



# ***Engine Management System***

***604-001***

***INSTRUCTIONS***

***For 2005 - 2007***

***Harley-Davidson® FL Models***



***Revolution Performance*** was founded with two major goals in mind – to go that extra mile providing a superior level of customer service and support in the V-Twin performance industry and to provide an outlet for a complete line of performance components and services for Harley-Davidson® Evo Big Twin® and Twin Cam® 88 as well as Buell® American Motorcycles. Revolution Performance carries a full line of aerospace aluminum alloy cylinders for Harley-Davidson® and Buell® American motorcycles as well as a complete inventory of performance components to make your package work together. The staff at Revolution Performance brings a great deal of engine development experience to the table not only in several disciplines of professional racing but in street applications as well. From the individual who wants a one stop shop for all his performance component needs to the shop owner seeking a reliable supplier of parts and services we are here to help. We also have a long history in professional race team support so we can not only assist in your R&D efforts but with our manufacturing capabilities we can make your ideas reality with the utmost in security. We use our expertise to help OEMs produce better racing components as well as parts that make it to the street. We work closely with premier engineers at Harley-Davidson® on many of their projects and our customers receive that same level of dedication. Our commitment to providing the best components and customer service in the industry is a basis for everything we do so that the customer can meet any realistic performance goal that they set for themselves.

# ***HD Tuner Installation Instructions for 2005-2007 FL Models***

**Revolution Performance LLC** makes no claims to the suitability of this product for your motorcycle. Use of this product may void the manufacturer's warranty and may void federal emissions compliance of your vehicle. This product is intended for closed course/racing use only.

Use of leaded fuels will significantly shorten the life of O2 sensors, and may over time cause poor vehicle performance. It is suggested that if leaded fuels are being used that the O2 sensors be changed every 10 hours of vehicle operation to ensure peak performance.

Installation of this performance kit requires a moderate level of vehicle mechanical knowledge. If you feel that you may not be capable of the safe installation of this product, please contact your local service provider for professional assistance.

Installation of this product on your motorcycle requires an exhaust system with O2 sensor bungs installed. You may either upgrade your exhaust system to a '07 system that would have the sensor bungs already installed in it, or weld O2 bungs into your system. If welding is required it is critical that the welds be air tight. An air leak at the sensor bung will cause the product to malfunction. If you are not comfortable in the ability to get an air tight weld please have the sensors welded to your pipes by a qualified welder. Details about sensor placement prior to welding can be found in step 4. **Revolution Performance** can supply O2 sensor bungs for a nominal fee. Please contact **Revolution Performance** if O2 bungs are needed.

Before beginning installation verify that all necessary components have arrived. The kit should include:

- 1 **Control Box**
- 2 **Wide Band O2 Sensors**
- 2 **Easy Turn Wire Connectors (2007 models only have 1 connector)**
- 1 **ECU Shipment Box**
- 1 **Customer Information Data Sheet**

## **Step 1**

Remove the seat, saddlebags, and side covers from your vehicle. Refer to your owner's or service manual for details.

## **Step 2**

Remove the maxi-fuse and ECU from your vehicle. Refer to your owner's or service manual for details.

### Step 3

Fill out the customer information sheet. This sheet needs to be filled out as completely as possible. Your VIN number needs to be written on the sheet or the sheet will be returned to you so that the VIN may be completed. Be sure to include your return address and a phone number where you may be reached. When completed fold your information sheet up and pack it into the mailer, preaddressed and posted to **Revolution Performance**, with your ECU and send it in the mail. Your ECU will be processed and in several days you will receive your ECU back.

