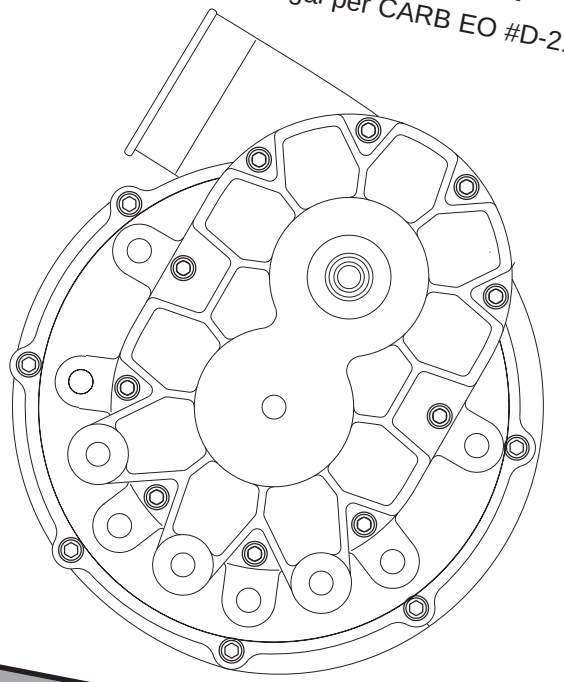
Ford 5.4 3V F-150

Supercharger System Installation Instructions

2004-2007 Model Year

50 State Smog Legal per CARB EO #D-213-25



VORTECH®

ENGINEERING, LLC

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Fax: 805 247-0669 • www.vortechsuperchargers.com • M-F 8:00AM - 4:30PM (PST)

DP/N: 4FN020-010 - v2.0 *03/02/07*

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) 247-0228 8:00am-4:30pm 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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NOTICE

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2004-2007
Ford 5.4L F-150
Installation Instructions

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 and the Warranty Registration form and return envelope.

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

Vortech supercharger systems are performance improving devices. In most cases, increases in torque of 30-35% and horsepower of 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.

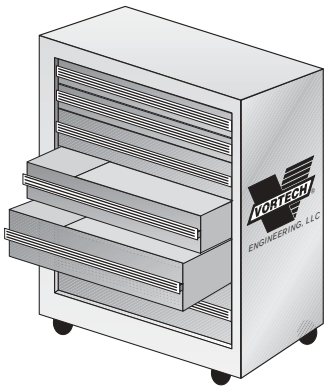
Installation on new vehicles will not harm or adversely affect the break-in period so long as factory break-in procedures are followed.

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 every 3,000 miles or less. **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 20,000 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 40,000 miles and spark plug wires at least every 60,000 miles.

TOOL & SUPPLY REQUIREMENTS:

- Factory Repair Manual
- 3/8" Socket and Drive Set: SAE & Metric
- 1/2" Socket and Drive Set: SAE & Metric
- 3/8" NPT Tap and Handle
- Open End Wrenches: 5/16", 3/8", 7/16", 1/2", 9/16", 5/8", 11/16", 3/4", 10mm, 13-18mm, 18mm tappet (thin) wrench
- 1-1/16" Oil Sending Unit Socket (Snap-on #A119A)
- 6 Quarts SH/CF Rated Quality Engine Oil
- Oil Filter and Wrench
- Flat #2 Screwdriver
- Phillips #2 Screwdriver
- Heavy Grease
- Silicone Sealer
- "R", 1/8", 5/16", 11/32" Drill Bits
- 3/16", 8mm Allen Wrenches
- Wire Strippers and Crimpers
- Utility Knife
- 3/8" profile drill
- T15 Torx Wrench
- 9/16" Crows Foot



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02MAR07 v2.0 Ford F-150(4FNv2.0)

