



5.4L Ford F-150 ROUSHcharger Kit P/N R07000001 Installation Instructions

Application: 2004-2005 Ford F-150 5.4L 3 Valve 4x2 & 4x4 Models

E.O. # D-418-3

Before installing your Roush Performance Product(s), read through the entire installation procedure and check to make sure all items are present.

This ROUSHcharger kit is designed and tested to function properly only on vehicles as they are equipped from the factory (completely stock powertrains). The use of aftermarket parts and equipment such as: cams, headers, nitrous oxide systems, other bolt-on performance parts, or any other performance parts not sold by, manufactured by, or approved of in writing by Roush for specific application to the F-150, 5.4 liter ROUSHcharger, will result in powertrain and ROUSHcharger kit damage, including potential total engine failure, and will not be the responsibility of Roush in any way.

Premium fuel (91 octane minimum) is required to help reduce the possibility of “spark-knock” or detonation under various operating conditions.

Operating your engine without the Roush PCM recalibration will result in engine damage or failure and will void all warranty.

Packaging List for Complete ROUSHcharger Kit

<u>Item</u>	<u>Part No.</u>	<u>Quantity</u>
Air Inlet Kit	R07060024	1
Black MAF Adapter (1)	-	
MAF Air Dam Coated (1)	-	
Bottom Panel Coated (1)	-	
Silicone Hump Hose (1)	-	
Weather Strip (1)	-	
T-Body Connector Hose (1)	R07060071	

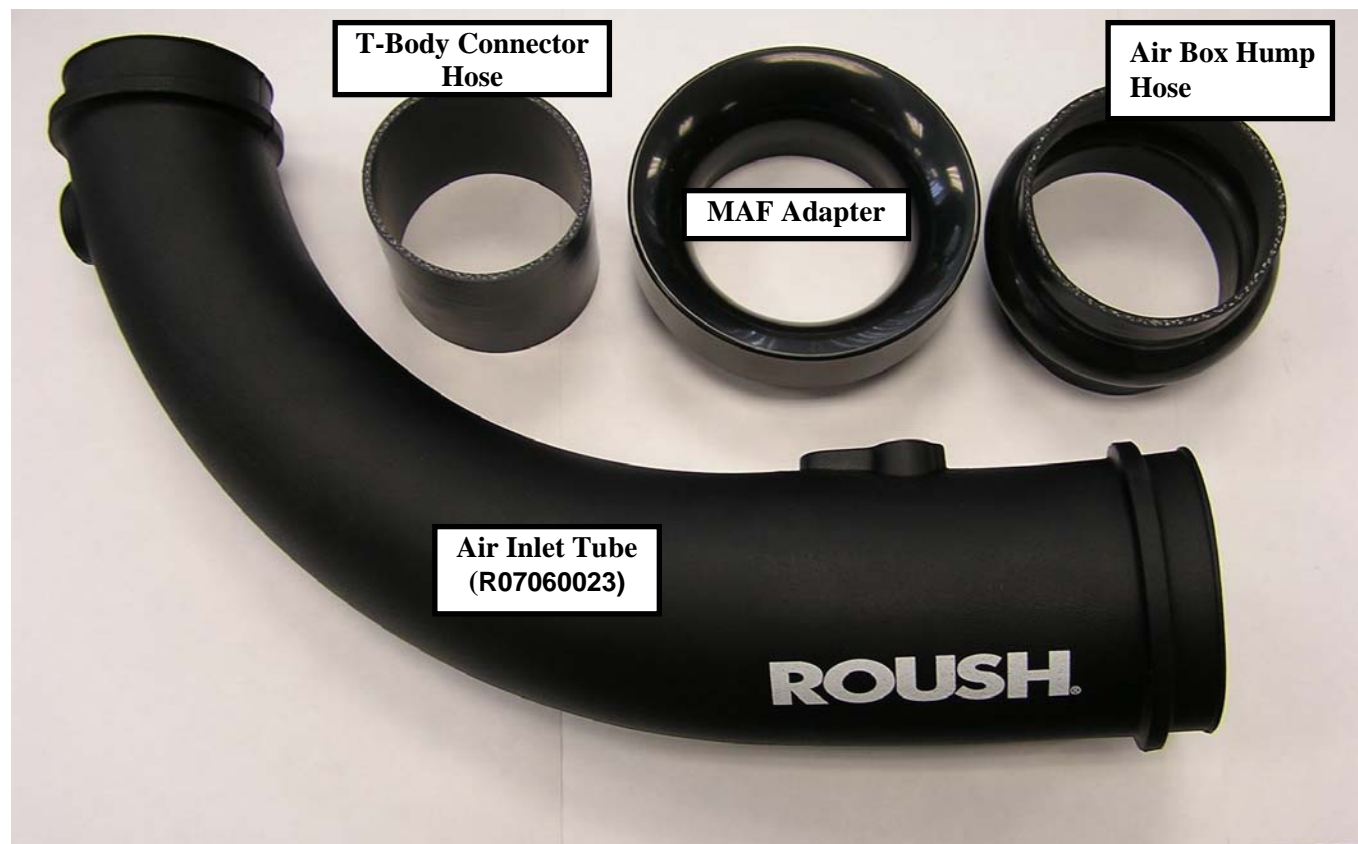
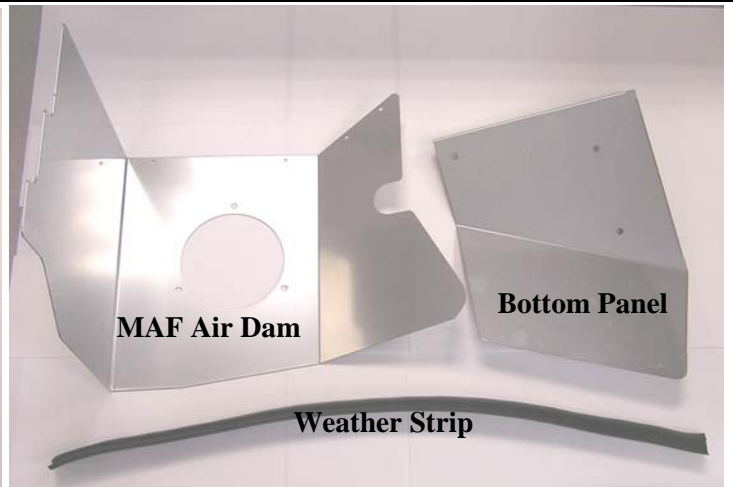


<u>Item</u>	<u>Part No.</u>	<u>Quantity</u>
Hardware Pack- (1) Contains:	-	
(2) Hose Clamp- #64		
(2) Hose Clamp- #56		
(2) Grommet- 32mm O.D.		
(1) Grommet- 25mm O.D.		
(1) Barb Fitting- PCV closure tube		
(1) Clip- hose		
(1) Retaining Plate- air box		
(1) Edge Molding- (approx 110mm long)		
(3) ¼-20 Button Head Screw		
(3) M6x25mm Bolt		
(2) M6 Nut		
(10) 1/4 Flat-Washer		
(2) 6-32 Button Head Screw		
(6) 6-32 x .25" Screw		
(6) 6-32 Lock-Nut		
(6) 6-32 Flat-Washer		
(1) ¼-20 x .75" Bolt		
Clean Air Tube (1)	R07060023	
Air Filter Element	R07060021	1
Hardware Kit A- Air Inlet Tube	R07060025	1
Support Bracket Bolts- M6x18mm (2)	-	
Bracket- Tube Support- (1)	-	
Intake Manifold Assembly	1104-9424-AA	1
Sensor- Inlet Air Temp- (1)	R07090044	
90° Vacuum Port Fitting- (1)	-	
Throttle Body Spacer	1104-9A589-AA	1
ROUSHcharger	1104-6F066-AA	1
Gasket – Intake to S/C	R07050008	1
Gasket – S/C to Spacer	R07050009	1
Hardware Kit B- Intake	R07050010	1
Dowel – Intake to S/C- (2)		
Crush Limiter – Intake to Head- (9)	1104-9439-AA	
Bolt – Spacer to S/C- M6x32mm (4)	-	
Bolt – S/C to Intake- M8x48mm (8)	-	
Bolt – Intake to Head- M6x45mm (10)	-	
FEAD Bridge Assembly	1104-8B653-AA	1
Bridge- Machined Casting- (1)	1104-8B603-AA	
Tensioner Assy.- (1)	R07020007	
Idler Pulley- (2)	R07020008	
Serpentine Belt	1104-8620-AA	1



<u>Item</u>	<u>Part No.</u>	<u>Quantity</u>
S/C Drive Pulley (Spider Bracket Assembly)	R07020009	1
S/C Crank Adapter	R07020010	1
Fan Spacer	1104-8546-AA	1
Hardware Kit C- FEAD	R07020011	1
Bolt – Pulley to Damper- M10x23mm (3)	-	
Bolt – Bridge to Frt. Cover- M8x75mm (1)	-	
Bolt – S/C Drive Pulley to Frt. Cover- M10x36mm (1)		
Bolt – P/S Reservoir to Bridge- M6x28mm (2)		
Washer – 10mm (1)		
Washer – 8mm (1)		
Hardware Kit D- Vacuum & Hose	R07040001	1
PCV Purge & Bubbler Hose Assy.- (1)	1104-6C324-AA	
Vacuum Harness- Engine- (1)	1104-9E498-AA	
Hose- Brake Booster- (1)	1104-2B432-AA	
Clamp – Brake Booster Hose- (2)	-	
Clamp – Upper Radiator Hose- (2)	-	
Clamp – Heater Hose- (1)	-	
Upper Radiator Hose	1104-8B274-AA	1
Hardware Kit E- Electrical	R07080003	1
Jumper – Bypass Solenoid- (1)	1104-12B637-DA	
Jumper – Inlet Air Temp Sensor- (1)	1104-12B637-BA	
Heat Shrink Tubing (8)	Included with harness	
Wire Clips (4)	Included with harness	
Hardware Kit F- Instructions & Decal	R07000002	1
Installation Instructions (1)	R07000003	
Vacuum Schematic w/EO # (1)	R07040021	
Premium Fuel Only Decal (1)	R07110003	
Premium Fuel Decal- Dash (1)	R07110004	
Hardware Kit G- Boost Bypass	R07050011	1
Bypass Solenoid Bracket (1)	-	
Bolt – Solenoid Bracket to Intake-	M6x18mm (3)	
Hardware Kit H- Vacuum	R07040004	1
Vacuum Harness (1)	-	
Vacuum Cap (1)	-	
Box- PCM Return	R07050012	1

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Air Inlet Kit R07060024

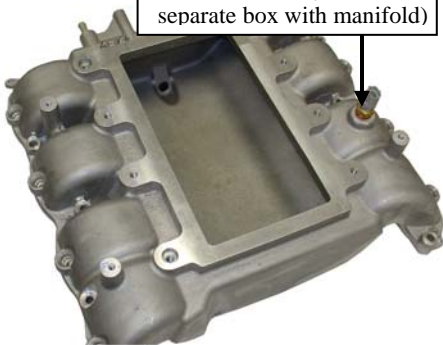
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Air Filter (R07060021)



Hardware Kit A- Air Inlet Tube



R07090044 (may be in separate box with manifold)

Intake (1104-9424-AA)



T-Body Spacer (P/N 1104-9A589-AA)



