

Part 1: Module Installation



#309-312 95-98 Marelli® FL (stock throttle body)
#309-313 99-01 Marelli® FL (stock throttle body)
mechanical speedo bikes require part # HA0313-6

The ECM is lasered 309-313 in -312 & -313 kits

(-312 has a tip sensor, bracket and a different speedo harness).

***ALL models: There are several relays in the wiring system. Locate and remove the "ECM Power Relay" usually under the seat (some models on the ECM bracket) This will be replaced with the supplied (Blue Dot) relay. This specially modified relay is configured with a "stay alive" circuit, required for your ECM. (more info below on making sure you replace the correct relay)

Thank you for purchasing a ThunderMax ECM! Please read through the following instructions before beginning the installation procedure. Following these instructions will ensure that the ECM is installed and setup properly for optimal results. If you have any problems or questions, please refer to the TMax Tuner .pdf Manual, included on the CD (Help Menu) with this package. **Record serial number NOW, in the space below for later use registering your ECM.**

Serial # TMMM _____



If you don't have an HD® service manual for the year and model of the motorcycle you are working on, get one before starting the installation to use for reference.

The factory ECM you are replacing is triggered by signals from the cam position and crankshaft position sensor (CPS), while the ThunderMax, like the later Delphi® system, uses only the signal from the crankshaft position sensor. We recommend disconnecting the cam position sensor and installing a new crankshaft sensor and in-tank fuel filter on your (at least) 15-year old motorcycle during installation. Verify charging system operation and battery condition; check both ends of battery cables for clean, tight connections.

Oxygen Sensor Installation Tips

The ThunderMax kit includes robust Wide-Band oxygen sensors that report data from every cylinder combustion event to the ThunderMax ECM for automatic air/fuel corrections. 1995-2002 models will require the addition of 18mm sensor bungs to the exhaust header pipes if yours don't currently have them installed.

"DISCLAIMER: NOT LEGAL FOR SALE OR USE IN CALIFORNIA ON ANY POLLUTION CONTROLLED MOTOR VEHICLES" The user shall determine suitability of the product for his or her use. Installation and use on a pollution-controlled vehicle constitutes tampering under the U.S. EPA guidelines and can lead to substantial fines. Review your application and check your local laws before installing.

* CA Proposition 65 "known to the state of CA to cause [cancer] [birth defects or other reproductive harm]"
see www.p65warnings.ca.gov for details

Installation of the wide band sensors into most bung-equipped headpipes presents no clearance problems; however, some pipe brands may require exhaust pipe modification or sensor bung relocation for interference-free installation. The sensors must mount freely without contacting surrounding components. **If this is not possible, do not attempt to bend or modify the sensor in any way as it is a sensitive electronic component and will be damaged if you do.** Modify the pipe if required for clearance. Weld-in bungs are available for exhaust systems not equipped with bungs or if current bungs present clearance issues. Bungs should be located no more than 3-4" from the head/pipe connection (for ideal location, refer to the 2007 FL model factory location). Weld-in bungs are available in straight or angled style from many industry sources. After installation, route the sensor harness away from the engine and along the frame when possible, above the lowest frame point to avoid the possibility of dragging ground during operation. **Avoid routing harnesses where engine movement or sharp edges can contact and cut into the harness or connector plugs.**

Installation

FL-A: Remove the seat, right saddlebag and side cover from the bike. Locate the fuse box that contains the ECM fuse, remove fuse labeled "ECM POWER".

FL-B: If the exhaust system you are using is not equipped with oxygen sensor bungs, bungs will need to be added to the exhaust pipes. Bungs must be located within 3"- 4" from the cylinder head. Install supplied wide band oxygen sensors in the front and rear exhaust pipes. Route and tie down the sensor harness away from the engine.



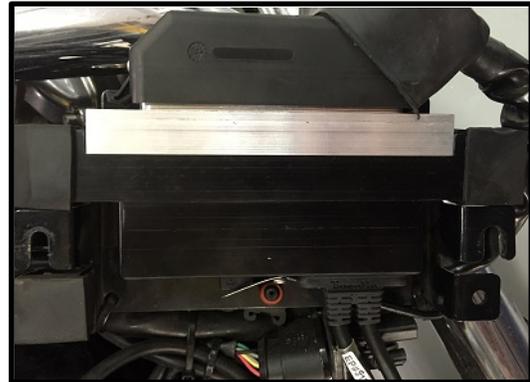
FL-C: Dis-connect the ECM connector and remove the factory ECM from the motorcycle, remove the 2 nuts that retain the ECM bracket. The ECM is attached to the bracket with rubber grommets, just slip the ECM housing tabs out of the grommets. If there are any other previously installed ancillary tuning device, remove it at this time.