2004-2007 Ford 5.4L F-150

Part No. 4FN218-020(8)SQ

ENGINEERING, LLC

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
2E229-110(8)	**V2SQ S-TRIM ASY, '04 F150, w/CLR**	**1**
2A036-131	S/C PULLEY 3.125" 6-RIB w/FLG	1
2A046-120	BELT, GATES K061203	1
4FN012-011(8)	DUCT, S/C INTAKE, '04 F150	1
4FN110-033	**MTG PLATE ASY, '04 F150**	**1**
2A017-462	SPACER, IDLER SMOOTH 6-RIB	2
2A017-102-740	SPACER, .74"L x 1"OD	?
2A017-102-205	SPACER, 1"OD x 2.055" LONG	2
2A017-087-077	SPACER, .875"OD x .770" LONG	6
4FA016-171	DUST COVER (IDLER PULLEY)	1
4FH016-150	IDLER PULLEY, 6-RIB SMOOTH 3" FLANGD	1
4FN010-010	BRKT, PWR STR RES, '04 F150	1
4FN010-033	PLATE, MTG, PRIMARY	1
4HS017-021	SPACER, S/C BOSS S2000	2
7A312-075	5/16-18 x 3/4" HXCS GR5 ZINC	2
7A375-175	3/8-16 x 1-3/4" HXHD GR5 PLT	5
7A375-225	3/8-16 x 2-1/4" HXHD G8	1
7A375-275	3/8-16 x 2-3/4" HXCS G8 P	1
7C010-055	M10-1.5 x 50 HXHD GR10.9	1
7C080-120	M8-1.25 x 120 HXHD ZN PLT	2
7F006-093	6mm NYLOCK NUT	2
7F375-017	3/8-16 NYLOCK NUT	1
7J250-001	1/4" SAE WASHER, PLTD	5
7J312-000	5/16" FLAT WASHER-SAE	4
7J375-044	3/8" SAE WASHER, PLTD	12
4FN110-040	MNT BRKT SPT, '04 F150	1
7A250-074	1/4-20 x .75" HHCS	2
2A017-750-03	SPACER, .13"	2
4FN130-026	**OIL FEED LINE ASY, '04 F150**	**1**
7P125-004	1/8"NPT x 90° x -4 JIC FTG	1
7P250-122	1/4" PIPE THRD AN917 TEE	1
7P250-123	1/4"NPT x 1-1/2" NIPPLE	1
7P250-250	1/4"NPT STR x -4 JIC FTG	1
7U100-055	TIE-WRAP, 7.5" NYLON	5
7U250-000-465	OIL FEED HOSE, 46.5" -4 STRT	1
4FN130-036	**OIL DRAIN LINE ASY, '04 F150**	**1**
7P375-055	3/8"NPT x 1/2" HOSE BARB	1
7R001-008	#8 STNLS HOSE CLAMP	2
7T560-001	CUTTER, 9/16" ROTABROACH	1
7T560-002	ARBOR, ROTABROACH	1
7U030-036	1/2" OIL DRAIN HOSE	0.67'
4FN112-040	**AIR INTAKE ASY, '04 F150**	**1**
4FA012-012	INTAKE ELBOW, 90° w/o BOSSES	1
4FN012-040	COVER, AIR FILTER, '04 F150	1
7A250-075	1/4-20 x .75" HHCS	3
7F250-021	1/4-20 x NYLOCK NUT	3
7J250-001	1/4" WASHER SAE	4
7J250-150	1/4" FENDER WASHER	2
7P250-033	1/4" x 5/32" RED.UNION	1
7P250-125	1/4" BARBED MALE TEE	1
7P375-008	ELBOW, 3/8" x 90° UNION	1
7P375-050	3/8" HOSEMENDER	1
7R002-016	#16 GOLDSEAL HOSE CLAMP	2
7R002-056	#56 GOLDSEAL HOSE CLAMP	4
7R005-001	208-91 T-BOLT CLAMP	1
7S350-200	3-1/2" x 2" SLEEVE	1
7S350-300	3-1/2" x 3" SLEEVE	1
7U030-030	1/4" VACUUM HOSE	0.167'
7U030-046	5/32" VACUUM LINE	2.5'
7U030-056	3/8" PCV HOSE	3.25'
7U100-061	GROMMET, 3/8"ID x 5/8" FLANGE	1
7U100-100	GROMMET, 1"ID x 1.38"OD, .12-GRV	1
7U133-100	HOSE, ELBOW, 90° x 1"ID, MOLDED	1
5W001-012	18-22GA BUTT CONNECTOR	13
5W018-010	18GA STD RED WIRE	1'
5W018-020	18GA WIRE, BLK	1'
5W018-090	18GA WIRE, BROWN	1'
5W018-080	18GA WIRE, BLUE	1'
5W018-240	18GA WIRE, WHITE/YELLOW	1'
5W018-030	18GA WIRE, GREY	1'
8A002-021	MAF, 3.8", '04 F150	1
8D001-001	STD COMP BYPASS VALVE	1
8H040-095	AIR FILTER, MOSSELMAN 4" FLG	1
4FN139-096	**ASY, PCV INSTALL, '04 F150**	**1**
7P375-106	PCV VALVE, FORD, 3/8" HOSE	1
7P625-375	REDUCER, 5/8" BARB TO 3/8" BARB	1
7R001-006	#6 STNLS HOSE CLAMP	2
7R001-008	#8 STNLS HOSE CLAMP	4
7U030-056	3/8" PCV/VAC RUBBER HOSE	1.6'
7U033-000	5/8" PCV HOSE	.5'
8N301-260(8)	**POWER COOLER ASY, '04 F150**	**1**
8N201-260(8)	**DISCHARGE ASY, '04 F150**	**1**
8N101-260(8)	CAC ASY, '04 F150, AIR/WATER	1
008341	POWERCOOLER DECAL	1
7P100-100	1"NPT x 1" BARB FITTING	1
7S350-303	ELBOW, 3.5" x 3.0" 90° w/LEG, SILICONE	1
7R002-044	#44 SAE TYPE "F" SS HOSE CLAMP	2
7R002-048	#48 SAE TYPE "F" SS HOSE CLAMP	1
7R002-056	#56 GOLDSEAL HOSE CLAMP	1
8N055-050	PLASTIC CAP, SURGE TANK	1
7S275-200	2-3/4" x 2" SLEEVE	1
8N105-260	**WATER TANK MTG ASY, '04 F150**	**1**
4FN010-060	BRKT, WATER RES, 2004 F150	1
7A250-051	1/4-20 x .50" HXHD ZN PLT	3
7E010-075	#12 x 3/4" SHT METL SCRW, HEX	3
7J250-001	1/4"SAE WASHER, PLTD	3
7P500-026	1/2"NPT x 3/4" BARB 90°	1
7P500-034	1/2"NPT x 3/4" BARB 90° NICKEL PLATE	2
7P500-078	1/2"NPT x 3/4" HOSE FIT	3
7R007-001	NYLON CLAMP 1-1/8"	8
7U030-065	3/4" x 90° HOSE SHORT	1
7U038-000	3/4" HEATER HOSE	6'
8N055-030	TANK, LT1 AFTERCOOLER	1
8N006-010	**WATER COOLER**	**1**
8N107-260	**WATER PUMP ASY, '04 F150**	**1**
5W001-005	3/8" PLASTIC WIRE LOOM	3.5'
5W001-009	16-14GA MALE SLIDE INSULATED	1
5W001-046	16-14GA EYELET .33" HOLE	1
5W001-013	14-16AWG, SOLDERLESS CONNECTOR	2
5W001-022	T-TAP CONN, 14-16AWG	1
5W014-010	14GA STRD WIRE, RED, UL1015	3'
5W014-030	14GA STRD WIRE, BLACK	3'
7U100-044	TIE-WRAP, 4" NYLON	8
8F001-402	PUMP, WATER, PIERBURG	1
8N100-001	NYLON MOUNTING KIT	1
8F060-048	**FUEL INJ, 48LB PENCIL, FACT. '03 COBRA**	**8**
5A003-033	**ECU TUNER, F150, 3V**	**1**