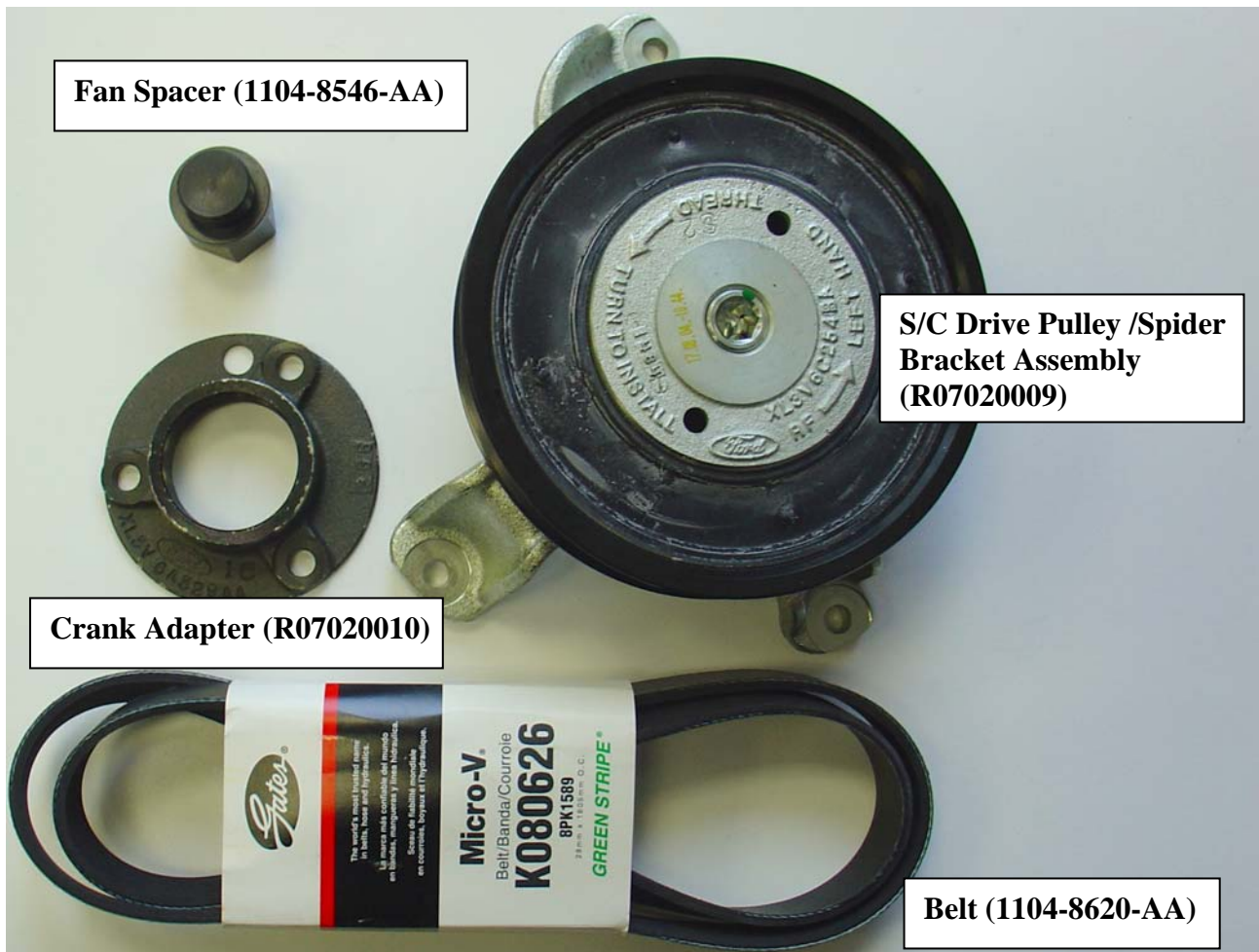
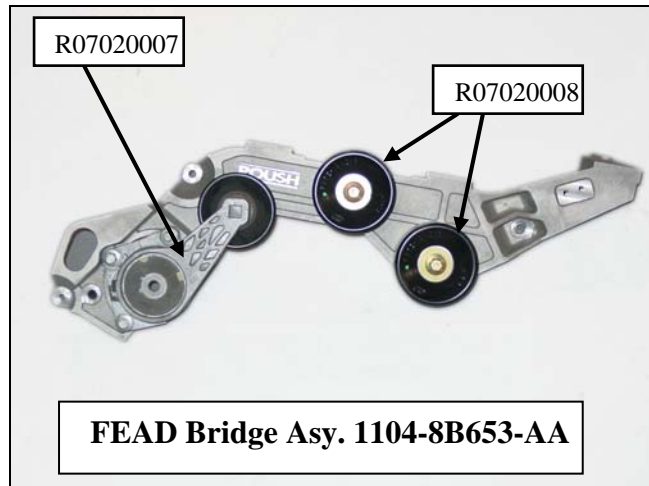
ROUSHcharger (1104-6F066-AA)

Intake to S/C (R07050008)

S/C to Spacer (R07050009)

Gaskets

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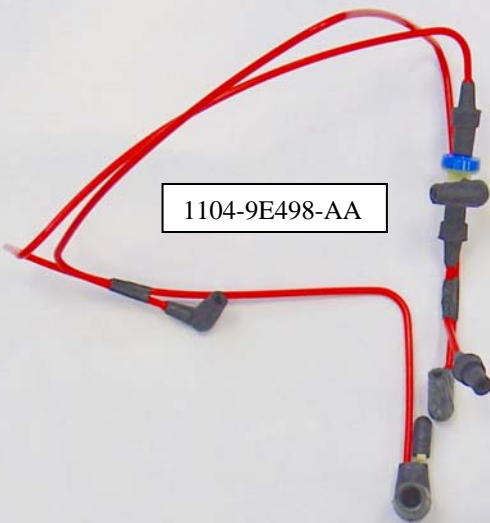
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**Hardware Kit C- FEAD
(R07020011)**



**Upper Radiator Hose
(1104-8B274-AA)**



1104-9E498-AA



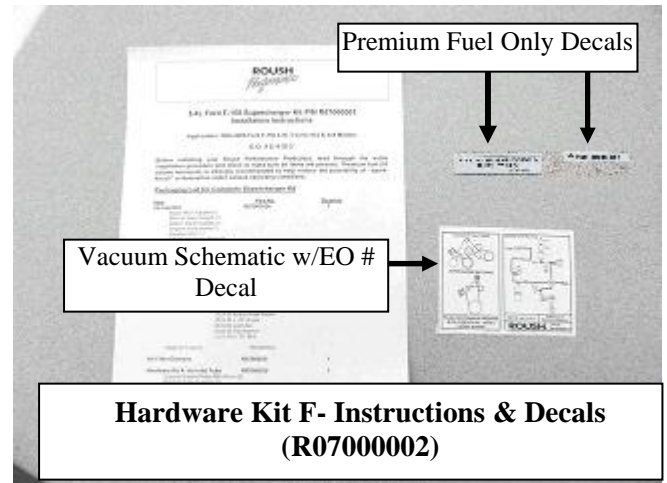
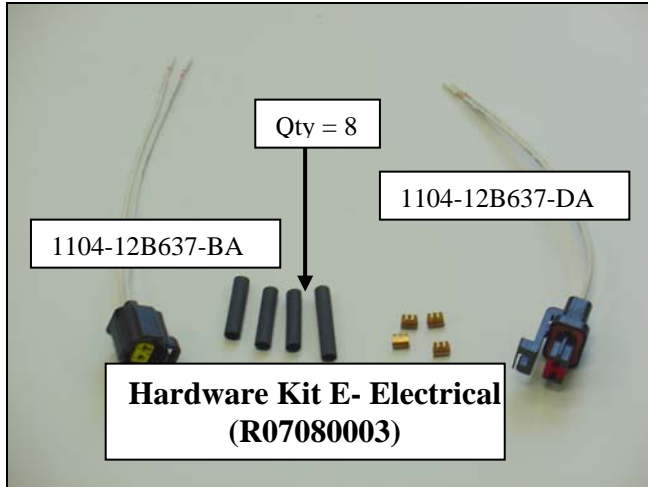
1104-2B432-AA



1104-6C324-AA

Hardware Kit D- Vacuum & Hose (R07040001)

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Equipment and Supplies Required

¼" and 3/8" Drive Ratchets with Extensions

Metric Socket Set (7mm, 8mm, 10mm, 13mm short and deep recommended)

14mm Hex Socket

½" Drive Ratchet or Breaker Bar

Metric Wrench Set

3/8" Drive Torque Wrench – 7-35 ft-lb range

Small Phillips-head Screwdriver

5/8" Fuel Line Removal Tool

T-20 Torx Bit Screwdriver or Socket

3/32" Allen Wrench

5/32" Allen Wrench

Fan Wrenches (can be found at local auto parts store)

Soldering Iron and Solder

Wire Strippers

Wire Crimpers ("W" type for OEM-style wiring connectors)

Coolant – See Owner's Guide for Specification

6" Scale, Tape Measure, or Other Measuring Device

Parts Cleaner

Assembly Lubricant (White Lithium Grease or Petroleum Jelly)

Anti-Seize (thread lubricant)



Equipment and Supplies Required- cont'd

Air Saw, Jig Saw, Dremel, Roto-Zip, or Pneumatic 3" Cut-Off Wheel (something able to cut plastic)

Palm Sander, Sand Paper, or File

Tie Straps

Trim Pad Tool (for pushpin removal)

Fender Cover (2)

Glossary of Terms

ACT –	Air Charge Temperature. On the base truck, this function is integrated into the MAF sensor. For the supercharged truck, a separate ACT sensor is used in the intake manifold.
CMCV –	Charge Motion Control Valve (also referred to as IMRC- Intake Manifold Runner control). Located on the back of the base intake manifold- not used with the ROUSHcharger. Two wires are reconfigured to operate the SCBP.
ETC –	Electronic Throttle Control.
IPS –	Injector Pressure Sensor (2004)
IPTS –	Injection Pressure and Temperature Sensor (2005)
MAF –	Mass Air Flow Sensor
PCM –	Powertrain Control Module (aka ECM, ECU, PCU, EEC).
PCV –	Positive Crankcase Ventilation
SCBP –	ROUSHcharger Control Bypass. A 3-way electronic vacuum control solenoid used to allow the PCM to control the ROUSHcharger bypass to reduce heat buildup and noise during low throttle operation.
TPS –	Throttle Position Sensor. Located on the left side of the throttle body.
VMV –	Vapor Management Valve. Located near the brake booster on driver's side dash panel.



NOTE ON ROUSHCHARGER BYPASS OPERATION

There is a great deal of misinformation about the function of ROUSHcharger bypass systems. The ROUSHcharger is a positive-displacement pump; that is, so long as it is rotating, it is always pumping air. During low demand or high vacuum operation (idles, decelerations, and light throttle cruise), the pumping action is undesirable as it creates unwanted heat and noise. The bypass circuit, when open, prevents any pressure buildup across the ROUSHcharger and allows air to circulate through the rotors, allowing the ROUSHcharger to "idle" freely during these conditions. This results in reduced noise, and by reducing heat buildup in the intake, significantly improves street and strip performance. As throttle demand increases, the bypass circuit is closed, resulting in full performance from the ROUSHcharger. The bypass circuit is never used to limit or control boost during full-throttle operation, and defeating or altering the bypass function will not result in improved performance in any condition, and will result in significantly degraded drivability.

LIMIT OF LIABILITY STATEMENT

The information contained in this publication was accurate and in effect at the time the publication was approved for printing and is subject to change without notice or liability. Roush Performance Products (RPP) reserves the right to revise the information presented herein or to discontinue the production of parts described at any time.



SAFETY REQUIREMENTS

STOP! READ IMPORTANT SAFETY CAUTIONS AND WARNINGS BEFORE PROCEEDING.

IMPORTANT SAFETY NOTICE

Appropriate disassembly, assembly methods and procedures are essential to ensure the personal safety of the individual performing the kit installation. Improper installation due to the failure to correctly follow these instructions could cause personal injury or death. Read each step of the installation manual carefully before starting the actual installation.

- Always wear safety glasses for eye protection.
- Place the ignition switch in the OFF position.
- Always apply the parking brake when working on the vehicle.
- Block the front and rear tire surfaces to prevent unexpected vehicle movement.
- Operate the engine only in well-ventilated areas to avoid exposure to carbon monoxide.
- Do not smoke or use flammable items near or around the fuel system.
- Use chemicals and cleaners only in well-ventilated areas.
- Batteries can produce explosive hydrogen gas, which can cause personal injury. Therefore do not allow flames, sparks or flammable substances to come near the battery.

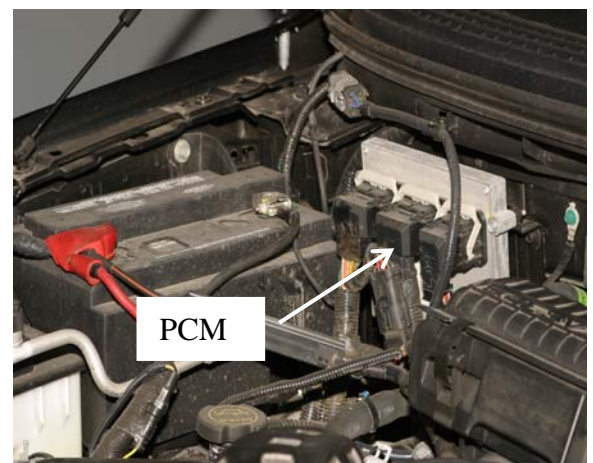


- Keep hands and any other objects away from the radiator fan blades.
- Keep yourself and your clothing away from moving parts when the engine is running.
- Do not wear loose clothing or jewelry that can be caught in rotating or moving parts.

SECTION A- Disassembly

The following section will guide you through the disassembly of the stock components on the 5.4 L 3V engine. Special care should be taken to label fasteners and parts that are taken off during this procedure since many will be used again. In order to facilitate photography, some of the following photos show the hood removed from the vehicle. Hood removal is not required in order to install the kit, but it does improve access to the rear of the engine compartment. If you do wish to remove the hood, mark the hood hinge bracket locations (with paint pen, marker, etc.) to ensure proper alignment when reinstalling, then remove the two bolts on each side holding the hood to the brackets and remove the hood (you will need an assistant for this job). If you remove the support struts from the hinge brackets, this will allow the hinges and struts to lie flat, and improves the fit of the fender liners.

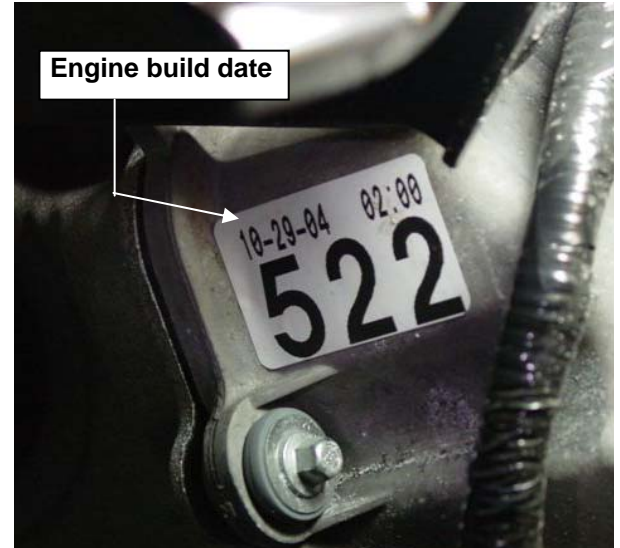
1. Disconnect the ground terminal from the battery.
2. Remove the PCM (powertrain control module) by disconnecting the three electrical connectors and four 10mm bolts.





