

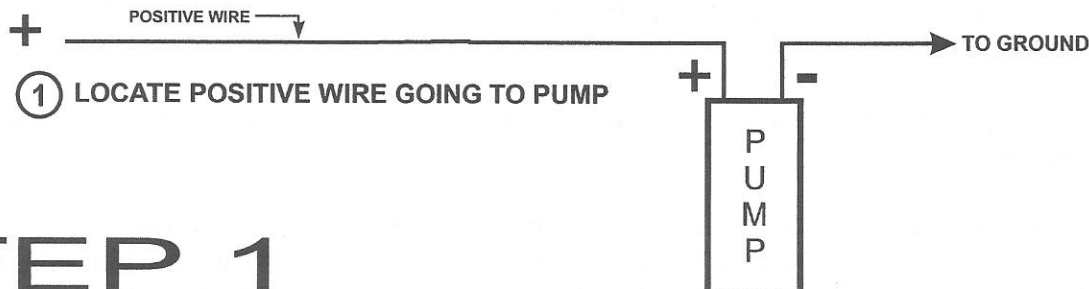
Hi Tech Performance Products

BOOST-A-PUMP™ WIRING INSTRUCTIONS

Installation of the KENNE BELL BOOST-A-PUMP™ (BAP) is simple and straightforward. All you need to do is locate the "HOT" (12 VOLT POSITIVE +) wire going to your pump and wire the BAP in series as shown in the following diagrams. **NOTE: The INPUT wire to the BAP is the fused red wire.**

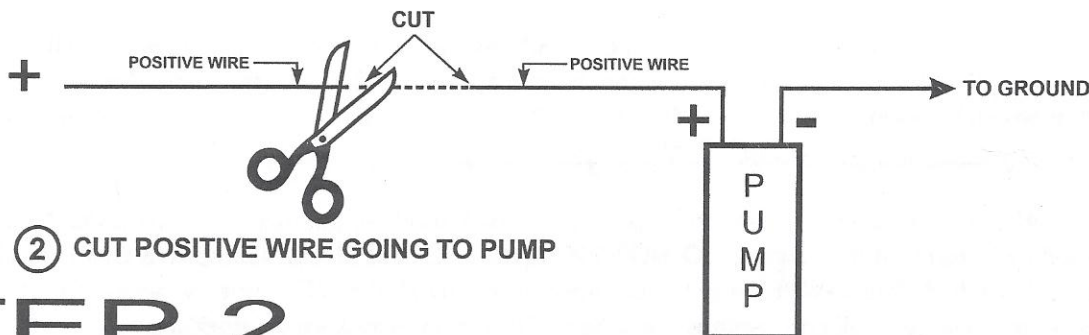
IMPORTANT! ON VEHICLES USING FEEDBACK TO THE ENGINE COMPUTER TO TELL IT WHEN THE PUMP IS RUNNING - WIRE THE BAP AFTER THE FEEDBACK WIRE OR THE CHECK ENGINE LIGHT MAY COME ON. WIRE THE BAP ONLY AS SHOWN IN THE FOLLOWING DIAGRAMS OR DAMAGE MAY OCCUR AND WARRANTY WILL BE VOID..

FROM FUEL PUMP
RELAY OR OTHER
PUMP SUPPLY
(manual switch,
pressure switch,
etc...)



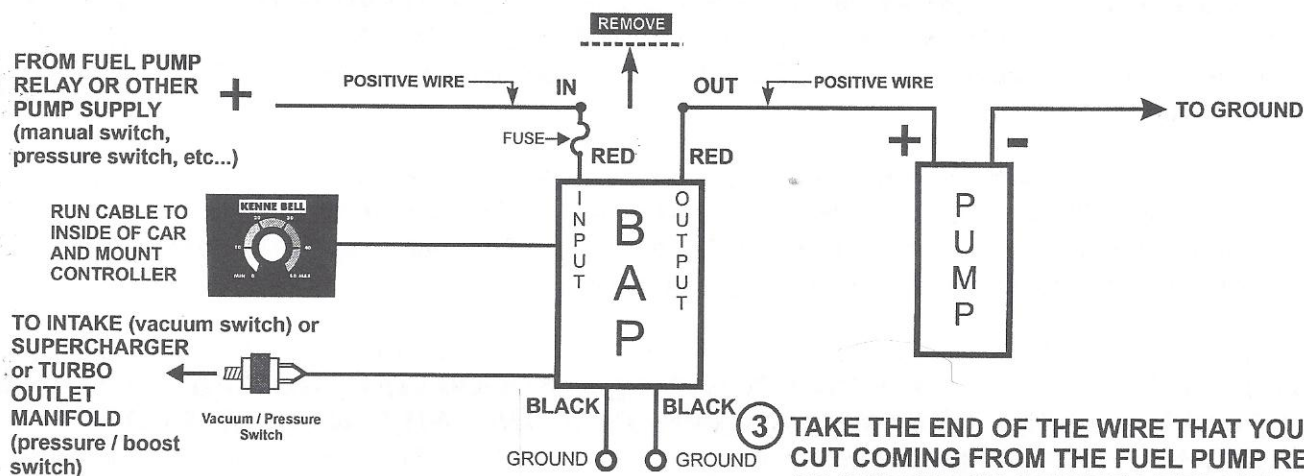
STEP 1

FROM FUEL PUMP
RELAY OR OTHER
PUMP SUPPLY
(manual switch,
pressure switch,
etc...)



