Installation Manual For The Ford ACCEL Digital Fuel Injection Engine Management System Part #74030

The Mr. Gasket Performance Group
Cleveland, Ohio
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www.mrgasket.com

Prior to starting the installation of your ACCEL DFI system, read this manual carefully!!

Contents **Pages**

Some parts are not legal for sale or use in California or on any pollution-controlled motor vehicle.

INTRODUCTION

CONGRATULATIONS! You have
engine management system availa
exact science that ACCEL has mad
written to assist you with the inst
system to your FORD application
carefully.

Prior to starting your installation,
of your ACCEL DFI package. You
components:

Quantity	Component
(1)	Electronic Contro
(1)	Main Wiring Har
(1)	Injector Wire Ha
(1)	Manifold Absolu
(1)	Heated Oxygen S
(1)	Coolant Tempera
(1)	6 way to 4 way T
(1)	Throttle Position conversion conne
(1)	Idle Air Control
(1)	Idle Air Control
(1)	IAC Motor Hous
(1)	IAC Adapter Pla

If your are missing any item , plea
immediately.

Although this package is designed to allow you to convert a carbureted engine to fuel injection or allow you better control over your present fuel injected engine, it does not include the hydraulic portion of the installation. If you need a fuel pump, filter, fittings, etc. contact your local ACCEL EMIC center for the proper ACCEL DFI part numbers for your application.

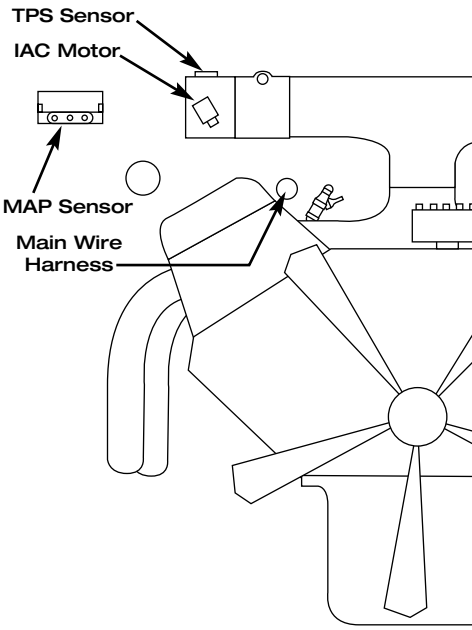
I. OBTAINING YOUR MANIFOLD

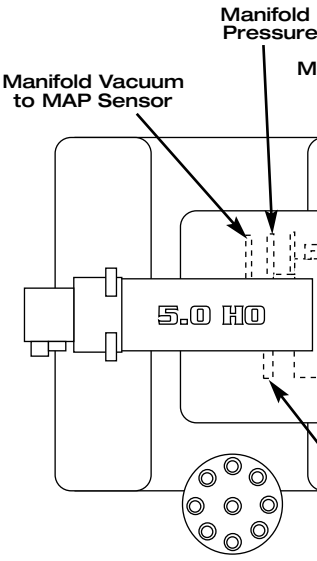
Currently ACCEL DFI only has manifolds for Chevrolet applications, for your Ford application you may use an OEM or aftermarket fuel injection manifold. Talk to some of our ACCEL DFI's EMIC centers for fabricating or modifying a carbureted style manifold for your application. ACCEL DFI EMIC Centers can also sell, install, and tune all ACCEL DFI products. For the nearest dealer to you please call: 1.800.992.2235.