**If your exhaust system already has O2 sensor bungs installed in it simply install the provided O2 sensors, and omit steps 4 through 6.**



### Step 4

If your vehicle is not equipped with O2 bungs they will need to be installed. The ideal placement for the sensors is 6 to 8 inches from the exhaust port on each cylinder. The bungs should be installed so that the O2 sensor inclination is between horizontal and vertical. This allows water that naturally condenses in a cool exhaust system to drain out of the sensor, and prevents sensor damage from occurring. The easiest way to locate the sensor on the pipe is to partially thread the sensor into the bung and hold it up to the exhaust to check for clearance. Once a good spot has been found use a permanent marker to outline the bung and mark it for welding. Photos illustrating ideal placement on both the front and rear pipes are shown above.

## Step 5

Remove the exhaust system from the vehicle. Drill holes for the O2 sensors at the locations marked in step 4. Make sure that the holes are large enough that the snout of the sensor can stick into the exhaust stream without contacting the sides of the hole. Weld the sensor bungs to the exhaust system.

After the exhaust system has cooled carefully thread each sensor into the bungs. If the sensor does not thread in easily after welding, a M18 X 1.5 spark plug thread chase (commonly available at auto parts stores) may be used to clean the threads.

## Step 6

Reinstall the exhaust system. New exhaust gaskets should be used at the ports to reduce the chance of leaks that could affect the O2 sensor performance. Make sure that all potential leaks at slip joints in the pipes are sealed (orange O2 sensor safe silicone may be used). Now install and tighten the O2 sensors.

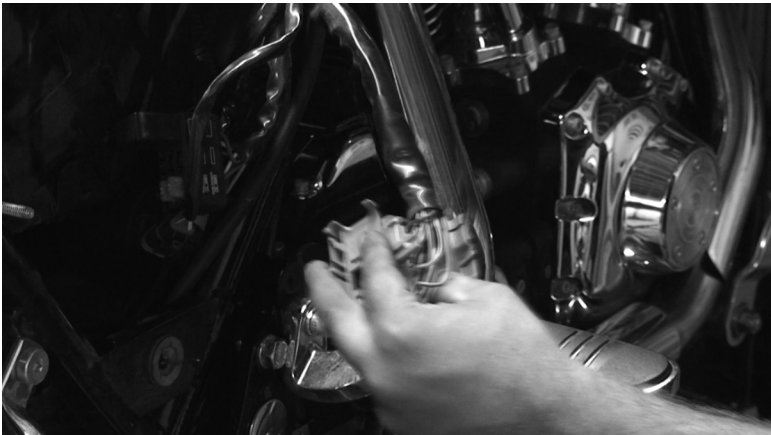
**'07 model motorcycles omit steps 7 through 9.**

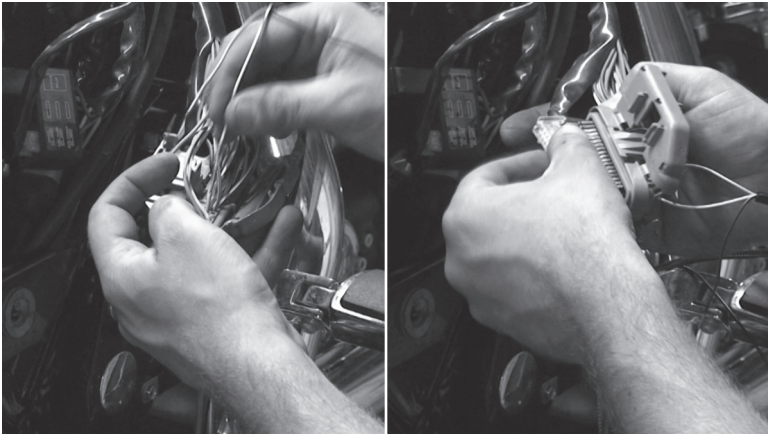


## Step 7

Locate the ECU connector on the right side of the vehicle. Using a small flat blade screwdriver depress the locking tab on the side of the clear portion of the ECU connector. Pull on the clear portion of the connector to remove it from the connector body (see photo above).