STEP 2

FROM FUEL PUMP
RELAY OR OTHER
PUMP SUPPLY
(manual switch,
pressure switch, etc...)



STEP 3

**CAUTION! BOOST-A-PUMP
GROUND IMPORTANT!**

Note: Double check ground. If
ground is inadequate unit may be
damaged.

PART# KB89066 / KB89067 20AMP
KB89068 / KB89069 40AMP

BOOST-A-PUMP™ INSTALLATION INSTRUCTIONS

1. The Kenne Bell BOOST-A-PUMP™ (BAP) may be mounted anywhere as long as it is protected from exposure to water or extreme heat (above 300° F). Preferred mounting is under the seat or in the trunk.
2. Locate the 12 volt + wire going to the fuel pump from the fuel pump relay. It is important that you positively determine the proper wire to splice into or the BAP will not function. If you do not see your vehicle listed on our FUEL PUMP WIRE GUIDE, use your service manual or contact the dealer to determine the wire color and location. NOTE: ON VEHICLES WITH COMPUTER CONTROL, THE BAP SHOULD BE WIRED IN **AFTER** THE FEEDBACK TO THE COMPUTER, NOT BEFORE. A CODE MAY BE SET IF THE COMPUTER SEES HIGHER THAN NORMAL VOLTAGE TO THE FUEL PUMP.
3. After you have located the fuel pump wire, trial fit the assembly first to insure the cables will reach their proper installation points.
4. The Cockpit Controller must be located inside the vehicle to allow access to the adjustment knob. The cable has a plug-in connector that can be routed through a small hole in the firewall or trunk depending on where the BAP module is mounted. Make sure that the cable will reach the module as this cable CAN NOT be extended. Extending this cable will affect the operation of the BAP.
5. The other cable included in the kit goes from the BAP module to the activation switch (VACUUM for normally aspirated and BOOST for supercharged / turbocharged applications). Route this cable through the firewall or trunk from the switch location to the module. Make sure that the cable will reach the module because this cable CAN NOT be extended. Extending cable will affect operation of the BAP.
6. If the cable(s) will not reach the desired location of the BAP module, the main #10 AWG POWER WIRES may be extended up to ten (10) feet. Again, DO NOT EXTEND THE MULTI-CONDUCTOR CABLES, ONLY THE RED AND/OR BLACK POWER WIRES may be extended. Use only #10 AWG copper stranded wire to extend the BAP power wires. Make sure all connections are solid and free from exposure to moisture.
7. Check to make sure you have the correct activation switch for your application. The VACUUM switch application has two wires: RED and BLACK (RED from switch connects to the RED wire/ BLACK to BLACK). The SUPERCHARGED / TURBOCHARGED switch also has two wires: RED and BLACK. These simply connect to the BOOST switch. Polarity has no effect.
8. Install the VACUUM switch with a short piece (no longer than 24") of 5/32" vacuum line from a good intake manifold vacuum source. ON SUPERCHARGED / TURBOCHARGED applications, install the BOOST switch with a short piece (no longer than 24") of 5/32" vacuum line to the BLOWER SIDE ONLY of the intake manifold (the BAP will not function if the line is on the inlet side of the supercharger / turbocharger).
9. Connect the fuel pump wires as shown in STEPS 1 - 3. The two BLACK ground wires on the BAP module may be connected to the frame if desired. **IMPORTANT: THIS MUST BE A GOOD CLEAN GROUND CONNECTION FREE OF PAINT, RUST OR OTHER MATERIAL - DAMAGE TO THE UNIT CAN RESULT IF NOT GROUNDED PROPERLY.** (we recommend grounding the BLACK BAP wires to the battery NEGATIVE terminal or to the ground wire going to the fuel pump).
10. Mount the BAP module with the four (4) included self tapping screws. The module does not need to be mounted to a metal surface since the two black wires act as a ground.
11. Plug in the Cockpit Controller and activation switch cables. The BAP is now ready for use.

