Vortech Engineering, Inc. This product may not be copied or duplicated in whole or part, abstractly or fundamentally, intentionally or fortuitously, nor shall any design, dimension, or other information be incorporated into any product or apparatus without prior written consent of Vortech Engineering, Inc.

GM LS SWAP

EFI; PASS. SIDE MOUNT

Installation Instructions

Congratulations on selecting the best performing and best backed automotive supercharger available today... the VORTECH® supercharger!

Before beginning this installation, please read through this entire instruction booklet and the Street Supercharger System Owner's Manual which includes the Limited Warranty Program, the Warranty Registration form and return envelope.

Vortech supercharger systems are performance improving devices. In most cases, increases in torque of 30-35% and horsepower between 35-45% can be expected with the boost levels specified by Vortech Engineering. This product is intended for use on healthy, well maintained engines. Installation on a worn-out or damaged engine is not recommended and may result in failure of the engine as well as the supercharger. Vortech Engineering is not responsible for engine damage.

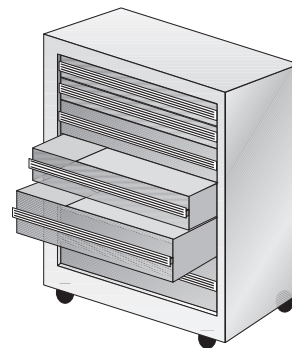
Installation on new vehicles will not harm or adversely affect the break-in period so long as factory break-in procedures are followed.

For best performance and continued durability, please take note of the following key points:

1. Use only premium grade fuel 91 octane or higher (R+M/2).
2. The engine must have stock compression ratio.
3. If the engine has been modified in any way, check with Vortech prior to using this product.
4. Always listen for any sign of detonation (pinging) and discontinue hard use (no boost) until problem is resolved.
5. Perform an oil and filter change upon completion of this installation and prior to test driving your vehicle. Thereafter, always use a high grade SF rated engine oil or a high quality synthetic, and change the oil and filter at least every 3,000 miles. Never attempt to extend the oil change interval beyond 3,000 miles, regardless of oil manufacturer's claims as potential damage to the supercharger may result.
6. Before beginning installation, replace all spark plugs that are older than 1-year or 15,000 miles with original heat range plugs as specified by the manufacturer and reset timing to factory specifications (follow the procedures indicated within the factory repair manual and/or as indicated on the factory underhood emissions tag). Do not use platinum spark plugs unless they are original equipment. Change spark plugs every 20,000 miles.

TOOL & SUPPLY REQUIREMENTS

- 3/8" socket and drive set: SAE & metric
- 1/2" socket and drive set: SAE & metric
- Adjustable wrench
- Channel Locks
- Open end wrenches: 3/8", 7/16", 1/2", 9/16"
- Screwdriver set



If it has been 15,000 miles or more since your vehicle's last spark plug change, then you will also need:

- Spark plug socket
- NEW spark plugs



EFI, GM LS SWAP, TRUCK FEAD

Part No. 4GX218-110L

PARTS LIST

IMPORTANT: Before beginning installation, verify that all parts are included in the kit. Report any shortages or damaged parts immediately.