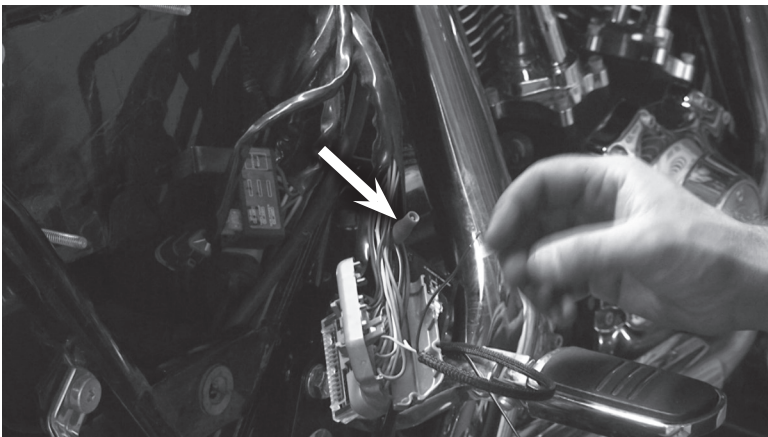
Separate the back of the connector body halves by inserting the blade of the screwdriver between them and prying the 2 halves apart (see photos on next page).





### Step 8

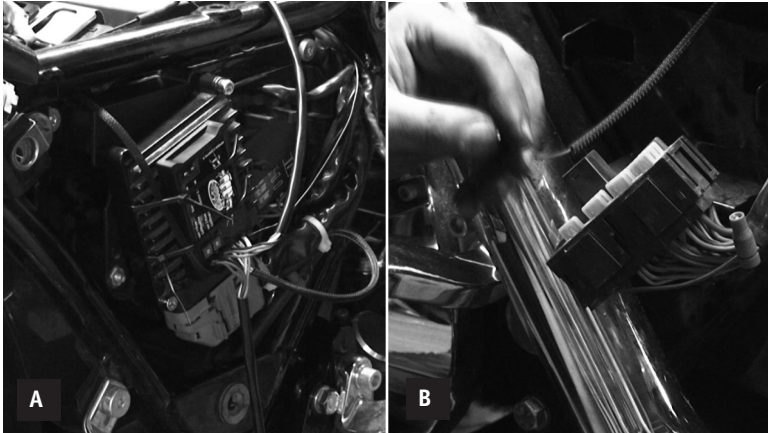
Remove the blue seal pins from the back of the ECU connectors at locations 8 & 23 by prying them up with a screwdriver and using a pliers to pull them from their sockets. Locate the **Revolution Performance Precision™** Controller and insert the white wire from the controller into hole 8, and the blue wire into hole 23. Make sure the pins are fully seated. When this is accomplished reinstall the clear plastic cover over the end of the ECU connector. (note: Make sure all pins are seated. If the clear cover will not slide on and lock in place easily there is a pin out of place.)



### Step 9

Locate a blue easy turn wire connector from the **Revolution Performance Precision™** kit, and disassemble the connector. Using a razor knife, slice 4" of wire harness sheath back at the ECU connector to expose some wire length. Locate the black wire with the white stripe coming from pin 26 on the ECU connector. Place the U portion of the easy turn connector around this wire, and screw the connector body together. Insert the

single black wire from the **Revolution Performance Precision™** EMS through the cap of the connector and twist it tight to make a secure connection. When this is accomplished use zip ties to secure all wires and sheath in place.



### Step 10

Reinstall your ECU. Connect the ECU connector, and secure the **Revolution Performance Precision™** EMS to the ECU as pictured in photo "A" above.

