

CB PERFORMANCE QUICK TUNE EFI MANUAL



Step 1 - Pre Installation Procedures

A) Before beginning this installation, read the instructions completely and be certain you understand all aspects of the installation before proceeding. There will also be some necessary tests to perform on the vehicle to ensure a successful install.

Check voltage output of the alternator to make sure it falls within acceptable tolerances. This will be between 12.7-14 volts. Check the battery to make sure it is fully charged and is in good condition.

The standard Bosch "Blue Coil" is not compatible with this system.

Standard VW solid core plug wires must not be used. A high quality suppression core wire is required. Ask the tech representative at CB Performance for recommendations.

B) Disconnect the battery. DO NOT proceed further without doing so. It is advisable after disconnecting the battery to drain the fuel tank and remove it. Disconnect the fuel line at the engine and blow the line clear with compressed air (wear eye protection) to be absolutely certain the fuel line is clear of any foreign material or debris. On engines up to 2 liters, the factory fuel line may be used. On engines larger

than 2 liters, install a 3/8" fuel line from the fuel pump to the engine. The larger 3/8" line is needed to prevent fuel starvation to the engine on larger/higher horsepower engines. Make sure the supplied fuel filter are installed. The 1/2" filter is the pre-filter and is installed between the tank outlet and the fuel pump. This is a very high-pressure system. Make sure all hose connections are tight and leak proof.

On All applications, make sure you have a good chassis ground, free of rust or powder coating. Install the Fuel Pressure Regulator (FPR) between the last remaining port of the two fuel rails and the fuel 'T' under the tank. The FPR must not be mounted inside the engine compartment. Extended periods of high temperatures will cause fluctuations in your fuel pressure. Make sure the vacuum line is securely attached to the vacuum port of the FPR.

After engine is started, the FPR needs to be set to 45 lbs. @ idle. Re-check the pressure after the engine warms up. If the pressure has changed you will need to re-adjust it to 45 lbs. @ idle.

Remove the existing carburetors and fuel pump. It may be necessary to mock up the 48 mm throttle bodies and linkage to make sure it fits your particular configuration. Once satisfied with the fit, remove them and use

ducttape to cover the intake ports to prevent any debris from entering the engine.

Step 2 - Wiring

Stretch out the wiring harness to determine the best routing of the wiring for your particular application based on where you want to mount the EMS. If the EMS is going to be installed in a Beetle/Karmann Ghia the EMS is supposed to be installed under the back seat opposite the battery. In other off road applications where the environment is a factor, find the best possible mounting point (an enclosure is a must). Ensure that the harness will reach the engine correctly from its mounting point. The harness is clearly tagged for where all the wires need to go. The ends which connect to the injectors, throttle position sensor, cylinder head temp sensor, and O2 sensor, HEI ignition wiring (if used) as well as the ganged ground wires (engine case attachment required) will need to be routed into the engine bay. A minimum 1 1/4" hole will need to be drilled wherever the wiring is to pass thru sheet metal, so plan well. This is the easiest to do when the throttle bodies/carbs are off for best access. DO NOT cut or modify the wire harness. The harness is designed for you application and modifying it will void any type of warranty or support from CB Performance.

NOTE: The fuel pump must be mounted in the horizontal position.

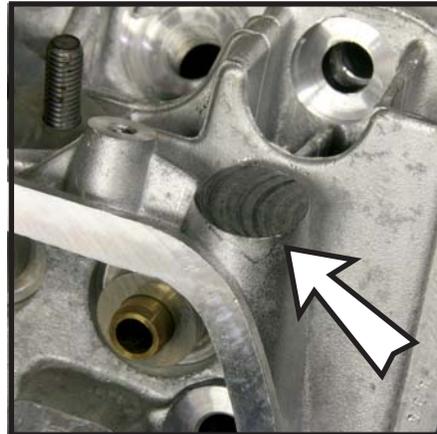
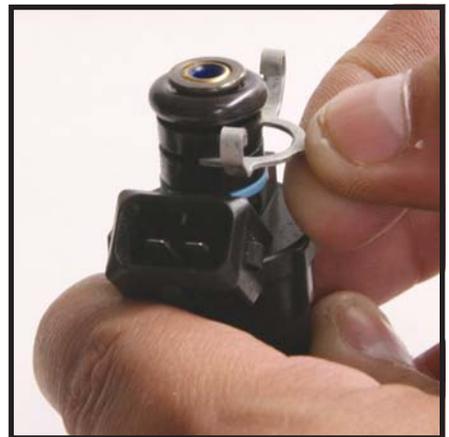
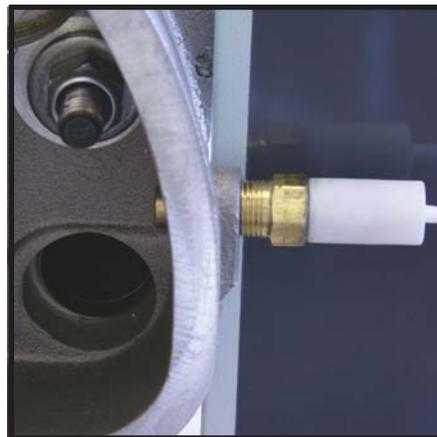
Mounting the fuel pump vertically will damage it. Do not mount the pump at the rear of the vehicle. The fuel pump is designed to be gravity fed from the tank. Trying to pull the fuel through the small diameter stock fuel line will compromise the efficiency of the pump and cause it to run hot or cause it to fail. A pump can tolerate restrictions on the discharge much better than on the suction side.

Mount the EMS under the back seat opposite the battery side of the tunnel. The PLX wide band controller also mounts close by the EMS. Keeping the EMS connector where the EMS is mounted, pull the engine bay segment of the wiring through the hole(s) you drilled being careful not to cut the insulation sheathing as you pass it through. Be sure there is enough slack in the wiring to attach all the connectors without stretching the wires too tightly.

valve cover bail boss. If using clip on style valve covers, we recommend that it be installed below the boss. Make sure before you drill a hole into your cylinder head that there is no interference from push rods or head studs and the sensor. Use an 11/32" drill and a 1/8" pipe tap. You will break through into the rocker box of the head, so be prepared to catch the shavings to prevent entry into the engine. Clean the shavings from the tapped hole and install the sensor using blue loctite for thread sealant.

There are several types of throttle body/manifold setups. Regardless of the setup you are running you must first push the injector clips onto the injectors.

Then grease up the "O" rings on the injectors (DO NOT USE OIL). Take the injectors and push them up into the fuel rails until they seat all the way and you hear the clip latch onto the rail. Next take the rail assembly and push it down into either the throttle body or manifold. In either throttle body or manifold



Step 3 - Hardware Installation

Under no circumstances should Teflon tape be used on any threads in this kit. Use only Blue Loctite for threaded sealant. Teflon tape will find it's way into the fuel injectors and or the fuel pump and damage them.

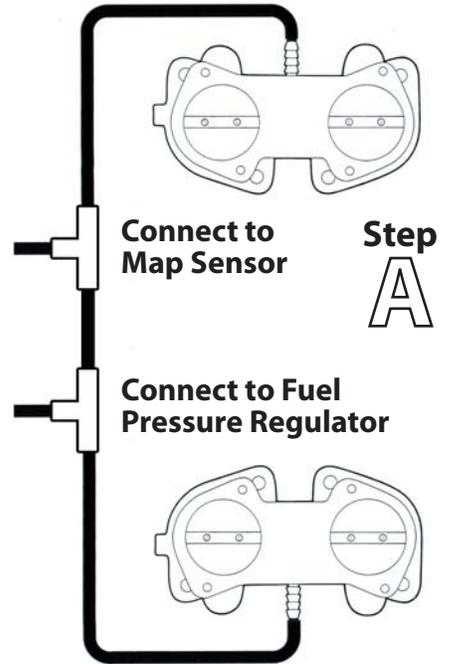
The cylinder head temp sensor is to be installed in the 3-4 cylinder head area. If using bolt on valve covers, we recommend that it be installed in the





assembly, some fuel rail hold downs need to be used. Refer to pictures to correctly assemble the hold down assemblies.

