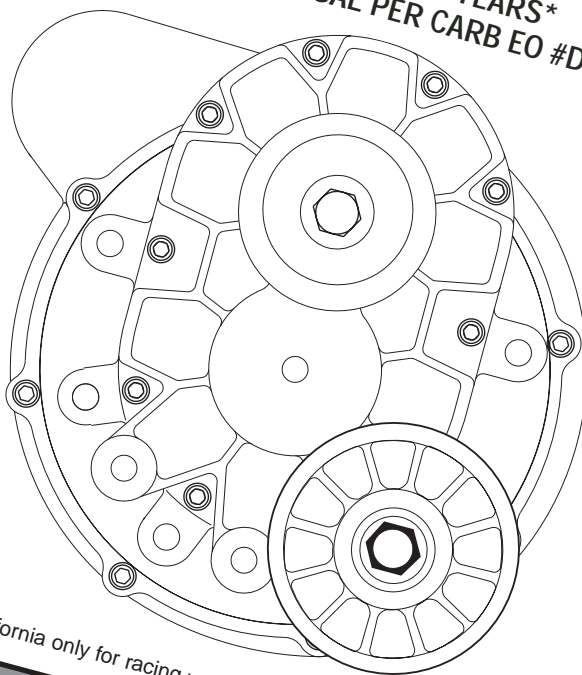


GM VORTEC 4.3L V-6 S-10/Sonoma/Jimmy/Blazer Supercharger System Installation Instructions

1996-1999 MODEL YEARS*
50 STATE SMOG LEGAL PER CARB EO #D-213-17



*1999 models Legal in California only for racing vehicles which may never be used upon a highway.



ENGINEERING, LLC

1650 PACIFIC AVENUE • CHANNEL ISLANDS, CA 93033-9901 • (805) 247-0226
FAX (805) 247-0669 • www.vortechsuperchargers.com • M-F 8:00 AM - 4:30 PM PST

FOREWORD

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 call Vortech Engineering for installers in your area.

© 2003 VORTECH ENGINEERING, LLC

All rights reserved. No part of this publication may be reproduced, transmitted, transcribed, or translated into another language in any form, by any means without written permission of Vortech Engineering, LLC.

Table Of Contents

FOREWORD	ii
TABLE OF CONTENTS	iii
NOTICE	iv
TOOL & SUPPLY REQUIREMENTS	v
PARTS LIST/1996-1999 GM VORTEC 4.3L V-6	vi
1. PREPARATION/REMOVAL	1
2. OIL DRAIN	2
3. OIL FEED	2
4. MAIN BRACKET	3
5. SUPERCHARGER INSTALLATION	4
6. SUPERCHARGER/ACCESSORY DRIVE BELT	5
7. COIL RELOCATION/IGNITION INSTALLATION	6
8. SUPERCHARGER DISCHARGE	8
9. SUPERCHARGER AIR INLET	9
10. FUEL MANAGEMENT UNIT	11
11. SUPPLEMENTARY FUEL PUMP AND HARNESS	12
12. FINAL REASSEMBLY AND CHECK	14

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, LLC.

1996-1999*
GM VORTEC 4.3L V-6 S-10/Sonoma/Jimmy/Blazer
Installation Instructions

50 State Smog Legal as per CARB EO #D-213-17

*1999 models Legal in California only for racing vehicles which may never be used upon a highway.

*Congratulations on selecting the best performing and best backed automotive supercharger available today...
the VORTECH® V-2® supercharger!*

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

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 92 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 10,000 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 and spark plug wires at least every 50,000 miles.

TOOL & SUPPLY REQUIREMENTS

- Factory repair manual
- 3/8" socket and drive set: SAE & metric
- Drill motor, 3/32" 5/8" and #16 drill bits
- Flat #2 screwdriver
- Open end wrenches: 5/16", 3/8", 7/16", 1/2", 9/16", 5/8", 10mm
13mm, 15mm, 16mm, 17mm, 18mm
- 5mm Hex wrench
- Hammer
- Silicone sealer
- Oil filter wrench
- Oil filter
- SF rated quality engine oil
- Gasket scraper
- Punch (tapered)
- 3/8" NPT tap
- Fuel line disconnect tool
- Rota Broach (9/16) boring tool (Snap-on #GA219-A)

If your vehicle is in excess of 10,000 miles since its last spark plug change, then you will also need:

- Spark plug socket
- NEW spark plugs





1996-1999 GM VORTEC 4.3L V-6

Part No. 4GD218-050/058SQ

PARTS LIST

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

Part Number	Description	Quantity	Part Number	Description	Quantity
2E228-280	Supercharger Assembly	1	4GD112-020	Air Discharge Assembly	1
2E128-280	V-2 SQ Supercharger	1	7R002-044	#44 Hose Clamps	4
2A036-312	Supercharger Pulley 3.125" 6 groove	1	8D001-001	Bypass Valve	1
7K375-040	3/8 AN960 Flat Washer	1	7R002-016	#16 Hose Clamps	4
2A040-011	Pulley Retainer	1	7P156-082	5/32" TEE	1
7B375-125	3/8"-24 x 1-1/4" HX CLS	1	7U030-046	5/32" x 24" Vacuum line	1
7U100-070	Key, 3/16 x 3/16 x 7/8	1	4GD012-020	Discharge tube	1
4GD111-021	Mounting Bracket Assembly	1	4GD050-011	Discharge Plenum	1
7A375-101	3/8 x 1" Socket Head	1	7W100-070	O-Ring, Throttle Body	1
7A375-100	3/8"-16 x 1-1/4" HXHD Cap Screws	2	7S275-200	2-3/4 x 2 Sleeve	2
7K375-040	3/8" AN960 Flat Washers	16	7P500-156	1/2" Vac. TEE x 1/4 NPT	1
7A375-100	3/8"-16 x 1" HXHD Bolts	5	7P250-033	1/4 x 5/32 Red Union	1
7A375-275	3/8"-16 x 2-3/4" HX Cap Screws	2	7P250-039	1/4 NPT Fem. x 1/4 Hose	1
4GM011-021	Mounting Bracket	1	7U030-030	1/4" Vacuum Hose (.0833")	1
4GM010-033	Mounting Plate	1	7U034-016	1" GS Hose (3/16")	1
7A375-075	3/8-16 x 3/4" HXHD Bolts	6	7U034-016	1" GS Hose (1/4")	1
4GD011-032	Spring Tensioner	1	2A017-028	Plenum, Spacer A	1
2A046-102	Belt	1	2A017-029	Plenum, Spacer B	1
4FA016-170	Idle Pulley	1	2A017-030	Plenum Spacer C	2
4FD017-011	Spacer, Idle	1	7C060-600	M6 x 6" TB 4.3 Stud, front	2
7C012-050	12mm x 1.75 x 50mm Bolt	1	7C060-387	M6 x 3.87" 4.3 Stud, RR	1
4FA016-171	Dust Cover	1	7F006-093	6mm Nylock Nut	3
4GD116-150	Idle Pulley Assembly	1	7J006-093	6mm Washer	3
4GD010-060	Coil Mount Bracket	1	4GD101-002	Fuel Pump Assembly	1
4GM010-050	Heat Shield	1	5W001-014	Fuse Holder	1
7A250-050	1/4-20 x 1/2" SH Cap Screw	1	5W001-015	20 amp Blade Type Fuse	1
7J250-001	1/4" SAE Washer	1	5W001-017	Large Ring Terminal	1
4GD014-010	Radiator Pipe	1	5W001-019	12-10 Ga. Solderless Connector	1
7R002-024	#24 Gold Seal Hose	2	7J010-001	#10 Flat Washers	4
7C008-100	#8-32 x 1" Socket Head Cap Screw	4	7U100-055	6" Nylon Tie Wraps	4
7F008-032	8-32 Hex Lock Nut	4	8F101-200	T-Rex Wiring Assembly	4
7J008-001	#8 Flat Washer	4	7F008-020	M8 x 1.25 Nut	1
SW022-120	226A STD. Wire Brown	1'	7U031-018	5/16" Fuel Hose x 1.5"	1
SW001-007	3/16" Heat Shrink Tube	6'	8F001-200	200 Inline Fuel Pump	1
SW001-005	3/8" Plastic Wire Loom	1'	7P375-006	3/8 to 5/16 Fuel Fitting	1
7C010-066	M10 x 1.5 x Soc. HD. Bolt	1	7U032-016	3/8" Fuel Hose x 4.75"	1
7K437-001	7/16" AN Washer	1	7R004-003	14.5 Stepless Clamp	2
4GD112-010	Air Intake Assembly	1	5W001-022	T-Tap Connector	1
4GD112-012	Air Inlet Tube	1	5W001-042	12-10GA 3/16" Ring Terminal	4
4GD015-022	Air Inlet Support	1	7E010-049	#10 x 3/4 Hex Head Sheet	5
8H040-085	Air Filter	1	7R004-002	17.0 Stepless Clamp	1
7S350-200	3-1/2 x 2 Sleeve	1	7R001-004	#4 Hose Clamp	1
7R002-056	#56 Gold Seal Hose Clamp	2	7P375-072	Female Fuel Fitting	1
7U035-001	3-1/2 Flex Hose x 12"	1	7R001-008	#4 Clamp	4
7R002-052	#52 Gold Seal Hose Clamp	3	7P250-042	Compression ftg.	2
7U038-000	3/4" Heater Hose	1	7P250-045	1/4 NPT to 3/8 Barb	1
7U100-056	90° Vent Tube	1	7P250-043	1/4 NPT to 5/16 Barb	1
7P500-026	1/2 NPT 3/4 90° Barb	1	5A101-010	HI-6R Assembly	1
7R001-008	#8 Hose Clamp	1	5A001-009	HI-6R Ignition System Assy.	1
7U034-016	1" GS Hose x 4"	1	5W001-001	Wire Tap	1
4GD112-030	Air Box Duct Assembly	1	5W001-009	16-14GA Male Slide	10
7U100-057	Grommet	1	5W001-010	16-14GA Female Slide	10
7S300-101	3 x 1 Sleeve	1	5W001-011	16-14GA Eyelet .25: Hole	2
7R002-016	#16 Gold Seal Hose Clamp	2	5W001-014	Fuse Holder 10GA Wire	1
4GD130-036	Oil Drain Assembly	1	5W001-015	Fuse, Blade Type 20 amp	1
7R001-008	#8 Stainless Hose Clamps	2	5W001-017	Large Ring Terminal 12GA	2
7P375-017	3/8" NPT x 1/2" Straight Hose Barb	1	5W001-020	3/4" Plastic Wire Loom	1
7U030-036	1/2" Oil Drain Hose x 24"	1	5W012-000	12GA, STRD Wire, Red	1
7U100-055	Tie Wraps	2	5W012-010	12GA Wire, Black	1
4GD130-026	Oil Feed Line Assembly	1	5W022-120	22GA, STRD Wire, Brown	1
7U030-026	1/4" Oil Feed Hose x 48"	1	7E010-046	#8 x 3/4 Sheet Metal	1
7P525-067	.525" Crimp Ferrules	2	7P156-082	5/32 TEE	1
7P250-066	#4 Swivel x 1/4" Hose Barb Fittings	2	7U030-046	5/32" Vacuum Line	1
7P125-103	-4 x 45° 1/8" NPT Male Elbow	1	7U100-055	Tie Wrap, 6" Nylon	10
7P375-033	3/8 NPT x 3/8 NPT SRT EL	1	7U375-001	Velcro-Hook 1" Black	1
7P375-018	3/8-1/8 NPT Bushing 2WD/4WD	1	7U375-002	Velcro-Latch 1" Black	1
7P125-026	90° 1/8 NPT x #4 Fitting	1	5W018-010	18GA, STRD Wire, Red	1
7P250-100	1/4-1/8 NPT Bushing	1	5W018-020	18GA, STRD Wire, Black	1
7P250-146	1/4" NPT Street Elbow	1	5W018-060	18GA, STRD Wire, Orange	1
4GD238-068	FMU With Lines	1	5W018-240	18GA, STRD Wire, White/Yellow	1
6Z110-134	Fuel Management Unit	1	70000	Inspector Number	1
7U030-046	5/32" Vacuum Line x 4.3"	1	5W001-040	12-10GA Female Slide	2
4GD145-010	Female FMU Line (to tank)	1	5W001-041	12-10GA Male Slide	2
4GD145-020	Male FMU Line (to rail)	1			
7P250-041	Compression ftg.	2			
7P250-036	#4 x 1/4" NPT	2			
4GM135-056	36" FMU Line	1			
4GM135-057	22" FMU Line	1			

1. COMPONENT REMOVAL

- A. Disconnect the negative battery cable from the battery.
- B. Remove and set aside the following components:
 - The entire air inlet/filter box assembly, including the throttle body resonator and all hardware including the throttle body mounting bolts.
 - The crankcase vent tube from the passenger side valve cover.
 - The accessory drive belt.
 - The tensioner and idler from the alternator mounting bracket.
 - The alternator and bracket.
 - The 3/8" stud protruding from the right side cylinder head.

(2000 California models only) Disconnect both ends of the hose connecting to the factory check valve and remove valve from the air injection tube. Remove the air injection tube from the passenger's side exhaust manifold. Remove the two studs using a 5.5mm socket.

- C. Drain the contents from the radiator into a clean container.
- D. Remove lower radiator hose.

2. OIL DRAIN

- A. To provide an oil drain for the supercharger, it is necessary to make a hole in the oil pan. Locate and mark hole (see *Figs. 2-a, 2-b*).

NOTE: Removal of the oil pan may ease oil drain fitting installation on some applications.

- B. Remove the factory anti-roll bar brackets (2) from the frame and allow the bar to temporarily drop down. Unplug the factory crank trigger connector from the sensor located in the timing cover.

NOTE: The factory transmission cooler lines may require bending to clear the supercharger oil drain hose.

- C. Carefully drill a pilot hole (the same diameter as the Rota Broach pilot) into the marked spot on the oil pan (this procedure may also be done by removing the oil pan if you are unsure of your ability to perform the following steps properly). Drill slowly as to catch most of the aluminum chips from the hole being drilled. Using the 9/16" Roto Broach, very slowly machine a hole in the pan (use the previously drilled hole as a guide). Stop machining just before the tool breaks through into the oil pan. Using a scribe or a small screwdriver, remove the remaining disc-shaped oil pan piece (this allows you to remove the pan slug before it falls into the oil pan and keeps most of the aluminum chips out).