BOOST-A-PUMP™ FUEL PUMP WIRE GUIDE

VEHICLE	YEAR	WIRE COLOR	LOCATION
Mustang 5.0L	'86 - '90	PINK w/ BLACK STRIPE	Under driver's seat at relay
Mustang 5.0L	'91 - '93 [^]	GREEN w/ YELLOW STRIPE	Under mass air meter
Mustang 5.0L/4.6L	'94 - '98 [^]	BROWN w/ PINK STRIPE	In trunk in harness
Ford Trucks	*	GREEN w/ YELLOW STRIPE	Under power distribution box under hood
Buick GN	'84 - '87	TAN w/ WHITE STRIPE	In trunk (left side)+++
Syclone / Typh	'91 - '92	GRAY	Past bulkhead connector towards pump (see diagram). Fuel pump relay is located on the left side firewall. There are 2 relays; one for the A/C and the other for the fuel pump (closest to engine).+++

[^] Includes Cobra

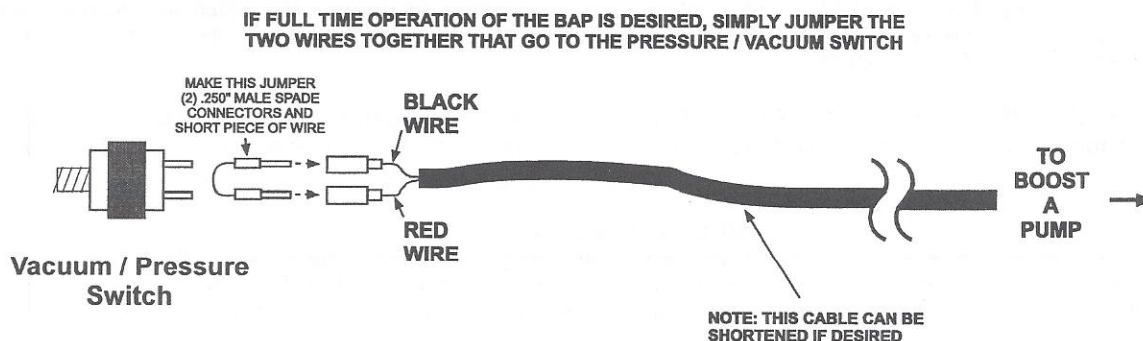
* All models and years from '91 up that we know of...

+++ You must change the stock fuel pump fuse from 10 AMP to 20 AMP.

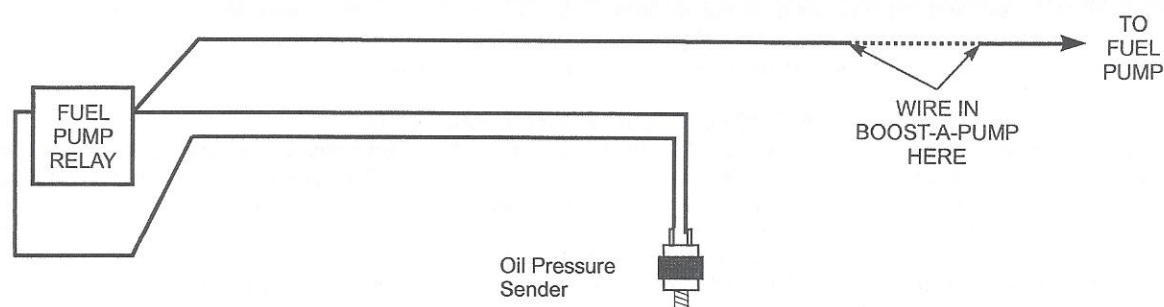
NOTE: DO NOT TIE INTO WIRE AT RELAY - VOLTAGE WILL FEED BACK TO INPUT OF BAP AND BLOW FUSE.

Sorry, but we do not have the wire locations and colors for all vehicles, so please consult your service manual or dealer if you do not see your vehicle listed above, OR you may be able to get info from Taylor Automotive Tech 1(800) 636-6414 or retrieve information from the internet at www.nashville.net/~teklin19/manual.html.

CK GN SWITCH PANELS - Note: If using a Kenne Bell KB82068 Fuel Pump / Anti Theft Switch, the switch MUST BE BYPASSED as the switch is not rated high enough to handle the increased load.



NOTE: SOME VEHICLES HAVE A BUILT-IN SAFETY SYSTEM (BELOW) WHERE THE ENGINE WILL NOT START UNTIL THE OIL PRESSURE HAS BUILT UP ENOUGH TO ACTIVATE THE FUEL PUMP RELAY. DO NOT WIRE THE BAP INTO THIS CIRCUIT. IF YOU ARE NOT SURE WHETHER YOUR VEHICLE HAS THIS DEVICE, LOCATE THE FUEL PUMP FIRST AND WIRE THE BAP CLOSEST TO THE PUMP.



KENNE BELL

BOOST-A-PUMP

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TECHNICAL INFORMATION AND INSTALLATION INSTRUCTIONS

OVERVIEW

The Kenne Bell BOOST-A-PUMP is designed to increase the output of any fuel pump from 1% up to 50%. It accomplishes this by increasing the voltage approx. 5 volts (10% per volt). It will also maintain this pre-set voltage or output within 1% regardless of battery voltage (within 9 - 17 volts). A little known fact is that voltage to a fuel pump can vary 10% depending on the accessories that are on i.e. lights, stereo, AC, wipers, heater, brake lights and even directional signals. The BOOST-A-PUMP immediately compensates for any subsequent voltage drop and fuel output reduction. In fact, the BOOST-A-PUMP will maintain the +50% output as low as 9 volts! Yes, you can also use it on the ignition system to either increase or maintain the desired voltage if bypassing or eliminating the charging system.