Depending on your vehicle configuration, it may be easier to install the manifolds first without the throttle body rather than the whole assembly. Remove the duct tape covering the intake ports and install the throttle bodies with the supplied gaskets. A fuel pump block off plate will be required



and is provided in the kit.

Connect a 1/4" vacuum hose to the barbed fitting in each throttle body. You will need to install 2 vacuum "T's" in this line. Try to space the "T's" evenly between each Throttle Body. Refer to schematic (step A). One of these "T's" will go to the Map Sensor, the other "T" will go to the fuel pressure regulator. Take a small nylon zip tie, and use it as a clamp to secure the line to the fuel pressure regulator.

It will be necessary to weld an O2 sensor bung into the exhaust if one is not already present. If a 4 into 1 header is being used, install the bung into the muffler head pipe a few inches away from the collector flange, preferably at



somewhere between the 10 O'clock and 2 O'clock position. Turbo Applications: Weld the O2 sensor bung in the collector. Please refer to the pictures above to see the recommended placement of the O2 sensor.

Step 4 - Linkage

See **Dual Throttle Body Linkage Installation Guide** for a detailed diagram.

The first step to assemble your linkage is to slide the linkage arms onto the hex bar. The two linkage arms mount on each end of the hex bar while the straight throttle cable arm mounts in the middle. The throttle cable arm locates 60 degrees, or "one hex degree" down from the linkage arms. There are two centering springs supplied in your kit. Grease these springs very well and push them into each end of the hex bar. Take the two threaded swivel balls and jam nuts and thread them into the linkage bases that are mounted on your throttle bodies. Slip one end of the hex bar into

the swivel ball. While centering the other end, slide it into the second swivel ball. It might be necessary to loosen the throttle body or intake manifold to make enough room to slide the hex bar into place. The swivel balls will need to be adjusted outward until there is a 1/4" of side to side movement of the hex bar. Try to keep the outward adjustment of the swivel balls the same from side to side. Once this is accomplished, lock the jam nuts down. Make sure you have at least a 1/4" of hex bar free play after tightening the jam nuts.

The linkage rods and heim joints are next. There are four heim joints in all. Two right hand and two left hand heim joints with corresponding lock nuts. Each side will need one of each. The linkage rods are equipped with matching right and left hand threads. Thread the locknuts and heim joints onto the linkage rods. Leave these loose for now. After the assembly of the linkage rods is done, secure them to the cross bar linkage arms and the throttle body linkage arms. You will need two open ended wrenches for this operation, an 8mm and 3/8".

Position the aluminum linkage arms on the cross bar so that the throttle linkage rods are vertical when viewed from the rear of the engine. Lock the aluminum linkage arms into position by tightening the Allen set screws to prevent the aluminum linkage arms from sliding on the cross bar. Slide the aluminum throttle cable arm into position to line up with the throttle cable and tighten down the setscrew. Now check the installed linkage rods, both left and right, making sure that the rods rotate freely. Observe the way the rotation changes the length of the rod assembly. Up to this point the linkage assembly should work freely without any drag or binding. If there is any type of resistance, something is not right. Go back and double-check your installation. If everything is in correct working order, tighten up the shake proof lock nuts that secure the heim joints to the upper and lower linkage arms. Tighten these to no more than 2 pounds of torque.

Step 5 - Fine Tuning the Linkage Assembly

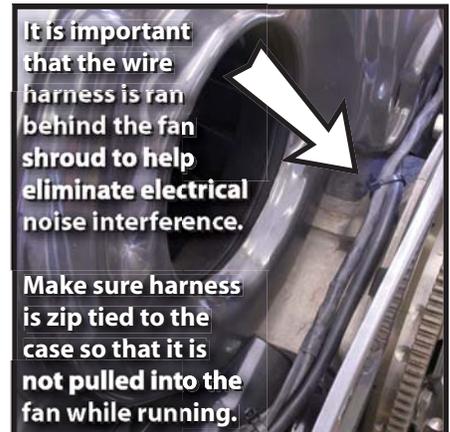
Adjust the throttle linkage by rotating in the right or left hand directions, until both throttle stop arms are resting on the idle speed set screws. By rotating the linkage rods you'll be able to extend or shorten the length of the rods. This will allow you to match the preset throttle bodies. Do not change the position of the idle speed set screws to match your linkage. Adjust the linkage to match the throttle bodies.

Once dialed in, push the aluminum throttle arm down-wards and watch the linkage arms, as they should move from their stops or "closed" position at the same identical time. If they don't, then you have some more adjusting to do.

Step 6 - Wiring Connection

The gang of grounded wires needs to be attached directly to the engine case. One of the case, distributor, or fuel pump block off bolts will suffice for grounding. It's vital that these wires are attached to the engine case to minimize electrical "noise." Snap the injector connectors to the injectors. The connectors are clearly marked. The injectors may be rotated to facilitate easy wiring connection.

The fuel pressure sensor is screwed into one end of one of the fuel rails. Apply blue loctite to the threads and tighten it firmly. It uses a clearly marked connector. Attach the TPS and CHT sensor connectors via their respective



weatherpack connectors.

Screw the O2 sensor into the bung with a little anti-seize compound on the threads and attach the connector. Be sure to route the wiring away from the hot exhaust.

Remove the positive lead from the coil and attach that wire to the wire marked "to ignition switch," and then finally both the coil connections from the EMS to the coil, one marked negative, and one positive. Make sure that there are no "hot" wires from the ignition switch attached to the coil. After connections have been made, tie the wiring harness up and away from hot surfaces and away from the cooling fan inlet. Use rubber grommets on the holes that the wiring passes through.

Step 7 - Fuel Line Connections

A) It is desirable to mount the pump as close to the tank as possible. It uses a rather large 1/2" hose attachment on the suction side along with a similar sized



filter. A new tank bung is provided with a 1/2" hose barb as well. The filter goes inline between the tank and pump, and is marked with an arrow for direction of flow. Make sure it points the correct way. Two "P" clamps are used to attach the pump to any flat surface. Mount the pump below tank level and in the horizontal position. Make sure there are no kinks in the hose. Connect the discharge end to the fuel line in the chassis.

B) On all engines, two fuel lines need to be installed in your vehicle. One for pressure and one for return. Use a 3/8" ID Fuel line for each. Make sure the 1/2" Fuel filter is installed before the fuel pump.

C) The fuel pressure regulator needs to be installed after the last fuel rail. The fuel pressure regulator must never be installed in the engine compartment or near high heat areas. Fuel Pressure fluctuations will occur if the fuel pressure regulator is mounted near heat. Attach the 1/4" vacuum line that is 'T'd between each throttle body to the vacuum port on the fuel pressure regulator. Make sure the connection is tight. Use a clamp if necessary (refer to the fuel pressure schematic page).

D) After engine is started, set fuel pressure to 45 psi @ idle. After engine warms up, recheck pressure and adjust if needed.

A precautionary note: on all applications it is advisable to install the fuel tank, connect the suction line, pour in a little fuel, and check for leaks. Turn the key on and let the pump cycle. The pump is designed to shut off in one second. Turn the key off and wait 5 seconds and turn the key on again. Repeat this process 3-4 times until you have confirmed there are no fuel leaks.

With all the hardware mounted, the connections to the EMS may now be made. The gang of red battery leads attach directly to the positive side of the battery. The PLX device connects both to the main harness and the O2 sensor lead. Those can only be made one way. There is also a power lead to connect to the PLX device. The map sensor has a weatherpack connector that is to be plugged in. Make sure the vacuum line is securely pushed onto the main sensor.

Indicator LEDs on Computer

These LED's will be lit up when each corresponding element is working properly.