PART NO.	DESCRIPTION	QTY.	PART NUMBER	DESCRIPTION	QTY.
008110	SMALL SILVER DIE CUT DECAL	2			
008130	LICENSE PLATE FRAME, VORTECH	1			
008447	1 YR S/C STRT INFO PKG ASY VORT	1			
009035	S/C LUBE, BOTTLED, 3-PACK	1			
2F338-050	S/C ASY,V3 SCI,CW,LS SWAP,TRK	1			
4GX020-030	INST MAN, EFI LS SWAP, TRK FEAD	1			
4GX110-054	MNTG BRKT ASSY, LS TRUCK SWAP	1			
2A017-016	PILOT, 6203/5 BRG, M10 3/8 SCREW	2			
2A017-072	SPACER, IDLER, .717	1			
2A017-875-157	IDLER SPACER, .88 OD X 2.360L	1			
2A017-878-12	SPACER, 875 OD X 2.494 LONG	6			
2A046-113	BELT, 6 RIB X 112.89 EFFECT. LENGTH	1			
4FA011-042	BELT TENS PLATE, HEAVY DUTY	1			
4FD017-011	PILOT, 6203/5 BRG, 1/2 SCREW	1			
4GX010-010	MNTG PLT, REAR, CYL HEAD	1			
4GX010-044	MNTG PLT, FRONT, S/C	1			
4TX016-150	IDLER, 2.75 DIA, SMOOTH, 7 RIB	3			
7A375-126	3/8-16 X 1.25 HHCS, GR8, PLT	5			
7A375-352	3/8-16 X 3.5" HX HD GR8	6			
7A375-400	3/8-16 X 4" BOLT HXHD GR8	1			
7C010-030	M10 X 1.5 X 30 HXHD CL10.9	4			
7C012-020	M12 X 1.75 X 20MM HXHD CL8.8	3			
7C012-065	M12 X 1.75 X 65MM HX	1			
7F375-021	3/8-16 NYLOCK NUT, FLG HEAD	1			
7G010-175	M12 X 1.75 NUT	1			
7J010-002	WASHER, M10 FLAT, ZN PLT	4			
7J012-092	WASHER, M12 FLAT, ZN PLT	4			
7J500-002	1/2" WASHER, SPLIT LOCK	1			
7K375-040	3/8 AN960 FLAT WASHER PLATED	11			
7P375-075	3/4" HOSE BARB UNION, BRASS	1			
7R002-010	#10 SAE TYPE F SS HOSE CLAMP	3			
7U030-065	HOSE, 3/4 X 90 ELOBOW RUBBER, SHORT	1			
4GX212-030	DISCH ASY, EFI LSX SWAP TRK SAT	1			
4GX012-040	DISCH TUBE B, EFI LS SWAP, TRK	1			
4GX112-030	ASY, DISCH TUBE A, EFI LS SWAP TRK SAT	1			
7P375-250	3/8 X 3/8 X 1/4 MALE BARB TEE	1			
7PS300-275	REDUCER, BLK 3.0- 2.75	1			
7PS300-300	SLEEVE, BLACK, 3.00D X 3.00	1			
7PS388-301	ELBOW, REDUCER, 3.88-3.00 X 90	1			
7R002-044	#44 SAE TYPE F SS HOSE CLAMP	1			
7R002-048	#48 SAE TYPE F SS HOSE CLAMP	4			
7R002-064	#64 SAE TYPE F SS HOSE CLAMP	1			
7U030-218	7/32 VAC HOSE, BUNA-N	5FT			
7U133-070	FILLER HOSE	1			
8D204-064	ASY, RACE BYPASS VALVE,BLK/SAT	1			
8H040-050	AIR FILTER 3.5"FLG X 7"L	1			
8H040-175	FILTER, 1.75" I.D., RACE BYPASS	1			

IMPORTANT INSTALLATION NOTES

This kit should only be installed by qualified mechanics. It is imperative that **the correct air/fuel mixture be maintained at all times. This kit is to be supplied to competent engine tuners for their completion by the addition of, and tuning of, appropriate fuel and ignition control components.**

This product is intended for use on healthy, well maintained engines. Installation on a worn-out or damaged engine is not recommended and may result in failure of the engine.

Vortech Engineering is not responsible for engine damage. Installation on new engines will not harm or adversely affect the break-in period so long as factory break-in procedures are followed.

1. This tuner system is based on the OEM 1999-2013 GM truck damper and accessory/FEAD configuration. Due to some variations in the OEM FEAD over the years, your installation may require minor modifications (belt length change, etc.).
2. Pulley diameter changes: Careful size selection is mandatory for proper engine and supercharger longevity. Contact the Vortech Tech Line for assistance with impeller speed calculations if necessary.

	7.53" OEM Truck Damper	Tensioner Idler Position
3.60" S/C Pulley P/N: 2A036-360 (Included in kit)	Belt Length - 113.0" P/N: 2A046-113 (Included in kit)	Upper Hole
3.48" S/C Pulley P/N: 2A036-348	Belt Length - 113.0" P/N: 2A046-113	Upper Hole
3.40" S/C Pulley P/N: 2A036-340	Belt Length - 113.0" P/N: 2A046-113	Upper Hole
3.33" S/C Pulley P/N: 2A036-333	Optional Belt Length - 113.0" P/N: 2A046-113	Lower Hole
	Preferred Belt Length - 112.5" Goodyear Gatorback P/N: 4061125 (NOT AVAIL. THRU VORTECH)	Upper Hole
3.25" S/C Pulley P/N: 2A036-325	Belt Length - 112.5" Goodyear Gatorback P/N: 4061125 (NOT AVAIL. THRU VORTECH)	Upper Hole
3.12" S/C Pulley P/N: 2A036-312	Belt Length - 112.5" Goodyear Gatorback P/N: 4061125 (NOT AVAIL. THRU VORTECH)	Upper Hole