3. Locate the Engine Build Date label on the front face of the Drivers side valve cover. Write the Engine Build Date, Vehicle Identification Number (VIN), and your phone number (in case we need to contact you for additional vehicle information) on the PCM using a permanent marker. Follow the instructions in step 4 as soon as possible to help minimize the amount of time you are without a PCM.

Important: Make sure you write your VIN number, Engine Build Date, and phone number (in case we need to contact you for additional vehicle information) on the PCM using a permanent marker.



4. INSTRUCTIONS for RETURNING PCM to ROUSH for CALIBRATION

Outlined below are the instructions for returning your stock powertrain control module (PCM) to Roush Performance Products so we can install our calibration to make the engine run properly with the new components. The prepaid, pre-addressed shipping box is set-up for next day delivery to us. Once we receive your PCM, we will reprogram and return ship it back to you the same day for next-day delivery. **Operating your engine without our calibration may result in engine damage or failure and will void all warranty.**

Note: It's important to reinstall the PCM in the vehicle it came from to prevent setting a trouble code and having to relearn the anti-theft code which can only be performed using specialized Ford Service Bay tools.

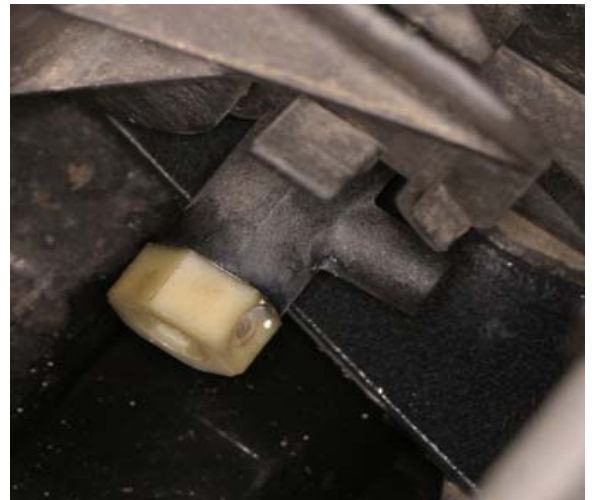
- If you haven't already done so, write your vehicle identification number (VIN), and engine build date information and phone number on the PCM using a permanent marker.
- Remove the bubble wrap from inside the supplied shipping box and wrap it around the PCM to help prevent it from being damaged during shipping.
- Place the wrapped PCM in the shipping box and follow the instructions on the box for sealing it shut.
- Fill in your name and address in the **FROM** area of the shipping label that is located inside the box.
- Peel the right label off and attach to the box where indicated.
- Retain the left side label for your records.



- Schedule a FEDEX **Package Pick-up** by calling **1-800-463-3339** and select **OPTION 0** to speak directly to an agent. DO NOT use the automated option to schedule a pick up.
- Inform the agent you have a **Prepaid FEDEX billable stamp package** and you need a pick-up.
- If there are any issues with the shipping box we supply and you want to ship the PCM to us another way, the address for the PCM Re-flash only is: **Roush Powertrain Development, Building 57 – attn: PCM Flash, 777 Republic Drive, Allen Park, MI 48101**

If you have any questions call Roush customer service at 1-800-597-6874.

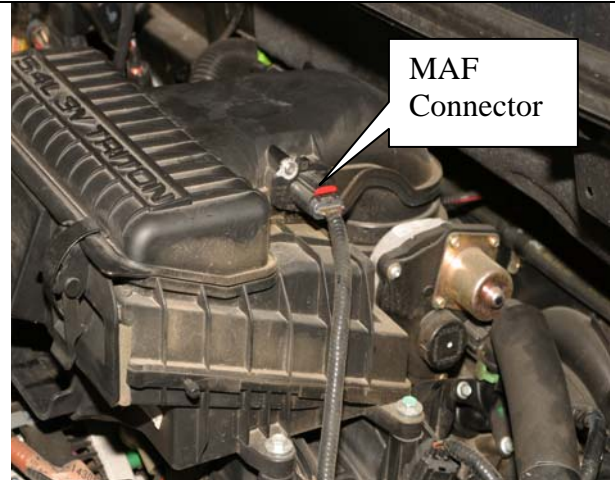
5. Open the cap on the degas bottle and drain the engine coolant using the petcock located on lower passenger side of radiator. TIP: Connect 5/8" hose to the drain fitting next to the petcock and run into a clean drain pan or bottle. Use 3/4" wrench to open petcock and allow coolant to drain out the fitting.



6. Remove the air inlet tube (one 10mm bolt, then pulls free from the air box and fender).

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7. Remove the mass-air flow connector (MAF) (pull the red locking tab back, then press the black release tab to disengage the lock) from the driver's side of the air box. Remove the PCV breather hose from the passenger side cam cover and air box, and unclip the battery cable from the air box. Remove the four 10mm bolts and remove the air box.



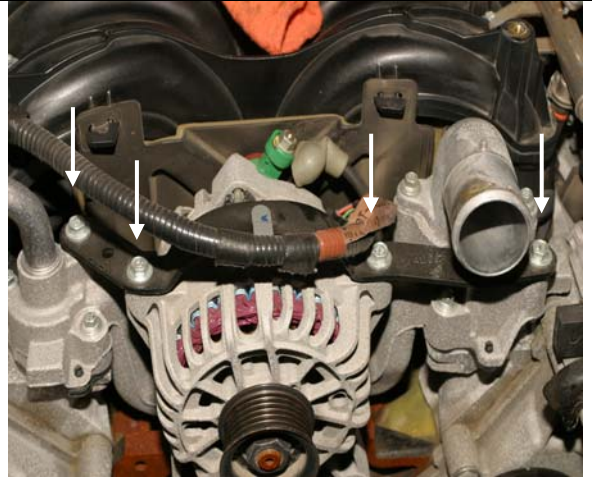
8. Remove the air tube support bracket (two 13mm nuts).



9. Remove the radiator cover (7 pushpins – unscrew and completely remove the Phillips-head center of the pushpin to disengage).
10. Remove the upper radiator hose (2 hose clamps). Remove the upper radiator hose support bracket (13mm nut).
11. Remove the two 8mm bolts holding the fan shroud to the radiator. Remove the wiring clip from the passenger side of the fan shroud. Using the fan removal tool, disconnect the fan from the water pump. Remove the fan and shroud from the vehicle.
12. Release the Accessory Drive Belt by rotating it clockwise with a ½" breaker bar or ratchet and slip belt off of the alternator pulley.

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13. Remove the battery cable from the alternator (10mm nut). Remove the upper four 10mm support bracket bolts, and loosen the lower two 10mm alternator bolts, to remove the alternator. Disconnect the regulator connector from the alternator, and fold the battery cable and support bracket back and out of the way.



14. Remove the heater hose from the water crossover.

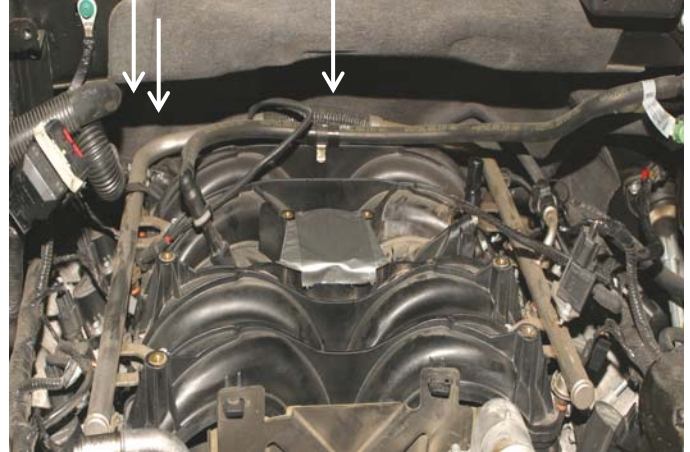


15. Remove the TPS harness from the passenger side of the throttle body. Remove the four 10mm bolts and remove the throttle body. Disconnect the ETC harness from the driver's side of the throttle body (this is MUCH easier once the throttle is unbolted from the intake). Remove the light blue o-ring gasket from the intake manifold; wipe it dry. As soon as possible (to prevent swelling), install the o-ring gasket into the new throttle spacer (1104-9A589-AA) and set aside. Cover the throttle opening to prevent anything falling in the manifold.



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16. Disconnect the heated PCV tube connector. Remove the PCV hose between the driver's side cam cover and intake manifold. Disconnect the VMV hose and clip from the intake manifold; fold back out of the way.

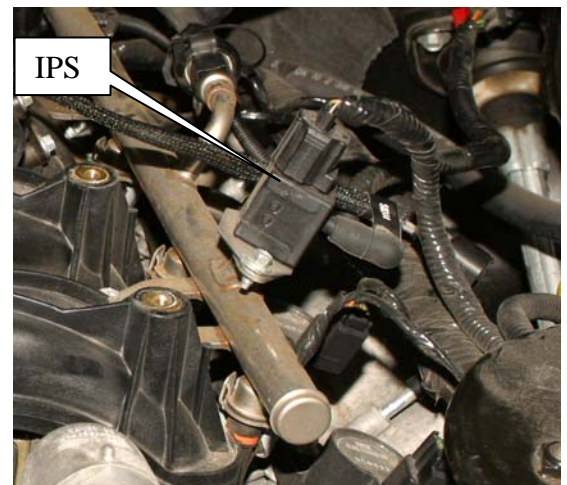


17. At this point, double-check to ensure that the ground cable is disconnected from the battery and that any possible sources of ignition are eliminated. Place rags under the fuel line connection at the fuel rail. Remove the black safety clip from the fuel line connection. Using 5/8" fuel line tool (wrap additional rags around the tool), disconnect the fuel line from the fuel rail. There will be some release of pressurized fuel, so be careful and proceed slowly. Clean up all released fuel prior to proceeding with next steps.

Push Tool to Release Fuel Line.
Rags not shown for clarity.



18. Disconnect the wiring connectors from the fuel injectors (8) and IPS/IPTS sensor (located on fuel rail). Remove the vacuum line from the IPS/IPTS sensor. (2004 shown)



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19. If the ground strap is wrapped around the fuel rail, unbolt it from the dash panel, unwrap it from the rail, and reconnect to the dash panel.
20. Remove the four 8mm bolts holding the fuel rail to the intake manifold. Remove the fuel rail assembly with injectors. There may be some additional fuel leakage around the injectors; clean up with rags prior to proceeding. Drain the fuel rail of all remaining fuel.
21. (2004 ONLY) On 4x4 models, disconnect vacuum line located above passenger side cam cover.



22. Remove the ten 10mm bolts holding the intake manifold to the cylinder heads. Lift the intake manifold slightly but do not remove.
23. Remove the coolant bridge (water crossover) (three 8mm bolts).

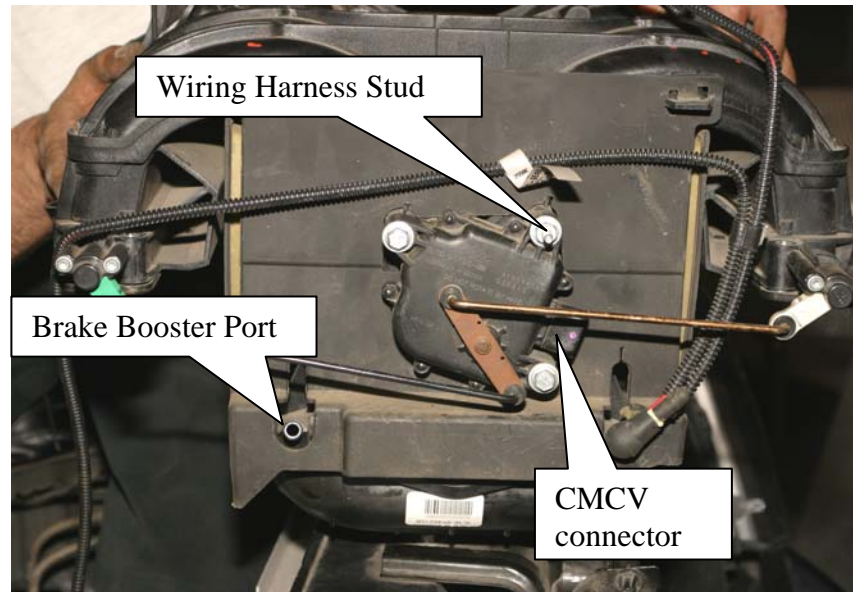
24. In order to gain access to the rear of the intake manifold, move it up and forward as far as possible (as shown). There is a brake booster hose attached to the driver's side bottom of the intake manifold; this should disengage as you pull the manifold forward.



25. Cover the cylinder head intake ports to prevent anything from falling in during the disassembly.

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26. Reach behind the intake manifold and remove the 10mm nut holding the wiring harness to the back of the intake. Disconnect the CMCV wiring connector. Check other wiring connectors behind the manifold; you may need to disconnect the knock sensor and/or CHT sensor connectors to allow the manifold to pull free. If so, reconnect these connectors after removing the intake manifold. Image at right shows the rear of the intake manifold after removal.



27. Remove the intake manifold. Remove the wiring harness stud from the intake manifold (upper right location on the CMCV) and vacuum harness and set aside for use during build-up of the new intake manifold.
28. Remove the brake booster hose from the steel line between the back of the head and dash panel. Install the new brake booster hose (1104-2B432-AA) to the steel line using the clamp provided in Hardware Kit D. Route the hose under the wiring harness, then over the passenger side cam cover. This will attach to the intake manifold later.