- 1 - Tach Signal
- 2 - Fuel Pump Control
- 3 - Switched Power
- 4 - Switched Power
- 5 - Primary Injector Power
- 6 - Secondary Injector Power
- 7 - Primary Injector Pulse

cbperformance.com

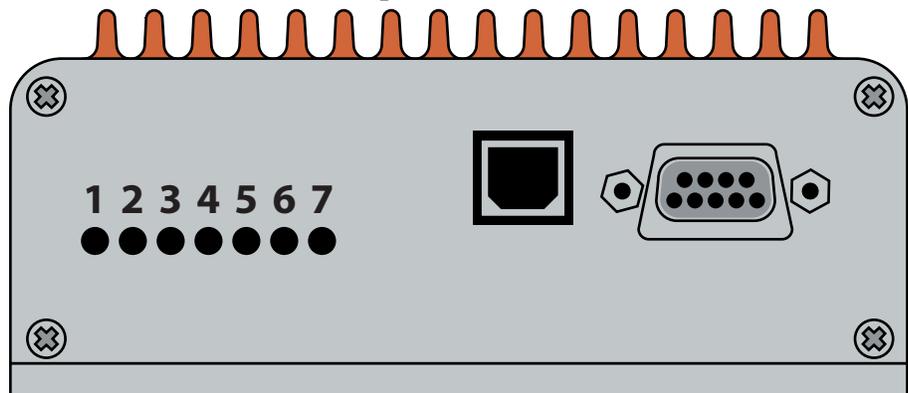
1715 N. Farmersville Blvd.
Farmersville, CA 93223

Phone: (559) 733-8222

Fax: (559) 733-7967

Toll Free: 1-800-274-8337

EFI Computer (side view)



CB PERFORMANCE

"ALL SALES AS IS"

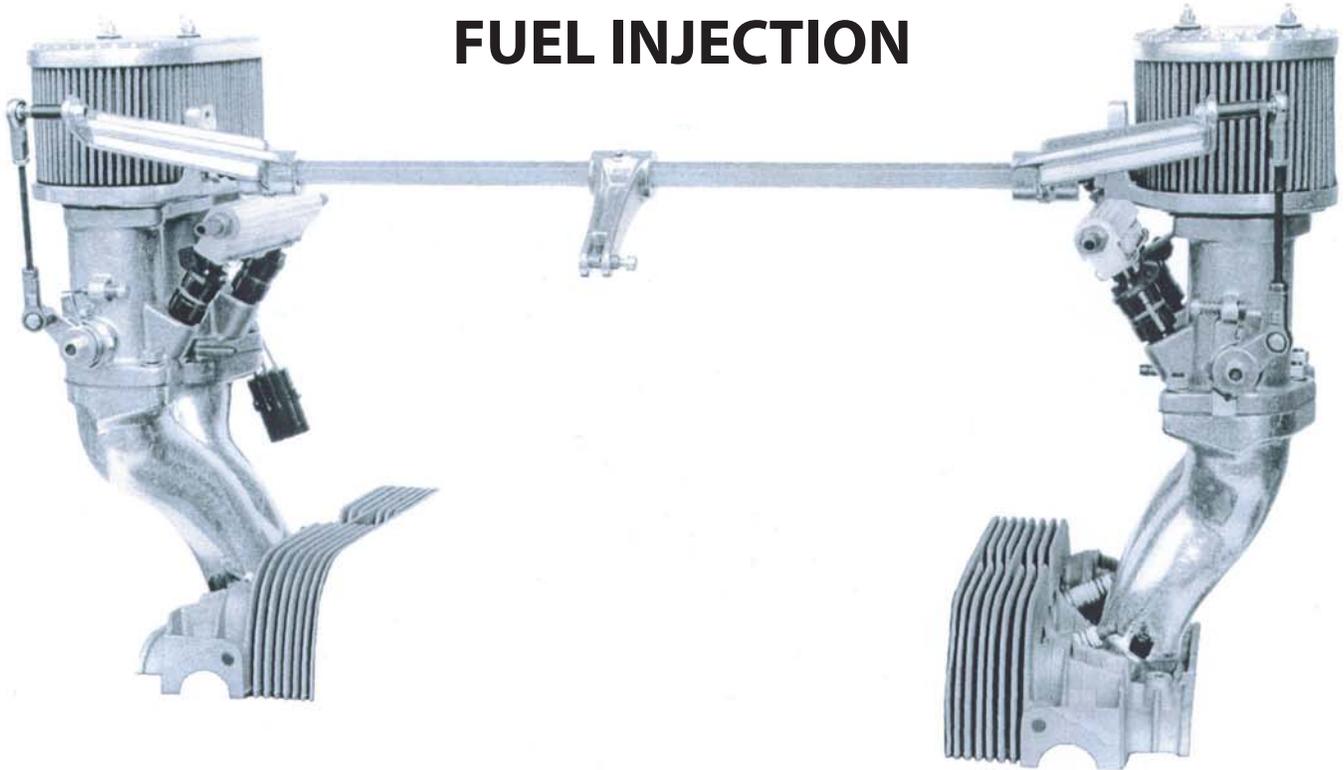
WARNING!

**NEVER, UNDER ANY
CIRCUMSTANCES SHOULD
YOU RUN LEADED RACING FUEL!**

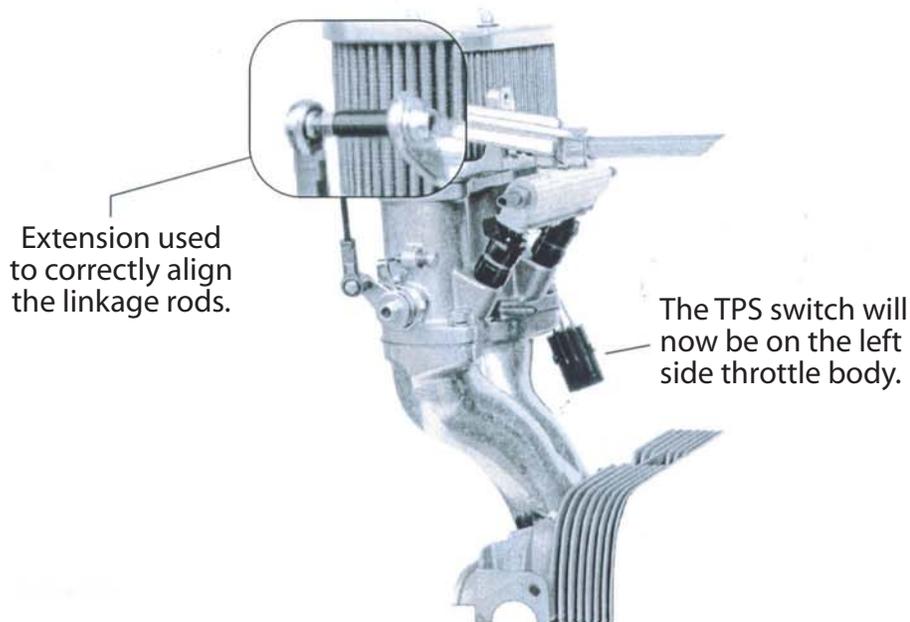
**ONLY UNLEADED RACING FUEL
IS ACCEPTABLE TO RUN IN YOUR
CB QUICK TUNE EFI SYSTEMS**