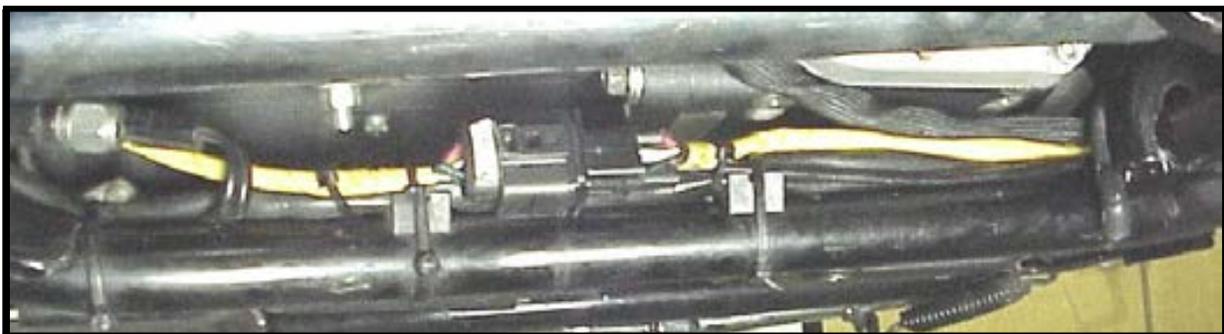
FL-D: Route the Autotune harness (single small connector end) through the frame opening behind the transmission before positioning the ECM for installation. Route the rear O2 sensor connector back through this opening as well. Be sure to secure the O2 sensor wire away from heat and abrasion. Pull the rear O2 harness lead connector into the opening and push the 2 connectors together listening for a locking "CLICK". Tie up excess wire along the bottom of the ECM caddy and protect from heat, pinching and abrasion from the rear tire.



FL-E: Apply dielectric grease to the oxygen harness connector and insert into the ECM with the imprinted "ThunderMax" logo facing inward (as pictured). Tighten the (2) Phillips connector screws. Connect the mini usb cable to communicate with the module (picture show cable locked into place to stay on bike). You can also remove the cable and seal with attached plug after setup is complete. Install the ThunderMax ECM to the ECM caddy by inserting ECM housing tabs into the bracket grommets. Use dielectric grease on the ECM connector and snap it back into place, then position the rubber connector boot over the connector. Dielectric grease aids in assembly and helps to maintain a good connection.



FL-F: Route oxygen sensor lead from front pipe along right frame rail and connect to 'front' O2 harness plug. Route front harness connector behind oil filler spout. Position connector along lower frame rail between engine and transmission. Push the 2 connectors together and listen for a loud "CLICK".



Securely tie harnesses to the frame and/or other harnesses with supplied wire ties. Avoid sharp turns while routing harnesses and avoid areas where engine movement, sharp edges, exhaust systems or hot engine components can contact and cut into the harnesses or connectors.

95-98 models: Mount bank angle sensor as shown below. Route tip sensor harness into the battery area and plug into accessory port.(do not use data link port). Insert the Green/ Black wire terminal into the ECM harness pin slot number 7.



95-96 Bank angle sensor

97-98 models: Drill 1/4" hole for bottom bolt/nut. The tab post goes in the top hole.



97-98 Bank angle sensor



ECM connector Pin 7



Accessory Port

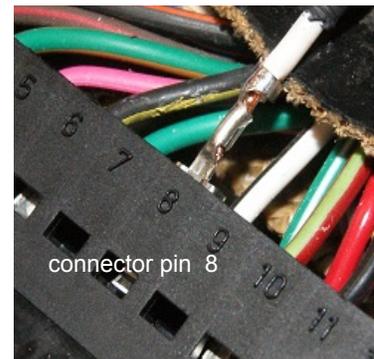
95-99 models: Locate speed sensor connector in front of battery. Disconnect, then plug supplied speed sensor harness inline (male/female connector with white wire). Remove screw in ECM connector cover, slide cover off. Remove the terminal cover, insert the White wire terminal into the ECM harness pin slot number 8.



