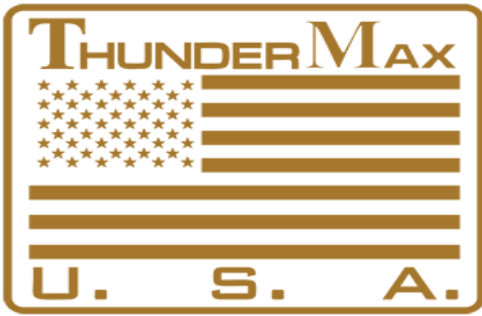


Part 1: Module Installation



WAVE-TUNE

**#309-382 2012-15 Softail®
2014-up Dyna®
2014-up XL Sportster®**

**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 # TMCM _____

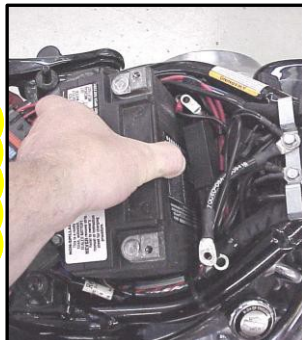


Module Installation - Softail® Models (Skip to page 3 for Dyna® models, page 4 for XL® models)

FX/FLST-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.



FX/FLST-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 may be plugged into the factory oxygen sensor harness.**

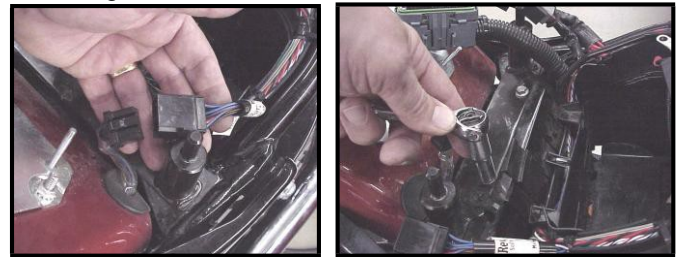


“DISCLAIMER: NOT LEGAL FOR SALE OR USE IN CALIFORNIA ON ANY POLLUTION CONTROLLED MOTOR VEHICLES” The user shall determine suitability of the product for his or her use. Installation and use on a pollution- controlled vehicle constitutes tampering under the U.S. EPA guidelines and can lead to substantial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

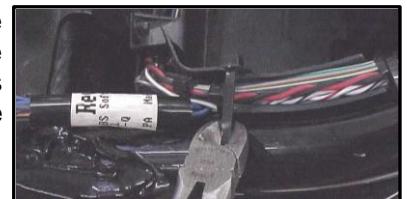
FX/FLST-C: Spread the plastic latches holding the factory ECM in place and lift the ECM from the mounting bracket. Depress the latch on the main connectors and remove the ECM from the wiring harness.



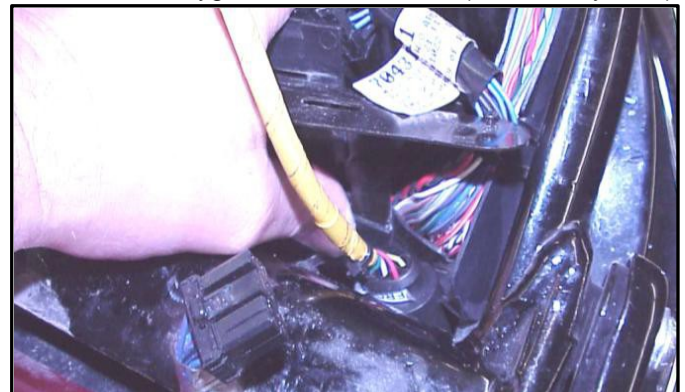
FX/FLST-D: Unplug the tail light harness connector plug. Remove the (2) bolts holding the steel fuse box mounting bracket.



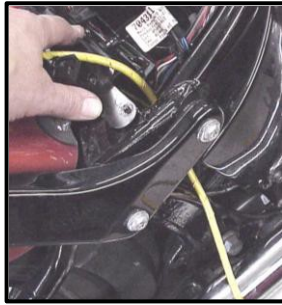
FX/FLST-E: Clip the right rear wire tie holding the harness trough to the frame as shown.



FX/FLST-F: Lift the steel fuse box mounting bracket to expose 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.



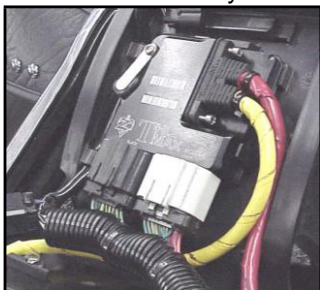
FX/FLST-G: A packet of dielectric grease is included with your ThunderMax. When installing the ECM, apply the provided dielectric grease to the inside lip of the ThunderMax ECM to ensure the rubber weather seal does not bind upon installation, and across the pin casing on both 18 pin ECM connectors. Spread the grease across all of the female terminal openings, making sure the grease penetrates openings. This grease will help to maintain vital conductivity between the ThunderMax and the 18 pin connectors.



FX/FLST-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 to the ECM.