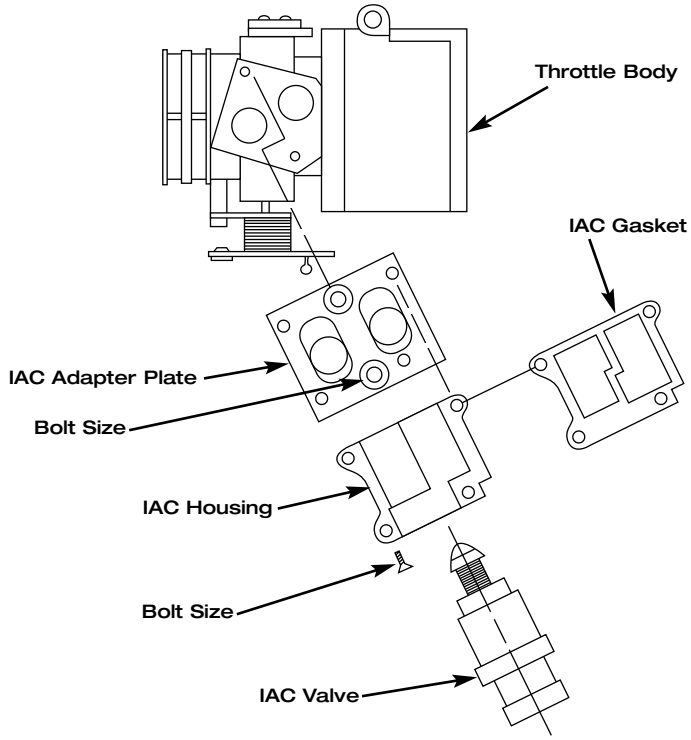
II. SETTING UP YOUR MANIFOLD

Prior to installing your manifold make sure that all gasket surfaces are clean. ACCEL recommends using a 180 degree thermostat in most applications. Place your thermostat and gasket onto your manifold, put your thermostat housing onto the manifold and bolt in place. When installing your fuel injectors, be careful not to cut the O-Rings. A small amount of oil on each O-Ring will aid in the assembly. Please reference a service manual for proper torque sequence and vacuum line routing. If this is a custom manifold, please contact your fabricator for this information.

NOTE: It is recommended at this point to use a hole saw (i.e. Green Lee punch) to put two (2) 1-5/8" diameter holes in the firewall to accommodate the main wiring harness. Please refer the figure below.





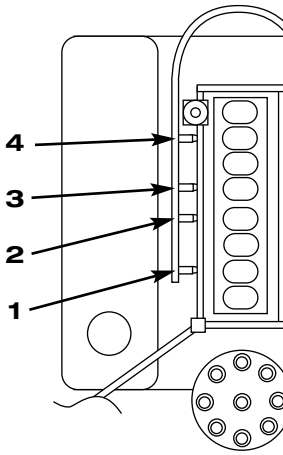


III. MOUNTING YOUR ECM

The ECM comes with three (3) mounting tabs designed for a #8 sheet metal screw. It is recommended that you mount the ECM in the passenger side kick panel. If the kick panel has an air vent incorporated into it, DO NOT mount the ECM here. This unit is not waterproof and therefore needs to be mounted in a location free of moisture. The alternate locations are in the dash board and behind the glove box. NEVER MOUNT THE ECM IN THE ENGINE COMPARTMENT!

IV. INJECTOR HARNES

This ACCEL DFI system is simult
therefore it does not matter what
to what injector. For your conveni
paired in sets of two, similar to th
mounted in the manifold. Lay the
lays naturally on the manifold. Cl
fuel injectors making sure that the
place.



V. MAIN WIRE HARN AND CONNE

An overview diagram of the main
at the end of this section. Please r
the connections between the ECM
sensors/components. The harness
nected as follows: Begin by conne
pin ECM connectors to the ACCE
that the tabs snap into place. Ther

two legs through the drivers side firewall hole that you cut in step two followed by the shorter leg though the passenger side firewall hole. Continue pulling the harness legs through the firewall until the rubber grommets seat themselves in the firewall. Once the grommets have been properly seated into the firewall, each leg can be routed between the manifold and the valve covers.

The drivers side leg will contain connectors for the following:

- MAP (3-pin green male connector)
- Computer Controlled Ignition (4-pin male black connector, for a TFI you will use the TFI adapter)
- ESC (purple wire, bare lead)
- Air (2-pin gray connector)
- Coolant (2-pin black connector)
- TPS (3-pin black male connector)

Make sure to connect the switched +12 volt wire (long pink wire with a female spade connector) to a switched ignition accessory in the fuse box. The switched ignition accessory MUST maintain 12 volts during cranking. If it does not, the vehicle will not start.

NOTE: If you are not controlling timing with the ACCEL DFI ECM (using a non-computer-controlled ignition system such as a points distributor) you will not be using the computer-controlled ignition connector (4-pin male black connector) or the ESC connector (purple wire with bare lead).