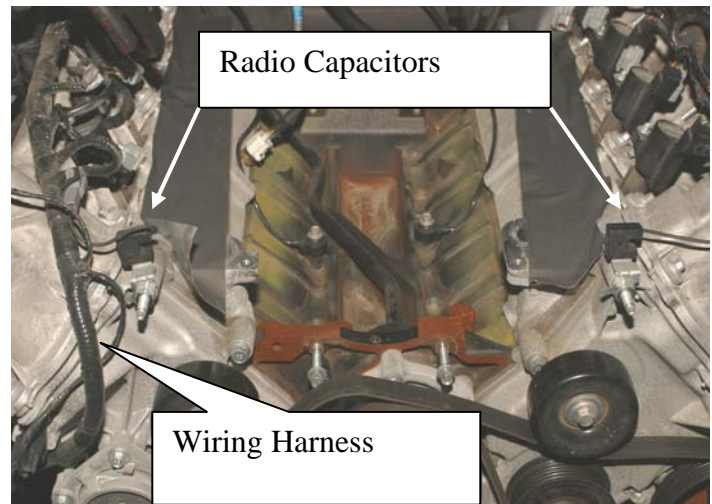
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29. Using a 13mm socket, remove the two bolts holding the power steering reservoir support bracket (bolts are located on the underside of the bracket).



30. Remove the wiring harness support clip from the front cover (located above the tensioner). This clip is extremely difficult to remove; if necessary, cut the clip from the harness and use pliers to remove the remaining clip from the front cover. Then use a nylon tie strap instead of the clip to retain the harness at the completion of the build.

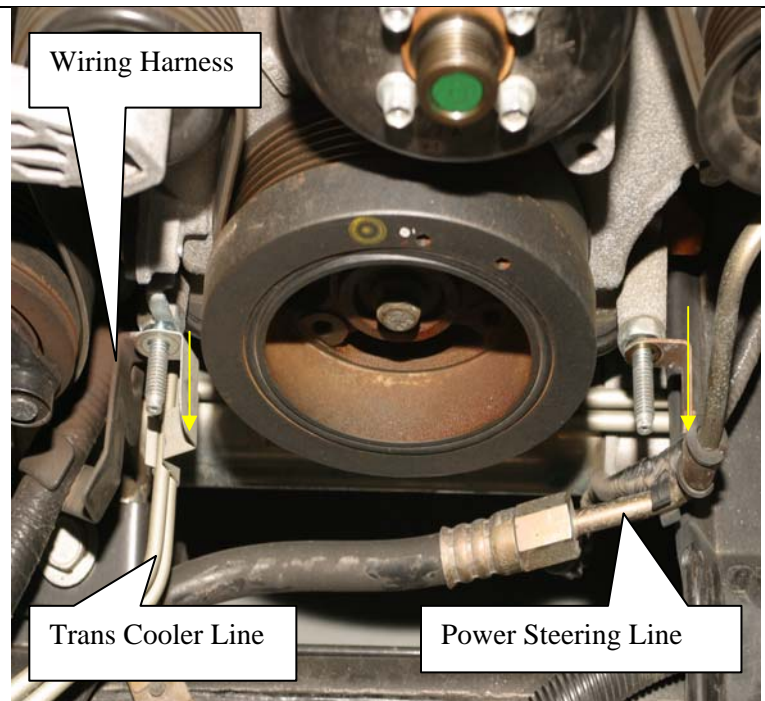
31. Remove the two 15mm nuts attaching the radio capacitors to the front cover. Fold the radio capacitor wires back and out of the way.



32. Disengage the two wiring harness clips from the studs on the passenger side cam cover. Leave harness in same position.

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33. Remove the two nuts on bottom right and left studs of the engine front cover. Slide transmission cooler line bracket and wiring harness off of the passenger side stud and out of the way. Pull the power steering line off of the driver's side stud.



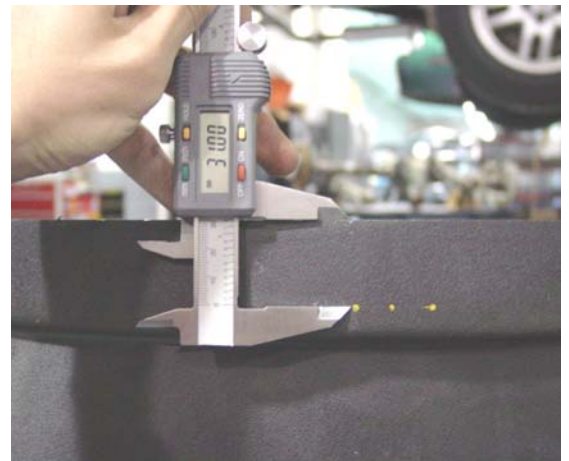
34. Proceed to Section B- Modifications

SECTION B- Modifications

The following section will guide you through the required modifications of existing components, and the build-up of some of the assemblies used to complete the installation. Except for the wiring modifications, all of this work can be performed away from the vehicle. This work can be completed by one person.

1. Fan Shroud Modification

- A. In order to accommodate the ROUSHcharger drive belt and pulleys, the fan is shifted forward 31mm (1-7/32"). To maintain proper fan flow performance, the fan shroud needs to be trimmed accordingly, as shown:
- B. Lay the fan shroud on a level surface with the radiator end down. Measure 31mm (1 7/32") from the top surface and mark all the way around the shroud.



- C. Using a 3" cutoff wheel, air saw, or other cutting tool, cut through the plastic shroud along the line you just marked. Keep the tool moving slowly through the plastic to prevent binding up.
- D. After cutting all the way around the shroud, you may need to tap or pry off the cutoff area to remove it. Lightly sand rough edges with an electric palm sander or file for a smooth, flat finish.



2. Vacuum Harness Modifications

A. 2004 4WD MODELS ONLY:

1. The 4WD vacuum line must be moved from the intake manifold (which is located after the ROUSHcharger) to the throttle spacer.
2. Pull the 4WD vacuum line out of the large rubber vacuum connector on the original intake manifold vacuum harness.
3. Remove a straight fitting and vacuum cap from the large rubber vacuum connector on the new vacuum harness provided in hardware kit D (1104-9E498-AA). Install the 4WD vacuum line into the harness (in place of the straight fitting you just pulled out).

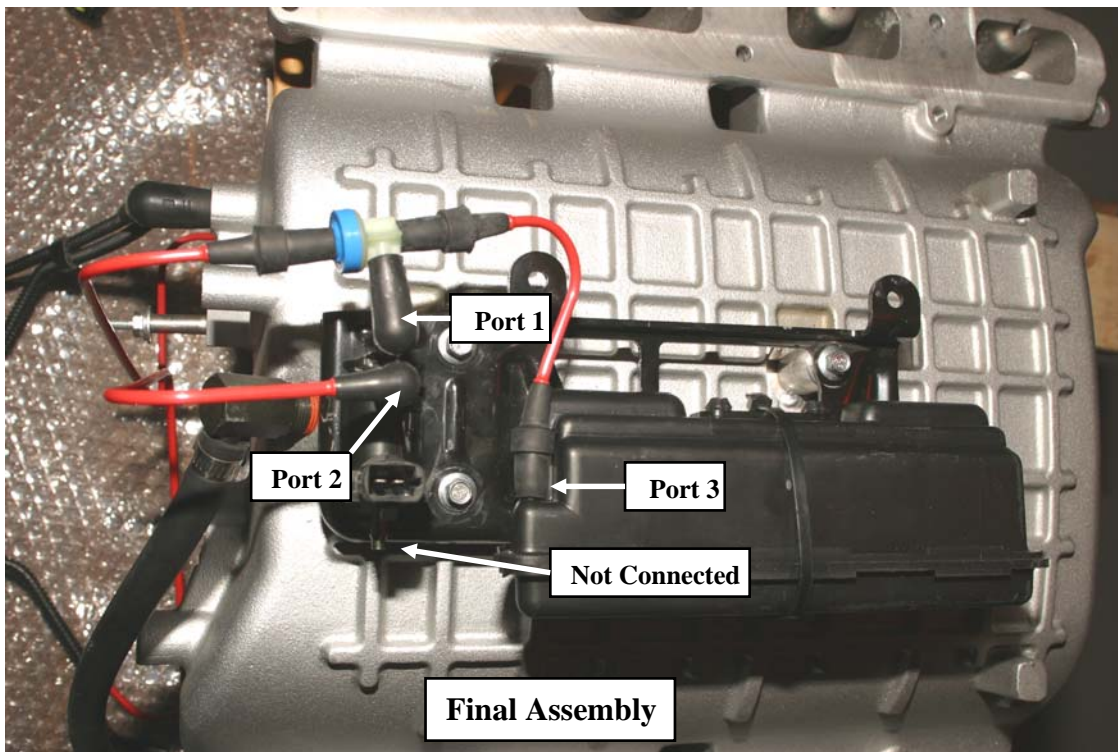
B. 2005 MODELS ONLY:

1. Remove the engine compartment vacuum line connecting the steel tube to the IPTS (mounted on the fuel rail).
2. Install the vacuum cap from Hardware Kit H onto the steel tube.

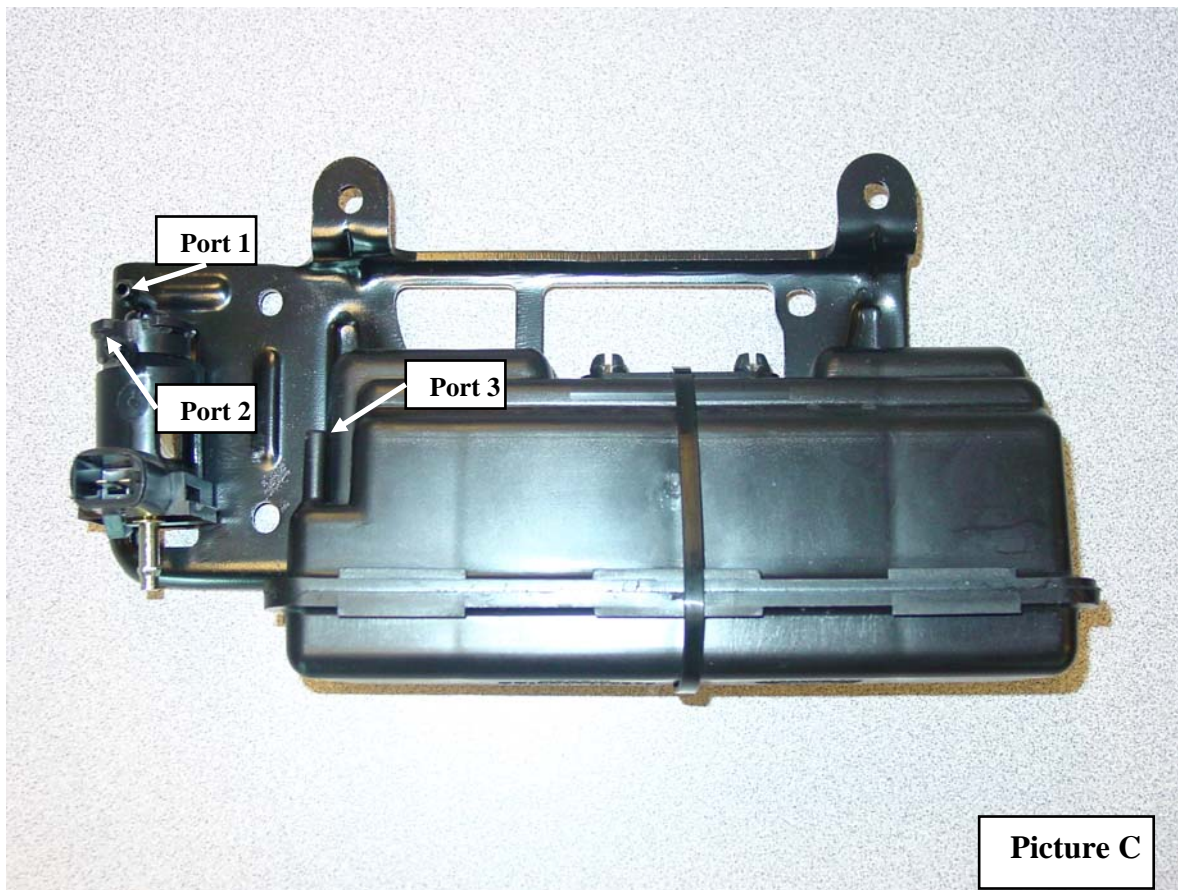
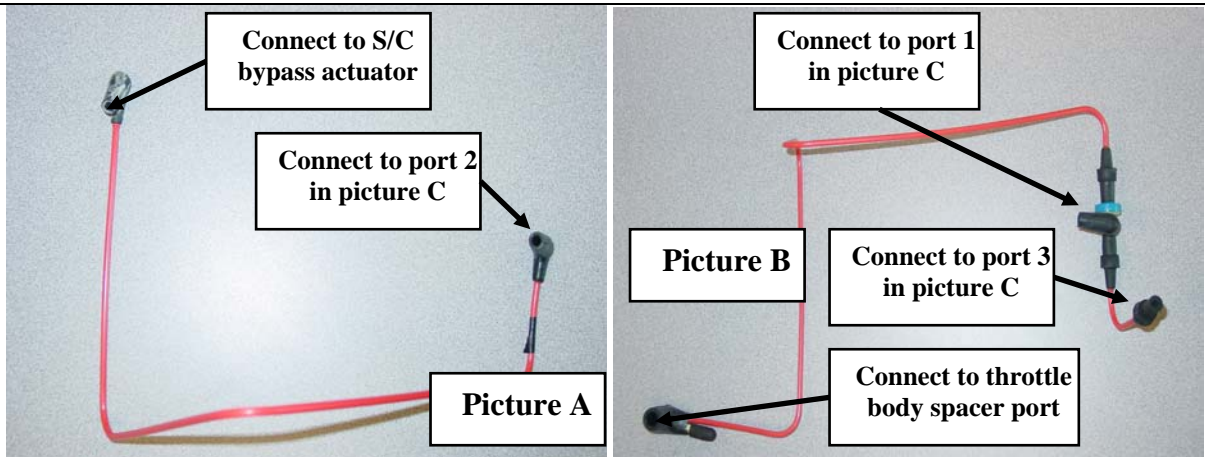


3. Intake Manifold Build-Up

- A. Remove intake manifold assembly (1104-9424-AA) from packaging and place upside-down on workbench. Take care not to damage the ACT sensor on the top of the manifold, if already installed.
- B. Remove tape from provided vacuum harness (1104-9E498-AA) to separate the two lines.
- C. Install boost bypass solenoid and control bracket (R07050011) onto underside of intake manifold using the three M6x18mm supplied bolts. Install new main vacuum harness (1104-9E498-AA) as shown in pictures A, B, and C below. Complete installation should look like first large picture below.