NOTE: If the supercharger drive pulley will not slide onto the shaft, DO NOT FORCE IT. Light heating of the supercharger drive pulley with a propane torch will aid in installation.

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1. MOUNTING BRACKET & SUPERCHARGER INSTALLATION

- A. Make sure there is nothing currently installed on the passenger side cylinder head.

(See Fig. 1-a)

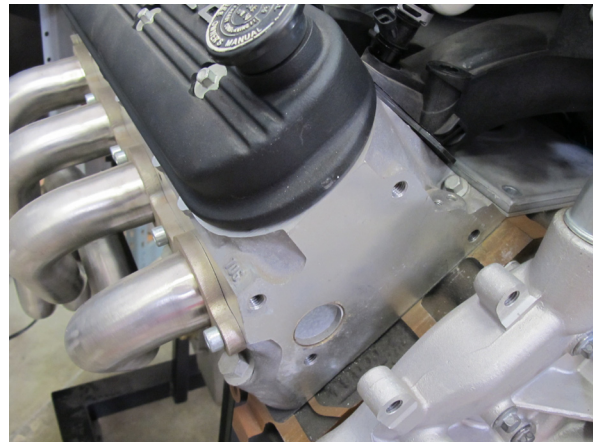


Fig. 1-a: P. Side Cylinder Head

- B. Locate the 4x M10 x 30mm screws & 4x 10mm washers & install them into the cylinder head bracket. Proceed to line up the screws with the cylinder head mount holes & begin to thread them in. Leave them hand tight at this time.

(See Fig. 1-b)

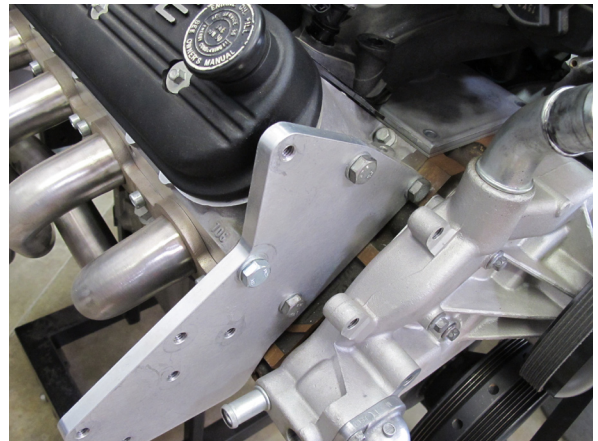


Fig. 1-b: Install Cylinder Head Bracket

- C. Sandwich the 6x 2.494" long spacers between the supercharger bracket & previously installed cylinder head bracket. Use the 6x 3/8-16 x 3.5" screws & 6x 3/8 washers to secure the bracket assembly together. With all hardware & spacers correctly installed, proceed to tighten all of the mounting bracket hardware.

(See Fig. 1-c)

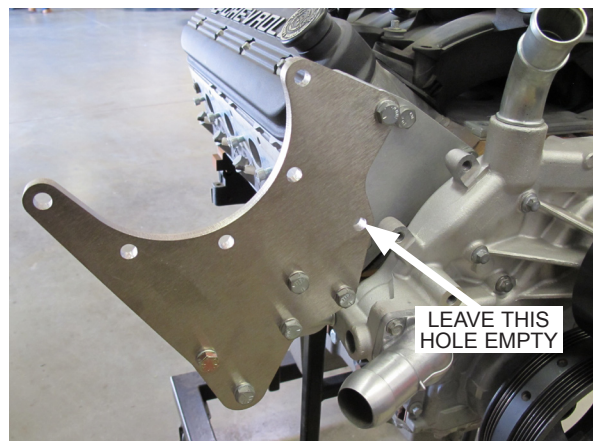


Fig. 1-c: Install Supercharger Bracket

1. MOUNTING BRACKET & SUPERCHARGER INSTALLATION, cont'd

- D. Using the provided 1x 2.360" idler spacer, 1x bearing pilot, 1x 3/6-16 x 4.00" screw & 1x 3/8-16 flanged nylock nut, secure the idler to the remaining hole on the right side of the supercharger bracket. Make sure that the bearing pilot is on the outside face of the smooth idler.