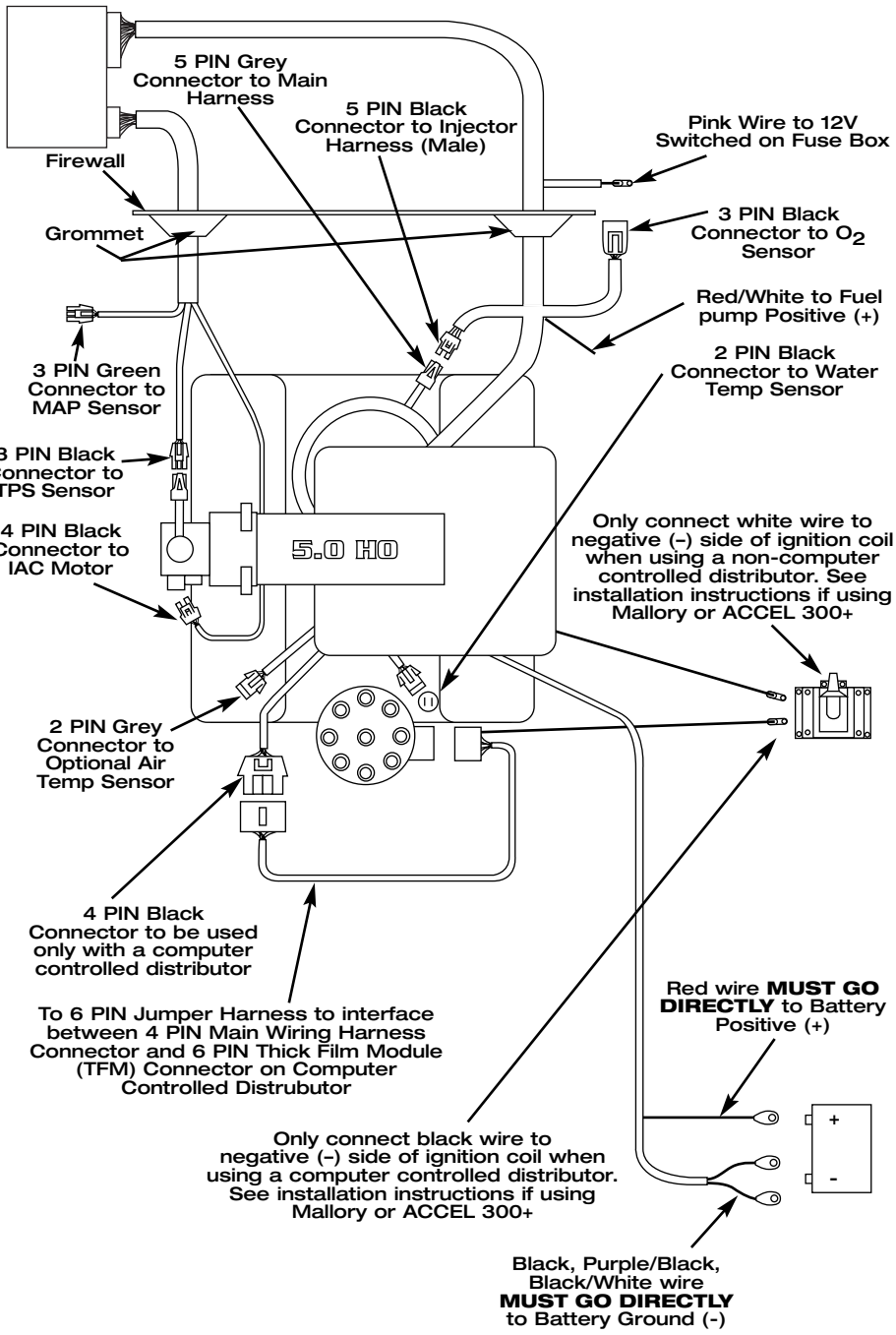
The passenger side harness leg will contain the following sensor connections:

- Oxygen (3-pin female black con
- Injector (5-pin round white con
- Tach pick-up (1-pin brown con
- Fuel pump (bare lead, red wire
- IAC (4-pin square male black co

Connect each to the appropriate s
at the end of this section. If you n
pump wire to reach your fuel pu
least 14 gauge wire, soldering an
connection between the two wire
connect both the positive and gro
wiring harness DIRECTLY to the
this, intermittent and unusual pro

NOTE: If you are controlling timi
ECM (using a computer-controlle
etc.) the Tach pick-up will not be
Tach pick-up and the computer-co
at the same time, your ACCEL DF
both out resulting in a no spark (
In many cases this will also dama

At this time you can connect you
(UIM, or Power Tuner) to the MW
6-way connector (located near the
6-way connector on the UIM. If y
there is nothing for you to do wit
the MWH. If using a UIM mount
sheet metal screws or 20 pan hea
location convenient to the driver.



