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## ***Motorcycle Fuel Injection Controller Installation Instructions***

**Part # M141200R**  
**Fits: Harley Davidson ©**  
**2009 XR1200™**  
**2007-2009 Sportster ©**

**WARNING:**

*Not legal for street use except for racing vehicles which may not be operated on a highway.  
Not Legal for Sale or Use in California on Emissions controlled Vehicles.*

California CARB Legal version also available, contact your dealer or go to [www.patriotpipes.com](http://www.patriotpipes.com)

*Your New Patriot Top Fueler utilizes State of the Art Load Based Technology to provide accurate Fuel/Air mixtures. It is not difficult to install or program but can be intimidating to new users. Take your time and follow the instructions. If you are uncomfortable with the tuning we suggest taking your motorcycle to a Professional Mechanic.*

*The Top Fueler is designed to be used with Patriot's Defender exhaust but will work equally well with other brands and will support most engine modifications you may make in the future.*

*Please read and understand these instructions completely prior to attempting installation. Check the parts list and tools required to be sure all you have all the necessary items.*

## **INSTALLATION**

1. Be sure your Harley Davidson is cold before starting installation.
2. If you are not familiar with the basic mechanical workings of your motorcycle we suggest you consult a factory shop manual.
3. XL's - Remove the seat and disconnect the Negative Battery Cable. XR's - the battery is located under the Left side cover
4. XL's - Disconnect the fuel line on the lower side of the gas tank. This is a quick disconnect fitting that comes apart by sliding the outer housing and removing the lower portion, if you are unsure how this works consult the factory manual. Do NOT unscrew the fitting from the tank.
5. Remove the rear gas tank mounting bolt and gently lift the tank as high as you can without hitting the steering area. It may be easier to access the fuel injectors if you remove the air cleaner assembly also. It is not necessary to remove the tank on the XR's.
6. XL - Lay the Top Fueler in the seat area and run the Fuel Injection Harness and Front Oxygen Sensor (O2) harness (pink/Tan wires) along the left side of the frame backbone under the tank.
7. XR - The Top Fueler will attach to the end of the battery with the wiring harness running along the left side frame tube. Remove the Fuel Line on the lower side of the gas tank. This is a quick disconnect fitting that comes apart by sliding the outer housing and removing the lower portion, if you are unsure how this works consult the factory manual.

Do NOT unscrew the fitting from the tank. Route the Top Fueler wiring along the frame behind the fuel fitting, then reattach the fuel line.

8. Locate the fuel injectors located between the cylinders at the intake manifold. Disconnect the factory harness from each injector. See Illustration 1 for XL, Illustration 2 for XR. Plug the Top Fueler harnesses to each fuel injector and the original harness. **NOTE: The Top Fueler harness with the White/Yellow wires goes to the front cylinder and the harness with the Green/Gray wires goes to the rear cylinder.**
9. XL - The front O2 connector is located between the front frame down tubes above the front motor mount. Run the front O2 harness (pink/tan wires) down the frame tube, disconnect the factory connection, and plug the Top Fueler harness to the O2 sensor and factory harness.
10. XR – The front O2 connector is located on the front frame down tube above the front motor mount near the oil cooler. Run the front O2 harness (pink/tan wires) down the frame tube, disconnect the factory connection, and plug the Top Fueler harness to the O2 sensor and factory harness.
11. Find the rear O2 sensor and disconnect the factory connection and plug the Top Fueler harness to the O2 sensor and factory harness.
12. Make sure all wiring is secured to the bike with zip ties and has some slack at the connections to prevent engine vibration from disconnecting or damaging the wires. Check that all connections have “snapped” together and wires are not in contact with any sharp metal.
13. Mount the Top Fueler to the bike using the supplied double side tape.
14. XL - Bolt the gas tank back down and re-install the fuel line.
15. Re-attach negative battery cable, connecting the small Top Fueler ground wire with it.

Top Fueler's come pre programmed with a base setting for a stock engine with a High Flow Air Cleaner and the Patriot Defender Exhaust.

If this is the way your bike is set up you can Skip the Tuning section and go directly to “Starting the Engine”. You can also use the Tuning section to verify that your Top Fueler has the appropriate base map programmed.

If you have other modifications, proceed to “Tuning your Top Fueler”

## TUNING YOUR TOP FUELER

### Understanding the tuning modes

The Top Fueler displays LED lights to tell you how each mode is set. As you scroll through the different modes the lights will change colors. The LED's will appear in different positions from left to right indicating the amount of fuel that is being added for that particular mode. Far left is leanest (least amount of fuel) far right is richest (most amount of fuel added). To check or change modes, you simply press the mode button. The Top Fueler will then display the current setting. To change that setting use the + and – buttons to increase or decrease the setting. When you are satisfied with the setting push the mode button again and it will move to the next mode. If you do not make any changes, after 5 seconds the Top Fueler will exit the adjusting mode and will return to the ready to ride state. You can start over or readjust at any time.