**SERIOUS DAMAGE TO
OXYGEN SENSOR AND/OR
ENGINE WILL OCCUR
WITH LEADED FUEL.**

SEDAN ULTRA COMPETITION FUEL INJECTION

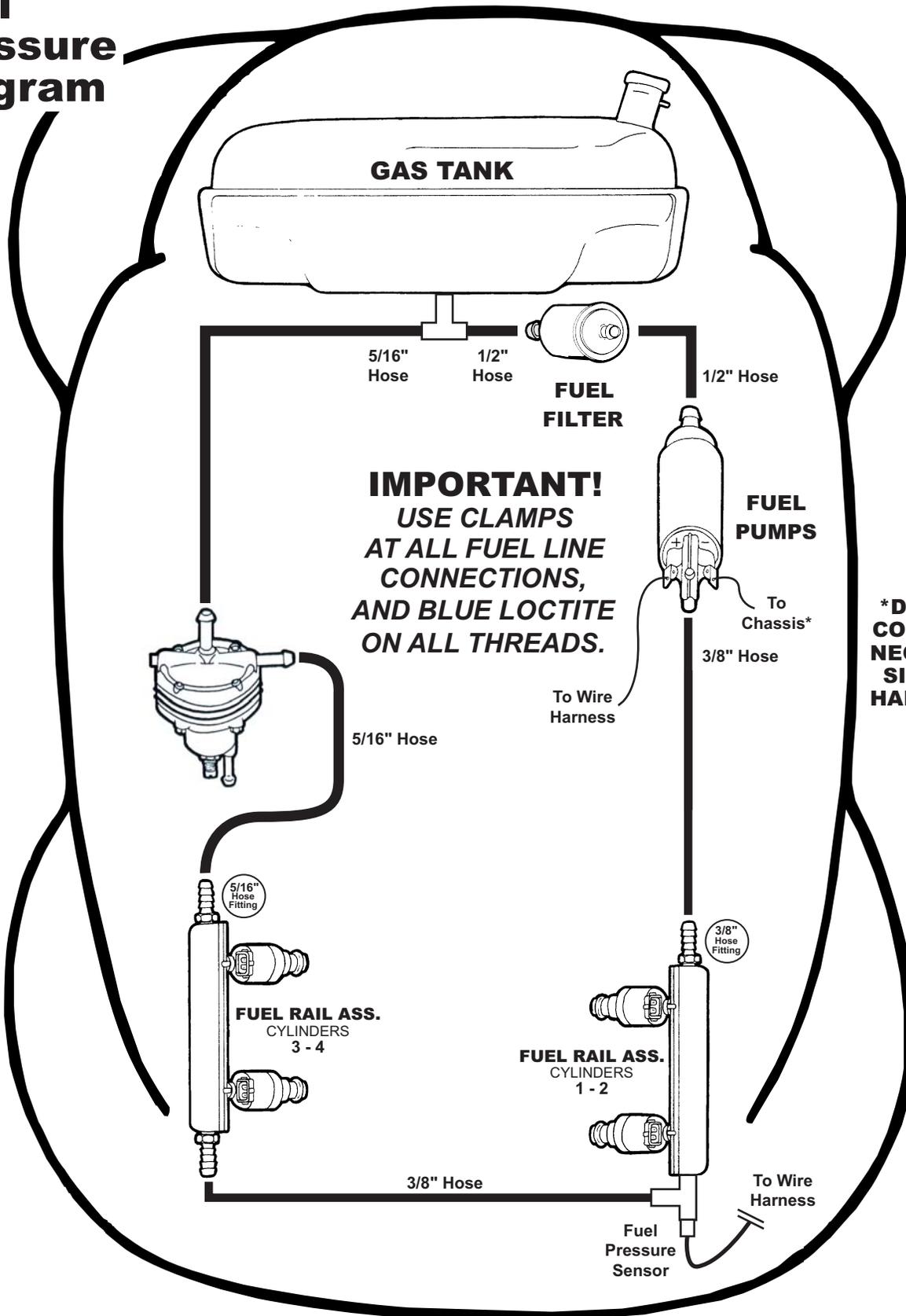


The Sedan Ultra Competition Fuel Injection Kits installed in a similar manner to what was shown in the manual. The major difference is the use of the Space Saver style linkage and manifolds. This enables throttle bodies machined for injectors to be used within a sedan engine compartment. The TPS will now be on the left side throttle body (drivers side) and the injectors will be inboard. There are two extensions used on the aluminum linkage arms to correctly align the linkage rods. Refer to the above photo for a completed view of a Sedan Ultra Competition Fuel Injection Kit.

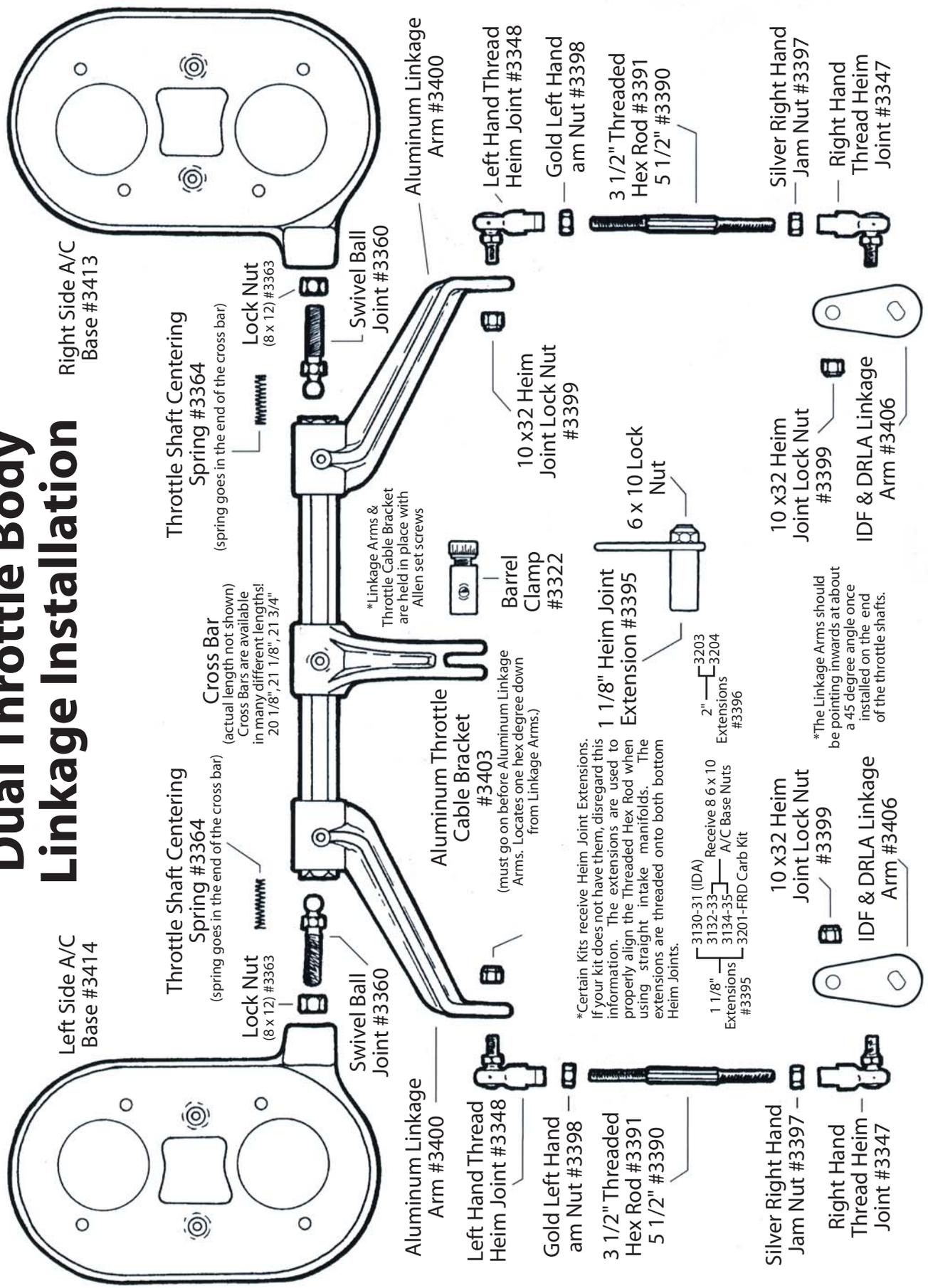


CAUTION - CLEAN AND FLUSH YOU GAS TANK BEFORE INSTALLING YOUR NEW FUEL LINES. THIS IS AN ABSOLUTE MUST! YOUR FUEL SYSTEM MUST BE CLEAN TO OPERATE CORRECTLY!