Speed Sensor connector



ECM connector

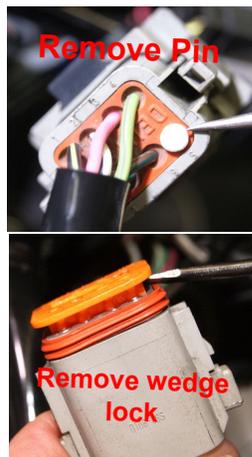


connector pin 8

00-01 models: Remove screw and slide connector cover off. (pics above). Insert the supplied speed signal wire (single Green / White wire) with the square style terminal into the ECM harness pin slot number 8. Then Install the round terminal end of the speed signal wire in the main harness connector pin location 5 (as shown below)



under right side cover



Remove Pin

Remove wedge lock

Insert socket through the connector seal, it will lock in place.

Slide wedge lock back in place.

Reconnect the to the harness connector.



ALL models with mechanical speedo: Install ecm side of green and white wire into ecm terminal 8 (See pic in 95-99). Run wire along existing bike wiring under tank and through fairing. Remove outer fairing, locate the 12 Deutsch connector, it has a white and green wire in terminal 11 on one end and nothing on the other. Unplug connector and release secondary lock. Install the Deutsch pin from the green and white wire into the empty slot in of the connector at terminal 11.



*****ALL models:** There are several relays in the wiring system. Locate and remove the "ECM Power Relay" usually under seat (some models on ECM bracket). This will be replaced with **supplied relay (Blue Dot)** AFTER the battery cable is reconnected. This specially modified relay is configured with a "stay alive" circuit, required for your new ECM. After the ECM is plugged in, connect the battery positive cable, then install the new ECM Power Relay. If the lights come on or the fuel pump runs upon relay connection, the wrong relay was replaced. (correct this).

ALL models: Push the IAC plunger inward until it stops. Lightly rotate linkage to check for play. If there is any play, use the set screw to adjust the play out of the linkage assembly.



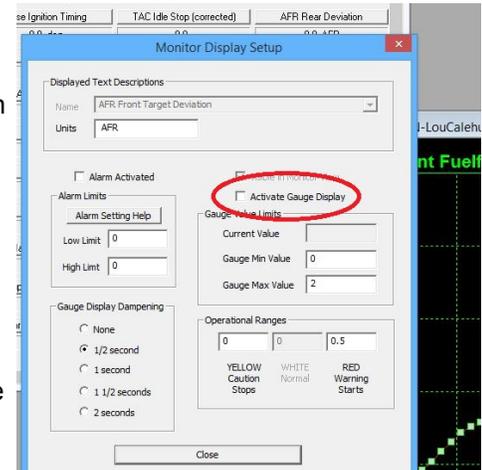
ALL models: Check to see if the bellcrank throttle stop is against the stop set screw. If not tighten screw (you may have to heat up to turn) until it just contacts the bell crank throttle stop. Be sure not to over tighten it will move partially open the throttle. If screw turns freely remove, install loctite and readjust until the screw lightly contacts.



Proceed to Part 2 setup of your system.

NOTE: Speedo calibrations 95-98 40960 99-01 4352
****all mechanical speedo's use speedo calibration 4352**

After your map is loaded, speedo calibration is set and you have initialized your system, start the bike and link to the ECM and click the Monitor button. If you don't have the following gauges visible (Std Throttle Pos, TPS 1 Raw, TAC Idle Position, Engine Head Temperature, Engine Speed, CL Corr Front, CL Corr Rear side the map display to the side. Click on the gauge banner, click the box by activate gauge display. Look at the TPS 1 Raw value displayed it should be between 20 - 100. Crank bike watch the Engine Head Temperature gauge when it gets over 205 degrees the CL Corr gauges should show 0, the AFR front/rear will show readings.



Look at the Standard Throttle position it should be between 3 - 7 degrees. Now look at the TAC Idle Position it should be between 20 - 40. If the TAC Idle Position is below 10 the Air bleed screws will need to be adjusted. There may be epoxy in the pocket covering the air bleed screws. If so shut the engine off and dig the epoxy out, then restart to proceed. When adjusting turn the both equally in 1/4 or 1/2 turn adjustments.

There is a video of this adjustment procedure located at www.thunder-max.com > Support > Support Videos.



NOTE: After Part 2 setup is complete, remove mini usb cable and tighten nuts on ECM caddy. Finish re-assembling bike.