

# Part 1: Module Installation

## Video Instructions Available on You Tube



### WAVE TUNE

### #309-362 2008-13 TBW Touring Models

**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 # TMWM** \_\_\_\_\_



309-362

#### Module Installation - Touring Models

**A:** Install the ThunderMax ECM. Remove seat and both side covers. Push up on the bottom of the fuse box cover to remove the cover (located on the left side of the bike), then remove the ECM fuse from the fuse box.



**“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](http://www.p65warnings.ca.gov) for details

**B:** Remove the stock narrow band sensors from the exhaust pipe. **Special Note – If you have previously installed another tuning device such as a Power Commander, be sure to remove the device and any “O<sub>2</sub> Sensor Eliminators” that may have been installed at the sensor harness plugs at that time!**

**2008-2009 models:** 18mm sensors are located at the top of the head pipe; supplied 18mm wide-band sensors will replace the stock narrow band sensors. Some stock 2008 model rear bung location may cause interference with the transmission lid when using the longer ThunderMax oxygen sensor. If this is the case, crease the pipe next to the bung to change the angle of the sensor for clearance, or relocate the bung for proper clearance. **DO NOT pull or pry on the sensor to gain clearance—the sensor will be damaged if you do!**

**2010-13 models:** 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 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

**Stock 2010-2013 12mm O2 sensors are located downstream on the factory header pipes, between the engine**

**and transmission; unplug and/or remove them as they can affect you ThunderMax systems performance if left plugged in.** Stock sensor connectors are located

under the bike's right side cover (black and gray plugs). 12mm O2 pipe bung caps are available from many sources. 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 4 for further detail.

**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.

**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.



**E:** Remove factory ECM 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.



**F:** Disconnect the ECM from the connector as per the following procedure: Depress button on socket housing of the connector; rotate locking bar until it reaches the full rearward position (the index pin on locking bar will engage the rear notch in the socket housing).



The connector internal latches are not fully disengaged until the locking bar on the connector is seated to the full rearward position to complete removal of the connector. If you force the socket housing with latches partially engaged, it will result in damaging the connector. Once index pin is fully seated, with steady yet careful attention, pull apart the connector from the factory ECM and remove it from the motorcycle.

**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.



**H:** If equipped with factory alarm, detach alarm antenna from ECM caddy clip by lifting slightly and sliding to the right of bike (do not disconnect).

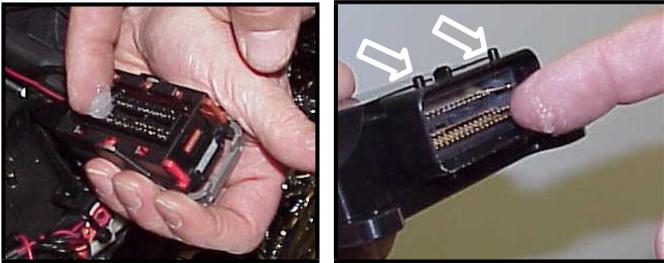


**I:** Locate the package of dielectric grease included with communication cable. Spread a small amount of grease on the AutoTune harness plug inboard of the mounting flange to allow the plug to easily slide into the ThunderMax ECM, with ThunderMax logo on harness plug facing up. Attach with screws provided.

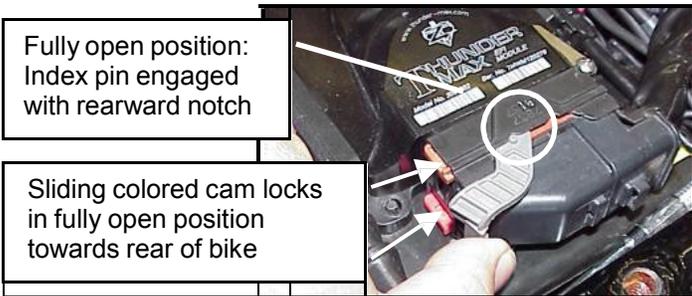
**J:** Install main harness connector to ThunderMax



ECM. Before installing connector, lightly spread some dielectric grease on harness connector terminals, and on the inside lip of the connector port opening of the ECM to allow the rubber weather seal in the connector plug to slide into place without binding. Apply a dab of grease to the (2) upper and lower locating pins on the ThunderMax housing as well (arrows). See 'Tips' on page 7 for additional dielectric grease instructions.