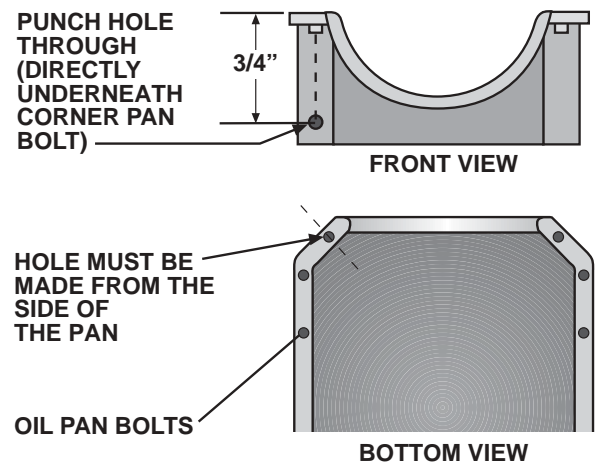


Fig. 2-a



Fig. 2-b

2. OIL DRAIN, cont'd.

- D. Tap the hole with a 3/8" NPT tap approximately 1/4" deep. Pack the flutes of the tap with heavy grease to hold chips.
- E. Thoroughly clean the threaded area. Apply a small amount of silicone sealer to the new threads. Apply more sealer to the supplied 3/8" NPT x 1/2" barb fitting. Install the fitting into the pan. Make sure a seal is formed around the entire fitting.
- F. Drain the engine oil, install a new filter and refill with fresh oil.
- G. Reattach anti-roll bar and crank trigger connector.

3. OIL FEED

- A. The supercharger uses engine oil for lubrication and must have an oil feed line connected to a filtered oil access on the engine.
- B. Remove the 3/8" NPT plug located on the engine block just above the oil filter boss. Replace the plug with the supplied 3/8" NPT elbow. Connect the remaining fittings as shown (see Fig. 3-a).

NOTE: Use clean engine oil on the pipe threads. Teflon tape and sealant is not recommended, as it might loosen and cause blockage of the small oil feed orifice resulting in supercharger failure.

- C. Connect the supplied feed line to the flare fitting and make a gentle downward loop around and back toward the front of the engine (see Fig. 3-b). Secure the hose with the tie wraps provided, routing it away from exhaust heat, chaffing and/or sharp objects. Temporarily cover the open end from debris until the connection is made to the supercharger in step 5.

4WD MODELS: Connect the feed hose and fittings to the remote oil filter boss at the front of the vehicle. (see Fig. 3-c)

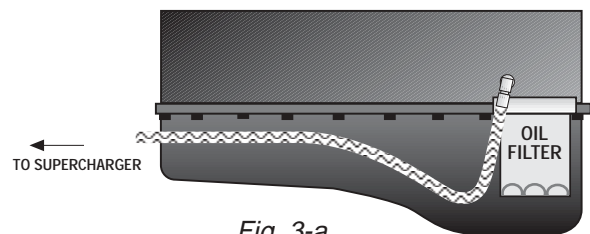


Fig. 3-a

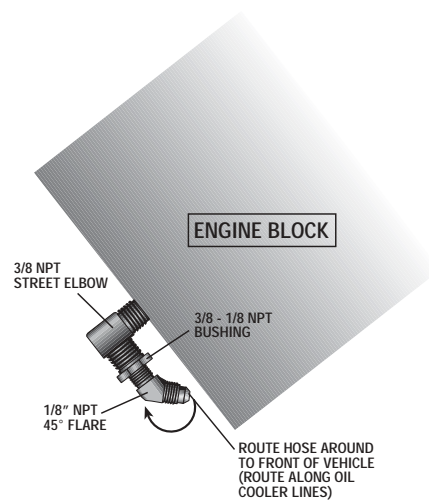


Fig. 3-b - Rear View, 2WD only



Fig. 3-c - 4WD only

4. MAIN BRACKET

- A. To accommodate the relocation of the alternator onto the new main bracket, the brown field wire must be extended approximately 12". Proceed by cutting the wire approximately 4" from the factory plug that attaches to the alternator. Splice the supplied piece of brown wire into the cut wire by soldering. Use the supplied piece of heat shrink tubing to seal the joints. Re-wrap the wire/harness with the supplied length of plastic flex-loom.
- B. The transmission cooler lines may need to be bent downward as far as possible (toward the frame) to obtain alternator clearance.
- C. Attach the supplied stainless steel heat shield onto the rear of the Vortech main bracket using the supplied 1/4" hardware (see Fig. 4-a).
- * D. Following Figure 4-d, cut the supplied protective sleeve as shown. Slide the protective sleeve onto the air injection adapter, following with the 90° compression fitting. Do not tighten compression fitting yet. Mount this assembly to the exhaust manifold using the supplied hardware and stock gasket (replace in necessary). Torque bolts evenly using a 5mm hex wrench. (See Fig. 4-e.)
- * E. Thread the factory check valve onto the compression fitting and tighten. Referring to Fig. 4-e, angle the compression fitting slightly upward, then tighten. Use one wrench on the compression fitting and one on the nut to protect the air injection adapter from damage while tightening the compressing nut.
- * F. Attach the supplied 5/8" x 24" hose to the factory check valve and to the TEE coming from the air injection pump and secure.
- G. Cut factory lower radiator hose as shown (see Fig. 4-c). Install the supplied 90° steel tube and secure using the supplied #24 clamps (see Fig. 4-b).
- H. Place the mounting bracket on the front of the passenger side cylinder head. Line up the bracket with the holes on the front of the head and block and start the 3/8-16 socket head bolt into the lowest bracket hole. Install the two 3/8-16 x 1.00" bolts and washers into the two remaining upper holes. Torque the three bolts evenly.
- * I. Place the alternator in position on the bracket and check for clearance between the air injection adapter and the back cover of the alternator. In some instances, it may be necessary to remove the cover and trim a small portion of the cover before final mounting.