Fuel Pressure Diagram



Dual Throttle Body Linkage Installation



Right Side A/C Base #3413

Left Side A/C Base #3414

Throttle Shaft Centering Spring #3364
(spring goes in the end of the cross bar)

Throttle Shaft Centering Spring #3364
(spring goes in the end of the cross bar)

Cross Bar
(actual length not shown)
Cross Bars are available in many different lengths!
20 1/8", 21 1/8", 21 3/4"

Lock Nut (8 x 12) #3363

Lock Nut (8 x 12) #3363

Swivel Ball Joint #3360

Swivel Ball Joint #3360

*Linkage Arms & Throttle Cable Bracket are held in place with Allen set screws

Aluminum Linkage Arm #3400

Aluminum Linkage Arm #3400

Left Hand Thread Heim Joint #3348

Left Hand Thread Heim Joint #3348

Gold Left Hand Jam Nut #3398

Gold Left Hand Jam Nut #3398

3 1/2" Threaded Hex Rod #3391
5 1/2" #3390

3 1/2" Threaded Hex Rod #3391
5 1/2" #3390

Silver Right Hand Jam Nut #3397

Silver Right Hand Jam Nut #3397

Right Hand Thread Heim Joint #3347

Right Hand Thread Heim Joint #3347

10 x32 Heim Joint Lock Nut #3399

10 x32 Heim Joint Lock Nut #3399

IDF & DRLA Linkage Arm #3406

IDF & DRLA Linkage Arm #3406

*Certain Kits receive Heim Joint Extensions. If your kit does not have them, disregard this information. The extensions are used to properly align the Threaded Hex Rod when using straight intake manifolds. The extensions are threaded onto both bottom Heim Joints.

1 1/8" Heim Joint Extension #3395

6 x 10 Lock Nut

10 x32 Heim Joint Lock Nut #3399

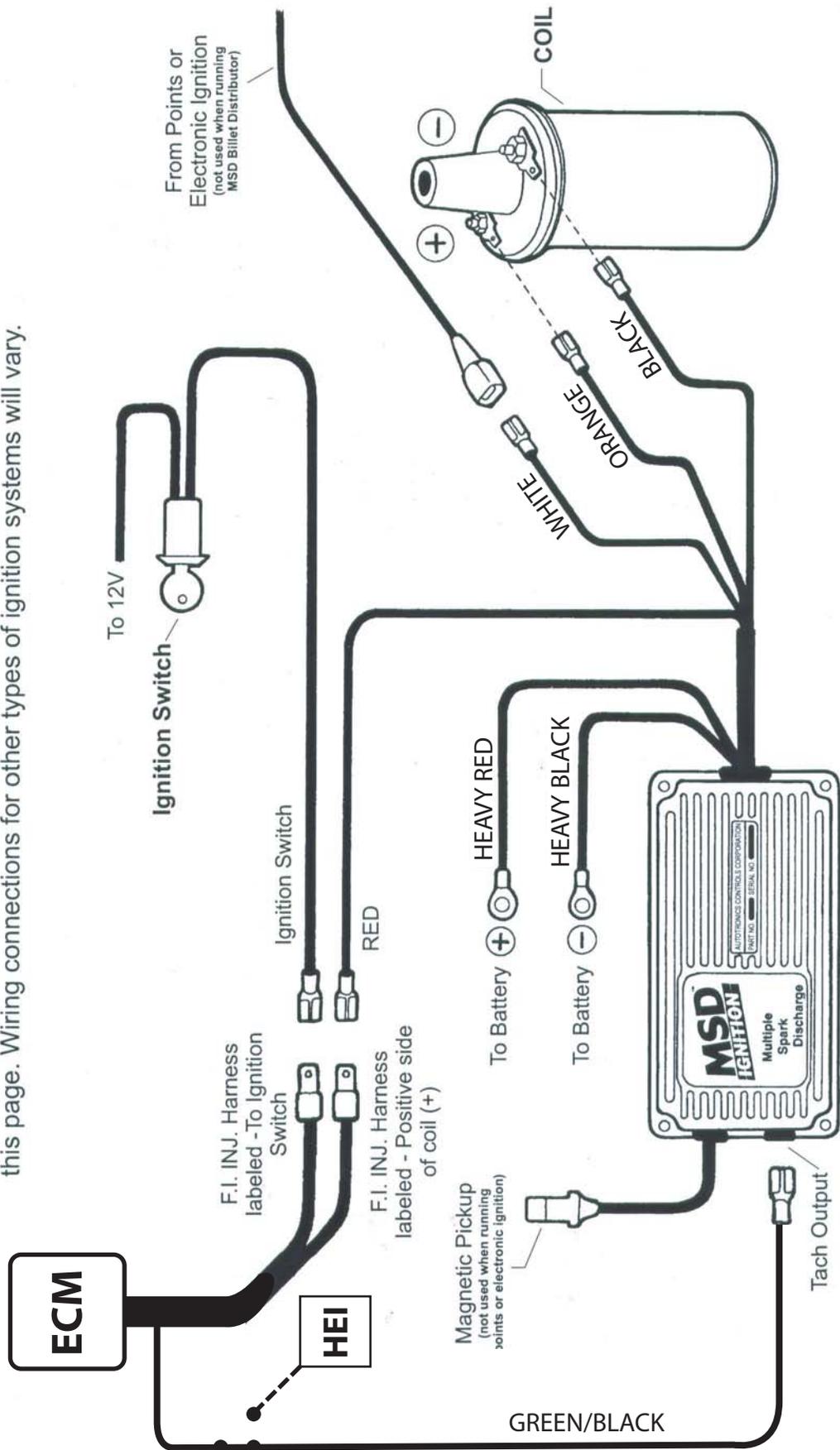
2" Extensions #3203
3204 #3396

1 1/8" Extensions #3395
3130-31 (IDA) Receive 8 6 x 10 A/C Base Nuts #3395
3132-33
3134-35
3201-FRD Carb Kit

*The Linkage Arms should be pointing inwards at about a 45 degree angle once installed on the end of the throttle shafts.

Special Installation Guide for MSD 6 Series Ignition

Refer to the original manufacturers mounting instructions. Attach the wiring as shown on this page. Wiring connections for other types of ignition systems will vary.