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1. COMPONENT REMOVAL AND PREPARATION

A. Disconnect negative cable at the battery.

B. Remove the valve cover breather hose from the passenger side side valve cover to the air filter housing.

C. Remove all ducting up to but not including the throttle body.

D. Remove the Mass Air Flow (*MAF*) sensor and Torx screws from the factory air inlet duct and set aside.

E. Remove the accessory drive belt.

F. Remove the plastic core support cover (*on top of radiator and hood latch area*) and set aside.

G. Remove the power steering reservoir support bracket. Set aside the three reservoir hold down screws for later use.

H. Remove the nut securing the capacitor and the two bolts from the front engine cover. (See *Fig. 1-a*.).

I. Remove the hose that runs from the driver's side valve cover to the intake.

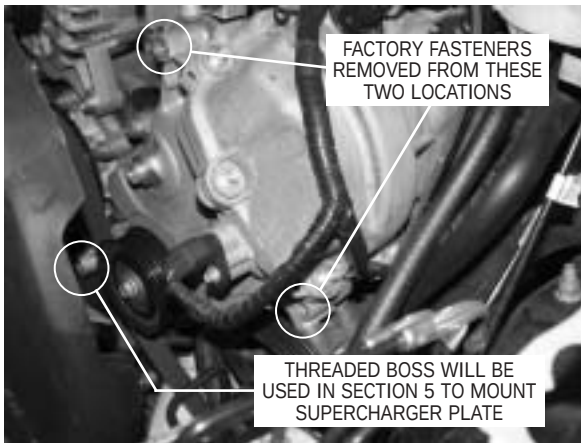

Fig. 1-a

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2. OIL DRAIN LINE INSTALLATION

A. To provide an oil drain for the supercharger, it is necessary to make a hole in the front of the driver side valve cover.

B. Temporarily install the supercharger mounting plate using the supplied M8 bolts installed in the holes from which the two factory bolts were removed.

C. Use a marker to trace the round hole in the supercharger mounting plate onto the driver's side valve cover.

D. Remove the supercharger mounting plate and the driver side valve cover.

E. Drill a 1/8" pilot hole at the center of the marked location. Use the supplied 9/16" roto broach to drill the hole.

F. Tap the hole with a 3/8"NPT tap to approximately 1/2" deep or until the fitting can be started.

G. Thoroughly clean the threaded area. Install the supplied 3/8"NPT x 1/2" hose barb fitting. Make sure that a seal is formed all around the fitting.

H. Re-install the valve cover. (See *Fig. 2-a.*)

Fig. 2-a

3. FUEL INJECTOR REPLACEMENT

> ***NOTE*** *Complete removal of the fuel rail will aid in injector replacement. Separate the fuel rail supply line from the rail using springlock disconnect tool.*

A. Relieve the fuel system pressure

B. Disconnect the eight fuel injector plugs and retaining clips from the injectors.

C. Remove the four screws that hold down the fuel rail on the intake manifold. Lift up on the rails evenly and remove all eight injectors.

D. Using a small amount of clean motor oil, lightly lubricate the O-rings on both ends of the Vortech supplied fuel injectors.

E. Install the new injectors into the fuel rails reusing the factory retaining clips.

F. Carefully lower the fuel rail/injector assembly down onto the intake manifold. Check to see that each injector has been seated properly into the intake manifold.