(See Fig. 1-d)

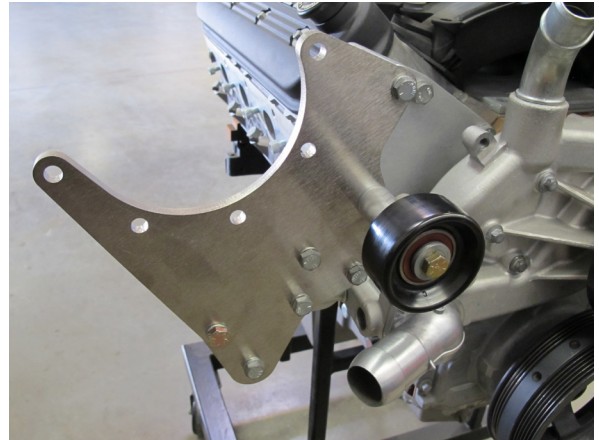


Fig. 1-d: Install Smooth Idler

- E. Install the supercharger unit onto the bracket & clock it as shown. Use the 5x 3/8-16 x 1.25" screws & 5x 3/8 washers to secure the supercharger to the mounting bracket.

(See Fig. 1-e)

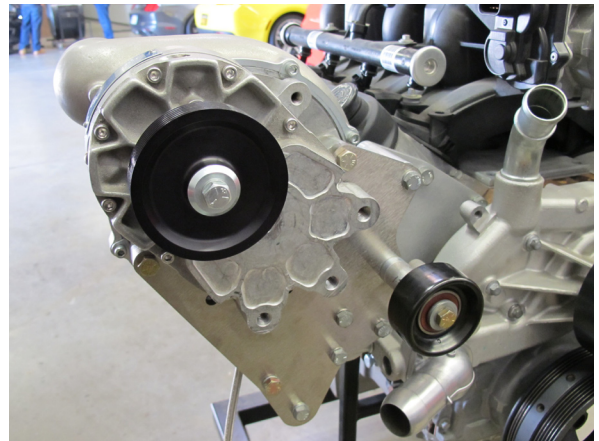


Fig. 1-e: Install Supercharger Unit

- F. Install the provided 3/4" x 90° coolant hose elbow to the coolant port closest to the front of the engine. Trim the hose as shown, making sure that it is clear of the supercharger mounting bracket. Once in place, insert the provided 3/4" barbed hose union into the opposite end of the elbow. Secure both ends of the hose with the provided hose clamps. Vortech does not supply the remaining length of hose as LS engines are swapped into a variety of vehicles, but can be purchased at your local auto parts store.

(See Fig. 1-f)

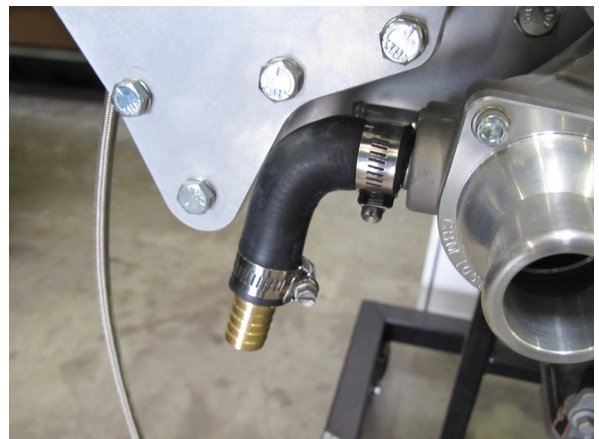


Fig. 1-f: Install 90° Coolant Hose Elbow

1. MOUNTING BRACKET & SUPERCHARGER INSTALLATION, cont'd

- G. The remaining coolant port will require 5/8" ID heater hose. You will be able to use a straight length of hose & route it through the supercharger mounting bracket. Vortech does not supply this length of hose as LS engines are swapped into a variety of cars, but can be purchased at your local auto parts store.

