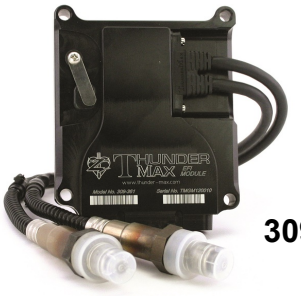
Part 1: Module Installation

"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

#309-361 2011 Softails®

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. Record serial number NOW, in the space below for later use registering your ECM.

Serial # TMGM_____



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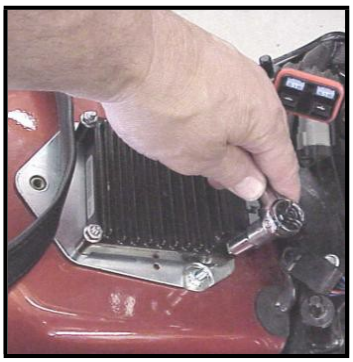
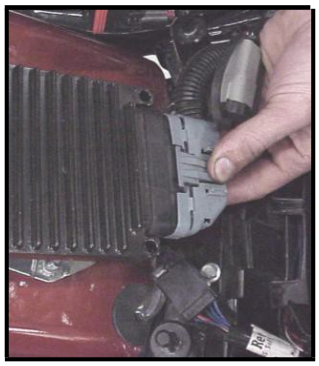
A: Remove the seat to access the factory Electronic Control Module (ECM). Slide the fuse box to the left to release it from the plastic bracket. Open the fuse box and remove the main fuse.

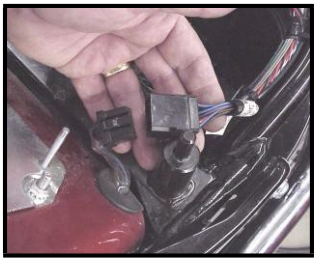
B: Remove the battery cables (negative first) and remove the battery from the motorcycle. Remove any previously installed ancillary tuning device including oxygen sensor eliminators that maybe plugged into the factory oxygen sensor harness.

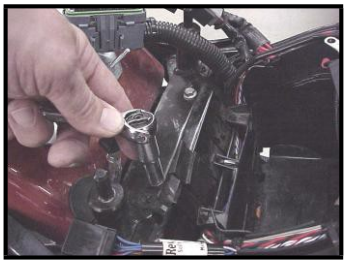
C: Remove the (4) mounting nuts holding the factory ECM in place and lift the ECM from the mounting bracket. Depress the latch on the main connector and remove the factory ECM from the wiring harness.





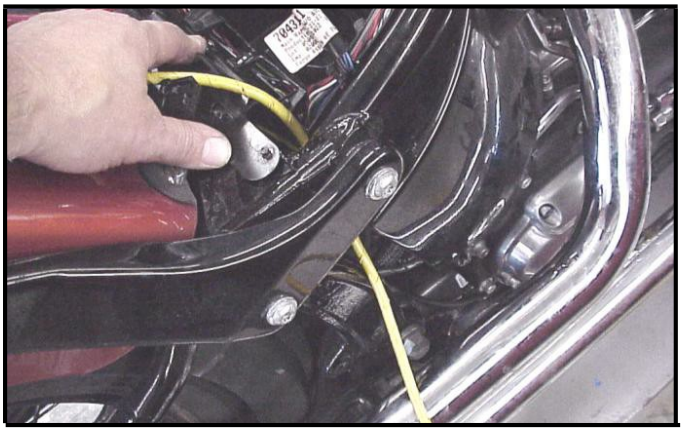
D: Unplug the tail light harness connector plug. Remove the (2) bolts holding the steel fuse box mounting bracket (and seat support for FLSTSB models; temporarily remove the support bracket only).





E: Clip the right rear wire tie holding the harness trough to the frame as shown.

F: Lift the steel fuse box mounting bracket to expose the rear of the plastic battery tray / wiring caddy. Firmly push the caddy forward to create space needed to feed the "Front" ThunderMax oxygen sensor harness (shown in yellow) connector through the opening between the frame and the caddy, exiting behind the right wing of the oil tank.



G: A packet of dielectric grease is included with your ThunderMax. W hen installing the ECM, apply the provided dielectric grease to the inside lip of the ThunderMax ECM to ensure the rubber weather seal does not bind during installation and across the clear case on the 36 pin ECM connector. Spread the grease across all of the female terminal openings, making sure the grease penetrates openings. This grease will helpt ot maintain vital conductivity between the ThunderMax and the 36 pin connector.