G. Tighten down the fuel rail assembly with the original bolts and attach the injector plugs to the injectors.

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4. OIL FEED LINE INSTALLATION

A. Remove the oil pressure sending unit located near the oil filter.

> ***WARNING:*** *Use engine oil on the pipe threads. Teflon tape or sealant is not recommended as it may loosen and cause blockage of the oil feed orifice resulting in supercharger failure.*

B. Install the supplied 1/4"NPT nipple into one end of the supplied TEE. Install the 1/4"NPT to #4 fitting onto the other end of the TEE.

C. Install the end of the nipple into the engine block and tighten all fittings.

D. Re-install the oil pressure sending unit into the side of the TEE.

E. Connect one end of the supplied oil feed line to the installed fitting. Temporarily cover the open end of the oil feed line.

F. Route the line back around the engine mount to the frame rail and then up the inner fender. Use tie-wraps to secure the line and protect it from kinking, abrasion, and high heat areas. (See *Fig. 4-a*.)

Fig. 4-a

5. SUPERCHARGER MOUNTING PLATE INSTALLATION

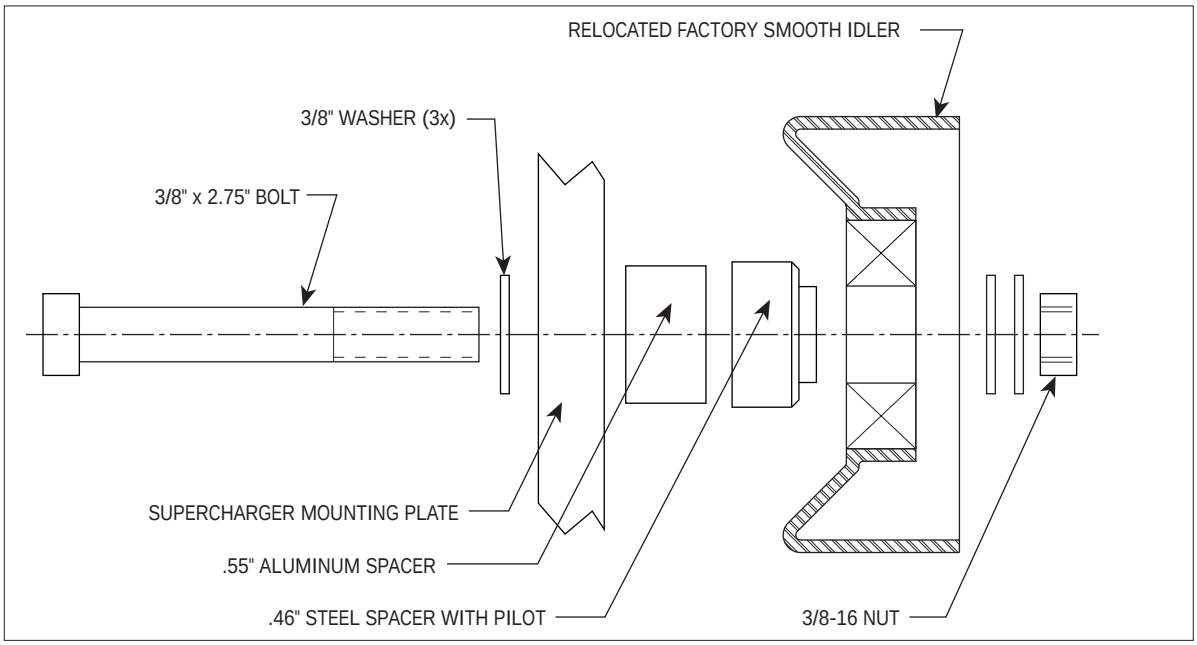

Fig. 5-a

A. Remove the smooth idler from the driver's side engine cover. Use one each of the supplied (*.55" aluminum and .46" steel with pilot*) spacers between the mounting plate and the idler and install it on the supercharger mounting plate as shown in *Fig. 5-a,* using the supplied 3/8" x 2.75" bolt and nut.

B. Route the supplied belt around the alternator and power steering pulley and loop it over the top of the driver's side valve cover.

C. Install the supercharger mounting plate using the supplied bolts and spacers. (See *Fig. 5-b*.) Make sure that the belt is routed between the alternator pulley and the smooth idler. Make sure that the cam sensor wires are not pinched. Tighten the three bolts evenly.

D. Loosely attach the supplied mounting plate strut support to the two holes in the mounting plate using the supplied 1/4-20 x 3/4" bolts. Note the two exhaust manifold studs that line up with the lower part of the strut support and remove the nuts. Install one of of the supplied .13" long spacers onto each of the exhaust manifold studs. Secure the strut support on top of the spacers by reinstalling the factory nuts. Tighten all fasteners. (See *Fig. 5-c*.)