(See Fig. 1-g)

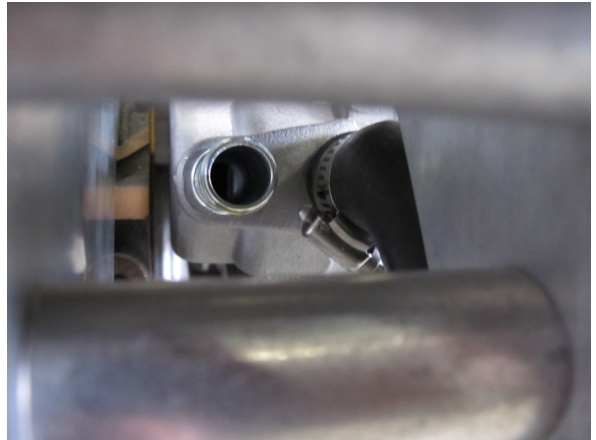


Fig. 1-g: 5/8" Coolant Port Location

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2. DRIVE BELT & MANUAL TENSIONER INSTALLATION

- A. Replace the OEM idler on the alternator bracket with the supplied smaller steel idler. Secure with OEM hardware & provided bearing pilot.

(See Fig. 2-a)

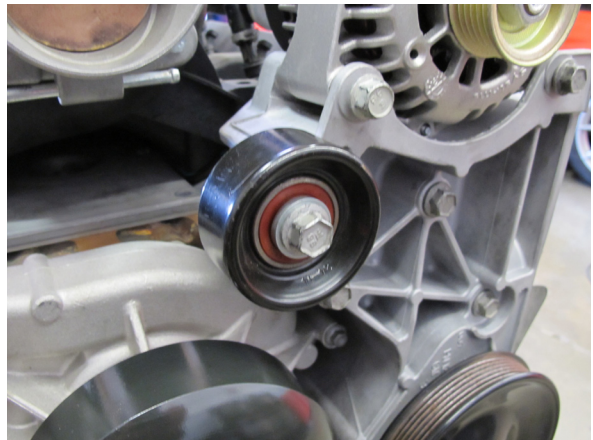


Fig. 2-a: Install Provided Smooth Idler

- B. Using the provided 3x M12 x 20mm screws & 3x M12 washers, mount the manual tensioner to the supercharger as shown. Make sure that the idler is mounted in the hole closest to the top of the tensioner plate.

(See Fig. 2-b)

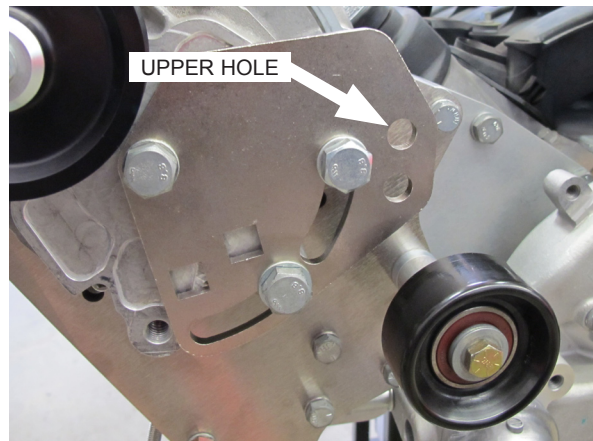


Fig. 2-b: Mount Manual Belt Tensioner

- C. Using the provided 1x M12 x 65mm screw, 1x M12 washer, 1x M12 nut, 1x 1/2 lock washer, 1x 1/2" bearing pilot & 1x .717" idler spacer, attach the smooth idler to the upper hole of the manual tensioner plate. Make sure that the bearing pilot is on the outside face of the smooth idler.