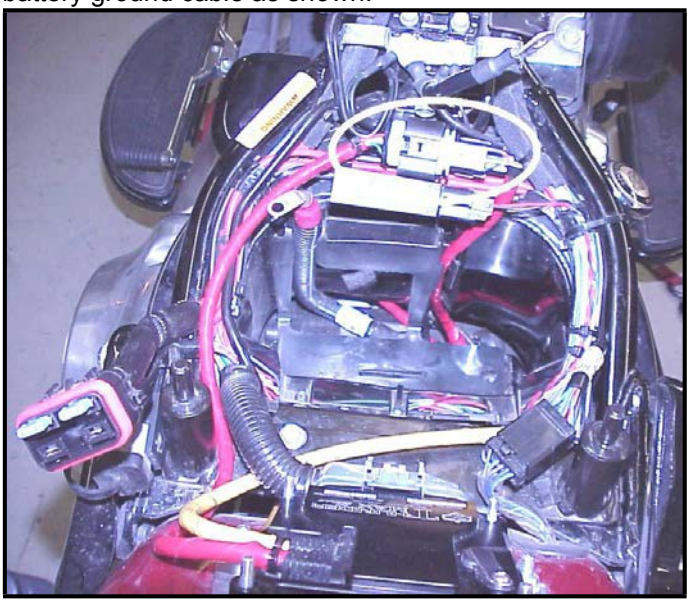
H: Apply dielectric grease to the ThunderMax oxygen harness connector female terminals to help maintain vital conductivity, and to the outer housing to prevent binding upon installation.

I: Install the ThunderMax ECM onto the ECM caddy studs without nuts; insert the oxygen harness connector into the ECM with the imprinted "ThunderMax" logo facing up. Tighten the (2) Phillips connector screws. Lift ECM and install main 36-pin connector, ensuring it is fully seated and latched. Replace ECM onto studs.

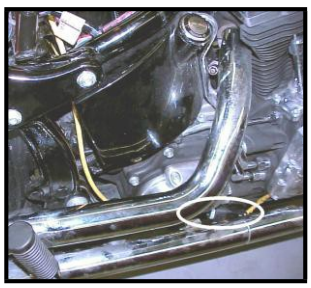
J: Unplug and remove factory oxygen sensors from the exhaust pipes (rear sensor plug located under oil tank). If you wish to cap off the bike side of the harness connector, protective caps are provided. See Tips and General Information section on page 7 for further detail. Install both ThunderMax oxygen sensors into exhaust pipes and tighten.

K: Route rear sensor harness under oil tank, feeding connector plug up though opening in the right front bottom of the battery cavity in the oil tank.

L: Position rear oxygen sensor harness connector on top of oil tank, just forward of the battery under battery ground cable as shown.



M: Route front oxygen sensor harness behind and under transmission with connector plug just under the engine/ transmission mounting boss; connect to front oxygen sensor.



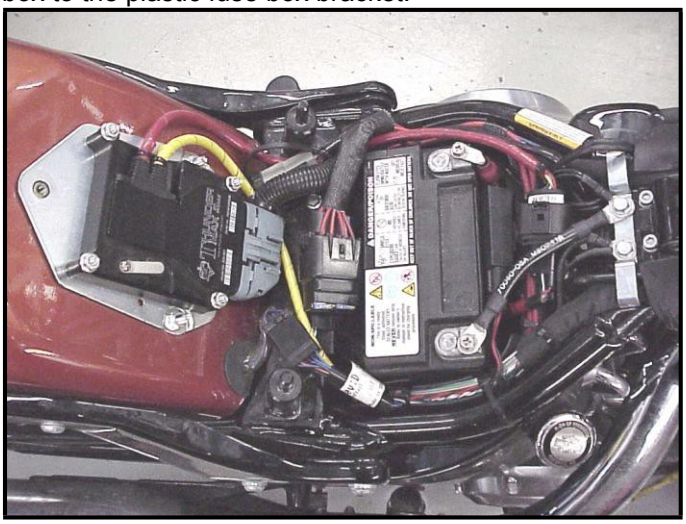
N: Securely tie all harnesses to the frame and/or other harnesses. Avoid routing harnesses where engine movement, sharp edges, exhaust systems or hot engine components can contact and cut into the harnesses or connector plugs. Be aware that swingarm movement at full suspension compression reduces the clearance opening at the rear of the oil tank where the front oxygen sensor harness is routed (tie harness inboard of swingarm).

Oxygen Sensor Installation Tips

Remove any previously installed ancillary tuning device including oxygen sensor eliminators that may be plugged into the factory oxygen sensor harness.