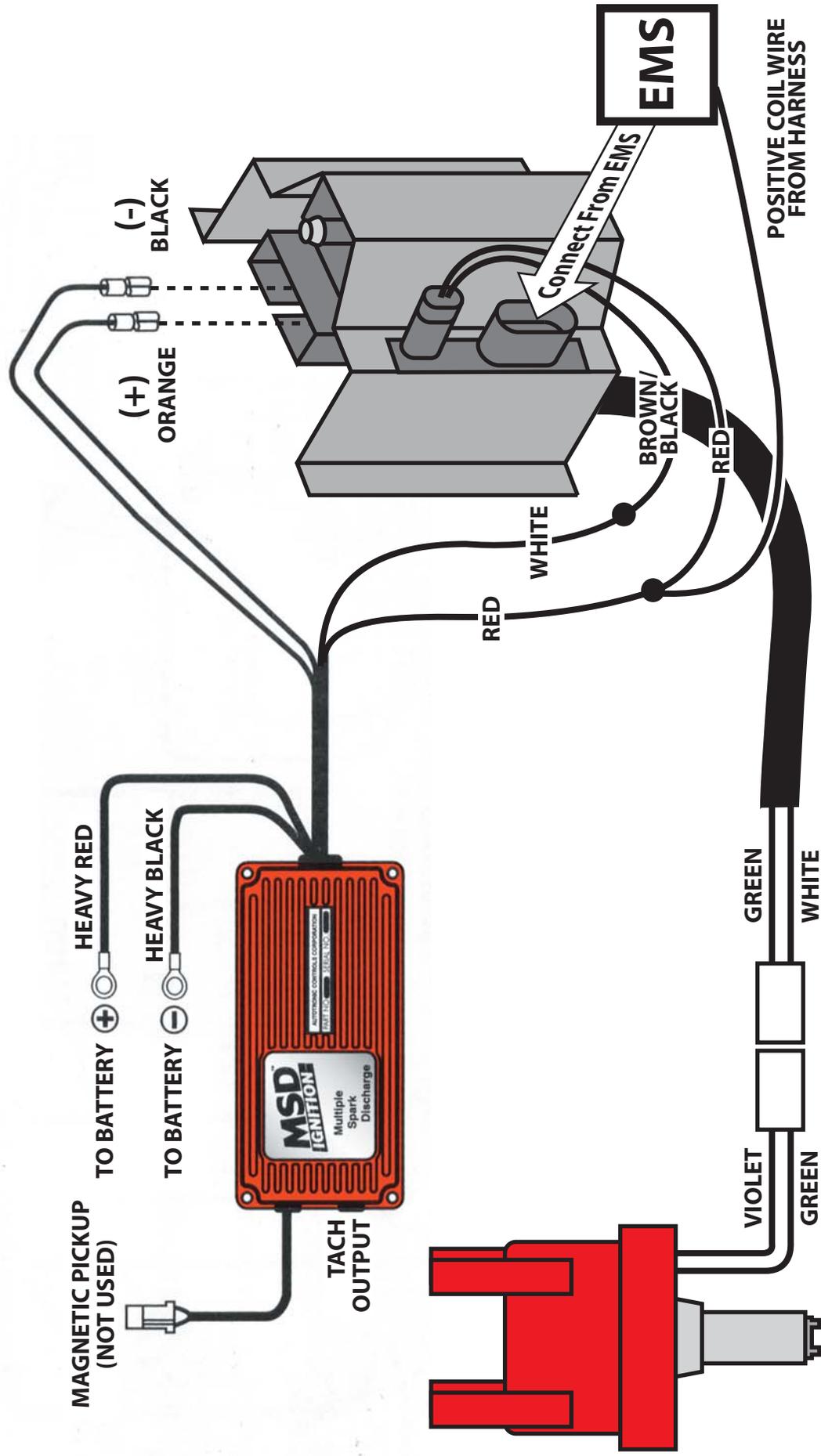


Disconnect single pin weather pack connector located 2" behind EMS connector. Connect the provided MSD adapter wire to the single pin connector leading to the EMS. Connect other end of MSD adapter to the MSD tach output.

FUEL INJECTION HARNESS labeled - Negative side of coil (-)

