INTAKE SWAP INSTRUCTION MANUAL

1.Items to pick up before you begin:

- Someone to lend you a hand for about 10 minutes
- Intake gasket set that pertains to your year of engine
- Coil of your choice
- Spark plugs (Copper Accel U-groove is our preferred choice)
- Wires (5.8 wires also an option sometimes fit nicer and tighter)
- 5/16” fitting (Brass: barbed on one side / male threads on the other)
- A pack of JB Kwik weld (We prefer Kwik due to its set up time)
- Block off plate for mechanical fuel pump
- 5/16” Hard fuel line (20’ spool)
- Flaring kit for fuel lines (if you don’t already have one)
- 5/16” EFI rubber line (about 4’)
- EFI Style hose clamps (Size 14-16)
- Fuel Filter (We prefer the Wix clear plastic ones over the expensive Mr. Gasket glass ones)
- Two fuse holders (you’ll need a 15-amp and a 10-amp fuse also)
- DVOM (voltmeter) if you don’t already own one
- 195° Thermostat
- Thermostat Gasket (AutoZone has a nice reusable one)
- Heat shrink but connectors, get a couple of each size. Harbor Freight’s are the cheapest and the best)
- A package of different sized vacuum caps (we prefer Nylon colored ones, we have found they stand up better than rubber)

When your kit arrives please remove everything from boxes and confirm that nothing is damaged from shipping and handling. Use an air compressor and blow out all passages of the intake and throttle body!!

2.Tear Down

1. **Disconnect Battery.**

2. **Rotate engine to TDC position.**

3. **Before removing the Distributor: One of our tricks for later dropping the new distributor in is to take a picture of the cap's orientation and then the rotor's orientation.**

4. **Remove the distributor and use a rag to plug hole to prevent contaminants from falling into the engine.**

5. **Drain Coolant (Don't drain oil yet, Coolant will fall into oil passages when pulling intake)**

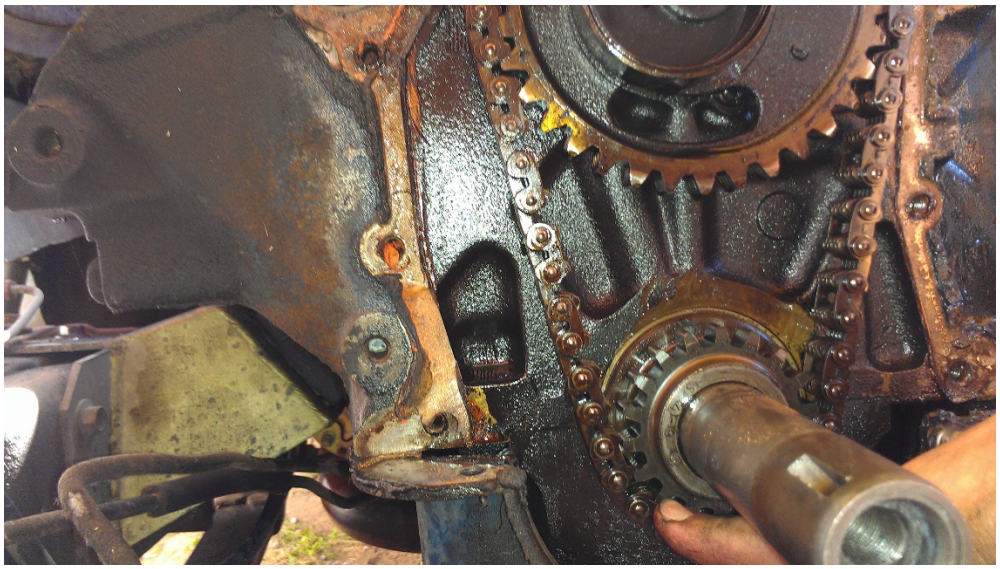
6. **Remove ignition box located by driver side firewall (unplug, don't cut). Leave the wires that go to the Starter, Alternator, Air Conditioning, oil pressure and coolant sensor. Remove all remaining ignition wires from the engine.**

7. **Removing intake:**
    a. **Disconnect throttle cable or linkage.**
    b. **Disconnect fuel lines running to carburetor (These can be cut since new lines will need to be ran).**
    c. **Remove intake (Coolant will drain into oil system).**

8. **Remove Mechanical Fuel Pump and install a fuel pump block off plate.**

9. **Through the fuel pump passage: you must inspect timing chain (VERY IMPORTANT!! If not in spec, replace timing chain now).**

    a. **Pictured below is an out of spec timing chain that was very close to jumping teeth and engine destruction.**