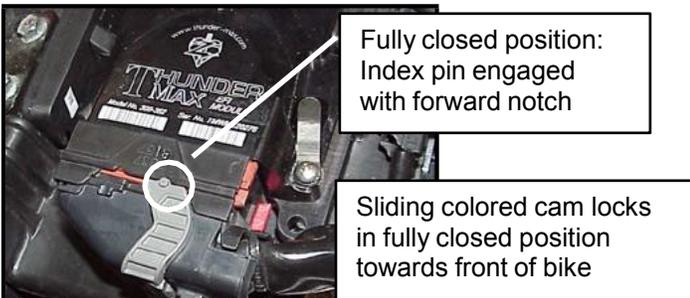


Before connecting, verify that the locking bar is in the fully open, rearward position (locking bar index pin is fully engaged with rear notch in the socket housing).



**Important Note:** If socket housing with grounding pin are not properly aligned during connector installation damage to the grounding pin will likely occur, which will require you to return the ThunderMax ECM for repair to the damaged pin.

Rotate the locking bar forward to engage the connector. Observe that the colored cam locks are moving with the locking bar; proper execution will show both colored cam locks visible in equal amounts on the forward-facing side of the connector when the locking bar is in its fully seated position with the button lock engaged, as in the image below (**do not force the locking bar**). Index pin will engage front notch in socket housing.



**Important Note:** Pin and socket housing of the connector must be fully engaged before you rotate the locking bar to the forward position. Forcing the locking bar forward before the connector is fully engaged will damage the connector and/or the ECM

**K:** Place the ThunderMax ECM into the ECM caddy. If equipped, position alarm antenna as shown.



**L:** Connect the oxygen sensor harnesses to the AutoTune harness. 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.

**M:** Position the rear connector under the ABS caddy and attach with wire ties provided as shown.



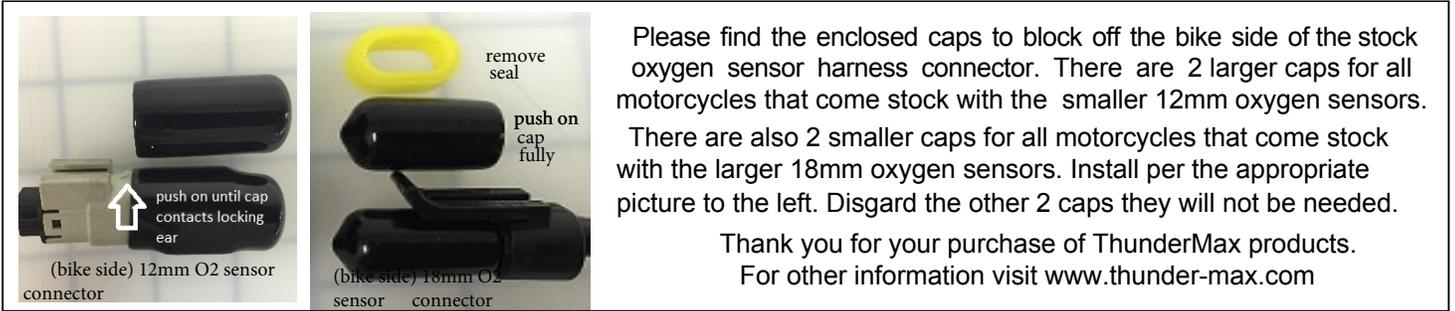
**N:** Position front connector above lower frame rail between engine and transmission. Attach to existing harness with provided wire ties. Inspect all wiring to make sure it is clear of moving parts and excessive heat.



**O:** Re-install the ECM fuse and replace the side covers.

**Your are ready to proceed to part 2 setup of your system.**

## TIPS AND GENERAL INFORMATION



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](http://www.thunder-max.com)

### 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.

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 capability 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.

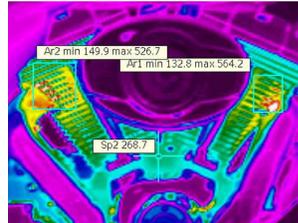
#### Built in support features

- [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

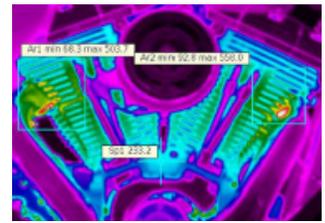
**System Updates are available** through TMax Tuner with an internet connection. Software, Firmware and Map updates can be downloaded; check frequently for updates.

**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.



**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!

**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.