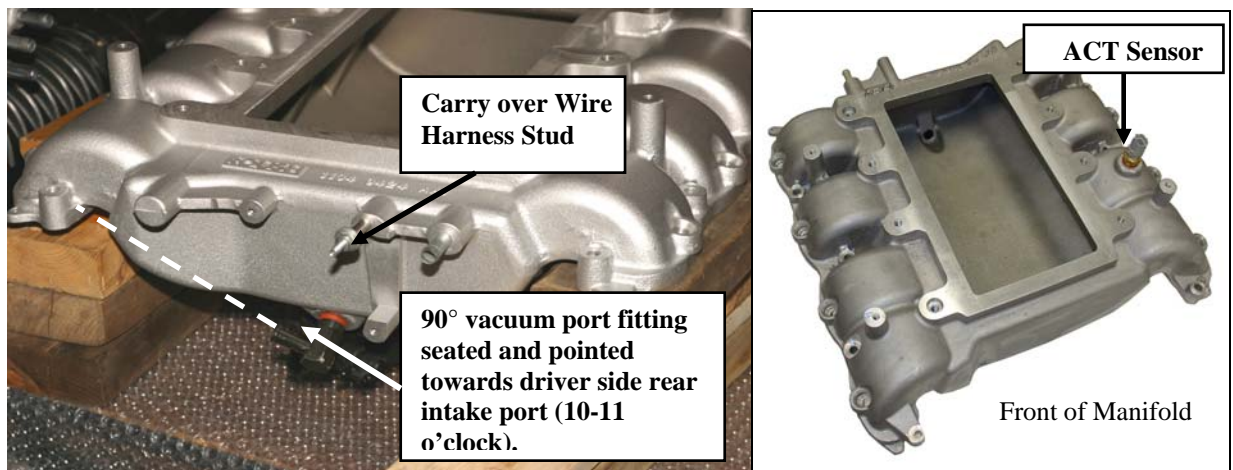
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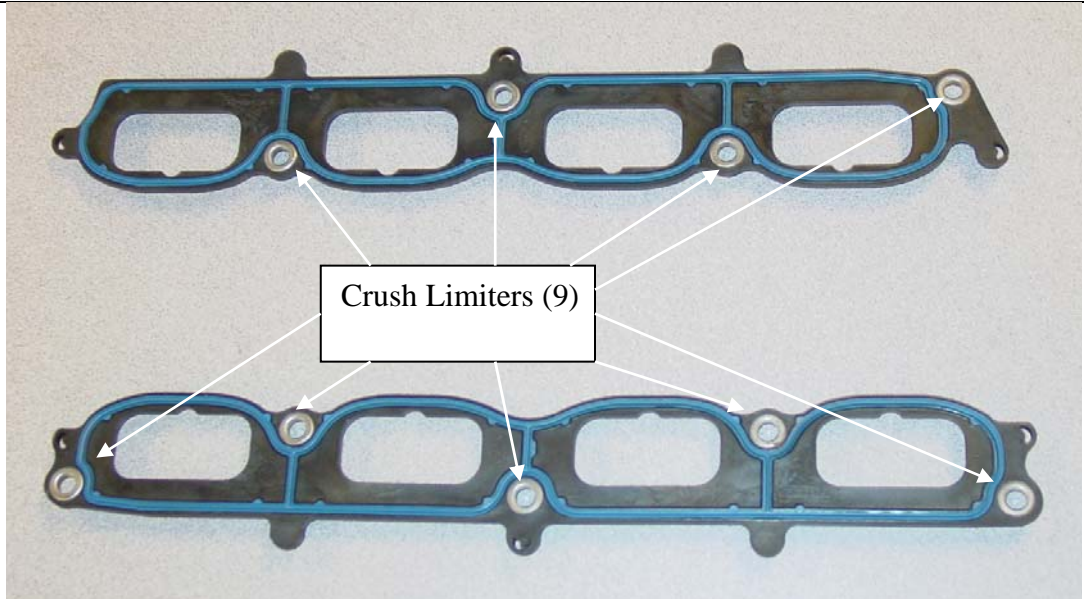
- D. Install the vacuum harness from Hardware Kit H on to the large fitting on the back of the intake. The first, uncapped, vacuum line in this harness will be used for the IPTS on the fuel rail. The second vacuum line (which is capped) can be used to provide a signal for a boost gauge if desired, or just leave capped.

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- E. Flip manifold right-side up. Using wooden blocks as shown will make the rest of the installation easier. If the ACT sensor (R07090044) is not already installed in the manifold, locate the bag containing the sensor from inside the intake manifold box and carefully thread it in the top front driver-side of intake manifold as shown below. Carefully, torque sensor to 18-26 ft-lbs. (24-35 N-M).
- F. Likewise, if the 90° vacuum port fitting is not already installed in the rear hole of the lower valley, locate the fitting in the small bag from the intake manifold box and apply a small amount of pipe thread sealant (PTFE) to the threads. Install in the fitting into the hole centered in the bottom rear of the manifold valley and rotate it so that it is tightened (seated) in the 10 - 11 o'clock position as shown in the picture below.



- G. Install wiring harness stud (from takeoff intake) into hole on rear of manifold. Connect the PCV line (1104-6C324-AA) to the bubbler fitting on the bottom of the intake.
- H. Insert the (9) metal crush limiters (spacers) from Hardware Kit B into the take-off intake manifold to cylinder head gaskets as shown.



- I. Push the intake to head gaskets onto the intake manifold, using the pins for alignment and retention.

4. **ROUSHcharger Assembly Buildup**

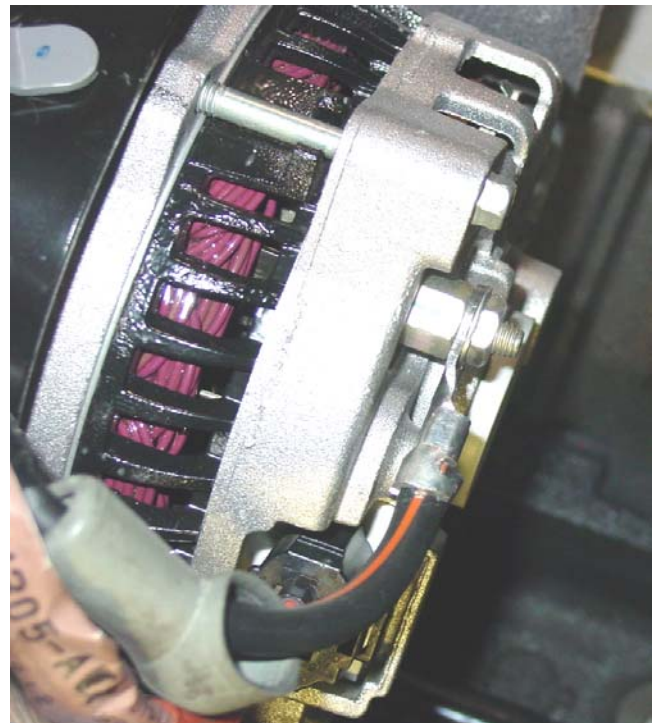
- A. Place gasket (R07050009) on ROUSHcharger (1104-6F066-AA) and bolt throttle body spacer (1104-9A589-AA) onto ROUSHcharger using the four M6x32mm spacer to ROUSHcharger bolts from Hardware Kit B (R07050010). Torque bolts to 7.5 ft-lb (10 N-m).
- B. Install throttle body onto the spacer using the carry over gasket (blue o-ring) and fasteners. Torque bolts to 7.5 ft-lb (10 N-m).
- C. Install heated PCV fitting into the driver's side of the throttle spacer using the takeoff 7mm bolts.





5. Alternator Modification

In order to clear the front casing of the ROUSHcharger, the green plastic adapter must be removed to allow the alternator wire to connect directly as shown (second photo is as installed in vehicle). Simply remove the nut holding the green connector to the alternator and remove the connector. Retain the nut as it will be used later to install the battery cable as shown.

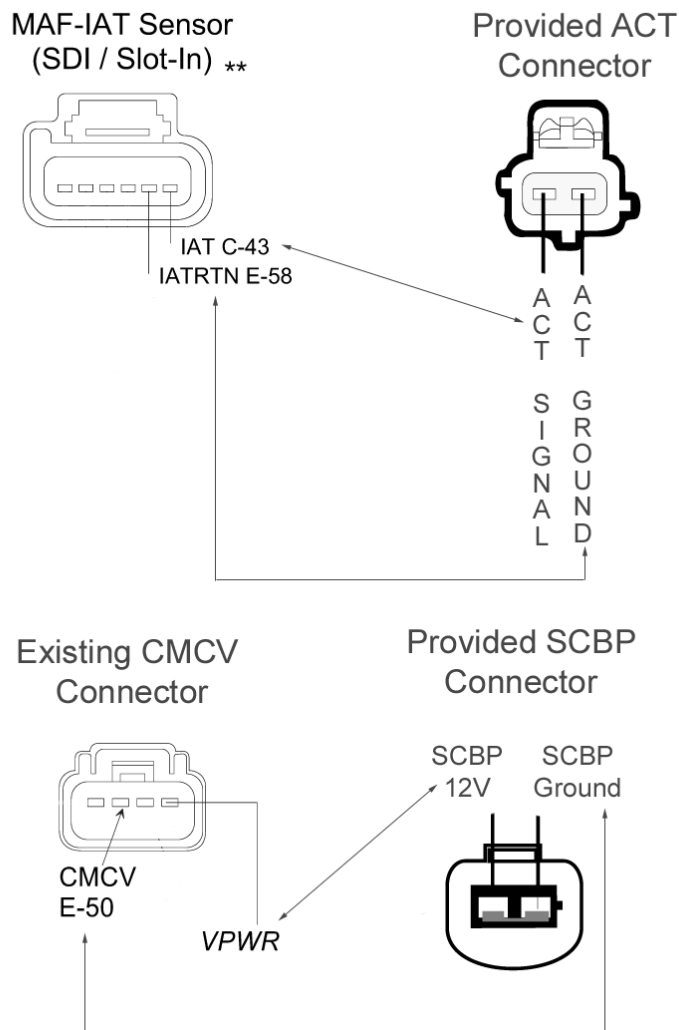




6. Wiring Harness Modification

In order to properly control the ROUSHcharger system, two circuits in the vehicle need to be modified. If these instructions are followed correctly, it will be relatively simple to restore the vehicle to its original wiring if the ROUSHcharger kit is removed in the future. Refer to the following connectors.

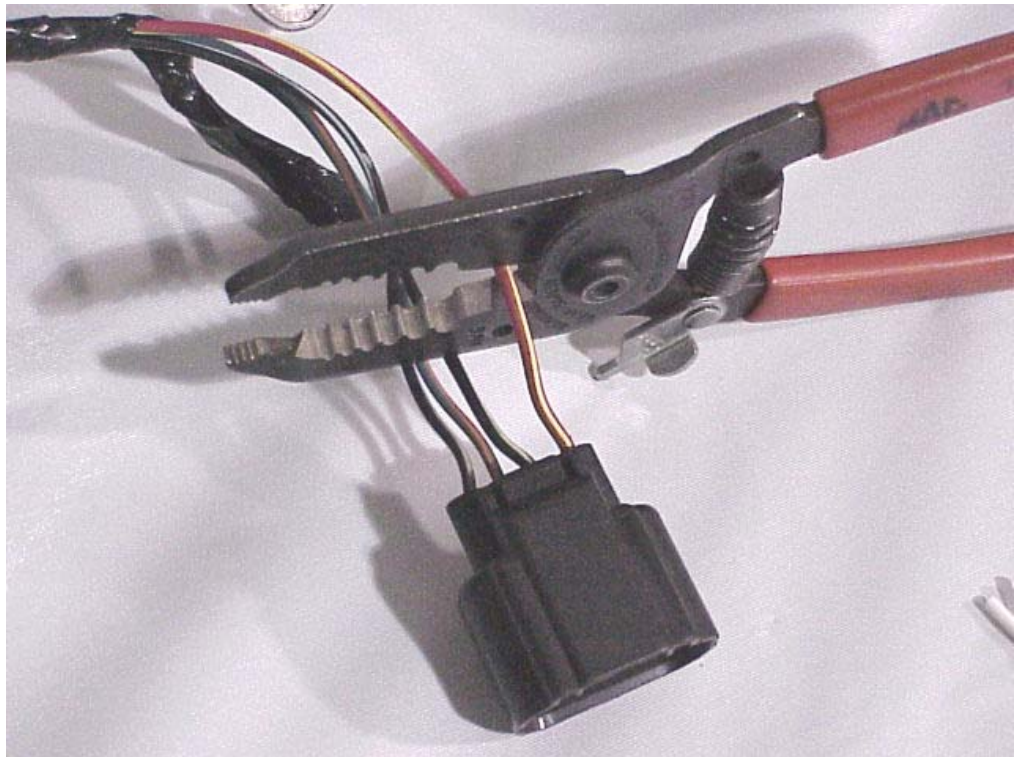
Note: Images are shown looking into the connector on the wiring harness.