VI. CHOOSING YOUR

NON-COMPUTER-CONTROLLE

If you are using a stand-alone ma
points distributor, etc., the Tach p
connector) must be used. Connect
side of the coil. If the brown conn
make sure not to remove the 39K
located 3" away from the existing

NOTE: If you are using an afterm
box (i.e. ACCEL 300+, Mallory Hy
pick-up connector MUST be conn
box's Tach output signal. It is also
39K ohm resistor from the Tach pi
from the end of the Tach pick-up
this lead to the negative side of th
box. This can result in ECM dama

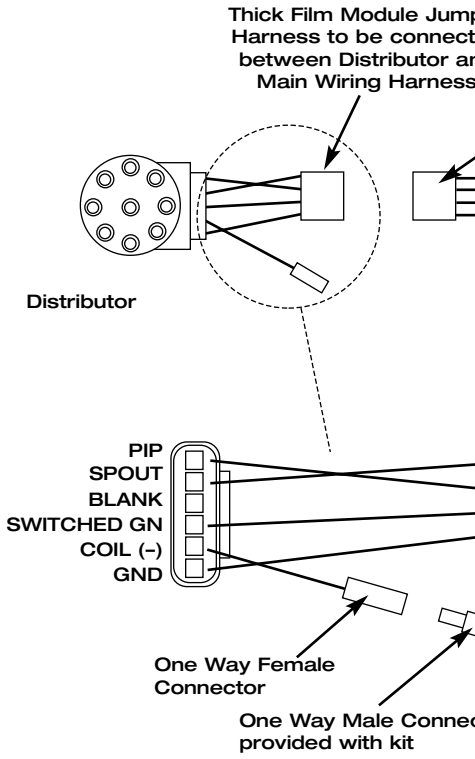
ACCEL strongly urges the use of a
wire such as ACCEL 300+ or ACC
Wires. We have encountered prob
suppressing electrical noise) with
available on the market such as h
core. The use of these wires may i
operation of the ECM. Further, son
ignition units also produce electri
interfere with the ECM's operatio
strictly at the risk of the owner. C
recommendations of ignition syst

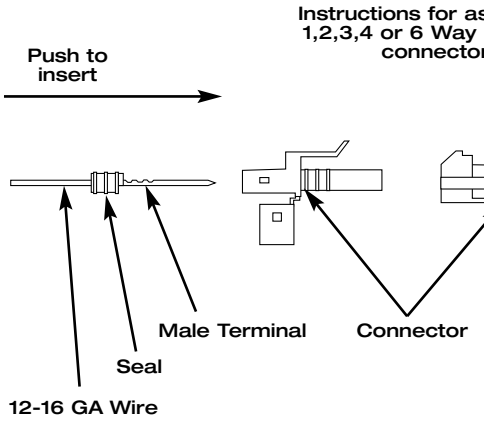
The total advance to which you set the engine will depend upon the engine you have. Vacuum advance should be controlled with the EGR port, which is located before the throttle blades. ACCEL DFI recommends a distributor with an adjustable vacuum advance. Once the total advance is set, connect the vacuum line to the canister. Adjust the canister to maintain 20-26 degrees with a hot idle at 800 RPM. Again, this is ACCEL's recommendation, depending upon compression ratio and cam profile, you may have to decrease this to avoid detonation.

COMPUTER-CONTROLLED IGNITION

If you are using a TFI distributor you will need to connect the TFI adapter harness to the 4-pin black ignition control connector on the MWH. After doing so you can plug the 6-way end into your TFI distributor; the 1-pin black connector will go to the negative side of your ignition coil or points/lead of your enhancer box. You can also control timing by using a magnetic pick-up distributor or crank trigger. In order to do so you must get a modification done to your ACCEL DFI ECM (ACCEL DFI part number 74043-I). This modification will come with the necessary wiring (this wiring with replace the TFI adapter) but will not come with an enhancer box that is required. If you will need this modification, contact ACCEL DFI for further instructions and a shipping address.