TECHNICAL BACKGROUND

Kenne Bell has 37 years of background experience in hydraulic engineering. We know fuel systems. The Kenne Bell fuel flow bench is second to none. We have documented the flow capacities of various fuel line types and sizes, tested all the currently available pumps (stand alone, inline booster and in tank), regulators, fuel rails, mass air meters and filters. Countless dyno tests have been conducted on our in house dyno with a variety of fuel system combinations. Fuel pressure and flow and air fuel ratio were measured with our computerized data logger system. The BOOST-A-PUMP is the latest on the long list of Kenne Bell innovations. Read the following technical information. It will help you to better understand the dynamics of fuel flow and pressure.

FLOW vs. PRESSURE

First of all, pressure - not volume - is the most important indicator. A fuel injector with the proper pressure will flow the necessary fuel (volume). If it doesn't have the correct pressure, only THEN do you become concerned about volume. Study the pump flow graph in our literature and you will notice that as flow increases - pressure decreases. Conversely as flow (volume) decreases, pressure increases. Never forget that and it will help you better understand the relationship between pumps, injectors, regulators, fuel lines, FMU/FMB's etc. EXAMPLE: (See Pump Flow Graph in literature). A pump flows 88L at 40 psi. What is the flow at 50 psi? Answer: 78L at 50 psi. What is the flow at 30 psi? Answer: 97L at 30 psi. You need 132L at 40 psi. Can't make it with the 88L. Add a Kenne Bell BOOST-A-PUMP to the 88L stock pump and you have it.

INSTALLATION

Installation is easy and straight forward. The BOOST-A-PUMP splices into the existing hot (+) fuel pump wire and increases the voltage to the pump (see STEPS 1 - 3). Connect to the red wires as shown. The black wires are the grounds. There is a cable that connects to the Cockpit Controller and a cable that connects to the Vacuum/Boost switch.

KB89066 VACUUM SWITCH ACTIVATION (NORMALLY ASPIRATED ONLY)

For non-supercharged applications, the cable connects to a vacuum switch (normally aspirated) and activates at WOT (wide open throttle) and low vacuum (approx. 4"). Depending on how efficient your intake system is (ideal vacuum gauge reading at WOT is 0") indicating "0" or no restriction thru the filter, hoses, throttle body and intake manifold. 2", 3", 4", 6" etc. represent varying degrees of restriction, 6" being highly restrictive. NOTE: The vacuum switch is adjustable. To alter setting tee in a vacuum gauge between the switch and an open hose. Suck on the other end of the hose. You can typically register up to 10" of vacuum. Watch the gauge needle. You will hear the switch "click." The "click" is the contacts closing that activate the BOOST-A-PUMP.

KB89067 PRESSURE SWITCH ACTIVATION (SUPERCHARGED OR TURBOCHARGED ONLY)

On supercharged or turbocharged applications, the pressure switch activates the BOOST-A-PUMP at approx. 3.5 psi. There is an optional 5 psi (cost \$10).

FULL TIME OPERATION

We consulted the major suppliers of fuel pumps and they concurred that operating their pumps at the elevated voltages we use with the BOOST-A-PUMP has little if any effect on pump life EVEN IF OPERATED FULL TIME. Therefore, the BOOST-A-PUMP may be activated full time if desired. The regulator merely returns the unused fuel to the tank via the return line much the same as any larger pump would do.

FMU / FMB APPLICATION

FMU/FMB (fuel management units or boosters) are supplied with all Kenne Bell, Vortech, Paxton, ATI, Wheeler/SVO and B&M, BBK supercharger kits. These valves are installed in the fuel return line and merely restrict or shut off this line and increase fuel pressure thereby diverting more fuel thru the injectors. NOTE: Our dyno testing has determined that these FMU/FMB devices increase fuel pressure as boost increases. Example: Mustangs with stock in tank pump and 24 lb injectors 48 psi with boost reference. An FMU raises the pressure to 55 psi "fixed." An inline pump raises pressure to 90 psi "fixed" and the injectors go sonic and lock. Better approach would have been the stock pump and FMU at 55 psi. BOOST-A-PUMP would allow pressure to be fully adjustable between 55 to 90 psi for ideal air fuel ratio and maximum horsepower. CAUTION: Typically an FMU raises fuel pressure 10 psi for every 1 psi of boost IF the pump has the capacity.

INLINE BOOSTER PUMPS (WITH FMU / FMB)

Therefore, we do not recommend inline "booster" pumps with any FMU/FMB system. 1.) They can increase fuel pressure to dangerous levels. 2.) There is no pump flow adjustment. Fuel and pressure are FIXED and cannot be adjusted. 3.) Some injectors go "sonic" or "lock up" at higher pressures negating control by the computer. 4.) "Inline" pumps are noisy. Inline stand alone high capacity pumps are acceptable but be careful big inline pumps with the FMU/FMB. Remember, the injectors must be capable of supplying or passing all this additional fuel volume into the engine or the pressure will increase to alarming levels. Larger injectors (increases pump volume and decreases pressure) and or eliminating the FMU/FMB (allows increased fuel volume thru the return line so lowers pressure) or a smaller pump with a Kenne Bell BOOST-A-PUMP will reduce and better control this pressure because of the adjustability.