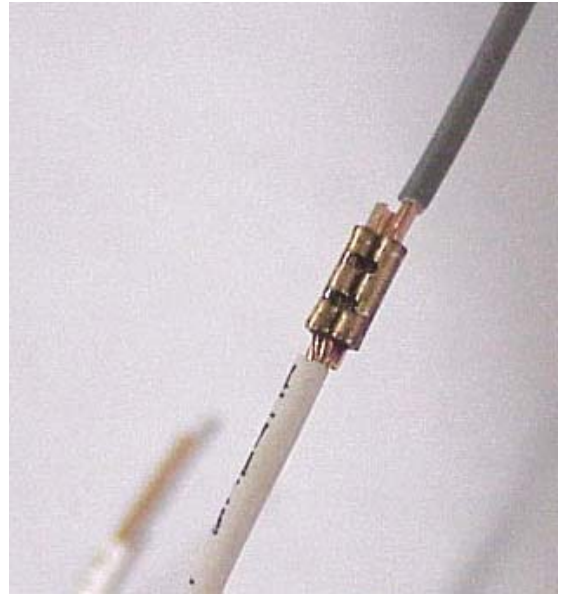
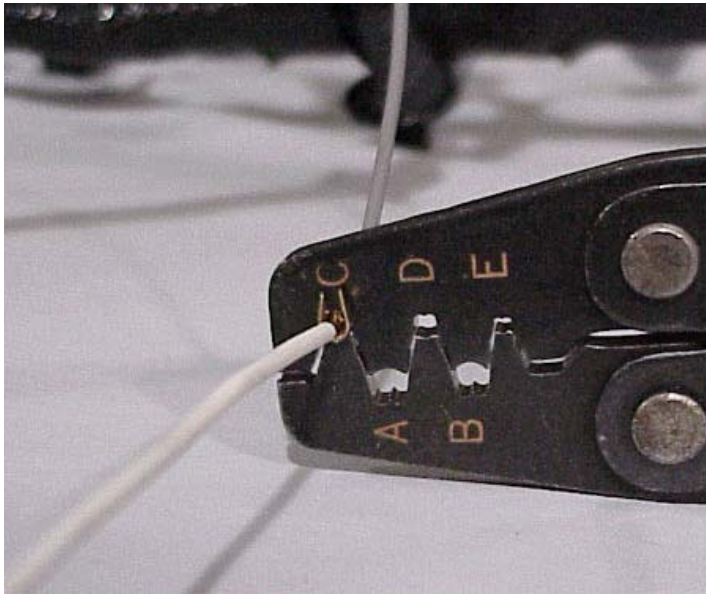
I. ROUSHcharger Bypass Solenoid (SCBP)

- a. Using a razor blade or other sharp knife, carefully cut the black wire wrap insulation from the hard plastic convolute and remove it from the wires leading into the 4-pin CMCV connector.
- b. Approximately 1 inch from the connector, cut the red wire with yellow tracer **VPWR** shown, and blue wire with orange tracer **CMCV** in drawing above. Pull the wires from the convolute, back to the where the convolute tees into the main harness, and temporarily mark the free end with tape.

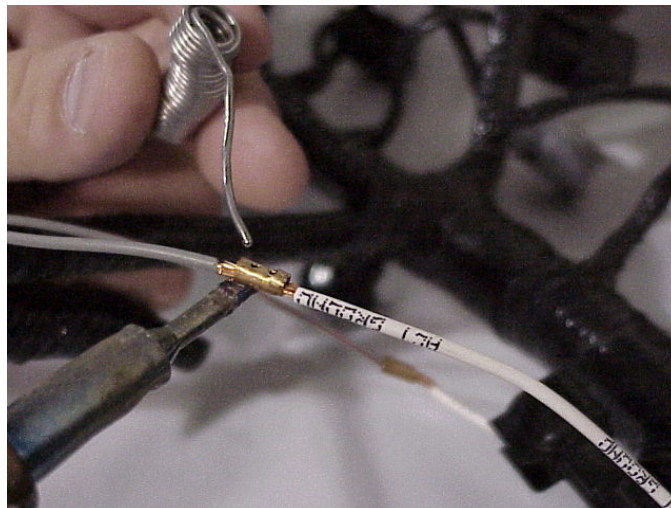


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- c. Strip approximately ¼" of insulation from the harness ends of both wires.
- d. Lay the stripped end of wire **VPWR** into one end of a provided splice connector, and crimp using a W-type crimp tool. Slide a short length of heat shrink tubing over the wire. Lay the **SCBP 12V** wire from the ROUSHcharger bypass connector into the other end of the splice connector, and crimp.

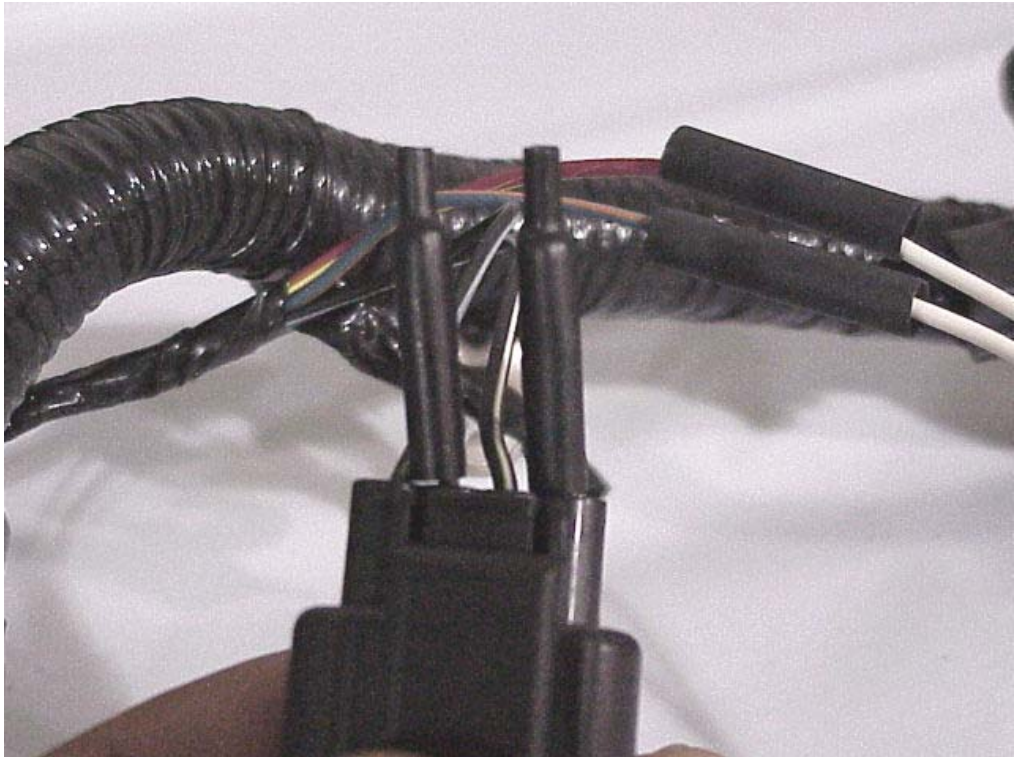


- e. Repeat steps e and f to attach engine harness wire **CMCV** to jumper harness **SCBP GROUND**.
- f. Using a hot clean soldering iron, heat the wires attached to the splice connector until they are hot enough to melt solder touched to them. Using the solder sparingly, solder all wires into the splice connectors.



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- g. Slide the heat shrink tubing over the splice connections, and heat gently with a heat gun or heat source to seal.
- h. Wrap the full length of the exposed SCBP wiring with electrical tape or wire harness wrap.
- i. In order to seal the wire ends left attached to the CMCV connector, fold the wire back over itself approximately ¼". Slide a short length of heat shrink tube over this doubled-up wire, and gently heat with a lighter or heat gun until it has shrunk noticeably and is tight over the wire. Repeat for both wires.



- j. Push the wires back into the convolute, and rewrap the CMCV harness with electrical tape or harness wrap. Since the CMCV connector will not be reconnected, wrap electrical tape around the exposed end of the connector and use a tie-strap to secure the loose end to the main wiring harness. This will ensure the connector is not damaged and can be reused if the vehicle is later restored to original condition.



II. MAF / ACT Sensor

- a. Using a razor blade or other sharp knife, carefully cut the black wire wrap insulation from the hard plastic convolute and remove it from the wires leading into the 6-pin MAF connector.
- b. Approximately 2 inches from the connector, cut the gray wire labeled IAT and the gray wire with red tracer labeled IATR TN in the drawing above. Pull the wire from the convolute back to the where the convolute tees into the main harness, and temporarily mark the free end with tape.
- c. Follow the above procedure to crimp and solder the IAT to **ACT SIGNAL**, and IATR TN to **ACT GROUND**, and seal with heat shrink tape.
- d. Wrap the full length of the exposed ACT wiring with electrical tape or wire harness wrap.
- e. Seal the wire ends left attached to the MAF connector as described in **(i)**. above.
- f. Push the wires back into the convolute, and rewrap the MAF harness with electrical tape or harness wrap.



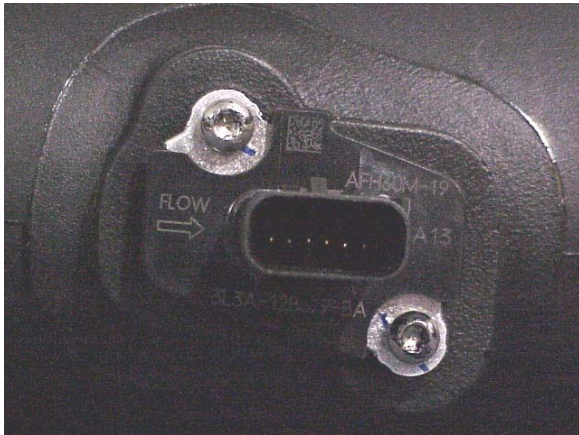
7. Induction System Buildup

- A. Assemble the sheet metal air dam with the six 6-32 screws, star washers and nuts provided in the hardware pack within the Air Inlet Kit (R07060024). Mount the black plastic adapter to the assembled air dams as shown in the picture below using the three ¼-20 button head screws and flat-washers provided in the same hardware pack. Install edge molding as shown in picture below (note smaller piece from hardware pack used on semi-circular cut out area).



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- B. Mount the factory mass air flow sensor onto the Roush intake tube (R07060023) using the two 8/32" button head screws provided in the hardware pack. Assure the MAF sensor is tight against the air tube however, don't over tighten the screws. Install the 3.5" diameter x 3" long straight T-body connector hose and (1) #56 clamp from the hardware pack contained in the Air Inlet Kit (R07060024) onto the small end of the air inlet tube as shown in the picture below. Carefully tighten clamp to avoid damaging clamp or hose.



- C. Insert the 25mm O.D. rubber grommet (has squared-off edges) into the side of the intake tube. Insert the billet barb fitting into the grommet. Loosely install second hose as shown in the picture below. All parts are from the hardware pack contained in the Air Inlet Kit (R07060024).

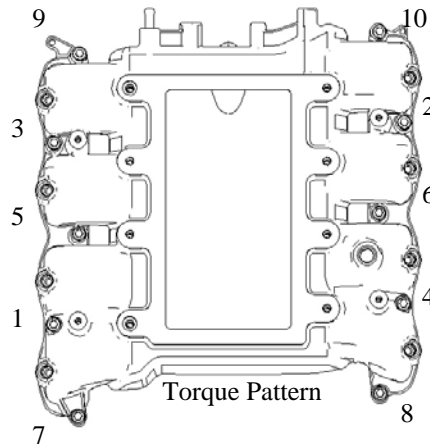




SECTION C- Installation

The following section will guide you through the final installation of the kit into the vehicle. If you need to stop during the installation, make sure to always cover any open ports in the cylinder heads or intake manifold to prevent foreign material getting into your engine.

1. Remove the tape from the cylinder heads. Carefully clean the cylinder head to intake and water bridge mating surfaces.
2. Confirm that intake manifold gaskets are in place on the intake. Place intake manifold (with gaskets) down onto the cylinder heads. During this process bolt engine harness to carry over stud (3), and connect the ROUSHcharger control solenoid (this can be accessed from the front by reaching under the manifold).
3. Once the intake is positioned on the cylinder heads, install the water bridge and (10) M6 x 45mm bolts from Hardware Kit B. Torque intake and crossover tube bolts to 7.5 ft-lb (10 N-m) according to the torque diagram.