(See Fig. 2-c)

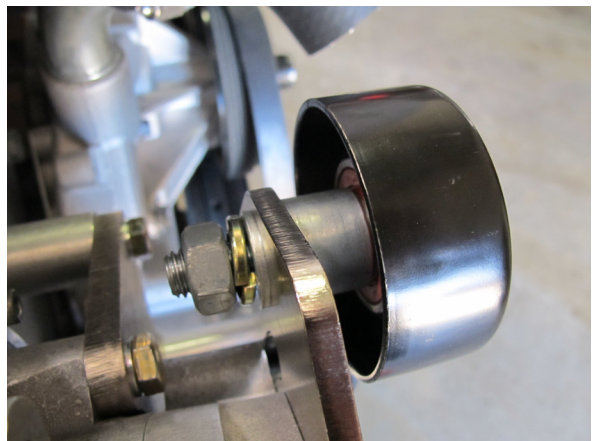


Fig. 2-c: Install Idler On Tensioner Plate

2. DRIVE BELT & MANUAL TENSIONER INSTALLATION, cont'd

- D. Route the supplied drive belt as shown. Verify that all pulleys and idlers are in line with one another and properly secured. Once verified, use the manual tensioner to apply tension to the smooth side of the drive belt, then tighten the 3 manual tensioner mounting screws.

(See Fig. 2-d)

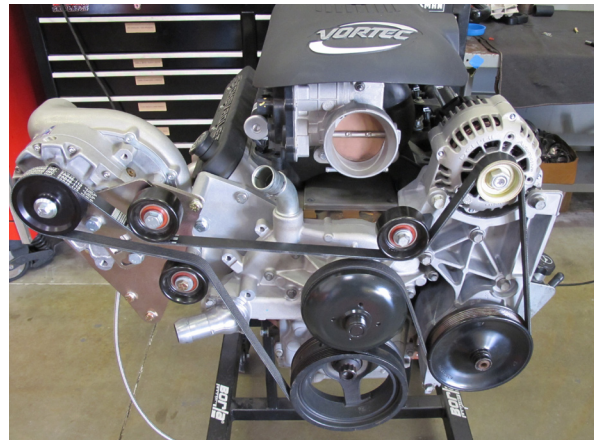


Fig. 2-d: Install & Route Drive Belt

3. DISCHARGE DUCT & BYPASS VALVE INSTALLATION

- A. Install the 3.00"-2.75" reducer sleeve, 1x #44 hose clamp & 1x #48 hose clamp to the supercharger outlet. Leave the hose clamps loose at this time.

(See Fig. 3-a)

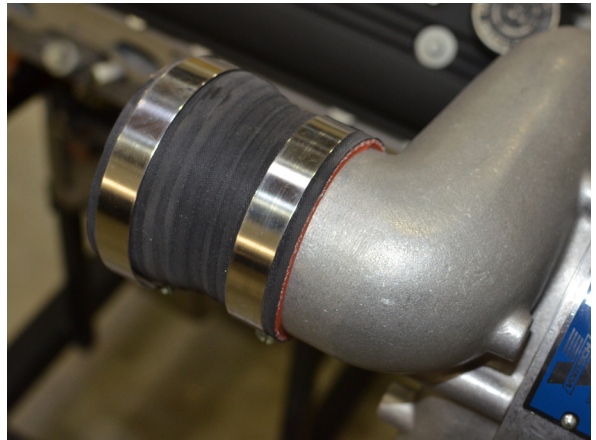


Fig. 3-a: Install 3.00"-2.75" Reducer Sleeve

- B. Install the 3.88"-3.00" 90° reducer elbow to the throttle body. Use a #64 hose clamp on the throttle body end & a #48 hose clamp on the other. Leave the hose clamps loose at this time.

(See Fig. 3-b)

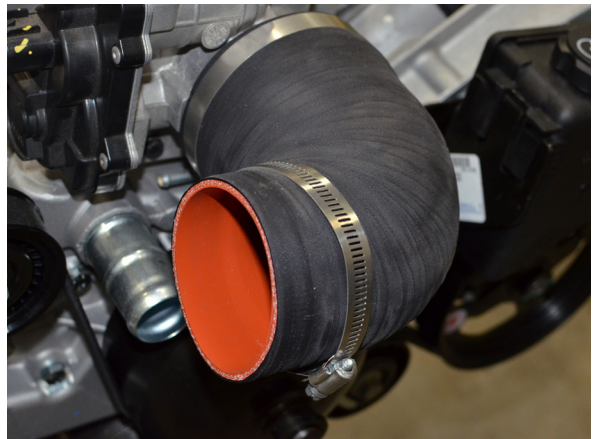


Fig. 3-b: Install 3.88"-3.00" 90° Reducer Elbow

- C. Locate Tube A & insert one end into the 3.00"-2.75" reducer. Install a 3.00" sleeve & 2x #48 hose clamps onto the other end of the tube. Do not tighten the hose clamps at this time.