Fig. 4-a



INSTALL 90° RADIATOR PIPE

Fig. 4-b

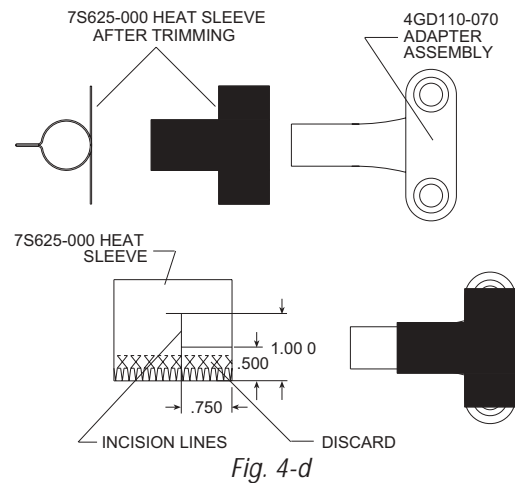


Fig. 4-d

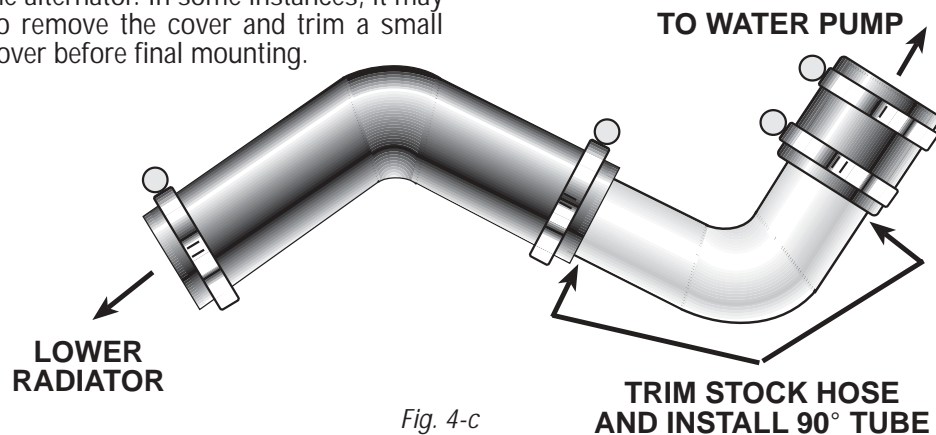


Fig. 4-c

* CA 2000 Models Only

4. MAIN BRACKET, cont'd

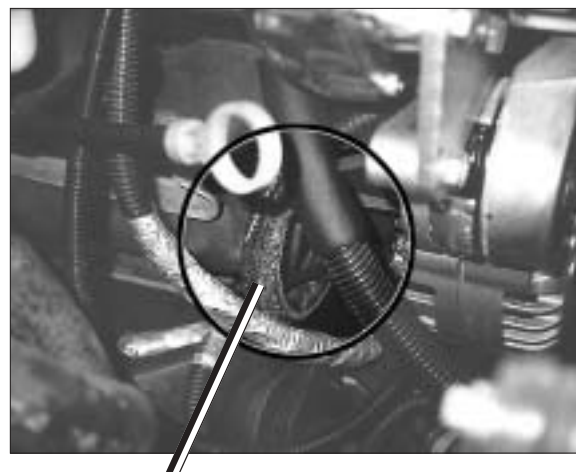
- J. Reattach the field wire and positive wire to the alternator (make sure that the large positive wire has the factory rubber boot properly secured to prevent arcing to the heat shield). Using the supplied 3/8-16 x 2.75" bolts and washers, attach the alternator to the main bracket. Secure all alternator wiring from heat and sharp objects.
- K. Align the supercharger mounting plate with the bracket and secure with the supplied 3/8-16 x 3/4" bolts and AN washers.



Fig. 4-e

5. SUPERCHARGER INSTALLATION

- A. Attach the 1/2" oil drain hose to the supercharger and secure with the #8 hose clamp.
- B. Route the hose down the rear of the main bracket while lowering the supercharger into the proper mounting location on the plate. Be sure that the oil drain hose remains unknicked with smooth bends.
- C. Using the five supplied 3/8-16 x 1" bolts and AN washers, secure the supercharger to the mounting plate.
- D. Route the oil drain hose around the main casting and down to the fitting in the oil pan. Make sure that the hose runs below the positive alternator lug, but still remains running "downhill". (See Fig. 5-a.) It is very important that the oil drain hose is free from restrictions, tight bends, kinks or any other drain obstructing conflict. Route the hose away from direct exhaust heat. Trim hose length if necessary and secure to the oil pan with the supplied #8 hose clamp.
- E. Attach the 1/8 NPT x 45° brass fitting to the supercharger oil feed. Use a 1/2" wrench to hold the feed fitting while tightening the 45° fitting. Attach the oil feed hose to the supercharger. (See Fig. 5-b.)



OIL DRAIN HOSE

Fig. 5-a

WARNING: The oil system contains a small orifice that is easily plugged. Do not use any type of sealant on any of the threads. Instead, use clean engine oil. Disassemble and blow out the entire line if there is any question.

- F. Using the tie wraps provided, secure the feed and drain systems away from heat and/or sharp objects.



Fig. 5-b

6. SUPERCHARGER/ACCESSORY DRIVE BELT

- A. Mount the supplied automatic belt tensioner onto the main bracket. Rotate the unit so that the small alignment pin falls into the corresponding hole in the bracket. Secure the tensioner to the bracket using the supplied socket head bolt and 7/16" AN washer.
- B. Route the supplied belt as shown (see *Fig. 6-a*). Belt installation is easiest when the water pump is the last pulley to be mounted (the radius on the edge of the water pump pulley allows the edge of the belt to be slid over it).

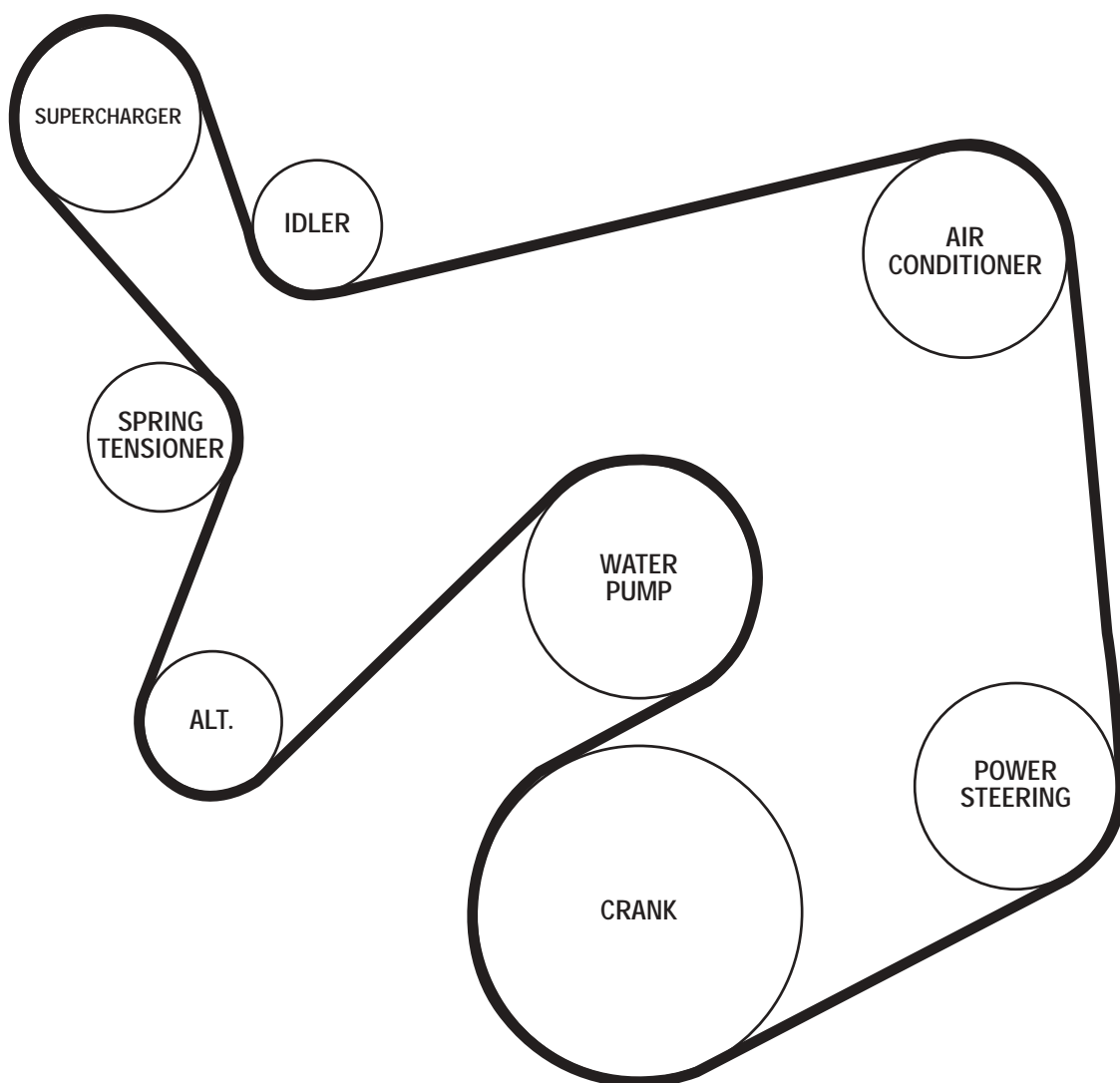


Fig. 6-a

7 . COIL RELOCATION/IGNITION INSTALLATION

- A. Remove ignition coil and bracket from the factory location.
- B. Separate the coil and module from factory mounting bracket.
- C. Install the coil and module to the supplied bracket using the supplied hardware (see Fig. 7-b).
- D. Mount the coil and bracket assembly to the intake manifold. Use the factory studs and nuts to secure the coil. (See Fig. 7-c.)
- E. Remove the interior center console (between the two front seats). Mount the supplied ignition control box assembly into the vehicle interior in one of two possible locations (alternate mounting locations of the control box, retard knob and MAP sensor may vary suiting the taste/preference of the installer). (See Figs. 7-f, 7-g.)
 1. Pickup truck models (S-10/Sonoma):
 - a. The suggested mounting location is in the center console between the two seats (remove the center console and mount the control unit vertically in the rear). (See Fig. 7-f.)
 - b. The retard knob can mount in the forward portion of the tray in the console. Mount the MAP sensor under the console. (See Fig. 7-f.)