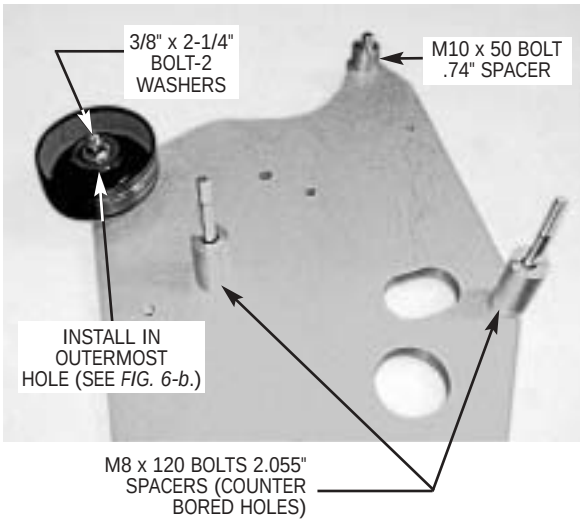

Fig. 5-b

Fig. 5-c

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6. SUPERCHARGER INSTALLATION

A. Remove the cap on the supercharger oil drain fitting, attach the supplied 1/2" oil drain hose and secure with a supplied #8 hose clamp.

B. Install the supercharger using five of the supplied .75" spacers and 3/8" x 1-3/4" bolts. (See *Fig. 6-a.*)

C. Attach the oil drain hose to the fitting previously installed in the valve cover and secure with a #8 hose clamp.

> ***NOTE:*** *The installed oil drain hose cannot have dips, kinks or uphill routing. Trim hose length if necessary.*

D. Use a zip-tie to secure the sensor wires to the oil drain fitting (*away from the eventual accessory drive belt location*).

E. Install the supplied smooth idler onto the supercharger mounting plate in the location shown in *Fig. 6-b* using one each of the supplied (*.55" aluminum and .46" steel with pilot*) spacers between the supercharger plate and the idler and 3/8" x 2.25" bolt.

F. Route the belt per *Fig. 6-b* except for the supercharger pulley. Using a 1/2" drive ratchet or breaker bar, fully compress the spring tensioner while pulling the belt onto the supercharger pulley.