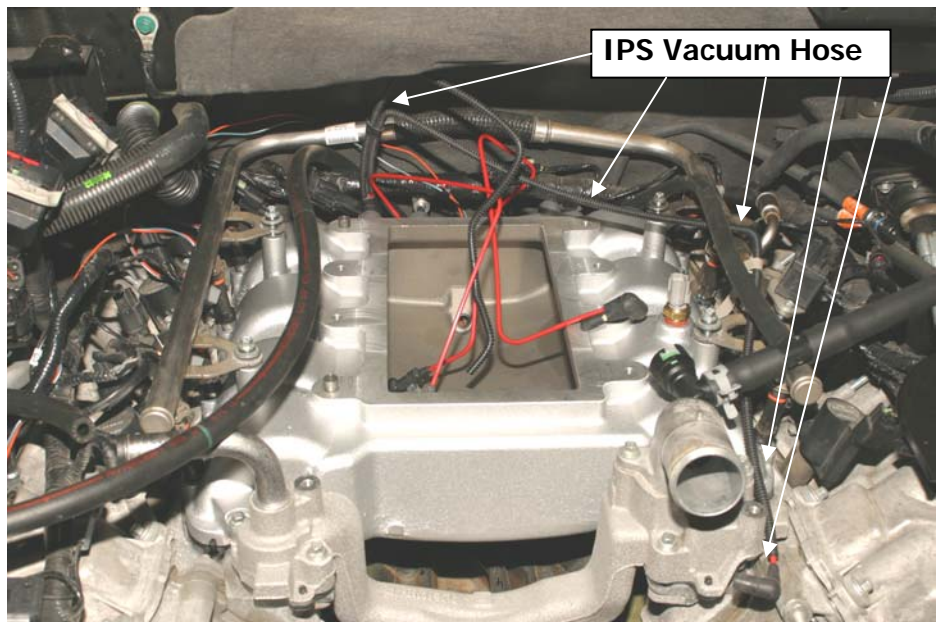
4. Install the two provided dowels from Hardware Kit B into the intake. Tap lightly using a brass hammer or equivalent, if required to seat fully.



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5. To install fuel rail, first carefully wipe injector o-rings and coat with assembly lube. Install the fuel rail on the new intake manifold using the carry over bolts. The brake booster line should be routed under the fuel rail and wiring harness on the passenger side. The PCV hose should be routed under the wiring harness and fuel rail on the driver's side. The vacuum harnesses should route under the fuel crossover tube in front of the wiring harness. Ensure all injectors are properly seated, that injector clips (located at the top of the injector) are all still in place, and that injector wiring connectors are not trapped under the rail. Torque to 7.5 ft-lb (10 N-m).

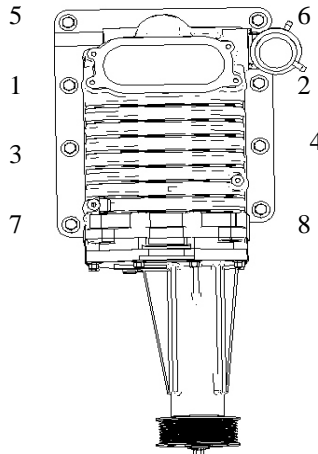
6. Connect the fuel injector wiring connectors. Connect the fuel line, IPS/IPTS vacuum, and IPS/IPTS wiring connectors to the fuel rail. Reinstall the fuel line safety clip. The clip should install easily; if any force is required, remove and check the fuel line to ensure the spring is still properly seated in the fitting.



7. Lay the ROUSHcharger gasket (R07050008) onto the intake manifold, over the dowels. Check to make sure the VMV line is routed around the back of the engine and will not interfere with installation of the ROUSHcharger. Move all vacuum lines, wiring, etc. to ensure that they do not interfere with installation of the ROUSHcharger.



8. Install the ROUSHcharger assembly (1104-6F066-AA) onto the intake manifold, being careful to line up the holes and lower straight down over the dowels. Use the (8) M8x48mm bolts from Hardware Kit B, install and torque to 18 ft-lb (24 N-m) according to the torque sequence shown.

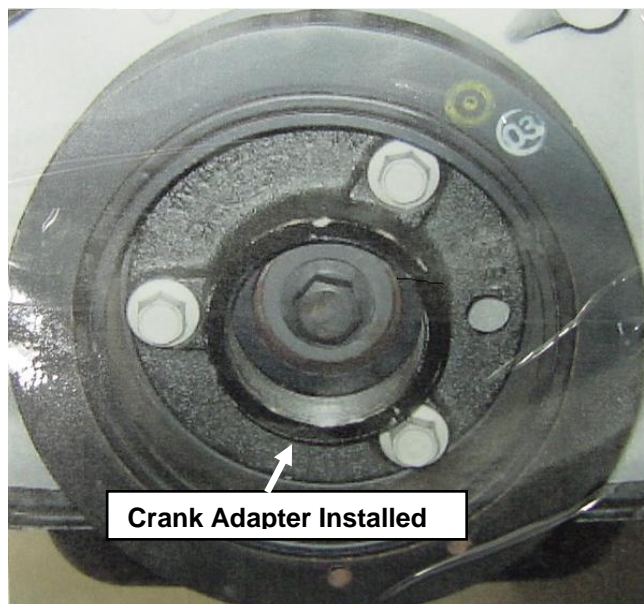


9. Connect the alternator wiring harness directly to alternator terminal.

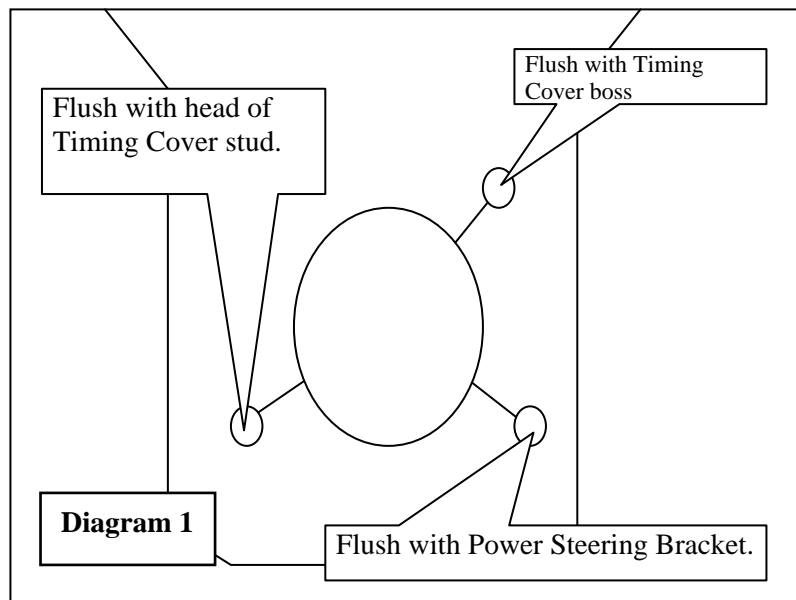
10. Install the alternator using the carry over fasteners & brackets, and torque the M6 bolts to 8.5 ft-lb (11.5 N-m) and 18 ft-lb (24 N-m) for the M8 bolts.

11. Using a ½" breaker bar or ratchet, rotate the tensioner clockwise and reinstall the 1st sheave serpentine belt. Refer to the Emissions and Vacuum Decal included in Hardware Kit F for belt routing information.

12. Install the crank adapter (R07020010) using the (3) M10x23mm bolts provided in Hardware Kit C. Torque bolts to 35 ft-lb (47 N-m). Adding anti-seize to the inner threads of the crank adapter will allow for easier installation and removal of the ROUSHcharger drive pulley.



13. Install the Drive Pulley and Spider Bracket Assembly (R07020009). The pulley will need to be spun counter-clockwise into the crank adapter. The Spider Bracket should be flush with the front cover bosses and bracket faces (see Diagram 1). On the lower passenger side stud, place the 10mm washer from Hardware Kit C against the Spider Bracket, followed by the Wire Harness Bracket and then the Transmission Cooler Line Bracket and the original nut. On the lower driver side stud, reinstall the Power Steering Line Bracket, then the original nut. In the upper driver side location, install the M10x36mm bolt from Hardware Kit C. Torque bolt and nuts to 35 ft-lb (47 N-m). Torque the center pulley bolt with 14mm hex socket to 74 ft-lb (100 N*m).



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14. Using the two carry over nuts for the radio capacitors and the M8x75mm bolt with 8mm washer from Hardware Kit C, install the front FEAD bridge assembly (1104-8B653-AA) onto the studs where the radio capacitors were originally located. Install passenger side radio capacitor onto stud but leave driver side off. Torque bolt and nuts to 18 ft-lb (24 N-m).



15. Remount the steering fluid reservoir bracket using the two M6x28mm bolts supplied in Hardware Kit C and torque to 8.5 ft-lb (11.5 N-m). Locate the second radio capacitor under the front bolt as shown in picture.



16. Install the new belt (1104-8620-AA) without applying the tensioner (leave loose). The tensioner may have to be moved in order to slip belt behind the tensioner pulley.

17. Apply anti-seize to inside threads on the supplied fan adapter (1104-8546-AA) and fan. Tighten the fan to the fan adapter.

18. Install the fan and the fan shroud at the same time. Using the fan wrenches, tighten fan with fan adapter to the water pump (normal thread). This may require more than one person.

19. Using a ½" breaker bar in the second tensioner, complete the installation of the second serpentine belt (1104-8620-AA).

20. Install the supplied upper radiator hose (1104-8B274-AA) with larger clamps (40-60mm) supplied in Hardware Kit D, to provide clearance with the ROUSHcharger pulley.

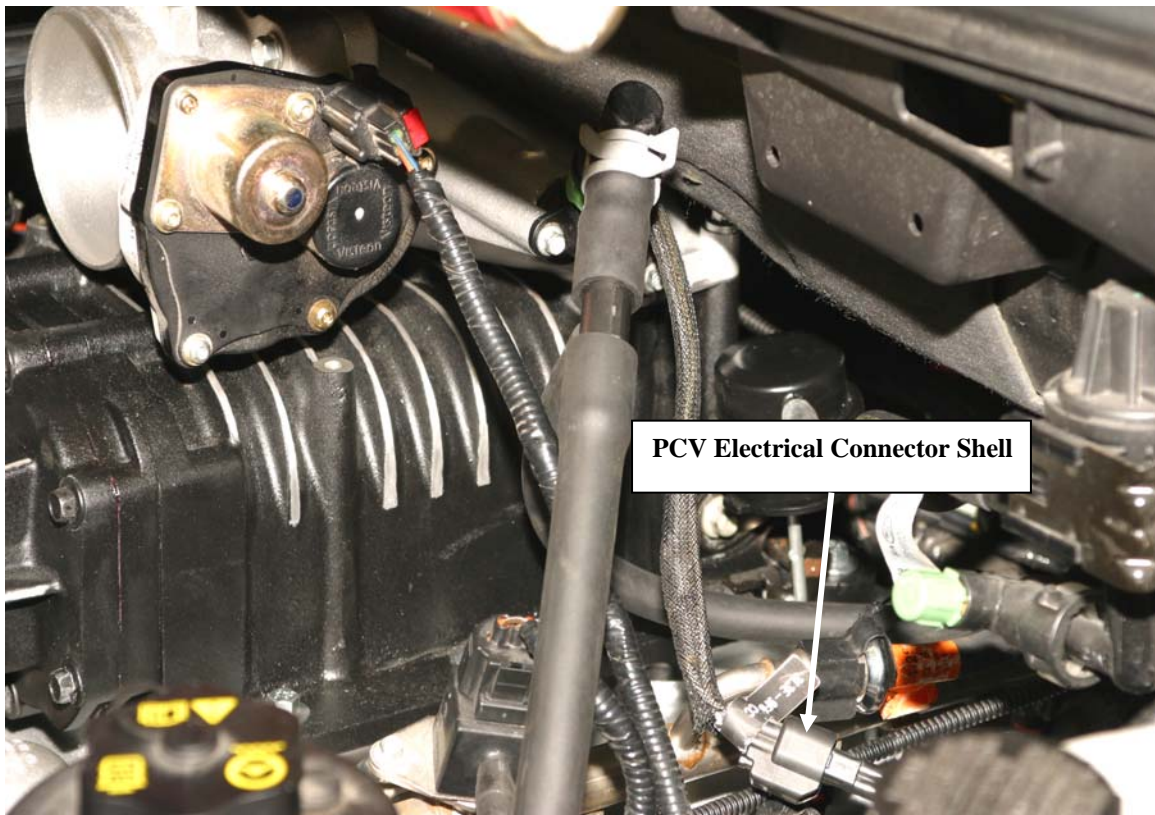
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21. Route the brake booster line (1104-2B432-AA) behind the ROUSHcharger and connect to the middle port in the throttle body spacer, using one of the smaller clamps (8-16mm) provided in Hardware Kit D. Refer to picture that follows.
22. Pass the carry-over VMV tube behind the ROUSHcharger and connect to the unique fitting on the throttle body spacer. Refer to picture that follows.
23. The last port in the throttle body is to be connected to the ROUSHcharger by-pass valve via the vacuum harness (1104-9E498-AA). Route the harness under the throttle body spacer and connect the 1/8" rubber elbow to the top vacuum port.



24. Connect the new PCV line (1104-6C324-AA) to the PCV heater and connect the other end to the driver side cam cover port (under steering fluid reservoir bracket).

25. Unclip the PCV heater electrical connector shell from the harness and connect to the PCV heater as shown in the picture below.



26. The wiring harness on the passenger side cam cover should be already disengaged from the stud. Disengage the wiring harness on the drivers side cam cover. This will allow for enough wire slack to reconnect the TPS harness and the ETC harness to the throttle body. It may be necessary to secure the wiring harness with a tie strap.

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27. Secure the factory radiator over flow hose to the driver's side of the engine compartment with the black plastic hose clip provided in the hardware pack contained within the Air Inlet Kit (R07060024). Insert the mount through the factory hole in the upper fender and secure by pushing a ¼ flat washer, from the Air Inlet Kit hardware pack, over the clip.



28. Place the two larger rubber body grommets (32mm O.D.) from the Air Inlet Kit (R07060024) into the base of the factory intake mounting sheet metal located on the driver side of the engine compartment near the ABS unit.