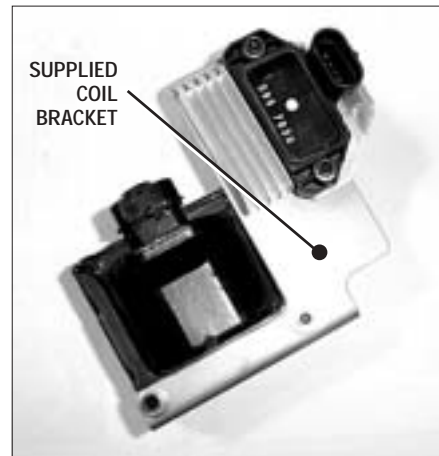


Fig. 7-b

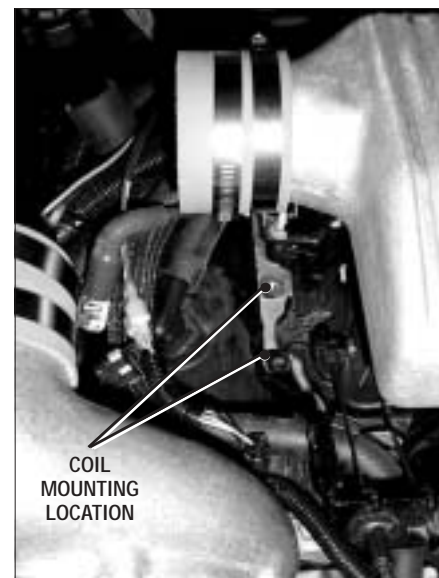


Fig. 7-c

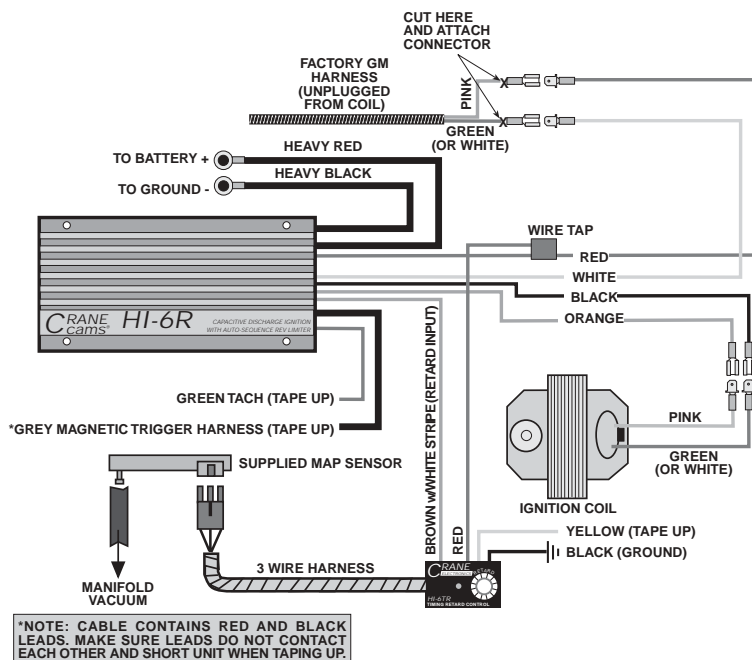


Fig. 7-a / 96-97 Coil Relocation



Fig. 7-d

7. COIL RELOCATION/IGNITION INSTALLATION, cont'd.

2. SUV models (Blazer/Jimmy)

- a. The suggested mounting location is in the storage box located next to the back seat on the passenger side of the vehicle.
 - b. The retard knob and MAP sensor can mount in the center console as the pickup trucks do (see Fig. 7-f). The brown retard wire and thin red power wire must be run over to the remote mounted ignition box.
- F. Connect all components as shown (see Fig. 7-a). Connect a manifold sourced vacuum line using the supplied 5/32" hose and TEE (use the FMU tap location). Route the extended coil wires and previously attached vacuum hose from the engine compartment back along the frame rail and to the transmission crossmember. Drill a 5/8" hole through the floor of the vehicle from the bottom of the center console location for wire/vacuum hose pass through. Route the wire/vacuum hose bundle up into the passenger compartment using the previously drilled hole.
- G. Use the supplied cable ties to keep the wires secure and away from moving/sharp/hot objects. Do not attempt to start the vehicle without all components installed as shown.
- H. Ignition Boost Control operation
1. The Ignition/Boost Control unit is designed to retard ignition in relation to boost.
 2. The unit is adjustable from 0° of ignition retard to 4° of ignition retard for each pound of boost, up to a maximum of 20°.
 3. Using the 1° per pound position as a starting point, adjust the ignition retard knob until just beyond the point of detonation (see Fig. 7-e). Use third gear for testing in a safe area or road. Adjust the retard according to changes in altitude and fuel quality.

Caution: It is extremely important that the boost retard never be turned to 0°. It is recommended that in stock street applications, the knob be at no less than 1° per lb.

Examples of Ignition Retard vs. Boost:

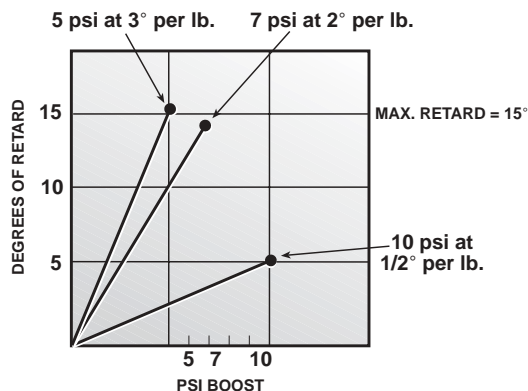


Fig. 7-e

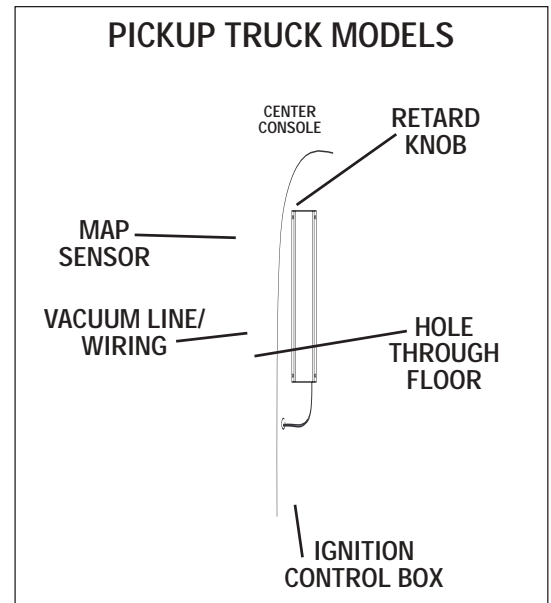


Fig. 7-f

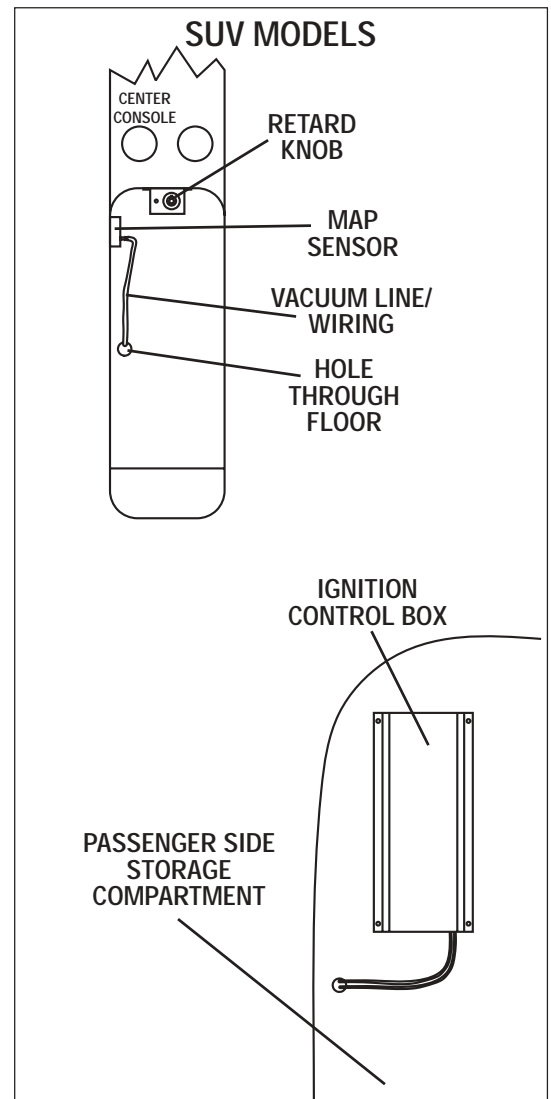


Fig. 7-g

8 . SUPERCHARGER DISCHARGE

- A. Install the supplied discharge plenum using studs, spacers, nuts and washers (see *Fig. 8-b*).
- B. Thread the three supplied studs into the factory throttle body mounting holes (into the intake manifold). The shortest of the three studs belongs at the rear of the throttle body. Insert the four spacers into their proper location (see *Fig. 8-c*).
- C. Slide the supplied O-ring around the top flange of the throttle body. Use a light amount of oil on the O-ring to allow easy installation of the discharge plenum. Carefully align the discharge plenum to the installed throttle body studs. Lower the plenum down onto the throttle body being careful not to upset the O-ring fit. When contact with the O-ring is felt, push down firmly on the plenum until you feel it seat on the top of the throttle body (see *Fig. 8-d*).
- D. Secure the plenum to the throttle body by attaching the supplied washers and nuts to the previously installed studs.
- E. Remove the 1/2" brake booster vacuum line from the intake manifold and cut approximately 2" off from the end. Splice the supplied adapter TEE into the brake booster line. Run the supplied piece of 1/4" vacuum hose from this TEE to the 1/4"-5/32" reducer (see *Fig. 8-a*).
- F. Attach the supplied compressor bypass valve and 1" x 2.25" hose to the plenum using #16 clamps. Orient the bypass valve as shown (see *Fig. 8-e*).
- G. Attach the discharge tube from the supercharger to the plenum using the supplied silicone sleeves and clamps (see *Fig. 8-e*). Connect the 5/32" hose to the nipple located on the bottom of the supercharger bypass valve to the reducer previously installed into the brake booster line.

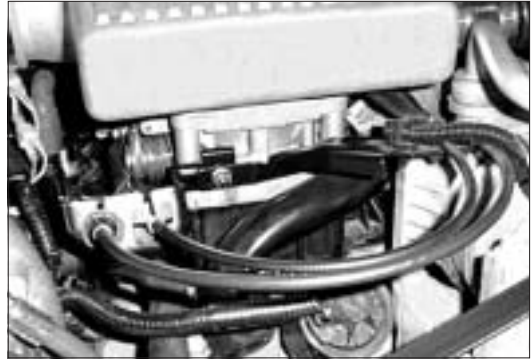


Fig. 8-b



Fig. 8-c



Fig. 8-d

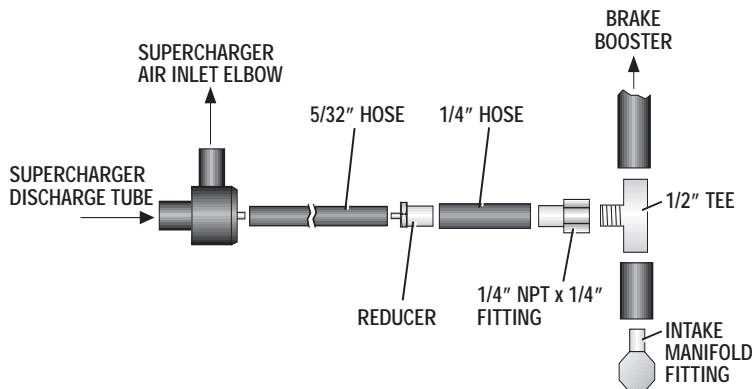


Fig. 8-a



Fig. 8-e

9. SUPERCHARGER AIR INLET

- A. Install the supplied plastic 3/4" x 90° vent adapter into the factory rubber grommet located on the right side valve cover. Rotate the vent adapter so that it points toward the rear of the vehicle. Attach the supplied 3/4" x 20" hose to the installed adapter.
- B. The oil fill riser must be modified to allow for fitment of the new air inlet duct (see *Fig. 9-a*). Begin by removing the plastic oil fill riser and cap located on the right side valve cover. Cut the riser in half (the diameter) using a saw or cut-off wheel. Clean and reinstall the base of the cut riser into the valve cover. Slide the supplied piece of 1" x 4" hose over the base. Insert the remaining top portion of the filler into the hose. The cap should now be approximately 2-3" higher than its factory location. Adjust height if necessary.
- C. Install the supplied 1/2" NPT x 90° x 3/4" hose barb fitting into the 3.5" steel inlet tube. The fitting must be "clocked" so that when the inlet tube is installed, the fitting points down and over to the right side valve cover and attaches to the previously installed 3/4" valve cover vent hose (temporarily place the tube in its installed position to approximate the fitting rotation before final installation).
- D. Attach the supplied inlet tube support to the left rear portion of the intake manifold (see *Fig. 9-b*).
- E. Using the supplied 3.5" silicone sleeve and #56 hose clamps, attach the 3.5" inlet duct to the supercharger. Lay the duct on top of the previously installed tube support. Connect the 3/4" valve cover vent hose to the 90° fitting on the inlet duct. Trim length if necessary. Situate duct so that it does not contact the firewall or any other object that will cause problems when the engine torques on operation. Secure duct to the tube support using the supplied #52 clamp.
- F. Attach the 1" x 3" compressor bypass discharge hose to the barb located on the inlet duct.
- G. Remove the factory MAF sensor and airbox assembly. Remove the driver's side headlight assembly. Separate the MAF sensor from the airbox (see *Fig. 9-e*). Remove the filter and venturi-shaped inlet from the box. Modify the lower portion of the airbox as shown and reinstall into the vehicle. Insert the supplied airbox inlet duct through the core support opening behind the headlight and into the modified factory airbox. Rotate the duct (see *Fig. 9-c*). Drill two holes into the core support using the duct flange as a guide. Secure the duct with the two sheet metal screws provided. Reinstall headlight assembly.
- H. Install the supplied K&N air filter into the factory airbox. Drill a 3/4" hole into the airbox top in the location shown (see *Fig. 9-d*). Insert the supplied rubber grommet and the factory air intake temperature sensor into the new hole. Attach the modified airbox lid the airbox base. Reattach the MAF to the airbox lid. Attach the factory MAF and IAT sensor connectors.