Mode 1 – Idle and Steady Throttle Cruising. This adjustment deals with idle condition and steady state cruising. Standard setting will be Green LED's 3 and 4 (from left) flashing.

Mode 2 – Acceleration. This setting is strictly for HARD acceleration, such as wide open throttle accelerating. Standard setting is Yellow LED's 2 and 3

Mode 3 – Full Throttle. This setting is the adjustment for full throttle from approximately 4000 rpm to red line. Standard setting is Red LED's 2 and 3.

Mode 4 – Acceleration Load. This adjustment determines the transition from cruise to acceleration from light load to heaviest load to switch to acceleration mode. This will tune out an acceleration stumble or lazy feeling acceleration. Standard setting is Yellow LED 4 and Blue LED 8

Mode 5 – Full Throttle Load. It is rare you will change this setting. The red light should be on any time you are wide open above 4000 rpm. If for some reason it is not you would then adjust this mode. Standard setting is Red LED 4 and 5, Blue LED 8

Ideally adjustments should be made on a Dyno with an exhaust sniffer reading the actual air/fuel mixtures under the various loads. As long as your bike is relatively stock (Hi Flow air filter, performance exhaust) the base settings will be very close. If you feel your bike is overly rich or lean, you can try different settings and then ride to see the difference. If your bike is more heavily modified (big bore, cams, head work, etc) then you can call or email us for new base settings to program, again without the use of a dyno.

## STARTING THE ENGINE

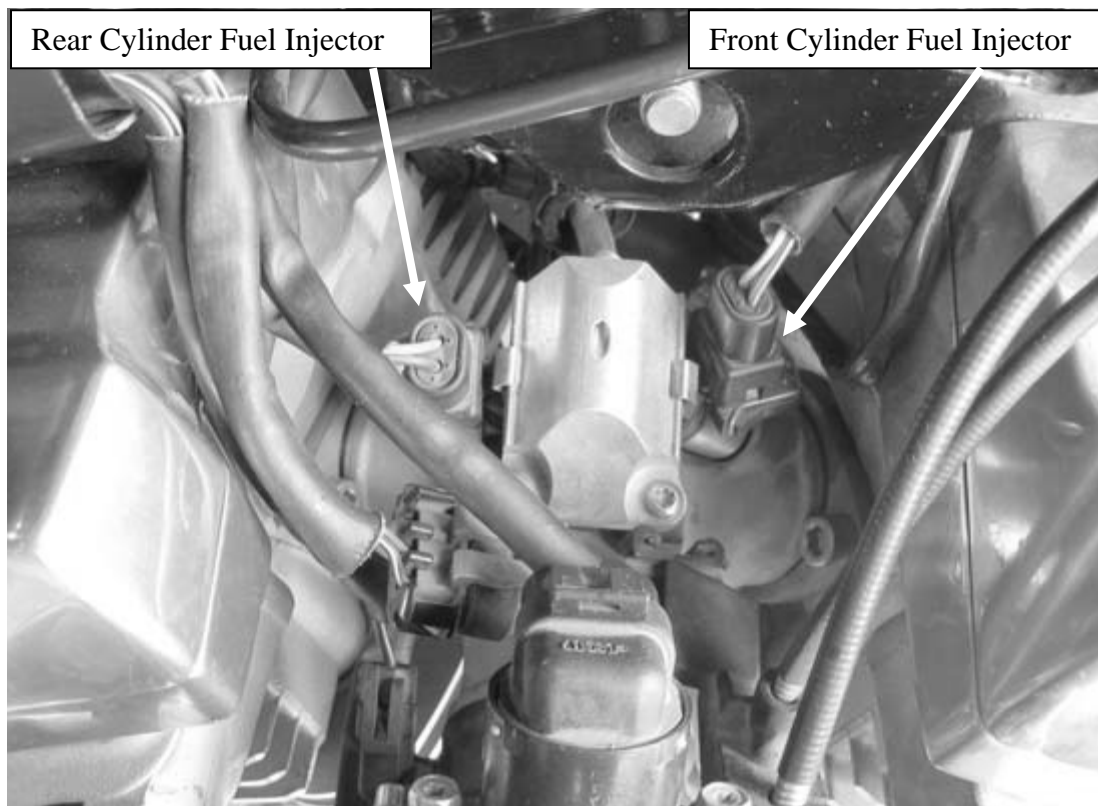
Start the bike. In approximately 5 seconds the LED lights on the Top Fueler will energize and become visible. If the connections were properly made, the Top Fueler LED's will flash in a sequence of green from left to right and back. This will repeat until the bike is warmed up. After it is warmed up the LED's will stop scrolling and you should see a Green LED towards the left and possibly a flashing Blue LED on the far right. If there is a faulty connection you will see a flashing Green and Red LED, recheck all connections until the red LED goes out.