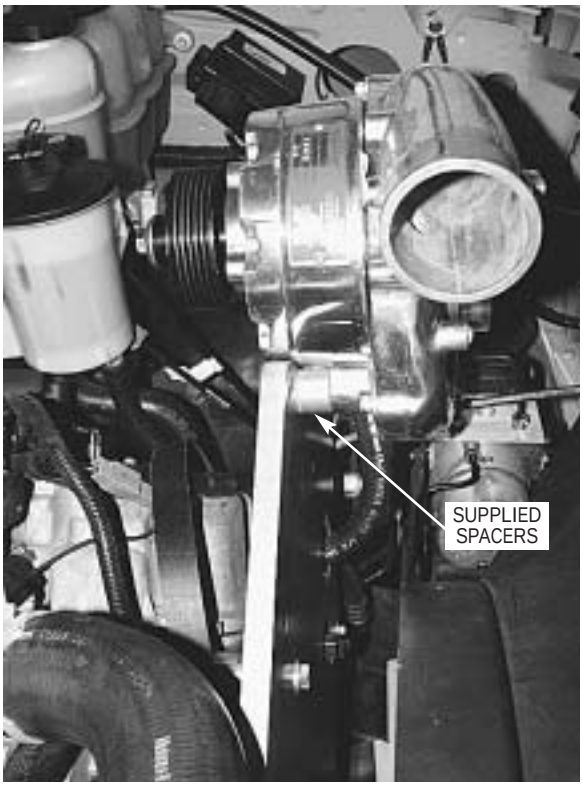

Fig. 6-a

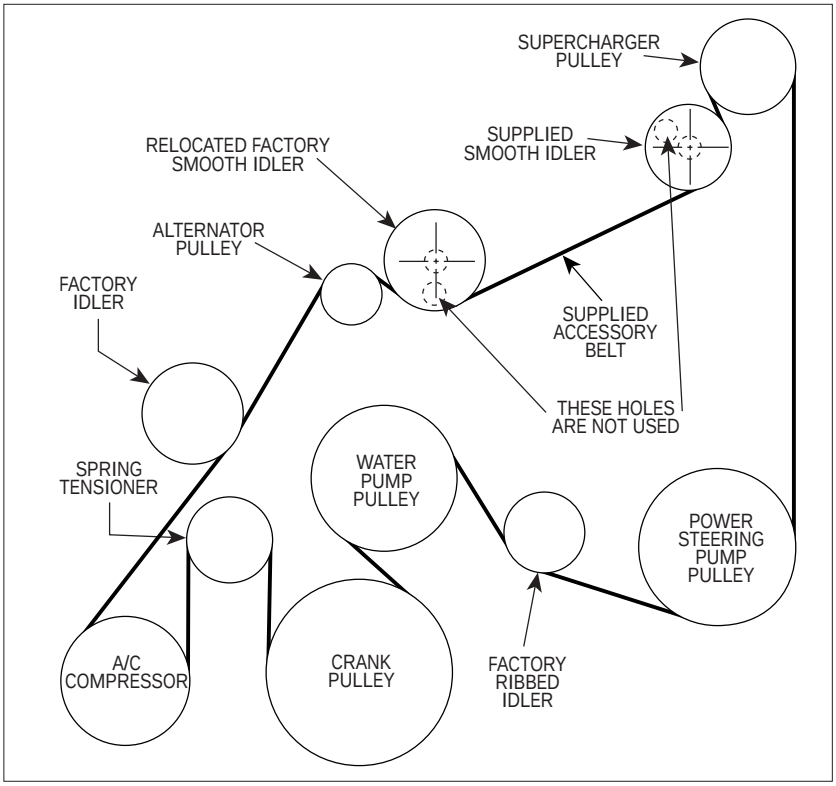

Fig. 6-b

6. SUPERCHARGER INSTALLATION, cont'd

> ***NOTE:*** *If the belt does not have enough slack to allow installation, start the belt around the supercharger and have an assistant rotate the engine (with a ratchet on the harmonic damper bolt) until the belt is completely installed.*

G. Install the supplied power steering reservoir mounting bracket onto the supercharger mounting bracket using the two 5/16" x 3/4" bolts. Attach the reservoir to the bracket using the original 6mm screws and the supplied nuts. (See *Fig. 6-c*.)

H. Remove the cap from the supercharger oil feed and using engine oil on the threads, install the 1/8"NPT x -4 x 90° fitting so that it points down. Attach the free end of the oil feed line to the fitting and tighten. (*If the oil feed hose does not reach, loosen the 90° end of the oil feed hose and re-position.*)

> ***NOTE:*** *DO NOT use any type of sealant on the oil feed fittings. It may become dislodged and clog the oil feed orifice, causing premature failure of the supercharger.*

I. Attach the capacitor removed from the top of the engine cover to the 8mm hole in the supercharger mounting plate using the remaining power steering reservoir hold-down screw.

J. Verify that the accessory drive belt has clearance to all hoses and wires.

Fig. 6-c

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7. CHARGE AIR COOLER SYSTEM INSTALLATION

A. CAC Radiator Installation

1. Install two of the supplied 1/2"NPT x 3/4" straight barb fittings into the supplied CAC radiator.

2. Position the radiator as shown. (See *Fig. 7-a*.) Position the radiator as close to the vertical core support as possible. This will allow for additional water pump clearance.

3. Use the supplied nylon mounting kit to secure the CAC radiator. Do this by pushing the four nylon connectors through the CAC radiator, a piece of foam and then the condenser. Do not push in all the way (*to avoid hitting the vehicle's radiator*).

4. Remove the top mounting screws from the condenser and hood latch. Pull the condenser forward until the snap connectors can be installed. Tighten the connectors and trim excess.

5. Re-install mounting screws.

B. CAC Water Reservoir Installation

1. Rotate the upper radiator hose clamp away from the passenger's side. Put the supplied water tank bracket into the area in front of the windshield washer reservoir.

2. Trial fit the plastic tank into the bracket, position for best fit, and mark the bracket hole locations.

3. Remove the tank and drill a 1/8" hole at each of the marked locations. Install the water tank bracket using the supplied sheet metal screws. (See *Fig. 7-b*.)

4. Using sealant, install a straight 1/2"NPT to 3/4" barb fitting into the bottom of the water tank which has only one 1/2"NPT hole. Attach a length (~3') of hose to the fitting and secure with a plastic clamp.

5. From the engine compartment, feed the hose straight down between the body mount and the plastic fender liner below the installed bracket and lower the plastic tank into the bracket. Secure the tank with two 1/4" screws.

6. Install a supplied 1/2"NPT x 90° fitting into the top of the tank using sealant and point towards the engine.

C. CAC Water Pump Installation

1. Trim the supplied short rubber elbow so that the water pump discharge can be connected to the lower fitting on the CAC radiator with the pump body positioned below.

Fig. 7-a

Fig. 7-b

7. CHARGE AIR COOLER SYSTEM INSTALLATION, cont'd.

2. Trim as necessary and attach the hose from the water reservoir to the inlet of the water pump. (See *Fig. 7-c*.) Route carefully so that there are no sharp bends to kink the hose.

3. Cut off the electrical plug on the water pump and use the supplied butt connectors to extend the wires. Connect the supplied red wire to the positive (green) water pump wire. Connect the supplied black wire to the negative (*brown*) water pump wire. Cover the wires with the supplied plastic wire loom.

4. Route the wires through the radiator core support and up to the front of the passenger's side valve cover. Install the supplied 5/16" eyelet on the black wire and attach to the stud as shown in *Fig.7-d* using the factory nut.

5. Using the supplied male slide connector and T-tap, TEE the free end of the positive wire into the passenger's side capacitor wire (*located on the front of the passenger's side valve cover*) as shown. (See *Fig. 7-d*).

D. Charge Air Cooler Install

1. Install two of the supplied 1/2"NPT x 90° fittings into the Charge Air Cooler end tank.

2. Loosely attach the supplied sleeve to the CAC inlet (*2-3/4"OD*) and the rubber elbow to the CAC outlet (*3"OD*).

3. Install the cooler in the vehicle by attaching the rubber elbow to the throttle body and the sleeve to the supercharger.