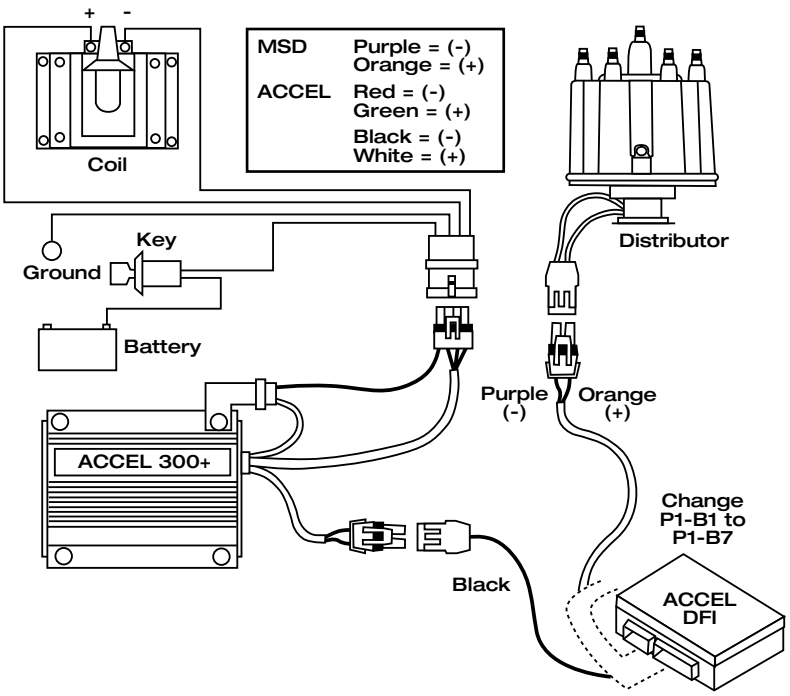
In order to set the initial timing, the ignition bypass connectors (two 1-pin connectors) incorporated into the ignition control leg must be disconnected. With the engine running hot at 800 RPM, manually adjust the distributor to 6 degrees BTDC. Once adjusted, reconnect the ignition bypass line. As soon as you connect the bypass line the ACCEL DFI ECM regains control of the timing. The spark





curve is pre-programmed into the ECM from ACCEL DFI. It has initial timing of 20 degrees BTDC and a total timing of 34 degrees BTDC in by 3000 RPM. The timing curves, as well as all other tables in the ECM, can be adjusted to better suit your engines requirements using ACCEL DFI's calibration software "CALMAP".

NOTE: If an aftermarket ignition enhancer box is used (i.e. ACCEL 300+, MALLORY HyFire), the TFI distributor can be wired as described by the manufacturer of the enhancer box. However, if you are controlling timing with a magnetic pick-up distributor or a crank trigger, refer to the illustration below.



VII. FUEL PUMP M
AND HIGH PRESSURE LI

ACCEL DFI currently has two hig
available: part number 74701, an e
which can support up to 450 hors
number 74702 which can support
45 PSI. This fuel pump can be mo
on the frame rail. You can use par
this pump onto your frame rail. R
pump used, be sure to mount you
at a point of fuel level and in a pr
components must also be protecte
exhaust and engine compartment
potential road damage.

FUEL PUMP WIRING

The fuel pump requires a +12 volt
was originally an EFI vehicle and
installed, you still MUST use the A
Connect the +12 VDC side of the
DFI main wiring harness, using th
tracer. The fuel pump relay is alre
main wiring harness and is contro
no wiring is necessary for the rela
between 4 and 8 amps of current
fuel system pressure, so 14 gauge
the pump to the red wire with wh
solder the connection between the
for the fuel pump can be at any cl
the chassis to the negative (-) term
Make sure that wiring between th
engine compartment does not hang
with rotating parts, or become exp