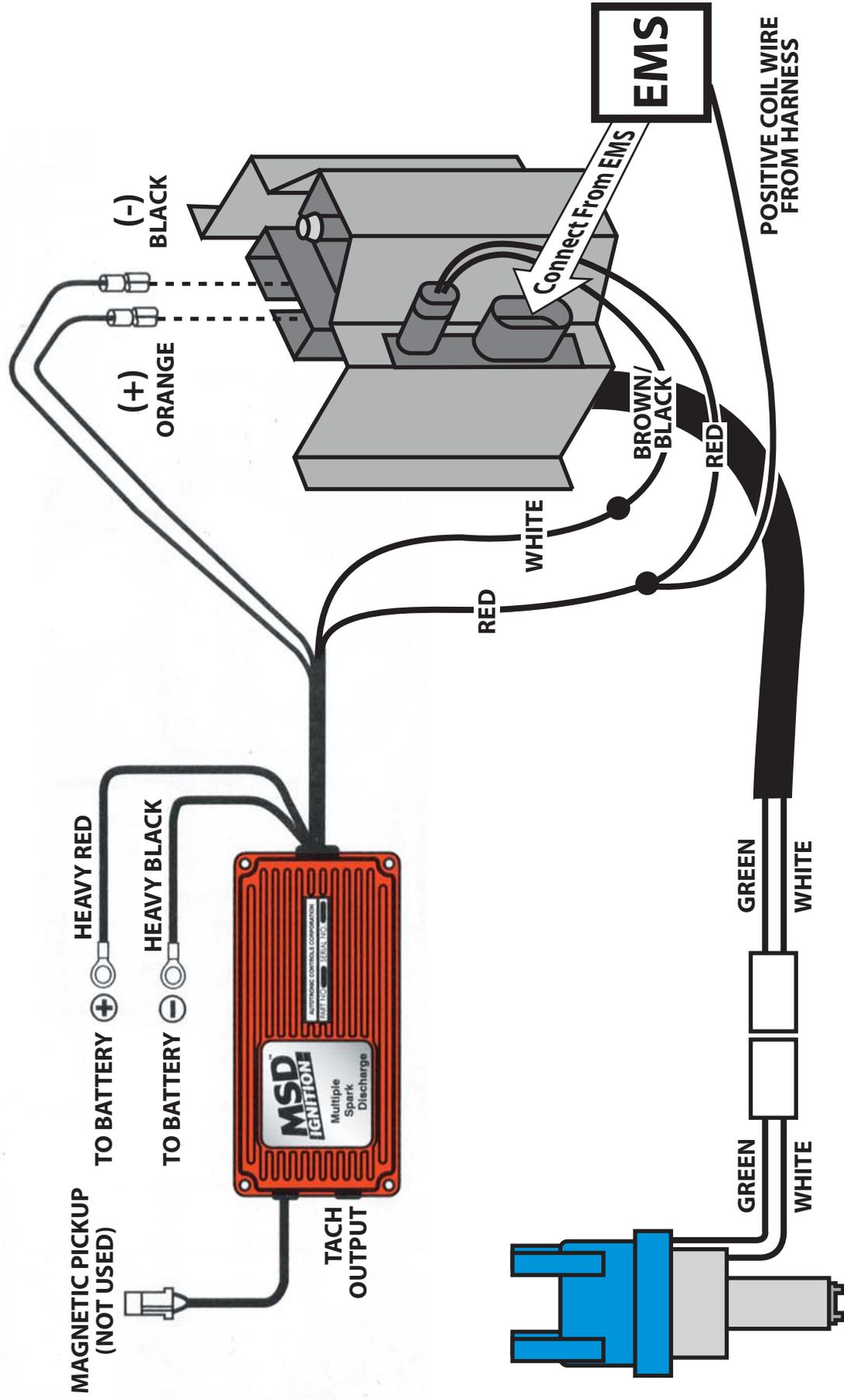
MSD Ignition Instruction Sheet

with CB HEI Coil and MSD Billet Distributor



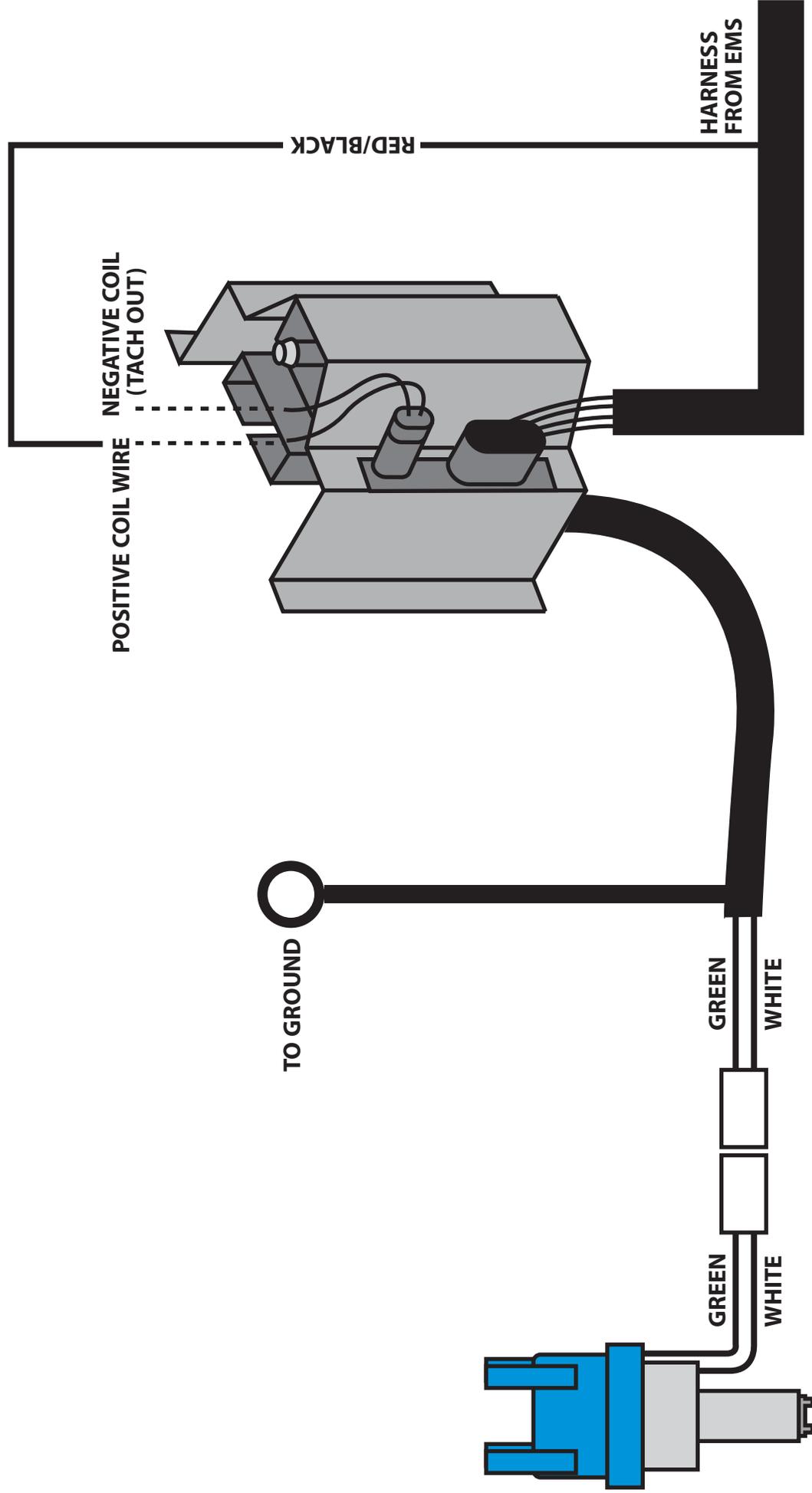
MSD Ignition Instruction Sheet

with CB HEI Kit



Magna Spark Ignition w/Quicktune EMS

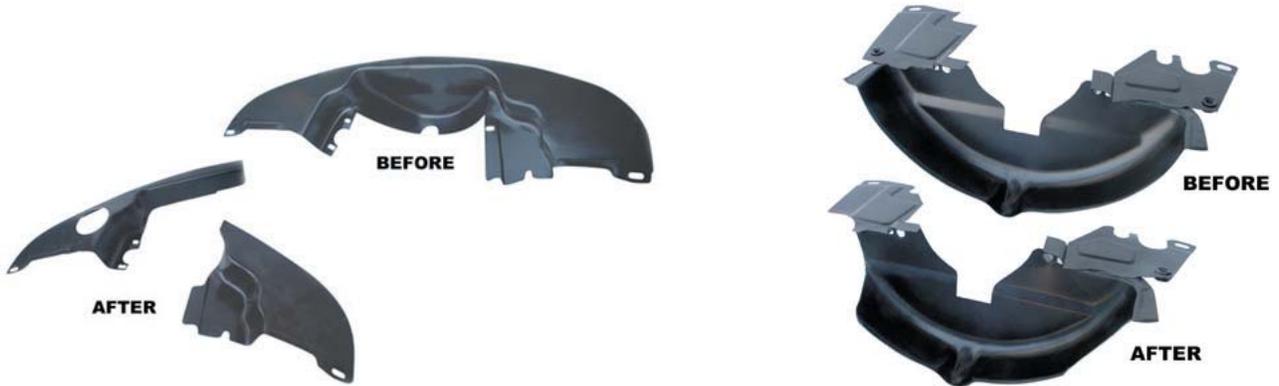
upright



IMPORTANT INFORMATION!

**Make sure to fit your header
to the Engine BEFORE any
aftermarket coating. Customer
assumes any responsibility for
the header, after coating.**

Hideway Turbo Assembly Instructions



Here you can see some before and after pics of some Engine Sheet Metal that has been modified to run on a Turbo System.

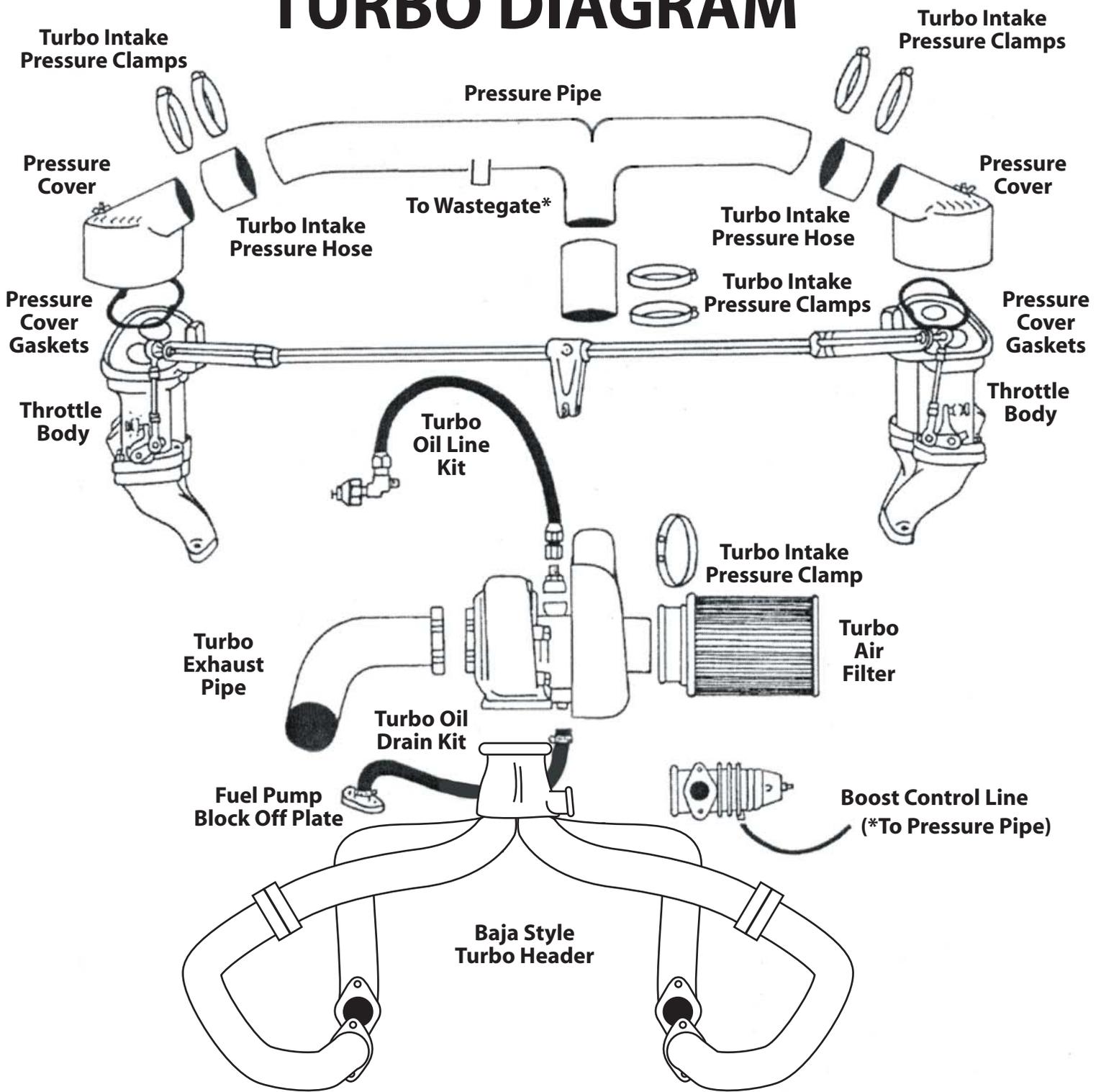


The following pictures show the proper assembly of Turbo Drain Pipe, and the next two pages feature the assembly of the entire Turbo System.

