Part 1: Module Installation

"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

#309-588 2017-2020 Touring Models

#309-588 2017 - 2020 Trike Models (email prior to install for the most current Firmware for Trike traction control)

#309-591 2021-24 Touring Models (except 23 1/2 CVO VVT M8® & 24 up Helix® platform)

#309-591 2021 - 2024 Trike Models (email prior to install for the most current Firmware for Trike traction control)

*****Allow fuel pump to shut off prior to starting engine!** this will allow enough time for the bikes HD LAN® system to completely power up and properly sync all control modules.***

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.The manual can be found in the software (see part 2), under the Help button in the menu.

309-588

309-591

The installation is exactly the same for the 309-588 and the 309-591, the only difference is the ECM and its main harness connector.

****NOTE:** The 309-588 module is set as a default to a liquid cooled model. When the VIN is entered the system will change to the appropriate model per the VIN definition. Depending on when you check your **D**iagnostic **T**rouble **C**odes it is possible to have codes because of this. After you enter the VIN, clear the (DTC's) codes and if there are any historic codes they will be cleared. This procedure is covered in the section 2 Thunder Setup instructions. ***The 309-588 is not interchangeable with a 309-562.***

Module Installation

FL-A: Remove seat and both side covers. Remove the Battery fuse/ECM fuse (as shown below, both located under the left side cover). On bikes with security, consult manual so not to activate alarm.

FL-B: Remove the stock 12mm narrow band sensors from the exhaust pipe and plug ports. If you wish to cap off the bike side of the harness connector, protective caps are provided. See Tips and General Information section on page 3 for further detail. ***Special Note– If you have previously installed another tuning device such as a Power Commander****, be sure to remove the device and any* ***"O_2 Sensor Eliminators" that may have been installed at the sensor harness plugs at that time!*** If replacing the factory exhaust system, ensure the system you purchase has 18mm exhaust oxygen sensor bungs. Most aftermarket pipe manufacturers now install both size ports (18mm & 12 mm) in their orginal factory locations. The correct size for use with ThunderMax is 18mm for the wide-band sensors. If retaining factory catalyst-equipped headpipes, 18mm bungs will need to be added to the headpipes.

Bungs should be located no more than 3 - 4" from the head pipe connection (for ideal location, refer to the factory location on 2009 FL models). Weld- in bungs are available from many sources in straight or angled designs.

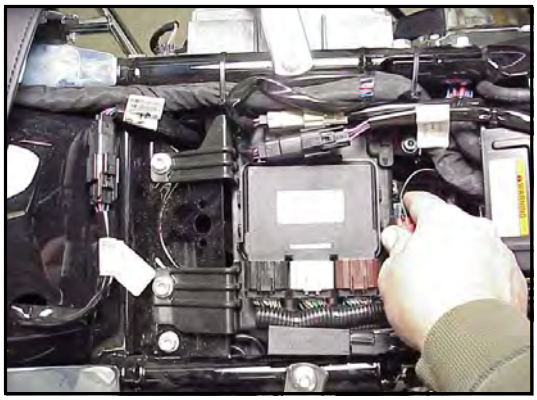
See Video on adding new bungs on the web at Youtube.com (search ThunderMax bung).

Stock 12mm O_2 sensors are located downstream on the factory header pipes, between the engine and transmission; unplug and remove them as they will affect your ThunderMax system performance if left plugged in. Stock sensor connectors are located under the bike's right side cover (black and gray plugs). 12 mm pipe bung O_2 caps are available from many sources.

FL-C: Install supplied wide-band sensors into the pipes; route the front sensor along the cross brace on the frame in front of the engine and down the lower frame rail on the right side of the motorcycle.

FL-D:. Route the rear sensor lead between transmission top cover and the starter, then towards the ABS caddy located under the right side cover. Place the sensor connector under the ABS caddy.

FL-E: Remove factory ECM located under the seat from the caddy by spreading the plastic caddy latches at the sides of the ECM. Lift the ECM up and to the right to release it from the caddy.



FL-F: 309-588 Disconnect the ECM from the three connectors by depressing the tab on the top of each connector. Some models have a red locking slide on the connectors. If equipped the red lock must be slid outward towards the harness before the the connector tab is depressed.

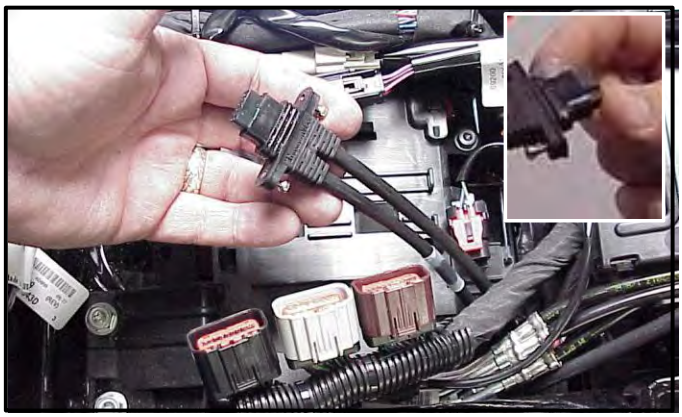
309-591 Disconnect the ECM by depressing the tab at the end of the connector then slide the bar over to the right of the motorcycle.