MECHANICAL PUMP REMOVAL

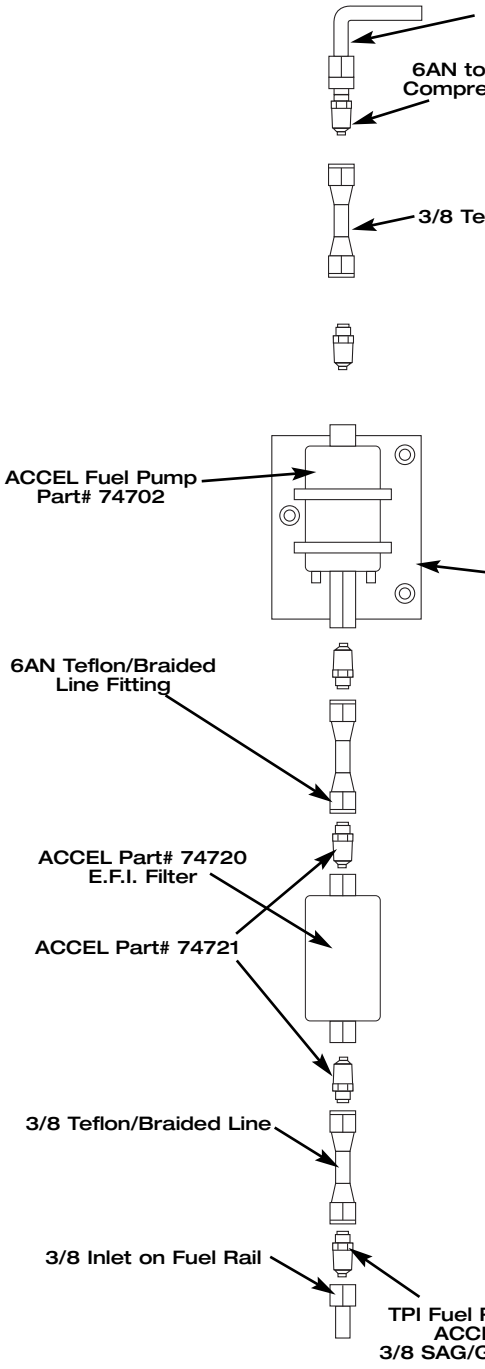
If your engine was carbureted, be sure to either cap off the fittings on your mechanical pump or remove the pump and cover the opening with a block off plate.

HIGH PRESSURE FUEL FILTER MOUNTING

Locate the high pressure fuel filter at the outlet of the high pressure fuel pump on the frame rail. It is recommended to place a filter between the fuel tank outlet and the pump inlet if the pickup tube in the tank does not have a filter. Failure to do so can result in fuel pump damage. ACCEL DFI high pressure filter, part number 74720 requires 3/8" Saginaw fittings. If your filter does not have these fittings you can use part number 74721, these adapter fittings will fit the 74720 filter and allow you to use a 6AN fitting.

ROUTING HIGH PRESSURE FUEL HOSE

At this point the high pressure circuit of the fuel system can be plumbed (refer to diagram at the end of this section). If the existing fuel supply line cannot sustain 150 PSI fuel pressure (ACCEL recommends a fuel line rated to at least 330 PSI), then it must be replaced with high pressure fuel line/tubing. Remember, with a carburetor, your fuel system operated at about 6 PSI. However, with fuel injection, the system operates around 50 PSI of fuel pressure. Never take any chances. If in doubt, replace the hose. You will need a minimum of 3/8" ID supply line and 5/16" ID return.



NOTE: If using ACCEL Pump Part #74701, please contact ACCEL/DFI Techn

DUAL FUEL TANKS

It is important to note that for vehicles with two fuel tanks and/or a class "A" RV, it is highly recommended that a boost pump be installed in each tank and feed though a multi-port switching valve, especially when operating in hot climates. Boost pumps used on such vehicles as a 1985 Ford F-250 5.0L EFI will work well for this type of application. The switching valve from a 1984 Ford Diesel or a 1986 Chevrolet C-10 (305 CID) will work well in dual tank applications. Dual tank equipped vehicles must be plumbed to return excess fuel to the tank which is supplying fuel to the EFI system to avoid tank overflow problems. The remotely-activated dual tank three-way valves described above will work well in these applications.