MODIFIED OIL FILL RISER

Fig. 9-a



INLET TUBE SUPPORT

Fig. 9-b



NEW IAT SENSOR LOCATION

Fig. 9-c

9. SUPERCHARGER AIR INLET, CONT'D.

- I. Slide the supplied 3" orange sleeve onto the outlet of the MAF meter. Connect the previously installed steel supercharger inlet duct to the MAF meter outlet using the supplied section of flex hose and #52 clamps (see *Fig. 9-f*).
- J. Check to see that there is adequate clearance between the factory mounted underhood light and the supercharger kit by slowly closing the hood. Remove light if necessary.



Fig. 9-d



Fig. 9-e

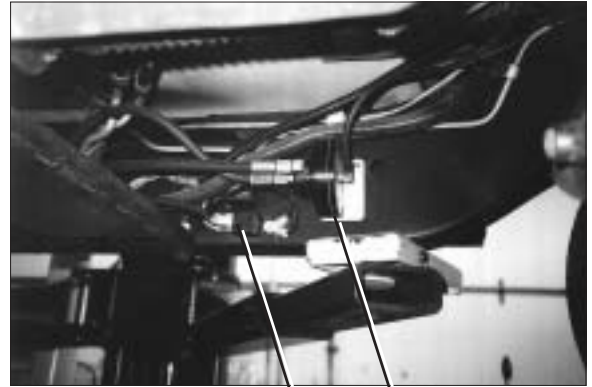


Fig. 9-f

10. FUEL MANAGEMENT UNIT

- A. Following the *Fig. 10-a*, position the fuel management unit (FMU) on the inside of the vehicle frame, underneath the driver's seat. Mark and drill two #16 holes. Secure the FMU using the supplied #12 hex head screws.

NOTE: Some earlier model trucks are not equipped with quick disconnect fittings and will require the use of compression fittings and alternate fuel lines. Proper lines and fittings are supplied to work with both versions of this vehicle. Refer to *Figures 10-c, 10-d* to verify the vehicle you are modifying.

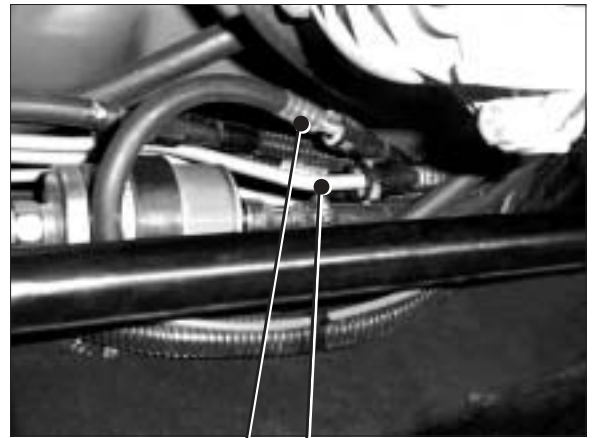


FUEL PUMP HARNESS FMU

Fig. 10-a

QUICK DISCONNECT TYPE FITTINGS ONLY

- B. Using a fuel line disconnect tool, separate the 5/16" fuel return (see *Figure 10-b*). Attach the supplied 33" fuel hose with the male fitting into the fuel line coming from the engine compartment. Attach the 17" supplied fuel hose with the female fitting into the line returning back to the tank. Connect the fuel line coming from the engine compartment to the 90° fitting on the side of the FMU. Connect the fuel line returning back to the tank to the straight fitting on the bottom of the FMU. Make sure that both lines have smooth bends and are absolutely free from sharp bends and kinks (see *Fig. 10-c*).



FUEL LINE FROM RAIL FUEL LINE TO TANK

Fig. 10-b

COMPRESSION STYLE FITTINGS ONLY

- B. Separate the factory 5/16" fuel rail return line at the compression fitting junction underneath the vehicle near the fuel filter. Attach the supplied -4 flare fitting adapters to each end of the open return line (one fitting will point toward the rear, and one toward the front). Connect one end of the supplied 22" FMU hose to the return line running back to the tank, and the other end to the straight fitting on the center of the FMU. Connect one end of the remaining 36" FMU hose to the return line coming from the fuel rail, and the other end to the 90° fitting on the side of the FMU (see *Fig. 10-d*).
- C. Tap into the supercharger bypass valve vacuum hose using the supplied 52" long length of hose and 5/32" brass TEE. Route the hose in a manner that will keep it away from exhaust heat and will allow gentle bends without pinching. Attach the hose end to the lid of the FMU.

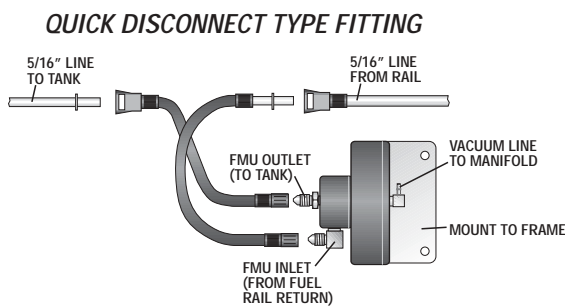


Fig. 10-c

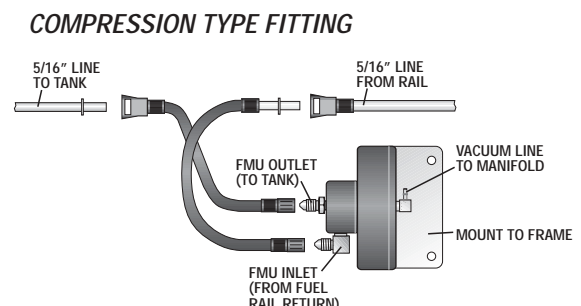


Fig. 10-d

11. SUPPLEMENTARY FUEL PUMP AND HARNESS

NOTE: Some earlier model trucks are not equipped with quick disconnect fittings and will require the use of compression fittings and alternate fuel lines. Proper lines and fittings are supplied to work with both versions of this vehicle. Refer to the graphic below to verify the vehicle you are modifying.

QUICK DISCONNECT TYPE FITTINGS ONLY

- A. Using a fuel line disconnect tool, separate the supply line from the outlet of the fuel filter.
- B. Attach the supplied 3/8" hose to the fuel filter outlet. Connect the remaining end of the 3/8" hose to the fuel pump inlet. Trim the hose if necessary.

COMPRESSION TYPE FITTINGS ONLY

- C. Separate the factory 3/8" fuel rail supply line at the compression fitting junction underneath the vehicle just to the rear of the fuel filter (see Fig. 11-b).
- D. Attach the supplied 3/8" hose to 3/8" compression fitting to the line coming from the fuel tank. Connect the supplied length of 3/8" fuel hose to the 3/8" fitting previously installed and the remaining end to the supplied inline pump. Secure with a #8 hose clamp.

BOTH APPLICATIONS

- E. Attach the discharge end of the fuel pump to the line running into the fuel filter (use the supplied 5/16" hose to 3/8" compression fitting). Position the pump in such a way that the inlet and discharge hoses are not kinked or restricted and maintain a gentle bend. The pump inlet is the most critical as far as restriction is concerned and may be trimmed if necessary to hold a smooth radius. Make sure that all fuel pump hose connections are secure.
- F. Mount the fuel pump to the frame using the 1-1/2" adel clamp. Position the clamp and drill a #16 hole. Secure using a #12 hex head screw.
- G. Using the existing hole in the frame and supplied #10 hardware, mount the relay to the vehicle frame (see Fig. 11-a on this page and Figure 10-a on page 11). The relay mounting hole will also work well as a grounding point for the pump and relay. Scrape away the frame coating and paint to provide a proper ground connection. Make sure that the pump and relay grounding terminals are mounted **under** the relay as opposed to **on top** so that a metal-to-metal contact will be made.