INLINE PUMPS (WITHOUT FMU/FMB)

Inline pumps that do not utilize an FMU are typically not a problem as most fuel regulators have the flow capacity to bypass the fuel not used by the injectors back to the tank via the return line. Two (big) stand alone pumps may flow more fuel at idle than the regulator can bypass. An abnormally high idle pressure that cannot be lowered with adjustment indicates this condition exists. Here again the preferred set up is one (1) big pump and Kenne Bell BOOST-A-PUMP triggered by a switch that eliminates all that high volume at idle.

FUEL TEMPERATURE

There is one other consideration - fuel temperature. The more fuel the pump discharges the higher the fuel temperature. An inline booster pump that is activated full time forces all the excess fuel flow thru the regulator and return line heating the fuel in the process. Yet another reason the Kenne Bell BOOST-A-PUMP activated by a pressure switch is the preferred set up.

REGULATORS

Kenne Bell was the first to manufacture a true billet aluminum adjustable regulator. The Syclone/Typhoon, Buick Turbo V6's and many other vehicles do not use the FMU/FMB's. Standard equipment for these vehicles is an adjustable pressure regulator. Set the idle with vacuum hose on. Pressure will increase 8 psi at 0 vacuum and increase proportionally with boost. Example #1. 30 psi idle, 38 psi at 0 vacuum and 48 psi at 10 psi boost. Example #2. 40 psi idle, 48 psi at 0 and 58 psi at 10 psi boost - or 68 psi at 20 psi boost. These numbers are attainable only if the regulator is boost referenced (vacuum line connected). If the vacuum line is not connected, expect 8 psi more at idle, the same at 0 vacuum and minus the boost psi at WOT. On naturally aspirated applications removing the vacuum line does not affect WOT fuel pressure - only idle pressure by 8 psi. Turbocharged or supercharged engines can experiment with an air fuel ratio by varying WOT pressure with this vacuum line. 8 psi can result in up to .6 AF/R variances.

FORD FUEL PRESSURE

DO IT WITH A CHIP

Ford pressure regulators work best at stock pressure (30 psi with vacuum line on). No, this is not a misprint. The EEC looks at both the idle and WOT fuel tables to adjust fuel. Therefore increasing fuel pressure helps only temporarily - until the EEC sets WOT fuel based on idle pressure. It begins adjusting both back to the pre set air fuel ratio programmed in the EEC or the Kenne Bell SWITCH CHIP program. However, at some point, as pressure is increased, the EEC is unable to "trim" back the rich mixture at idle and WOT. Then again, if idle remains at the stock 30 psi setting WOT pressure can be increased and the mixture richened without the EEC trimming either. That is the principle behind the FMU/FMB on all supercharger kits currently available. Emissions are not affected as the richening only occurs at WOT. The best approach is to control air fuel ratio with a Kenne Bell SWITCH CHIP or a stand alone system, such as the DFI. The Kenne Bell SWITCH CHIP does not alter air fuel ratio at idle, part throttle etc. - only WOT. And NEVER try to "adjust out" idle up and down surge with the idle screw. The air fuel ratio at idle is OFF (excessively lean) if the engine is "hunting." It's trying to adjust for a poorly calibrated idle mixture. Lower the pressure at idle to 30 psi and back off the idle screw to the factory setting. Slight adjustments may be made without adverse effects.

SPEED DENSITY

Speed Density System Ford cars and trucks use pre-mapped fuel tables in both open and closed loop so raising fuel pressure is sensitive as compared to the Mass Air Systems which rely on air flow (mass) to calibrate fuel delivery. Therefore, the Kenne Bell BOOST-A-PUMP is an ideal approach for both naturally aspirated and supercharged vehicles (with and without FMU/FMB). Because of it's less sophisticated computer, the Syclone/Typhoon Speed Density System is not as sensitive to idle pressure.

EMISSIONS

Since the Kenne Bell BOOST-A-PUMP is only activated at WOT (open loop) fuel pressure at idle and part throttle cannot possibly be affected on any vehicle. Even if activated full time at maximum 50% increase we have not seen evidence of elevated fuel pressure on any of the vehicles we've tested. Nevertheless, 50 State Legal Status has been applied for.

FUEL PRESSURE GAUGE - GET ONE!

You can't determine engine RPM without a tach. You can't determine engine temperature without a temperature gauge. You can't determine boost without a boost gauge. And there is certainly no way you can determine fuel pressure without a fuel pressure gauge. GET ONE. One cannot tune and trouble shoot a fuel injected car without a fuel pressure gauge.

TROUBLESHOOTING

BOOST-A-PUMP DOESN'T ACTIVATE

Check all wire connections

Check ground. MUST BE GOOD GROUND CONNECTION.