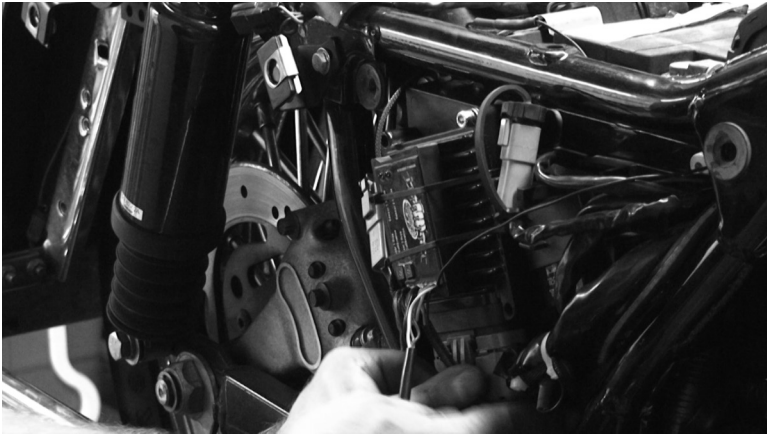
Route the red power wire from the **Revolution Performance Precision™** EMS under the seat and over to the left side of the motorcycle. Remove the fuse block from the motorcycle and locate the headlight circuit (usually a blue wire). Using an easy turn wire connector attach the power wire from the EMS to the headlight circuit. Using zip ties, neatly secure the wires making sure to provide strain relief for the new power wire.

### Step 11

Secure the ground ring terminal from the **Revolution Performance Precision™** EMS to the factory grounding lug in the backbone of the frame. On 2005 and 2006 models use a 1/4"-20 bolt 1/2" in length and attach the ground wire to the pre-threaded hole in the backbone of the frame. Scratch paint away from ground wire if necessary to ensure a good connection.

### Step 12

Route the front O2 sensor wires from the **Revolution Performance Precision™** EMS along the bottom of the frame rails and plug it into the front O2 sensor. On '07 models also route the feed-back wire from the EMS with the O2 sensor wire and plug the feedback wire into the factory O2 sensor plug on the vehicle wiring harness. Make sure that these wires are secured tightly to the lower frame rail of the vehicle, and that the wires route on top of any frame braces so that they cannot come in contact with the ground.



### Step 13

Route the wire from the rear O2 sensor back to the left side of the **Revolution Performance Precision™** EMS, and plug in the connector. On '07 models route the rear feedback wire through the frame and plug the connector into the stock wiring harness. Secure all wires as pictured in the photo.

### Step 14

Install the maxi-fuse, and switch the vehicle to the run position. Verify that both sensor lights on the control box are flashing slowly. After 30 seconds the lights will either flash rapidly or be solid on. Place a screw driver on the calibration screw and adjust it so that the light has just turned from flashing rapidly to steady on. Repeat this for cylinder #2.

### Step 15

Reassemble side covers and saddlebags, and install your seat.

### Step 16

Start your vehicle. Let it idle up to operating temperature (at least 5 minutes). Try not to blip the throttle unless necessary to keep the engine running. The vehicle may run poorly initially until the **Revolution Performance Precision™** EMS finds the correct parameters for your engine. You will notice that after several minutes your vehicle will run increasingly better. After your vehicle is at operating temperature shut it off.

## Step 17

Gear up and go ride! Your vehicle is now equipped with the finest dynamic fuel injection controls available. It will optimize as you ride, and grow with you as your bike does. As equipped it will self compensate for minor changes in intake and exhaust configurations, heads, and cams. The ECU functions like normal and your vehicle can be serviced by any dealer.

Want to perform significant modifications to your motor? No problem—simply download a new customer information form from the **Revolution Performance** web site ([www.revperf.com](http://www.revperf.com)) and send your ECU and form to us. For a small fee we will update your ECU for the new engine, and you are good to go. Your bike will tune itself!

**NO Dealer**

**NO DYNO**

**NO PROBLEM**



***Revolution Performance***

1312 Pilgrim Road  
Plymouth, WI 53073

Toll Free 1-866-892-2109

Phone 920-892-2109

Fax 920-892-2206

[info@revperf.com](mailto:info@revperf.com)

[www.revperf.com](http://www.revperf.com)

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