Fig. 11-b

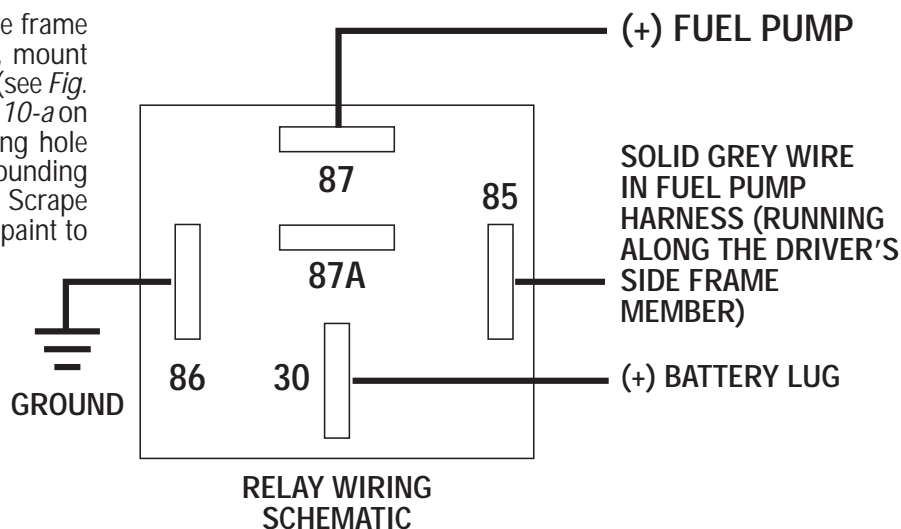


Fig. 11-a

11. SUPPLEMENTARY FUEL PUMP AND HARNESS, cont'd.

- H. Following the diagram (see *Figs. 11-c, 11d*), wire the fuel pump and relay. Use the supplied tie wraps to run the wire and keep it away from heat/abrasion. Use the supplied 8mm nut to connect the main power lead on the relay to the factory fuse/power box underhood (the factory has provided two open power lugs under the power box cover). Tap the yellow relay wire (terminal #87) into the solid gray wire in the harness running along the driver's side frame member. Use the supplied wire tap.

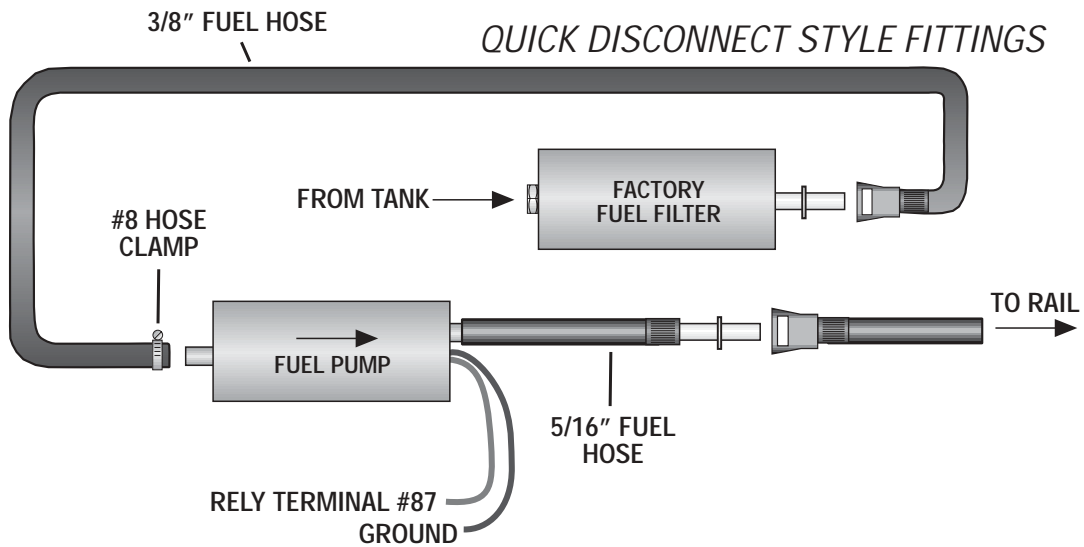


Fig. 11-c

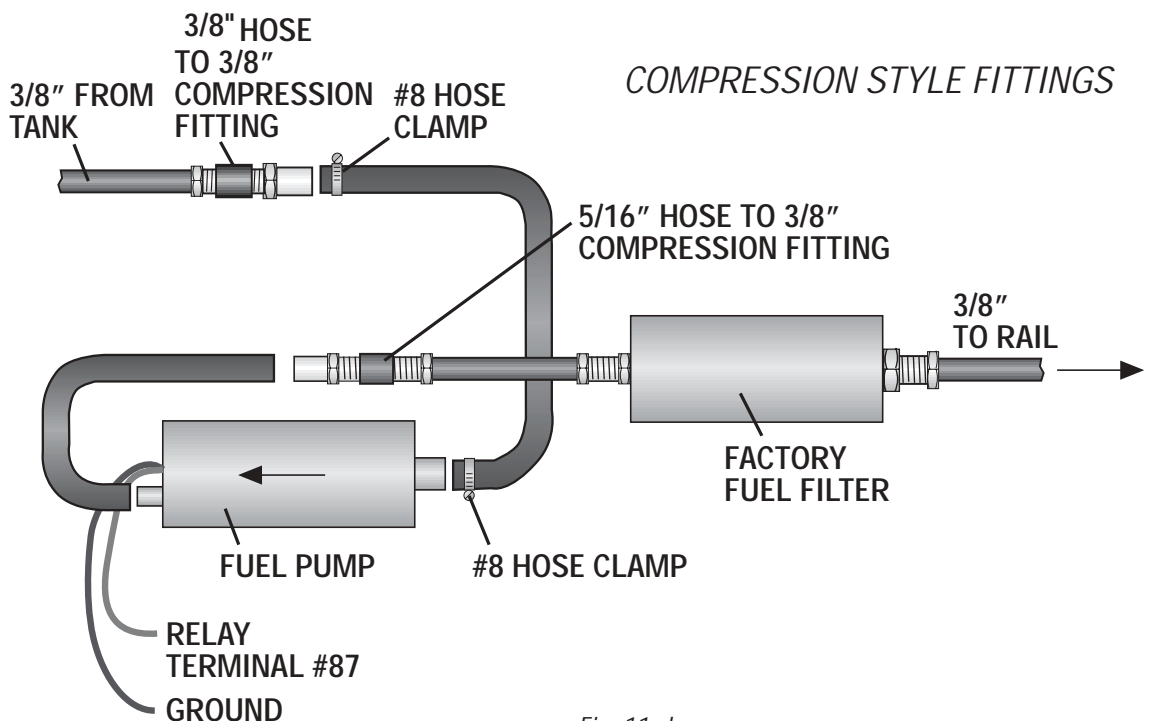


Fig. 11-d

12. FINAL REASSEMBLY AND 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 10,000 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 92 octane or higher fuel before commencing test drive.
- D. Start 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 and for signs of any fluid leakage.
- F. **PLEASE TAKE SPECIAL NOTE:** Operating the vehicle without all sub assemblies completely and properly installed and working may cause **FAILURE OF MAJOR ENGINE COMPONENTS.**
- G. Test drive the vehicle.
- H. 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 the 3 year limited warranty.



Figt 12-a



ENGINEERING, LLC

1650 PACIFIC AVENUE • CHANNEL ISLANDS, CA 93033-9901 • (805) 247-0226
FAX (805) 247-0669 • www.vortechsuperchargers.com • M-F 8:00 AM - 4:30 PM PST