10. **See "pedal and cable modification instruction manual" for style that applies to your kit and vehicle. This is easiest if done with the intake removed.**

3.Intake Installation

1. **Before you begin, do a final clean and inspections of intake to ensure it is clear of debris (we recommend blowing out with compressed air). On the engine use a razor blade to scrape all the mating surfaces, then use acetone to remove grease and residue.**

2. **Install intake with new gaskets and torque to spec**
    a. **This can be done full assembled (but is usually much easier if the fuel rails, injectors, and throttle body are removed).**
    b. **Using clean bearing grease: lightly coat all O-rings, threads, and barbed ends.**
    c. **Reinstall injectors, fuel rails, and throttle body.**

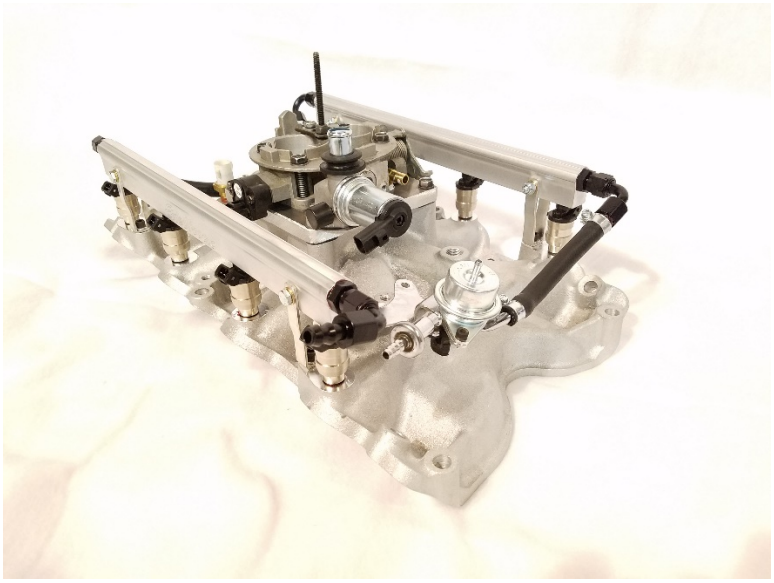
3. **Install fittings into fuel rails**
    a. **Install adapters on ends of fuel rails. The O-ring side goes on the rails x4**
        i. **Part# EAR-AT985006ERL**

b. **Install both the -6AN to 3/8” 90° barbed ends on rear of fuel rails pointed towards driver side “hand tight”**
    i. **Part# SUM-260687B**

c. **Install both -6AN to 3/8” 150° barbed ends on front of fuel rails pointed towards center and down “hand tight”**
    i. **Part# SUM-260691B**

d. **Refer to orientation in picture below**
    i. **Front**

ii. **Rear**



e. **Use 3/8” EFI hose to connect the front adapters together as seen in pictures (Be sure it will clear the distributer when installed).**
f. **Use 3/8” EFI hose to connect the passenger side rear to the fuel pressure regulator. It can be mounted anywhere where convenient if needed.**
g. **High Pressure or “Feed” line will be on the driver side rear with the barbed end.**
h. **Low Pressure or “Return” line will come off the Regulator to return to tank’s fill up tube.**
i. **After this is all set-up and the orientation is good, tighten all the AN fittings and hose clamps.**

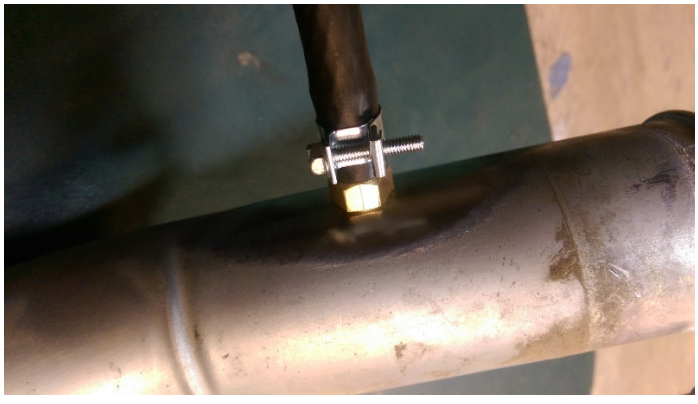
4. **Running Fuel Pump and High Pressure “Feed” Lines**
   a. **Mount the fuel pump as low on the frame and as close to the fuel tank as possible.**
      i. **Run a wire from where the old ignition box was down to the (+) prong of the fuel pump (We will hook this up later).**
      ii. **Clean a good spot on frame for the ground wire of the fuel pump.**

b. **You can use your existing steel fuel lines after the fuel pump up to the 3/8" barbed fitting on the fuel rail. However, any and all rubber fuel lines must be replaced with EFI rated fuel line and only use EFI style hose clamps.**
c. **Always install the fuel filters BEFORE the pump.**
    i. **If you have dual tanks refer to the "dual tank instruction manual".**
d. **We HIGHLY recommend that you use your bubble flare tool for all the hardline connections.**