Installation of the wide band sensors into most headpipes presents no clearance problems; however, some pipes 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 factory location). Weld-in bungs are available in straight or angled style from many industry sources; video installation link on page 8). 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 harnesses or connector plugs***. Tie the harnesses to the frame or existing component harnesses, taking care to avoid contact with any vibrating component that may chaff the sheathing or wires. Some disassembly of bike components may be required for best harness routing.

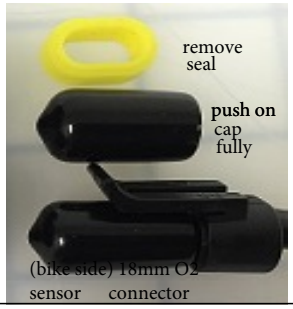
O: Install steel fuse box mounting bracket (with seat support for FLSTSB models). Install the (4) ECM mounting nuts, plug in the tail light harness plug, re-install the battery (positive cable first). Re-install the main fuse. Replace the fuse box cap and attach the fuse box to the plastic fuse box bracket.



Congratulations! You have successfully installed your ThunderMax ECM. Now it's time to follow the setup setup to register your ECM, enter your VIN, pick and write your map to the ECM.

TIPS AND GENERAL INFORMATION

(bike side) 12mm O2 sensor connector



(bike side) 18mm O2 sensor connector

Please find the enclosed caps to block off the bike side of the stock oxygen sensor harness connector. There are 2 larger caps for all motorcycles that come stock with the smaller 12mm oxygen sensors.

There are also 2 smaller caps for all motorcycles that come stock with the larger 18mm oxygen sensors. Install per the appropriate picture to the left. Disgard the other 2 caps they will not be needed.

Thank you for your purchase of ThunderMax products.
For other information visit www.thunder-max.com

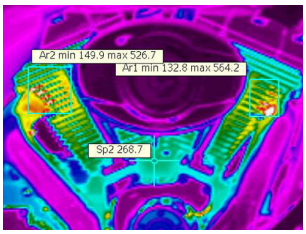
Heat Management Strategy

ThunderMax heat management strategy, benefits from using the wide band oxygen sensors that are used in our auto tuning system. Below is a brief summary of how we use the ThunderMax system to aid in managing the heat build up in your air cooled and liquid cooled HD® engine.

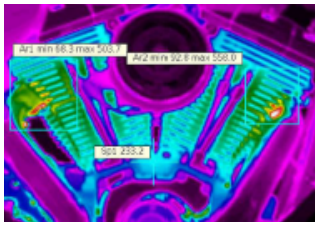
1. We run at a slightly lower engine idle and generate less heat. This also gives you back that true HD® sound.
2. As the bike starts to heat up (setting in traffic etc.) prior to an imediate need the check engine light will illmuniate telling you its not urgent, but you need air flow or to shut the bike off soon for it to cool down.
3. As the heat starts to build we reduce the engine idle slightly more, once again to generate less heat.
4. Utilizing the wide band oxygen sensors, we have the capabilitity to add fuel to help cool the engine.
5. With all of the data points available within our system, we can shift into a different area of the timing tables (timing vs temp)

to reduce the timing. Once again will generating less heat.

We are just effecient as the stock bikes with this strategy, but remember it is an air cooled engine, so with no air flow they are all going to get hot.



Pic 1: Shows the excessive, high-heat environment in which a typical air cooled H-D® engine normally operates - Very uncomfortable for the rider!



Pic2: Shows a ThunderMax®AT equipped engine; Note the cooler operating temperature resulting from a properly balanced fuel curve - Much more comfortable for both rider and passenger!

Built in support features

- [TMax-Auto Support tab] Includes *links* to collect and transmit module information, map data and/or monitor logs (recorded riding sessions) via E-mail directly to TMax support
- [TMax-Auto Support tab] Includes *links* to TMax-troubleshooting steps to aid in diagnosing issues, as bikes age and issues with them start to appear.
- [Help tab] Includes comprehensive tuning manual
- [Help tab] Has *link* directly to Thunder-Max.com website for other support documents and videos

System Updates are available through TMax Tuner with an internet connection. Software, Firmware and Map updates can be downloaded; check frequently for updates.

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.

Interrupting 12v power to the module (battery service/ replacement) requires system to be re- initialized (Setup Sheet Step 7). Check battery terminal tightness as part of routine service (like during oil changes); avoid stacking accessory power leads onto main battery cables. If equipped with dual battery post ports, connect accessories separately.

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 dealer can perform this simple test quickly.

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 problems
- Excessive moisture exposure
- Excessive (extreme) heat

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

H-D® released a Tech Tip (#418) regarding improving conductivity at the throttle body wire connector (TCA) plug. 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.