4. Connect the fitting on the top of the water reservoir to the lower 90° fitting installed in the CAC end tank

5. Connect the fitting on the top of the CAC radiator to the upper fitting installed in the CAC end tank by running it through the mat on the passenger's side of the radiator and then through the hole in the core support. (See *Fig. 7-e.*)

6. Verify that all hose connections have tightened clamps installed.

7. Remove cap from surge tank and slowly fill system with 25%/75% coolant/water mix.

8. Install the supplied plastic fitting into the CAC inlet tank.

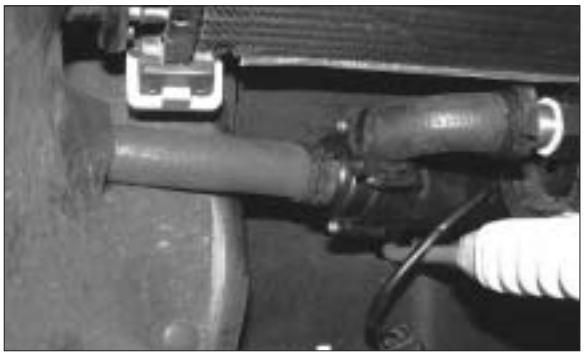

Fig. 7-c

Fig. 7-d

Fig. 7-e

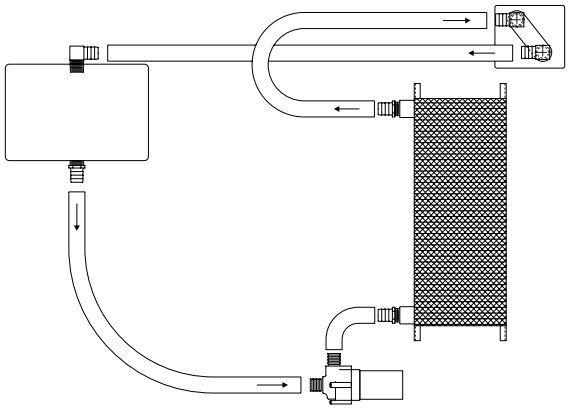

Fig. 7-f

8. AIR INLET ASSEMBLY

A. Install the MAF sensor removed in section one into the supplied MAF housing using the original screws. *Note that it only installs one way (Do not force it)*. Air flow direction is indicated on the sensor.

B. Verify that the supplied cast aluminum inlet duct has two grommets installed. Install the 90° plastic elbow into the 3/8"ID grommet. Attach the supplied 3/8" hose to the open end of the elbow. Install the bypass valve discharge barb into the 1" grommet. (See *Fig. 8-a*.)

C. With the supplied T-bolt clamp encircling it, install the duct onto the supercharger inlet and point it towards the driver side.

D. Attach the air filter assembly to the Ø4" end of the supplied MAF housing and tighten the clamp. Make sure that the MAF plug is oriented so that it will point towards the engine when installed. Attach the short leg of the supplied Ø3.5" plastic elbow to the MAF using the Ø3.5" x 2" long sleeve.

E. Attach the longer leg of the plastic elbow to the supercharger air inlet duct using the 3" long sleeve. Orient the assembly so that there is sufficient clearance to accommodate engine movement and tighten the clamps. (See *Fig. 8-b*.)

F. If the MAF plug will not reach the sensor: carefully cut, strip and lengthen the MAF wires with the supplied wire and connectors. Attach the MAF plug to the installed sensor.

G. Attach the supplied 3/8" x 39" hose from the inlet duct to the passenger side valve cover where the breather hose was removed in *Section 1*.

H. Trim the supplied 1" 90° hose to attach the barb on the supercharger discharge to the inlet of the bypass valve. Tighten supplied hose clamps on each of the connections. (See *Fig. 8-c*.)

I. Use the supplied 5/32" hose, 1/4" hose reducer and TEE to connect the fuel rail pressure sensor vacuum hose to the bypass valve.

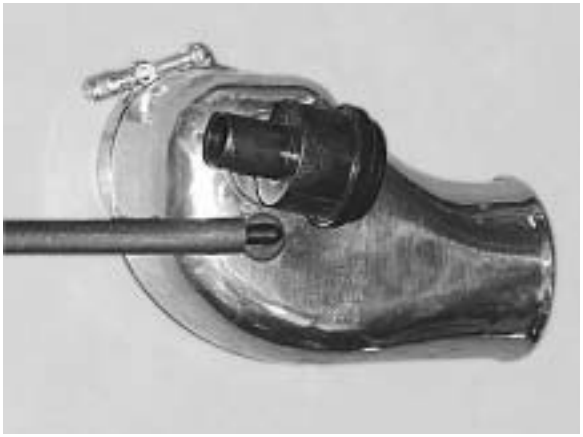

Fig. 8-a

Fig. 8-b

Fig. 8-c

8. AIR INLET ASSEMBLY, cont'd.

J. Replace the hose that runs from the driver side valve cover to the intake manifold with the supplied Positive Crankcase Ventilation (PCV) valve and hose as follows: Remove the factory 90° hose ends from the plastic tube and re-install onto the engine. Cut and install 3" of the supplied 5/8" hose onto the valve cover and the rest onto the intake manifold. Insert the supplied 5/8" to 3/8" reducer into the hose on the intake manifold and attach the supplied 3/8" hose to it. Install the large end of the PCV valve into the 5/8" hose installed on the valve cover and attach the 3/8" hose to it. (*Trim as necessary*). Install and tighten hose clamps on each connection. (See *Fig. 8-d*.)