5. **Running the Low Pressure "Return" line**

Do Not run the return line into the burp tube, it will making pumping gas next to impossible.

a. **For dual tanks refer to the "dual tank instruction manual"**
b. **Before you begin, use a Sharpie and mark a good place to install the return line. You will want this about an inch up from where the Fill Tube's rubber stops. Then remove fill-up tube. Clean with water to ensure no gas vapors left in tube.**
c. **Drill a pilot hole about where you have the Sharpie mark. Then drill the hole larger so that turning the brass barbed piece in is very difficult but possible.**
d. **Clean the fill up tube out of any debris.**
e. **Using your 5-16" brass fitting thread into hole carefully.**



i. **This is where you will use the JB KWIK weld to ensure that the fuel will not leak.**

4.Perform Oil Change and Replace Coolant

1. **There will be coolant in oil from removing old intake. The old oil helps flush all possible coolant out of the oil pan. Go ahead and do your oil change now.**
2. **Fill up your coolant system.**

5.Distributor Installation

1. **Clean distributor hole of debris (a clean shop rag works fine).**
2. **Install distributor in same orientation in which it was pulled off (refer to the pictures you took earlier).**
3. **Tighten down the hold down "snug" where you can still make adjustments later.**
4. **Don't install spark plug wires yet (they will just get in the way).**

6.Installing Wiring Harness

1. **PLEASE READ THIS SECTION SEVERAL TIMES, then begin.**
    a. **DO NOT hook up battery (+) (-) until instructed. These components are tough but are easily damaged by intermittent power, ground, or faulty tachometer. WE ARE NOT LIABLE FOR FRIED components due to improper power or ground.**
    b. **NEVER leave keys in ignition while connecting or disconnecting battery.**
    c. **NEVER use a tachometer that is not 100% confirmed reliable and functional.**
    d. **It Is HIGHLY recommended that you install a sufficient ground from engine to chassis and from engine to battery (Insufficient ground can lead to grounding through ECU and overloading it).**
    e. **When installing pigtails do not attempt to force them this can bend prongs and then your system will not perform as it should or at all (Some connectors are keyed differently but look very similar).**

2. **Installing wiring harness**
    a. **Start by placing the ECU on the driver side fender under the hood spring with the connector side facing the firewall**
    b. **Connecting the 60-pin connector to the ecu:**
        i. **Hand thread the 10mm bolt that holds in until hand tight (be gentle this should feed in nice and smooth).**
        ii. **Using a 10mm socket gently and slowly secure the connector (notice when it is seated and STOP!).**

c. **Fuses and relays will run towards the driver headlight and mount on the fender just after ECU, as pictured below.**

d. **On the harness, the longest lead will be thin with two wires coming out. These are BATT (+) and BATT (-).**
    i. **Run these wires along the top of the firewall around to the passenger side.**
    ii. **DO NOT HOOK UP YET! (this is just for harness placement).**
e. **If harness came in two separate parts, connect them now (Engine side and Chassis side).**
f. **Start with the leg that is labeled with Injector #1 – Injector#4**
    i. **This side will be fed around the backside of the intake with Injector #1 coming closes to the front passenger side of engine.**
    ii. **Connect "INJECTOR #1 – INJECTOR #4"**
g. **Hook up "distributor" pigtail towards the front of the engine.**
h. **Connect "Coolant Temp Sensor" and "Air Charge Temp"**
    i. **"Coolant Temp Sensor" is located next to Injector #5**
    ii. **"Air Charge Temp" is located at the center of the intake just in front of the throttle body.**
    iii. **WARNING! At a glance, these connectors look the same but are keyed in different ways.**