A NOTE TO THE INSTALLER

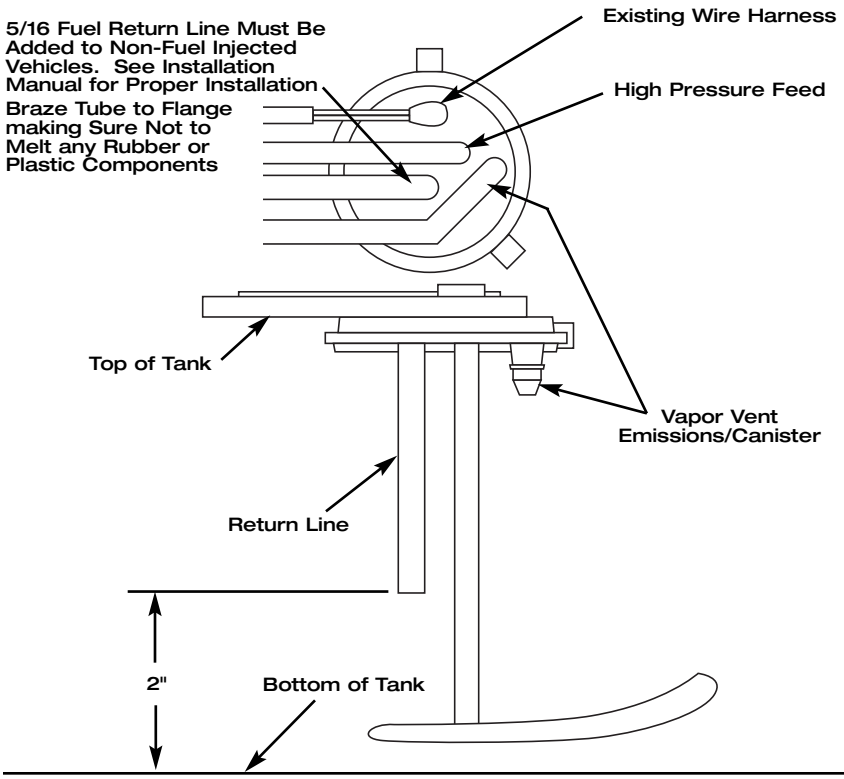
There seems to be a misunderstanding with some people that a fuel pump "produces pressure". This is not accurate. What actually happens is the pump produces fuel flow at a given system pressure which is dictated by the pressure regulator. The pressure regulator has a spring which is preset to provide a certain system pressure, i.e. 45 PSI. The regulator opens as the pressure in the fuel line increases due to the flow of fuel provided by the pump.

As the pressure drops, due to bypassing of fuel to the tank, the regulator closes at a pressure of 45 PSI (this pressure is variable on adjustable regulators). This process will begin again as pressure raises. Therefore, the pressure regulator is a dynamic modulating device which always tries to seek its preset pressure.

SENDING UNIT MODIFICATION

To install a return line in your tan
assembly from the fuel tank and c
the top of the flange. Be sure to gi
to weld the tube into place, weldi
discussed later in this section. AC
part number 74731, will supply yo
other lines that you may need. Pr
fuel line so that the in-tank portio
bottom of the tank and away from
figure at the end of this section). E
of this tube does not interfere wit
on the tank unit. Clean the unit w
to the next step. Seal and secure th
by welding or brazing with low h
does not occur. Also make sure th
damage the sending unit wires or
welded area and check for cracks
tubes or welded area.

Check the condition of the filter s
If the sock is torn or contaminated
are not using a filter sock in your
filter between the fuel tank supply
your fuel pump.



RETURN FUEL LINE INSTALLATION

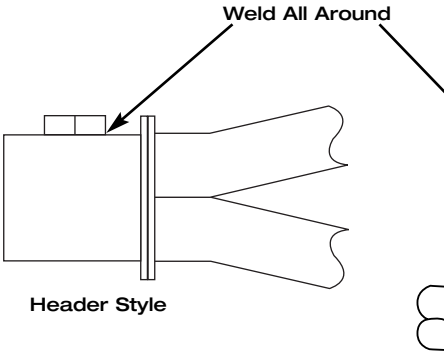
If your vehicle was originally equipped with a carburetor, you MUST run a 5/16" ID (inner diameter) or larger return line from the engine (fuel pressure regulator) to the fuel tank. Some vehicles with carburetors came with 1/4" diameter return lines. This is too small in ID (inner diameter) and will create an unacceptable amount of back pressure in the fuel line, thus causing a rich condition. Using good judgment install a fuel line from the pressure regulator outlet to the fuel tank with restriction free bends in protected areas (refer to the diagram at the end of the "Routing High Pressure Fuel Hose" section). The fitting at

the pressure regulator is a #5 AN
recommends a #5 AN to 5/16" A
connector to connect the 5/16" re

ACCEL DFI recommends using a
and return line plumbing, such as
stainless steel Teflon AQP by Are

VIII. MOUNTING THE

The ACCEL DFI System comes wi
M18 X 1.5 hex nut. This nut is to b
(preferably the passenger side) of
to mounting the nut, drill a perpe
hole in the exhaust pipe of header
to mount this nut closest to the he
manifold) without interfering wit
flanges.