Faulty pressure switch. Bypass the switch by connecting the two wires together (short together - there is no voltage on this circuit)

DO NOT GROUND THESE WIRES. Now check the red OUTPUT + wire and GROUND with a VOM. Turn Cockpit Control to MAX.

Voltage should read at least 16 volts.

Check for blown fuse. See inline fuse in red INPUT + wire (carry a spare with you at all times).

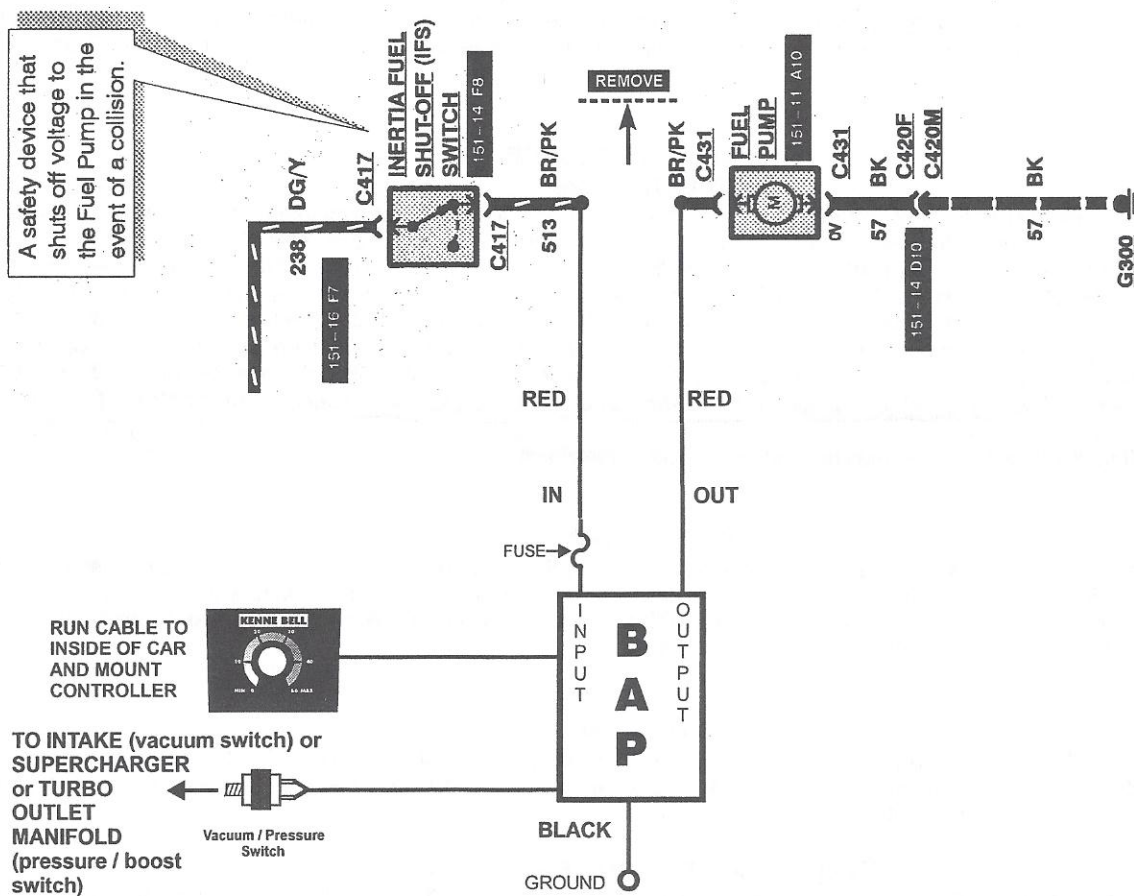
BOOST-A-PUMP CYCLES "ON" & "OFF"

Built-in internal circuit breaker (separate from the fuse) in BOOST-A-PUMP module is being triggered because of overload. Operating rating is 15 amps (maximum peak 20 amps, 40 amps for -2 Models).