i. **Connect "INJECTOR #5 – INJECTOR #8" located on driver side of engine**
j. **Connect "Throttle Position Sensor" located on the throttle body.**
k. **Connect "Idle Air Bypass".**
    i. **It is located at the back of throttle body.**
l. **Connect Coil.**
    i. **We have marked "+" "-" for ease to use whatever application you prefer (Use supplied pink weatherproof butt connectors).**
m. **Connect and mount MAP sensor**
    i. **Find a good place that both the connector and vacuum tube can be connected without stressing wires or rubber tube.**
n. **Connect spark plug wires.**
    i. **Firing order 460/429 + FE motors (15426378)**
    ii. **Firing order 400m/351m (13726548)**
o. **Oxygen Sensor**
    i. **We recommend placing O^2 Sensor 16"-36" from the closest exhaust port on the driver side. With long tube headers place it at the collector. You will need to weld in the provided Sensor Bung.**
    ii. **The Oxygen Sensor lead has a 4-wire set that is unloomed in the middle. This to offer ease of installation for the customer, this part of the harness can be shortened or lengthened depending on application**
    iii. **Use the supplied heat shrink but connectors, tape over each individually with electrical tape and use the provided cold shrink tape to protect harness.**

p. Ignition Module installation

i. If ignition module is attached to distributor, attach this now if you haven't already.

ii. If ignition module is separate, this MUST be mounted to a metal surface because it is grounded through its mount (We recommend using 2 self-tapping screws, and clean around these screw holes to bare metal).

iii. There should now only be 5 wires left not hooked up

iv. Wait to hook these five wires up until later

1. "ACC (+) KEY POWER ON"
2. "BATT (+)"
3. "BATT (-)"
4. "TACHOMETER"
5. And the fuel pump wire that was ran earlier

v. Besides these five wires make sure all the other pigtails are plugged into their sensors and that all fuel fittings are tight.

q. With the harness still completely unplugged from any power or ground, hook up the battery.

6. Time to find where to hook up the last five wires

1. Grab your helper and your DVOM (voltmeter)

a. If your installation is in an old Ford: Locate the old ignition module plug that looks like the female side of an old-style household extension cord (Pictured

below). Go ahead and cut the two wires and wire strip off ¼" .

i. **Locate the wire that shows 0 volts but has full power when the key is on and also while cranking the engine.**
    1. **Have your helper jump in and make sure the vehicle is in park or neutral and wheels chocked.**
    2. **While you are reading the power at that wire, have them turn the key to on (note the voltage). Then have them crank the engine to ensure it still has at least 10+V while the engine is cranking.**
    3. **If you have found the correct wire disconnect the battery positive and negative. Leave disconnected until the end of this section.**
    4. **Install supplied Y-shaped connector (pictured below). Cap the other wire that you cut.**
    5. **The 1st butt connector is where you will hook up the ACC (+) / Key Power On wire that is red with a black stripe. In the 2nd install a**

fuse holder and hook your fuel pump (+) wire to it. Install a 10-amp fuse.

ii. If your vehicle doesn't have a wire in the engine bay that supplies the correct power, you will need to find one coming from the ignition switch.

b. "TACHOMETER"

i. If running an aftermarket tachometer that is 100% confirmed good hook this wire up to the tachometer wire coming from the harness (it is green with a black stripe).

ii. If your install is in a vehicle with a factory tachometer, you will need to find out if it takes the same signal as an aftermarket tachometer.

c. "BATT (+)"

i. Install the second fuse holder (install 15amp fuse) to either the positive terminal or the hot side of the solenoid. Then connect the yellow "battery (+)" wire up to the fuse holder.

d. "BATT (-)"

i. THIS MUST BE GROUNDED TO THE BATTERY

1. Cannot be grounded to frame or body

2. Now that all the wires are securely ran go ahead and hook up the battery. Prime fuel pump and check for leaks

a. Key the vehicle on ensure that the fuel pump is turning on (Wait and let it prime up the fuel system).

b. Do this cycle a few times to make sure no fuel is leaking anywhere and to make sure the fuel rails are primed for initial start-up

3. Initial Start-Up

a. **Pull out the "TIMING PLUG" located right next to the ignition module**
b. **Start engine**
c. **Use timing light to set distributer to 10°BTDC**
d. **Return plug to "TIMING PLUG"**

4. **Before your drive**
    a. **The ECU needs to learn and adapt to your specific engine (which it will fully do over the first couple days).**
    b. **Before you drive, let the engine run to full operating temp.**
    c. **Remove the "Timing Plug" again and set the timing between 12°-14°BTDC this time (10°BTDC was factory spec, but we all run ours at 12-14 with no problems or issues).**
    d. **Before you drive the vehicle give the engine a few short wide-open throttle taps. Also, go through the RPM ranges a bit.**
5. **Test Driving**
    a. **In the first few miles drive conservatively (the ECU is still learning the engine).**
    b. **Short bursts of wide open throttle are ok.**
    c. **Try to avoid any long duration wide-open throttles or extended under-load scenarios. At for the first 100 miles (don't go pulling a trailer or driving up a mountain).**

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From all of us here a 460 EFI Guys we hope you enjoy your EFI system