(See Fig. 3-c)

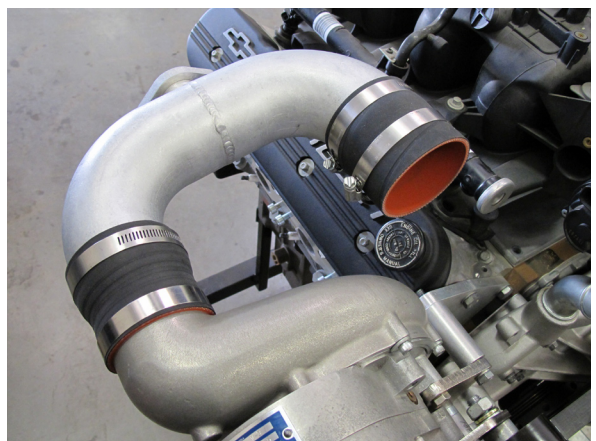


Fig. 3-c: Install Discharge Tube A

3. DISCHARGE DUCT & BYPASS VALVE INSTALLATION, cont'd

- D. Insert the long leg of Tube B into the previously installed 3.00" sleeve on Tube A. Insert the short leg of Tube B into the previously installed 3.88" to 3.00" 90° reducer elbow on the throttle body. Once both tubes are in position, proceed to tighten all hose clamps.

(See Fig. 3-d)



Fig. 3-d: Install Discharge Tube B

- E. Install the bypass valve & bypass valve filter to Tube A. Use the provided hardware that came with the bypass valve & install it as shown. Be sure to use the provided gasket in between the bypass valve & mounting flange on Tube A.

(See Fig. 3-e)



Fig. 3-e: Install Bypass Valve

- F. Install the provided 7.00" long air filter to the supercharger inlet & secure using the hose clamp provided with the filter.

(See Fig. 3-f)

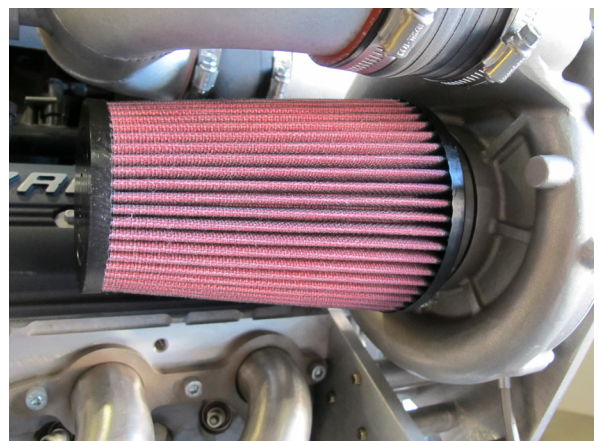


Fig. 3-f: Install Air Filter

3. DISCHARGE DUCT & BYPASS VALVE INSTALLATION, cont'd

- G. Included in this kit is a 5ft length of 7/32 vacuum hose. Attach one end of the hose to the fitting on the bypass valve. If possible, attach the other end of the vacuum hose directly to the intake manifold. If that is not an option, use the supplied 3/8 vacuum fitting & tee into a source that will see full vacuum and boost. Secure with the provided clamps. (See Fig. 3-g)



Fig. 3-g: Locate Vacuum Source

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4. UPPER RADIATOR HOSE ELBOW INSTALLATION

- A. In order for an upper radiator hose to clear the discharge tube, you will need to modify & install the provided 1.25" ID hose.

(See Fig. 4-a)

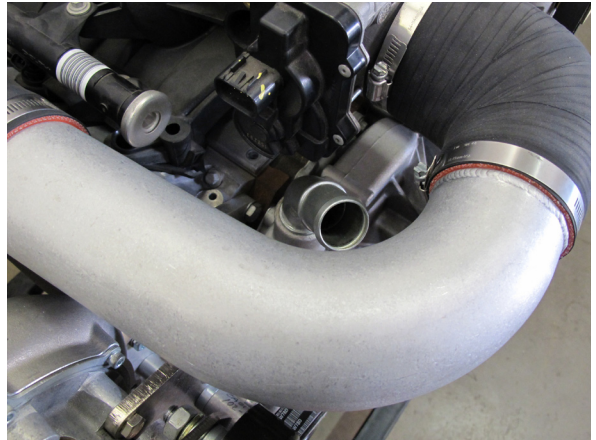


Fig. 4-a: Upper Water Pump Neck (Reference)

- B. Provided in this kit is a 1.25" ID hose with 2x 90° bends. This hose will not be a direct-fit for most applications, but it is included in the kit to assist with routing of the coolant system.