309-588

309-591

FL-G: With the factory ECM removed, route the AutoTune harness thru the opening on right side of the frame below the down tube for the seat, towards the ECM caddy.

FL-H:. Route the AutoTune harness plug under the brake lines to the ECM caddy area. Locate the package of dielectric grease included with communication cable. Spread a small amount of grease on the AutoTune harness plug end and inboard of the mounting flange to allow the plug to easily slide into the ThunderMax ECM. Install in case with the ThunderMax logo up and attach with the provided screws.



FL-I: Install main harness connectors to ThunderMax ECM. Before installing the connectors, lightly spread some dielectric grease on harness connector terminals.

309-588

309-591

FL-J: Once the three harness plugs are connected, place the ThunderMax ECM into the ECM caddy.

309-588

309-591

FL-K: Connect the oxygen sensor harnesses to the AutoTune harness, you will hear a click when they are connected properly. Carefully wire tie the leads to the motorcycle. Take extra care to ensure harness and sensor leads are safe from rubbing or chaffing on the motorcycle. Use all supplied wire ties; add extra ties if needed to properly secure wiring on your installation.

FL-L: Position the rear connector under the ABS caddy and attach with wire ties provided as shown.

FL-M: Position front connector above lower frame rail between engine and transmission. Attach to existing harness with provided wire ties. Inspect all wiring to make sure it is clear of moving parts and excessive heat.

FL-N: Re-install the 50A fuse, replace the side covers.

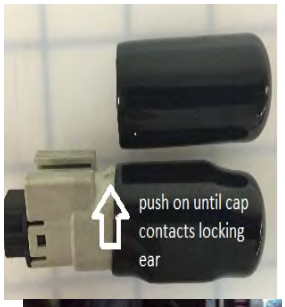
A 309-588 isn't interchangeable with the 309-562*

You are now ready to begin part 2 setup of your system.

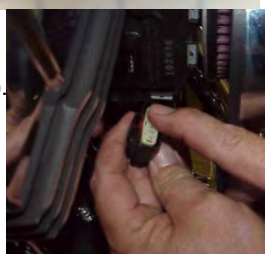
TIPS AND GENERAL INFORMATION

Special Note for International Model Bikes with Active Exhaust Enabled: *If your bike is equipped with a working Active Exhaust Valve, you must unplug the active exhaust harness before linking to the module, as the AEV circuitry conflicts with the communication stream. You can re-connect the harness after unlinking. If the stock exhaust has been changed, disregard this step. ThunderMax does not support active exhaust.*

Find the enclosed caps to block off the bike side of the stock oxygen sensor connector. There are 2 large caps for all motorcycles that come stock with the smaller 12mm oxygen sensors. Install per the picture to the left.



H-D® released a Tech Tip (#418) regarding improving conductivity at the throttle body wire connector (TCA). Carefully remove the harness plug from the throttle body, clean the male TCA pins with a swab and alcohol, apply dielectric grease to the female terminals and reassemble.



Nitrous - When adding a Nitrous system, plan to use a relay to control the activation of the system. This will keep from overloading the circuit and causing damage to the ECM.

In-Tank Fuel Filters should be inspected as a part of routine maintenance. The filter is small and one bad load of fuel can clog it. The factory recommended service interval is 25K miles.

Fuel pressure should be checked during periodic service; this is also the first thing to check should you experience sudden or gradual decreasing performance.
For any EFI system to operate properly, your fuel system should build and maintain 55-62 PSI of fuel pressure; your service provider can quickly perform this simple test.

Oxygen Sensors: Included Bosch wide-band sensors are very robust and durable; under normal conditions should last 50K miles or more. Circumstances that can damage or shorten the life of your sensors include:

- Leaded fuel – Race fuel
- Oil deposits from oil consumption
- Excessive moisture exposure
- Excessive (extreme) heat

There is no warranty on sensors. Replacement P/N is 309-355.

Heat Management Strategy

ThunderMax ECM's do not support the EITMS® (rear cylinder shutdown) feature like the stock ecm on HD® Throttle by Wire motorcycles. The ThunderMax heat management strategy which is just as affective, benefits from using the wide band oxygen sensors that are used in our auto tuning system. For more details please visit our website or email tech support.

iRIDE

INTELLIGENT RIDE CONTROL

The all-new iRIDE is the most advanced suspension for your 2014 - Up Touring® motorcycle. You have never had a ride this amazing or inteligent.

- **Precisely and automatically adjusts to rider, passenger, and luggage weight**
- **Fully adjustable "stopped" seat height level = No more tip-toe stops at the red light**
- **Automatically raises and lowers based on speed for improved suspension performance**
- **Eliminates the need for removing saddle bags to adjust suspension and spring preload**
- **Features high quality coil-over shock & air spring cylinder for improved ride quality**
- **Touch-screen display interface for quick & simple setup and mode selections**

BALLISTIC AIR SERIES

ThunderMax had K&N® manufacture the most advanced, high-flow air filter for your HD® motorcycle. The revolutionary one piece filter with top pleat design allows for MAXIMUM air flow to your engine which means more HP and TQ! Kit includes filter, billet backing plate, complete mounting kit and billet faceplate.

WWW. THUNDER-MAX. COM

THUNDERMAX U. S. A.