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1996 AND UP MUSTANG GT 2V AND COBRA 4V BOOST-A-PUMP WIRING

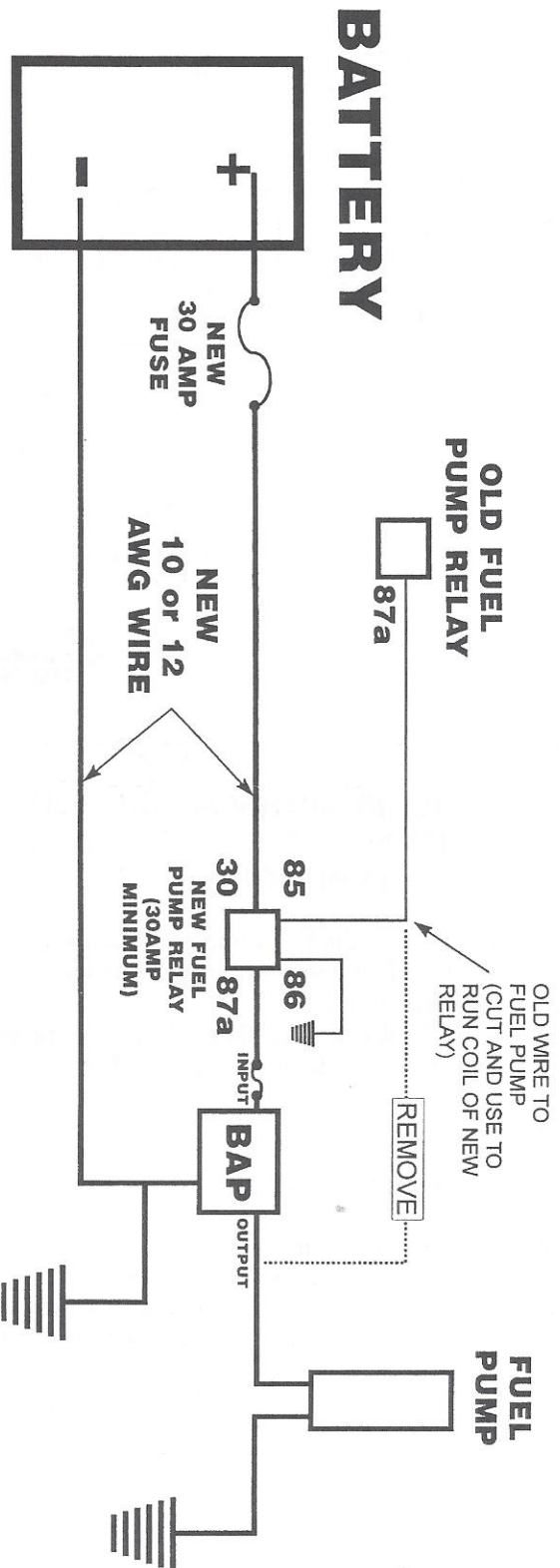


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ALTERNATE INSTRUCTIONS FOR RUNNING NEW WIRING TO BOOST-A-PUMP™



10743 Bell Ct. Rancho Cucamonga, CA 91730
Orders (909) 941-6646 Tech (909) 941-0985 Fax (909) 944-4883

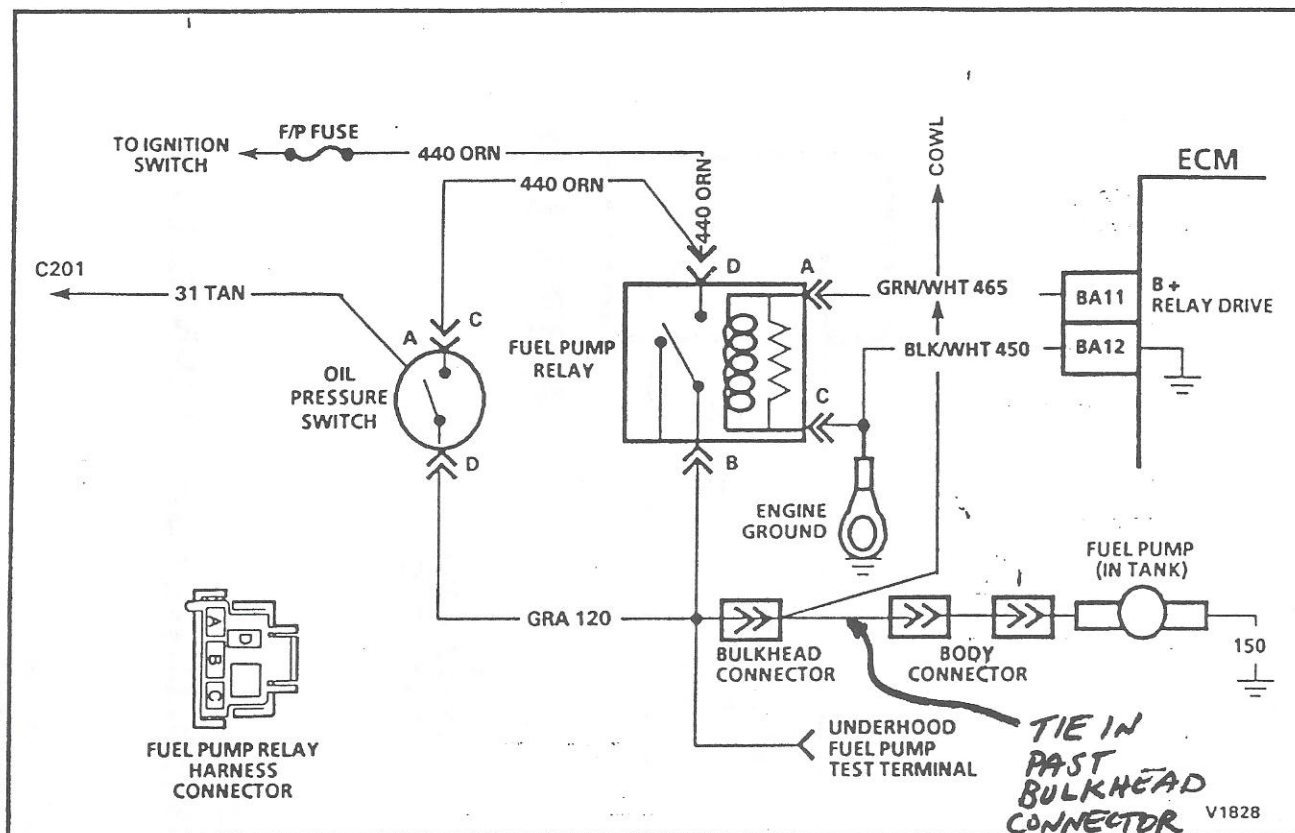


CHART A-5
FUEL PUMP RELAY CIRCUIT
4.3L TURBO (VIN Z) SYCLONE AND
TYPHOON (PORT)