(See Fig. 4-b)



Fig. 4-b: Modify Provided Coolant Hose Elbow

- C. Measure 2" from the inside of the bend & cut. Discard the cut section as it will not be used.

(See Fig. 4-c)



Fig. 4-c: Modified Coolant Hose

4. UPPER RADIATOR HOSE ELBOW INSTALLATION, cont'd

- D. Install the modified end of the 1.25" ID hose to the upper water pump neck making sure to clock the hose as necessary to keep it from coming into contact with the discharge tube, then secure it with the provided #24 hose clamp. Depending on your application, you may need to cut off the other 90° bend for proper cooling system routing. Vortech does not supply the remaining length of hose as LS engines are swapped into a variety of vehicles, but can be purchased at your local auto parts store.

(See Fig. 4-d)



Fig. 4-d: Install Modified Coolant Hose Elbow

5. FINAL CHECK

WARNING: Do not attempt to operate the vehicle until all components are installed and all operations are completed including the final check.

- A. If your vehicle has gone over 15,000 miles since its last spark plug change, you will need to change the spark plugs now *before* test driving the vehicle.
- B. Check all fittings, nuts, bolts and clamps for tightness. Pay particular attention to oil and fuel lines around moving parts, sharp edges and exhaust system parts. Make sure all wires and lines are properly secured with clamps or tie-wraps.
- C. Check all fluid levels, making sure that your tank(s) is/are filled with 91 octane or higher fuel before commencing test drive.
- D. Start the engine and allow to idle a few minutes, then shut off.
- E. Recheck to be sure that no hoses, wires, etc. are near exhaust headers or moving parts. Look also for any signs of fluid leakage.
- F. Use a wide band O2 sensor to verify a proper air/fuel ratio (Vortech suggests 11.0:1 for 91 octane pump fuel.) Check ignition timing to make sure it is properly set before commencing test drive.
- G. **PLEASE TAKE SPECIAL NOTE:** Operating the vehicle without ALL the subassemblies completely and properly installed may cause **FAILURE OF MAJOR COMPONENTS.**
- H. Keep in mind that this manual does not address air/fuel or ignition timing considerations.
- I. Test drive the vehicle.
- J. Always listen carefully for engine detonation. Discontinue heavy throttle usage if detonation is heard.
- K. Read the **STREET SUPERCHARGER SYSTEM OWNER'S MANUAL AND RETURN THE WARRANTY REGISTRATION FORM** within thirty (30) days of purchasing your supercharger system to qualify.

For internally lubricated V3 units only

This supercharger has been factory pre-filled with special Vortech synthetic lubricant. Oil does not need to be added to a brand new unit; however a fluid level check should be performed.

Prior to operating the supercharger on the vehicle and after installation onto the vehicle:

Remove the factory installed flat-head brass shipping plug (not the dipstick) from the top of the supercharger case. Replace the sealed shipping plug with the supplied "vented" plug. Do not operate the supercharger without it. Check the supercharger fluid level.

Fluid level checking procedure:

1. Ensure that the .06" copper sealing washer is located on the dipstick base.
2. Thread the clean dipstick into the unit until it seats.
3. Once the dipstick has seated, remove the dipstick from the unit. Fluid should register in the crosshatched area on the dipstick.
4. **DO NOT OVERFILL!!!** Drain excess fluid from the unit if it is above the maximum level on the dipstick.

Check the fluid level using the dipstick at least every 2,500 miles.

Initial supercharger fluid change must be performed at 2,500 miles. The supercharger fluid must be changed at least every 7,500 miles.

Drain the fluid, refill the unit with 4 oz. of Vortech V3 lubricating fluid and then confirm proper oil level using the dipstick. **DO NOT OVERFILL!!!**

WARNING: Use of any other fluid other than the special Vortech lubricant will void the warranty and may cause component failure.



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