IX. AIR CLEANER ASSEMBLY

If you are using a stock throttle body on your application, the ACCEL POWERFILTER division of ACCEL may very well have a high performance reusable air cleaner for you. They may also have one for your custom application, contact ACCEL's Technical support team for more information.

At this point all the electrical connections should be made between the sensors, computer, and optional equipment. Keep in mind that you will have at least one extra connector that will not be used on the main wiring harness. Now connect the positive terminal to the positive side of the battery, and the ground wires to the negative battery terminal (refer to the diagram in section V).

X. STARTING THE VEHICLE

Turn the ignition key to the run position. Do not crank yet. The fuel pump should run for two seconds, then shut off. Now turn the ignition key off. Repeat this procedure of turning the key on and off four times, listening carefully for the fuel pump. This is needed to prime the fuel delivery system. The best way to check if the system is priming is to connect a fuel pressure gauge to the shroeder valve on the fuel rail. ACCEL DFI offers gauges for some Ford applications, check your application with one of ACCEL's dealers. Now check for leaks along the entire length of the vehicle. Crank the engine. After the engine starts, the engine should fast idle and the speed will decrease as the coolant temperature heats up. If the engine does not start after ten seconds of cranking, check the following:

A) All electrical and mechanical c
securely.
B) There are no fuel leaks.
C) The fuel feed line is pressurize
common problem is the fuel p
On the ACCEL pumps, the po
designations are casted in the
terminals. If the ACCEL 74702
backwards, it will run backwa
D) Ensure that the engine timing

XI. OPTIONA

(1) User Interface Module (UIM, p

This option allows the driver to c
dimensional fuel table while the e
UIM contains two potentiometers
decreasing the amount of fuel sup
idle and WOT. The idle potentiom
with the ability to increase or dec
idle and part throttle by 10%. The
comes into play only when the th
percent increase and decrease is 2
change the amount of fuel deliver

The UIM must remain connected
harness after adjustments are mad
disconnected, the ECM will autom
its preset values.

If your engine requires a somewh
than is noted on the ECM or you
engine combination, use the ACC

Communications Interface option, CALMAP (part number 74990-S with a 5ft cable, 74990-L with a 25ft cable). This software will allow you to customize the Fuel and Timing curves as well as all other parameters in the ECM.

FAN CONTROL KIT (PART NUMBER 74171)

This kit includes a harness with a integral relay that interfaces between the ECM and the fan. This allows you to turn on an electric fan at a given engine temperature via CALMAP. This kit does not include a fan.

NITROUS OXIDE CONTROL (part numbers listed below)

Single Stage Harness Only
Part Number 74253

Multi-Stage Harness Only
Part Number 74697

Although ACCEL DFI currently does not have complete nitrous oxide kits available for Ford applications, we do offer the necessary wiring to allow you to control your nitrous through the ACCEL DFI ECM. The part numbers listed above are ready to plug into your ACCEL DFI ECM and nitrous solenoid to give you exact delay control, ignition timing and fuel control over your nitrous system. ACCEL can also offer you the nitrous solenoid, contact your local ACCEL EMIC dealer for more information.

XII. TROUBLE SHOO

The following are some common
encountered with various installa

Injectors not firing (clicking) - th
- Usually due to a low battery. Vo
  (9) volts during cranking to acti
- Injector harness not connected to
- Short in either pin P1-C7 or P1-
  battery positive (+) and negativ
  meter.
- Tach wires to positive (+) side of
- P1-D7 (long pink wire with fem
  receiving +12 volts during cranl
  connecting this wire to a voltag
  during cranking.

Runs rich at idle:
- Vacuum line to fuel pressure reg
- MAP sensor vacuum line pinch
- UIM idle knob turned all one w
- Wrong injectors for the applicat
- Return fuel line is too small/res
- Calibration in the ECM is wrong

Runs rich all the time:
- Wrong injectors for the applicat
- Return line is too small/restrict
- Calibration in the ECM is wrong

Engine cranks a while before sta
- +12V and ground terminals not c
- Fuel pump is not priming the fu

If you are experiencing problems ple
dealer, of feel free to call ACCEL's te
to an ACCEL DFI technical represent

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