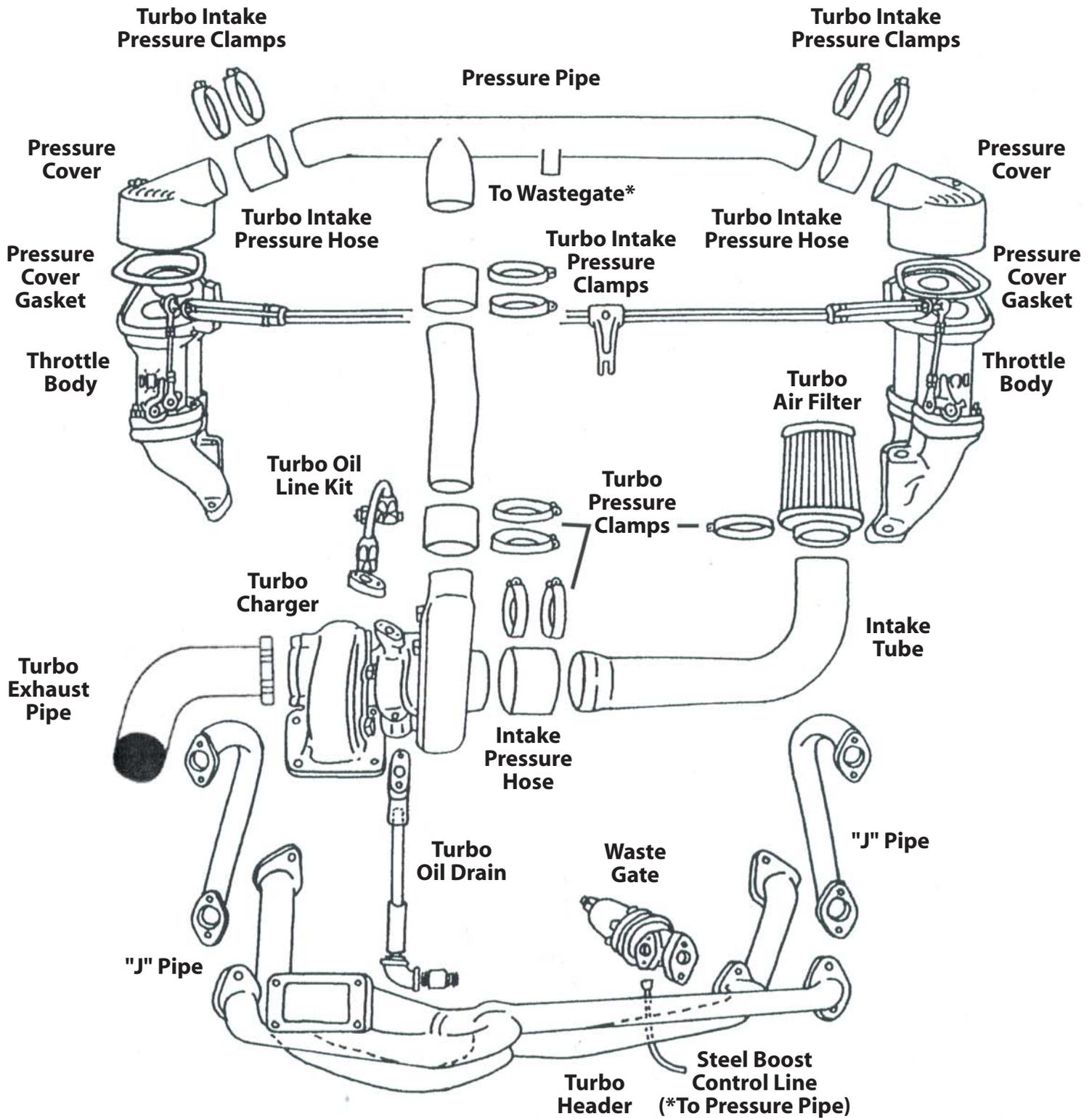


(Turbo Rotated
to show Fittings)

REAR ENGINE/BAJA TURBO DIAGRAM

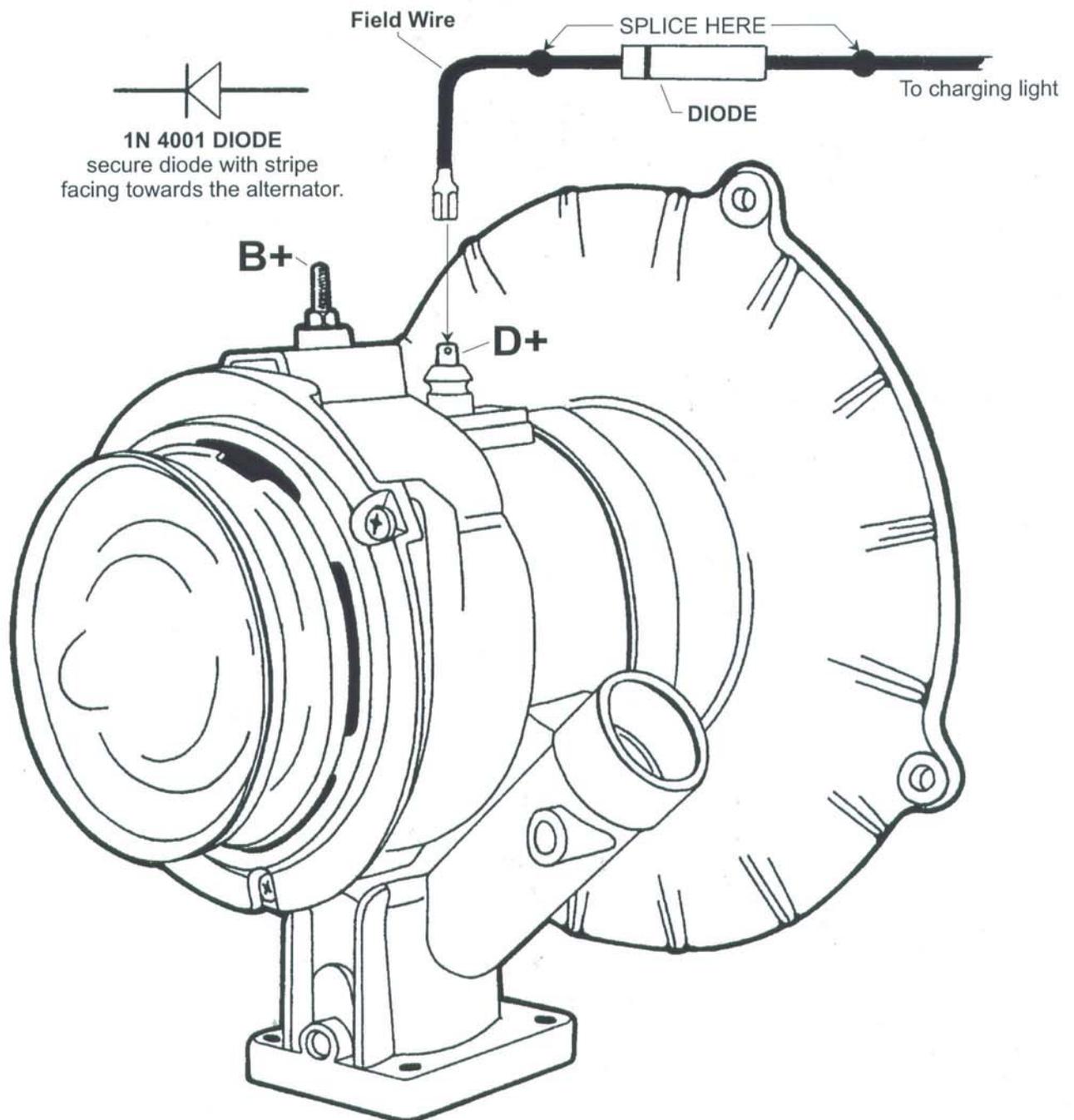


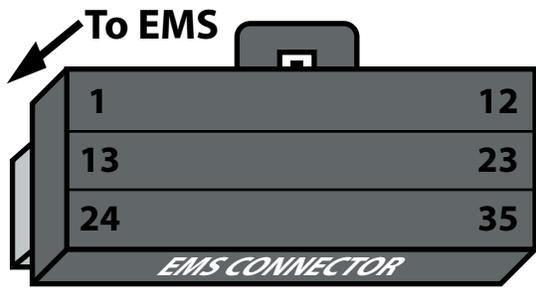
HIDEAWAY TURBO DIAGRAM



ENGINE RUN-ON

In some applications, a situation referred to as "Run-On" will occur. This is where the engine continues to run after the ignition switch is shut off. In a run on situation, a diode can be put in line with the alternator field wire. This diode will keep voltage from leaking through to the fuel injection system.





QUICK TUNE HARNESS

WARNING!

*** FUEL PUMP SHOULD ONLY BE GROUNDED TO CHASSIS, NEVER TO EMS HARNESS ***