## PARTS LIST

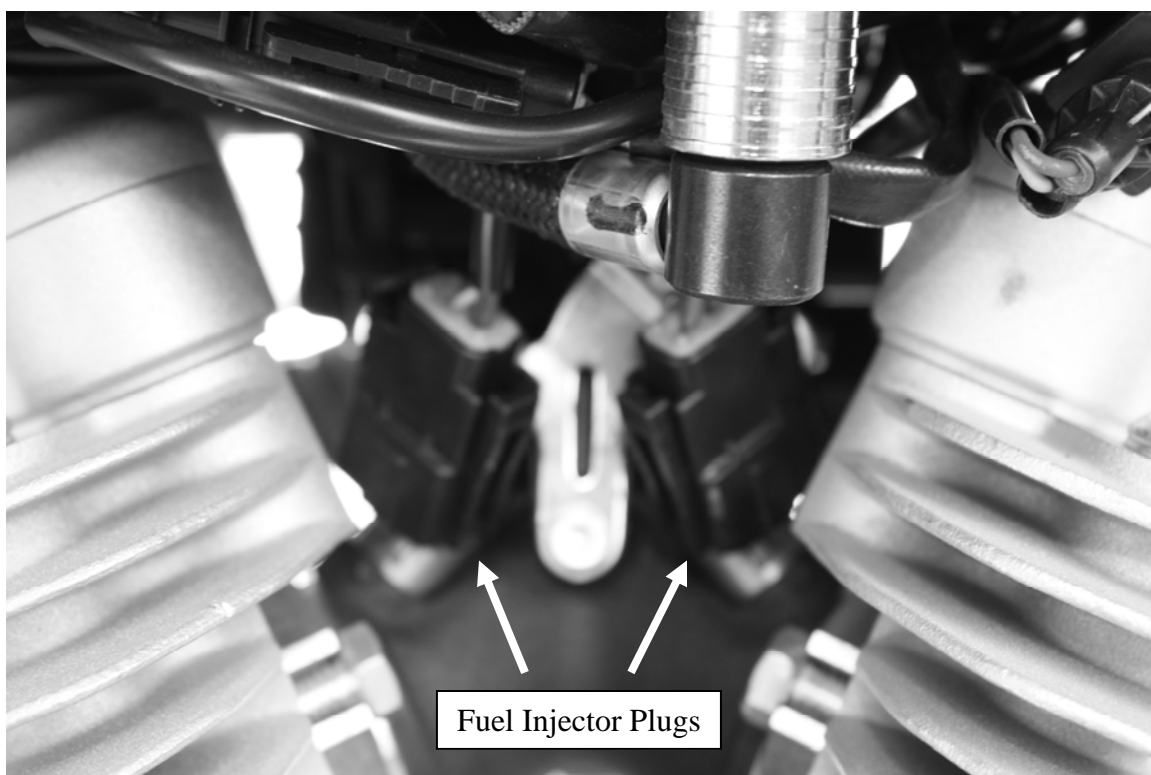
Top Fueler Fuel Injection Controller  
Double Sided Hook & Loop Tape  
Zip Ties

## LIMITED TWO YEAR WARRANTY

All Patriot Top Fueler's are guaranteed, to the original purchaser, to be free of defects in materials and workmanship for two years. If your Top Fueler should fail, your bike will continue to run with all original Harley-Davidson fuel settings return to original. This feature allows you to continue to ride your bike, although with a decrease in power and possibly hotter running. We don't recommend riding a bike with aftermarket engine or exhaust modifications without a fully functioning Top Fueler for any longer than absolutely necessary to prevent possible engine damage. This warranty covers the replacement or repair of the product only and does not cover the cost of removal and installation. Should a part become defective it should be returned to the original selling retailer and must be accompanied with the sales receipt. If there is no retailer in your area, call the factory for a return authorization and return your part prepaid to the factory for inspection. Patriot reserves the right to replace or repair the alleged defective part at our discretion and return the part freight collect.



**Illustration 1**  
**XL Models, from Right side of the bike**



**Illustration 2**  
**XR Models, from Left side of the bike**