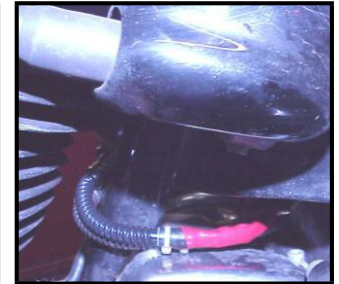


FX/FLST-I: Install the ThunderMax ECM onto the ECM caddy; insert the oxygen harness connector into the ECM with the imprinted "ThunderMax" logo facing up. Tighten the (2) Phillips connector screws. Lift ECM and install the two 18-pin connectors, ensuring they are fully seated and latched. Replace ECM into the caddy.



FX/FLST-J: **Unplug and/or remove factory oxygen sensors from the exhaust pipes** (rear sensor plug located under oil tank). If using an exhaust system equipped with 18mm sensor bungs ('07-'11 style), install the supplied sensors into the exhaust pipes and tighten. If retaining factory exhaust headpipes, 18mm bungs will need to be

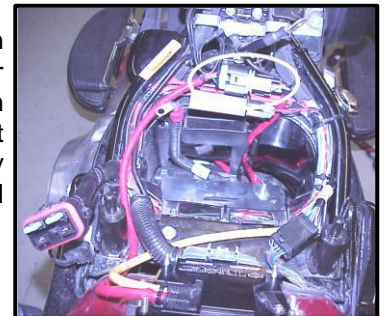
added to the headers in a similar location as '07-'11 models (3-4" from the cylinder head at the top of the pipe). Weld-in bungs are available in straight or angled style from many industry sources as well as plugs for the stock 12mm sensors. On '07-'11, if you wish to cap off the bike side of the harness connector, protective caps are provided. See Tips and General Information section on page 5 for further detail.



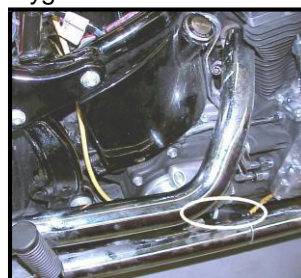
FX/FLST-K: Once your wide-band sensors are installed, route rear sensor harness under oil tank, feeding connector plug up through opening in the right front bottom of the battery cavity in the oil tank.



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



FX/FLST-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.



FX/FLST-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).

FX/FLST-O: Install steel fuse box mounting bracket. 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.



Step 2 - Module Installation - Dyna® Models

FXD-A: Remove seat. Disconnect fuel line from fuel tank by carefully pushing up the quick disconnect ring on the tank fitting while gently pulling the fuel line down. Loosen front fuel tank mounting bolt; remove rear mounting bolt, prop up tank rear 4-5" with a wood block.



FXD-B: Remove left side cover to expose electrical caddy. Remove fuse box cover and remove Maxi-fuse.



FXD-C: Remove factory ECM from caddy by pushing up ECM from bottom and sliding it out towards you. Depress locking tab on connectors and remove the ECM from the wire harnesses.

FXD-D: Remove the three caddy mounting bolts (do not remove caddy from bike) to allow caddy to drop down slightly towards primary cover. Pull caddy slightly towards you to allow room for oxygen sensor harness routing.



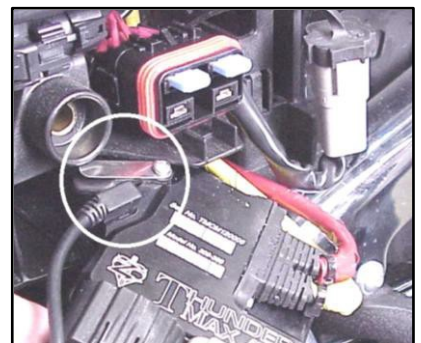
FXD-E: Starting at the rear cylinder head, route the oxygen sensor harness behind the coil and ECM caddy up through the frame opening as shown, then



back down through the frame opening, through the back of the ECM opening of the ECM caddy. Pull the harness through far enough to allow it to be attached to the ThunderMax ECM. Apply dielectric grease (see page 2, G&H) and attach the harness to the ECM using screws provided; plug black and gray harness plugs into ThunderMax ECM. With ECM still "out" of its home



position as shown, reinstall (3) caddy mounting screws. Verify that oxygen sensor harness moves freely (not pinched by caddy reattachment). Enough slack must be left in harness to allow ECM to be pulled out far enough for temporary attachment of the ECM communication cable for map programming and adjustments.



FXD-F: **Unplug** and remove factory oxygen sensors from the exhaust pipes. **Remove any previously installed ancillary tuning device including oxygen sensor eliminators that may be plugged into the factory oxygen sensor harness.** If using an exhaust system equipped with 18mm sensor bungs ('06-'11 style), install the supplied sensors into the exhaust pipes and tighten. If retaining factory exhaust headpipes, 18mm bungs will

need to be added to the headers in a similar location as '06-'11 models (3-4" from the cylinder head at the top of the pipe). Weld-in bungs are available in straight or angled style from many industry sources as well as plugs for the stock 12mm sensors (video installation link on page 8). 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 5 for further detail.