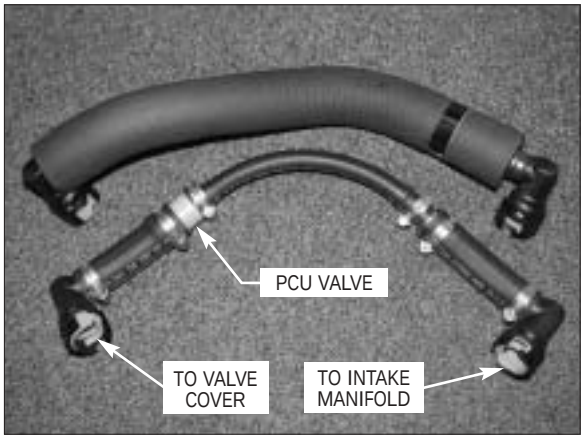

Fig. 8-d

K. Install the supplied air filter cover over the air filter as shown (see *Fig. 8-e*) and attach to the vehicle using the supplied 1/4" hardware.

Fig. 8-e

9. RE-FLASH COMPUTER

IMPORTANT: To ensure trouble-free programming of your vehicle's computer:

- Make sure the vehicle's battery is sufficiently charged.
- Turn off all accessories and close doors to prevent unecessary drain on battery.
- Do not attempt to program your vehicle while a battery charger is connected.
- Improper battery voltage will result in failure of the programming process.
- Do not disconnect the cable or turn off the ignition during programming.

A. Re-connect the battery.

B. Locate the vehicles OBD2 connector located in the lower right hand corner of the dash on the driver's side of the vehicle.

C. Attach the OBD2 connector from the Flash tool that is provided in the kit to the vehicle's OBD2 port.

D. The Re-flash tool will power up and display three parameters.

1. Performance Tune

2. Diagnostics

3. Options

E. Select "Performance Tune" and press the enter button in the middle of the arrow keys.

F. Read the disclaimer entirely, then select agree and press ENTER.

G. At this point, please read the screen displayed on the re-flash tool. If you have any questions, either refer to the manual that is provided with the re-flash tool or contact our service department for further assistance.

H. Turn the ignition on (do not start the vehicle). Set the parking brake and press the ENTER button to continue.

I. SELECT TUNE will be displayed at the top of the screen. Use the arrow keys to select the appropriate tune for your vehicle and press the ENTER button. You will have a choice of three to choose from:

1. Supercharged F-150

2. Original Backup

J. Continue to follow the screen commands and, when finished, unplug the re-flash tool from the vehicle's OBD2 port.

NOTE: *Do not disturb the cable or turn the ignition off during this time. If the programming is disrupted, the computer will not start or run your vehicle!*

10. FINAL ASSEMBLY AND CHECK

A. If your vehicle has gone over 20,000 miles since its last spark plug change, it is a good idea to change the spark plugs now, before test-driving.

B. Make sure that oil drain and oil feed fittings are tight and that the engine is filled with factory specified oil.

C. Check all fittings, nuts, bolts and clamps for tightness.

D. Make sure engine radiator and overflow tank are filled with 50/50 coolant/water mix.

E. With key on, make sure charge air cooler water pump is operating and that water is flowing through the surge tank. Fill as necessary. If water is not flowing, verify that the hose from the CAC to the water reservoir has no dips in it. Do not run the water pump for extended periods (*30 seconds or more*) without water flow.

F. Key off and key on the vehicle and verify that each fuel injector is sealed to the fuel rail and that no fuel is leaking.

G. Make sure that the vehicle is filled with 91 octane or higher fuel before commencing test drive.

H. At this point it is OK to start the vehicle.

> ***WARNING:*** *Do not attempt to operate the vehicle until ALL components are installed and ALL operations are completed including final check. Failure to do so may cause PREMATURE FAILURE OF MAJOR COMPONENTS.*

I. Turn off vehicle and recheck all fluid levels and verify that no hoses, wires, etc. are near exhaust headers or moving parts and that there is no fluid leakage.

J. Test drive vehicle by gradually working up to full throttle and paying close attention to any abnormal sounds or engine detonation.

K. Read the STREET SUPERCHARGER SYSTEM OWNER'S MANUALAND RETURN THE WARRANTY REGISTRATION FORM within thirty (30) days of purchasing your supercharger system to qualify for the 3-year limited warranty.

> ***WARNING:*** *Never operate your engine at full throttle when the engine is cold. Always allow plenty of time for the oil to reach full operating temperature before running above 2,500 RPM. Full supercharger operating temperature is generally achieved only after the engine water temperature has been at the normal indicated operating range for two or three minutes.*

Fig. 10-a

P/N: 4FN020-010

02MAR07 v2.0 Ford F-150(4FNv2.0)

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