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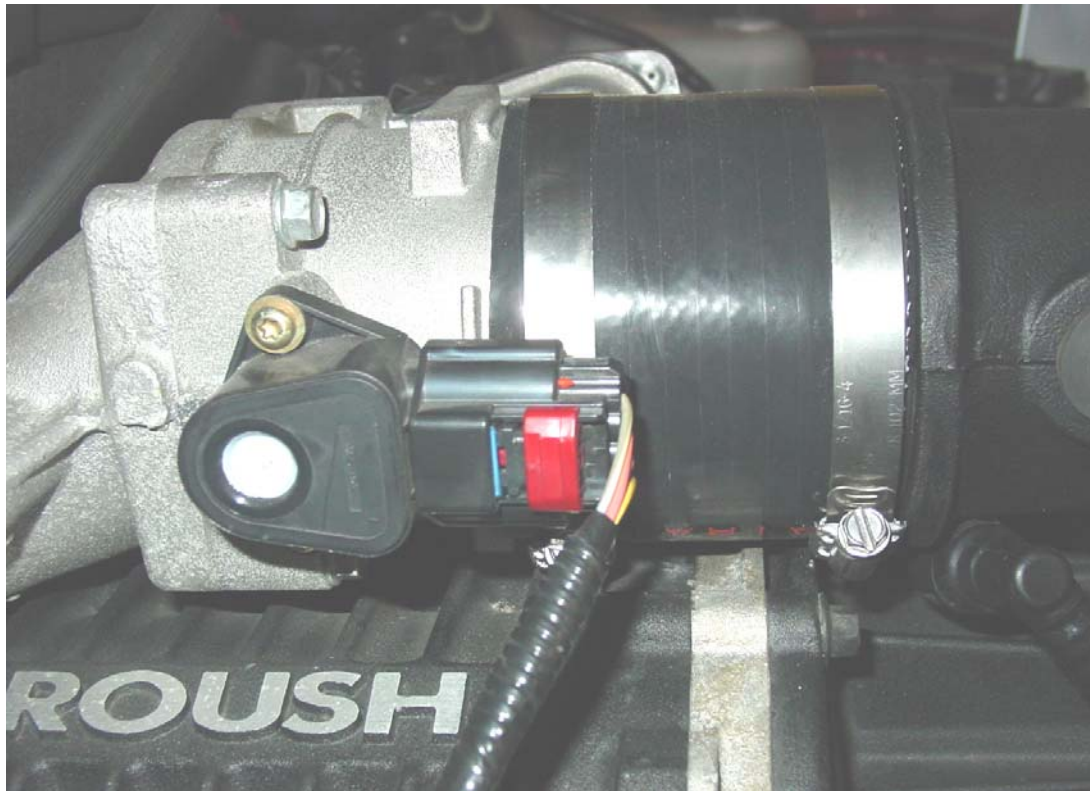
29. Position the air dam assembly into place over the factory intake mounting tray. The front two mounting points are attached using two of the M6x25mm bolts with flat washers from the hardware pack contained within the Air Inlet Kit (R07060024), through the previously installed grommets. Place the metal retaining plate from the air inlet kit under the grommets and install a ¼ flat-washer, lock washer and nut from the kit on each bolt. Finger-tighten the nuts at this point. The rear mounting point attaches into the existing factory threaded hole using the third M6x25mm bolt and ¼ flat-washer from the hardware pack. Again, just finger-tighten at this point.

30. Slide the black hump hose from the Air Inlet Kit (R07060024) over the plastic adapter on the air dam and loosely tighten with the #64 hose clamp provided in the kit. Loosely install remaining #64 hose clamp onto hump hose and insert large end of air inlet tube into the hose as shown below.



31. Slide the remaining #56 Hose Clamp over the 3.5" diameter x 3" long straight T-body connector hose already attached to the tube. Carefully install the small end of the tube onto the throttle body while using care not to damage the hose. Firmly push the hose all the way onto the throttle body until the end of the hose bottoms out on the t-body casting stops as shown in the following picture.

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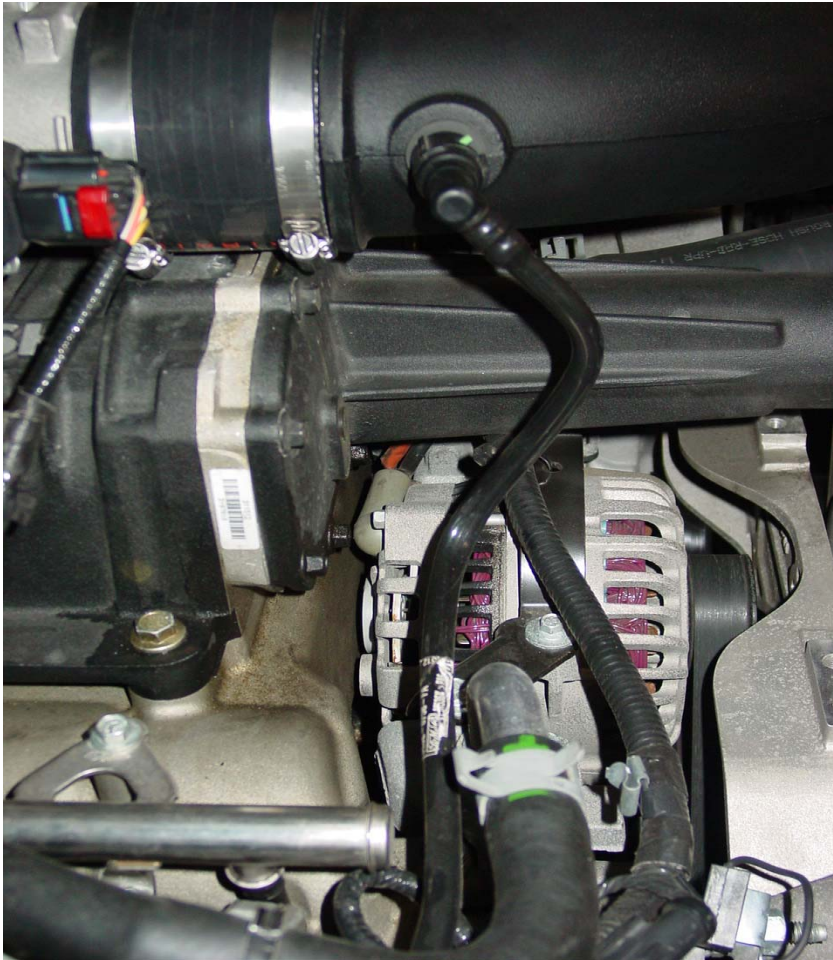


32. Install the intake tube support bracket from Hardware Kit A (R07060025) onto the FEAD bridge using the two M6x18mm bolts supplied in the kit. Finger-tighten only. Install the intake tube to the bracket using the ¼-20 bolt and ¼ flat-washer from the Air Inlet Kit hardware pack. Finger-tighten.

33. Check to ensure that the intake tube is still fully seated on the throttle body, then finish tightening all three bolts on the intake tube support bracket. Torque to 10-12 ft-lb (13-16 N-m). Tighten hose clamps on the throttle body and at the air box, using care not to over-tighten and possibly damage air inlet tube, hose or clamps.

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34. Re-install the passenger-side PCV closure hose to the cam cover and the fitting on the intake tube. In order to route the tube properly, the fittings will need to be rotated in the tube (just grasp the tube in one hand, fitting in the other, and gently twist to desired orientation).



35. Re-attach the MAF connector by pushing the connector back on, then pushing the red locking clip forward.

36. Mount the air filter element (R07060021) onto the plastic adapter of the air box and secure with the hose clamp provided.



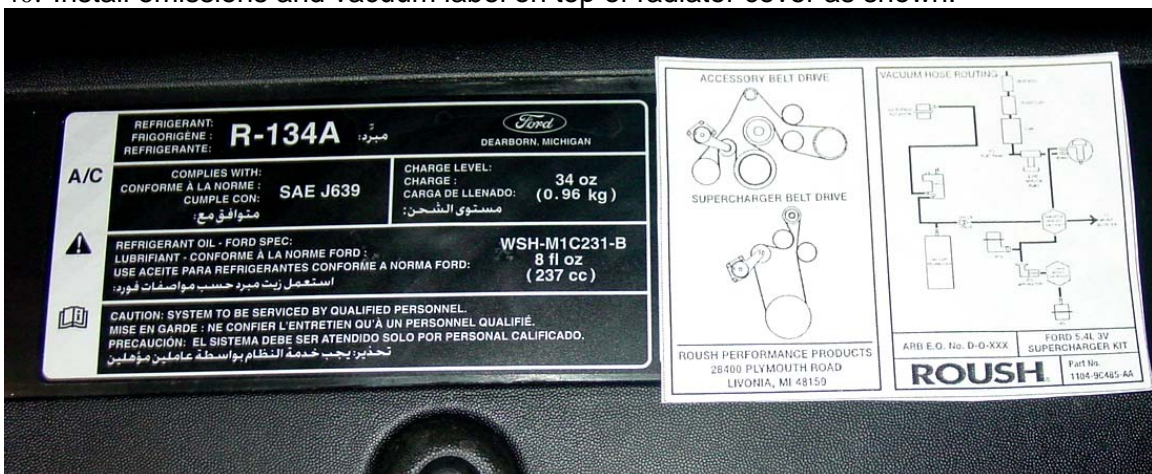
37. Press the weather seal onto the top of the air dam panels. (Hint: Start in a corner and work it on toward the ends)



38. Fill the engine with coolant. Use only the coolant specified in your owner's manual.

39. Re-install reprogrammed PCM. **Note: Due to the significant changes in the induction system and ROUSHcharger, the vehicle is NOT drivable on the original PCM calibration. Warranty will not cover resulting damage. Do not attempt to drive the vehicle with the original calibration, or use the Roush calibration in an unmodified vehicle.**

40. Install emissions and vacuum label on top of radiator cover as shown.



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41. Install White Background/Black Letter, Unleaded Premium Fuel Only decal (R07110003) on the fuel filler door.



42. Carefully place the Clear with White Lettering Premium Fuel Decal (R07110004) on the cluster bezel in the recommended area (dependent on vehicle's equipment level). Using a soft plastic device (i.e. back end of a ballpoint pen) or your fingernails, press the decal down firmly, starting from the center and working outward to avoid trapping air bubbles in the adhesive.





43. Reconnect battery terminals. Review engine compartment to ensure that all wiring connections are installed, all hoses are properly clamped, and that loose hoses and wires are properly secured.
44. Before starting the vehicle for the first time, cycle the key to the ON position two or three times to pressurize the fuel system. **Check the fuel lines and fuel rail for any sign of fuel leakage, and repair prior to any further action.**
45. Start and idle the vehicle to cycle the coolant. If there is any sign of rough operation, high or unstable RPM, or audible whistling, shut off the engine and check thoroughly for vacuum or other air leaks. Otherwise, continue warming the vehicle until the thermostat cycles open (upper radiator hose will become hot, and fan may engage).
46. If the coolant level drops significantly during this period, **allow the vehicle to cool off**, and then top off to the proper level. Repeat this cycle until no further coolant addition is required.
47. Reinstall the hood, if removed, and enjoy your new ROUSHcharged F-150!

8. Troubleshooting

Condition	Possible Source	Action to take
Check engine light on in dash-code P0113	Poor connection/ bad solder joint/ wire pushed out of connector	Verify pin out of ACT wiring and connector
S/C always in bypass mode/ Poor performance W.O.T.	Vacuum lines switched at SCBP solenoid	Verify routing and installation of vacuum lines
Poor performance @ light loads/ part throttle	Pinched vacuum line/ no vacuum @ SCBP actuator/ noisy operation	Verify routing and installation of vacuum lines
Part throttle hesitation	Poor connection/ bad solder joint/ wires pushed out of SCBP solenoid connector	Verify pin out of SCBP solenoid wiring and connector

If you are missing any items, please call us toll free at 1-800-59-ROUSH.



Warranty

All retail parts carry a 90-day warranty from the date of purchase. This warranty covers defects in materials or workmanship, and does not include (i) normal wear and tear, environmental conditions, improper installation; (ii) road hazards, misuse, abuse, neglect, accidents, collision, fire, theft, freezing, vandalism, riot, explosion, or objects striking the vehicle; (iii) misusing the vehicle, such as driving over curbs, overloading, racing, or using the vehicle as a stationary power source; (iv) altering, disassembling or modifying the parts; (v) defects caused or induced by failures, breakdowns, or damage by other parts, components or the vehicle; (vi) subjecting the parts to excessive moisture or water or any motor vehicle fluids (e.g.: oil, anti-freeze, battery acid, brake fluid, etc.); (vii) acts of God, natural disasters and other similar causes beyond the reasonable control of Roush; or (viii) application of chemicals that affect the parts. This Limited Warranty does not cover surface deterioration of paint, trim, and appearance items that result from use and/or exposure to the elements, such as stone chips, scratches, bird droppings, lightning, hail, windstorm, dings, dents, earthquake, road salt, tree sap, water or flood.

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This ROUSHcharger kit is designed and tested to function properly only on vehicles as they are equipped from the factory (completely stock powertrains). The use of aftermarket parts and equipment such as: cams, headers, nitrous oxide systems, other bolt-on performance parts, or any other performance parts not sold by, manufactured by, or approved of in writing by Roush for specific application to the F-150, 5.4 liter ROUSHcharger, will result in powertrain and ROUSHcharger kit damage, including potential total engine failure, and will not be the responsibility of Roush in any way.