FXD-G: Route front sensor harness along left frame backbone under gas tank; position sensor plug just forward of engine mount top link. Run front sensor harness up left frame tube to connector as shown. Check that connector position does not interfere with gas tank when in position before securing harnesses with plastic wire ties.



FXD-H: You will have excess harness on the rear sensor; gently bundle it together with a wire tie, connect it to the harness and tie it away from the engine and exhaust into the cavity between the battery and ECM caddy. After checking that all harnesses are securely tied down (away from any sharp edges that could chaff or cut harnesses), re-install the, gas tank, fuel line and seat. Re-install the maxi-fuse.

Module Installation - XL® Models

XL-A Unplug and Remove the factory oxygen sensors. 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 5 for further detail.

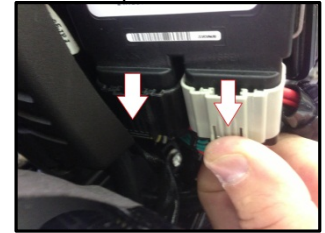
XL-B Remove the left side cover to expose the battery and main fuse



compartment. Pull fuse block away from mount (held by Velcro) Remove the main fuse over, then the main fuse.

Note: (if equipped with optional security system, turn on ignition before you remove the fuse to avoid tripping the alarm). Then unplug the Body Control wire to allow the ECM to be removed.

XL-C: Remove the bolt (9/64 allen) that retains the stock ECM. Slide the stock ECU out of the caddy, towards the primary side of the motorcycle



XL-D: Fully depress connector tab to remove each of the connectors and disconnect the stock ECM.



XL-E: Route the oxygen sensor harness into the ECM mounting area. Starting from under the chassis between the rear engine mount and rear frame cross member, tight to the engine case.



Pull the harness towards the ECM to the left side of the engine above the primary cover, being mindful not to stress wires or the connectors.

XL-F: Apply dielectric grease and insert the oxygen harness connector into the ECM with the imprinted "ThunderMax" logo facing up. Use a Phillips screwdriver to tighten the (2)Phillips connector screws.



Apply dielectric grease to the 18-pin ECM connectors and connect to the ThunderMax ECM. Install the ThunderMax ECM into the ECM caddy, replace the mounting bolt, then gently pull the oxygen sensor harness down, from under the bike to reduce slack.

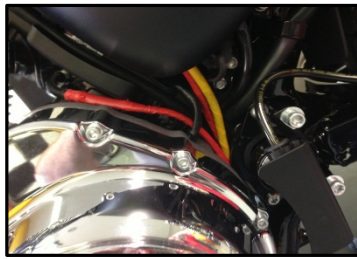


XL-G: Starting from under the chassis between the rear engine mount and rear frame cross member, feed the oxygen sensor for the front cylinder



towards the front of the engine between the left frame tube and the engine (a tight fit that may require some patience).

Install the rear sensor the same way, except once it's through the frame, loop the sensor and harness over the footpeg bracket towards the rear of the bike.



XL-H: Route the un-tied front and rear sensors to the exhaust pipes and install them into the pipes (leave all leads loose to allow them to rotate during tightening).

Plug oxygen Sensors into Thundermax ECM sensor harness under transmission. Securely tie all 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 connector plugs. Bundle excess harness together under transmission and secure so that they will not drop below frame rails or be contacted by engine movement.

XL-I: If you had to unplug the BCM to remove the ECM, re-plug the BCM connector , before re-installing the main fuse.

Oxygen Sensor Installation Tips

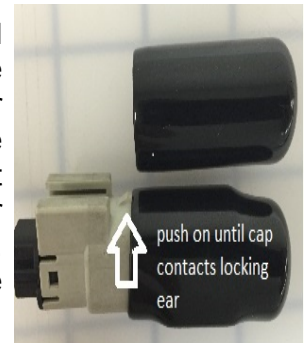
Remove any previously installed ancillary tuning device including oxygen sensor eliminators that may be plugged into the factory oxygen sensor harness.

Starting in 2012, H-D® Softail® and Dyna® models are supplied with 12mm narrow-band oxygen sensors, instead of 18mm NB sensors used in previous years. Your ThunderMax uses 18mm wide-band sensors and will require the 12mm ports to be plugged and 18mm bungs added to your stock head pipes or a 2011 style exhaust system with 18mm sensor ports. Bungs should be located no more than 3-4" from the head/pipe connection (for ideal location, refer to the factory 2011 location). Weld-in bungs are available in straight or angled style from many industry sources; video installation link on page 8. Installation of the wide band sensors into most '12-'13 headpipes presents no clearance problems; however, some brand 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. 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.

TIPS AND GENERAL INFORMATION

Please 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.



International (non-US) model notes – ThunderMax does not support active intake/exhaust functions.

Interrupting 12v power to the module (battery service/replacement) requires system to be re-initialized (see setup part 2 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 compromise 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 Sensor Care: Items that can damage or shorten the life of your sensors: Leaded fuel-racing fuel, oil deposits from oil consumption problems, excessive moisture, Excessive (Extreme heat) heat. There is no warranty on sensors (part # 309-355).

You are ready to proceed to part 2 setup of your system.