Circuit Description:

When the ignition switch is turned "ON," the Electronic Control Module (ECM) will activate the fuel pump relay and run the in-tank fuel pump. The fuel pump will operate as long as the engine is cranking or running and the ECM is receiving ignition reference pulses.

If there are no reference pulses, the ECM will shut "OFF" the fuel pump within 2 seconds after key "ON."

Should the fuel pump relay or the 12V relay drive from the ECM fail, the fuel pump will be run through an oil pressure switch back-up circuit.

Test Description: Numbers below refer to circled numbers on the diagnostic chart.

1. This test will determine if the oil pressure switch is closing and supplying voltage to the fuel pump when the relay is not functioning.
2. This test will determine if the oil pressure switch is stuck open.

Diagnostic Aids:

An inoperative fuel pump relay can result in long cranking times, particularly if the engine is cold or engine oil pressure is low. The extended crank period is caused by the time necessary for oil pressure to build enough to close the oil pressure switch and turn "ON" the fuel pump.

BOOST-A-PUMP Supplement for '03 Cobra

To be used with BAP instructions.

See general BAP instructions included with BAP for specific installation.

This page is meant as an overview explaining where to mount the BAP and exactly which wire to tap into.

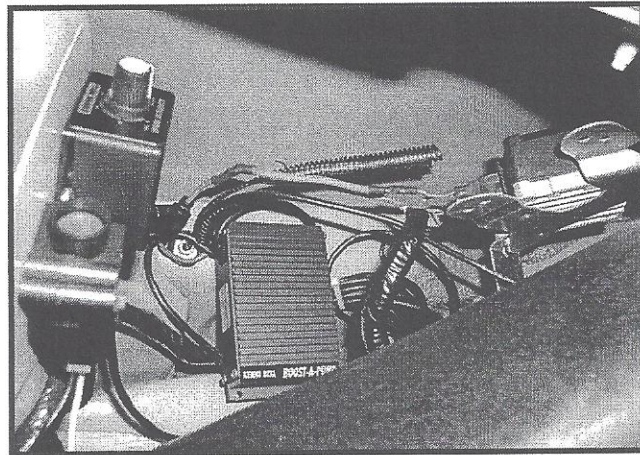
BAP SETTING

Set BAP controller based on supercharger pulley size.

NOTE: If you have a larger crank pulley than stock, use the pulley ratio or peak boost into engine.

PULLEY SIZE / BOOST / PULLEY RATIO

BAP Setting	Supercharger Pulley	7.5" Crank (stock) Ratio	Boost
20%	4"	1.87	9
25%	3-3/4"	2.00	11
30%	3-1/2"	2.14	13
35%	3-1/4"	2.3	15
40%	3"	2.51	17
45%	2-3/4"	2.73	19
50%	2-1/2"	3.0	21



Fuel pump control module.

Fuel psi at wide open throttle should be 85 psi at 6500RPM.

1. The BAP will be mounted in the trunk behind plastic/felt insulation, remove this to gain access for insulation. Pay attention and don't drill through the fender when drilling hole for BAP.
2. There is a wire loom leading to fuel pump control module, slice, tape and pull back loom.
3. Locate brown wire with pink stripe coming from fuel pump control module, this is the wire leading directly to the twin intake pumps. Cut this wire approximately 2-3 inches from connector.
4. Install heat shrink on red fused wire of BAP (input) splice to wire coming from fuel pump control module, solder wires and heat shrink.
5. Splice, solder, and heat shrink non-fused output wire from BAP to brown with pink wire leading to pump.
6. Install ground lug on black ground wire and attach chassis ground location in fender well. Close to fuel pump control module. Be sure to solder ground lug to insure against corrosion.
7. Run controller wire to desired location and mount control box. Shown installed in trunk, this is a nice place to mount it. (no one can re-adjust your fuel by accident)
8. Run switch wire through car inside under plastic lower trim panel to engine compartment.
9. Hook switch wire to boost switch and tee into boost line leading to fuel pressure sensor from discharge manifold.
10. Replace stock 20A fuse inn power distribution center (under hood) with 30A for fuel pump. Refer to owners manual for correct fuse location.
11. Overall this makes for a very clean installation. Ziptie all loose wires. Re-loom fuel pump control module and tape up with electrical tape.
12. Set BAP controller according to the table above.

