

## Improving Conductivity of Your Electrical System

Version 01-24-2013

The Product Support Team has identified poor conductivity as the most common source of problems that might falsely lead the user to believe there could be a problem with their ThunderMax® EFI system.

Interruption of 12v power to the EFI module causes some unusual problems with the engine management system, gauges or other electrical functions on the motorcycle.

Occasionally we hear reports of situations where performance has changed or diminished, or momentary **gauge loss** has occurred. These issues are abnormal and should be corrected.

If you ever incur **gauge loss**, simply cycling the main power may restore the gauge functionality

With the guidance of this tech document, it is likely you will find the correct process needed to address the root cause of the conductivity problem. This should be performed at your **earliest convenience**.

### 1. Read DTC's [Harley Diagnostic Codes and How To Access Them](#)

There may be stored **Diagnostic Trouble Codes (DTC)** in the module which could provide you with insight to specifically what is wrong with the motorcycles 12v power source.

**Record any DTC's prior to clearing.**

If no DTC's are present, move on to checking for **Corrosion or Oxidation** on electrical components and connections.

### 2. Check For Corrosion and Oxidation

**Corrosion/Oxidation** is the #1 enemy of your motorcycle's electrical system and power source connections.

Corrosion/Oxidation can cause a faulty or inconsistent ground which can lead to number of problems, one of which being **voltage spikes or surges** that can cause **VERY** harmful effects to your motorcycle.

Corrosion is routinely found in the field and will also cause problems related to **insufficient or interrupted voltage** that can affect the performance of your motorcycle.

It can be found on battery cables, electrical connectors, fuse connections, relays or completely hidden within the ECM connector and other connectors.

## 1) Fuse Box

All 12v power for the entire motorcycle goes through here and it's a common source of problems. The fuse box is not sealed unit therefore even garages kept motorcycles are highly venerable to problems due to the elements of exposure like moisture, humidity, washing and rain water etc..



**Note- corrosion / scale on spades**

Inspect the fuse panel sockets and fuse spades for scale and corrosion. Clean with alcohol and apply dielectric grease.

## 2) TMax-ECM Connector

With the ECM Fuse removed it's safe to unplug the ECM 36-pin connector. Swab the connector with alcohol then apply dielectric grease to the inside lip of the ThunderMax ECM (Photo A) to allow the connector rubber weather seal to slide into the housing without rolling or binding. Also apply a light film to the female pin receptacles housed within the clear terminal guide on the 36 pin ECM connector (Photo B) making sure to lightly cover the entire the surface of the terminal pins.

Initialize the system after reinstallation of the 36-pin connector and ECM fuse (with the handlebar switch in the "Run" position, turn the ignition switch ON 30 seconds, OFF 30 seconds, 3 times before moving the throttle or starting the engine).



(Photo A)



(Photo B)

### 3) Cylinder Head Temperature Sensor

If you are experiencing any irregular performance as the engine temperature changes, inspect the connections on the cylinder head temperature sensor. We routinely see monitor logs with a poor connection or a faulty sensor which will send erroneous data to the AutoTune system. This condition can easily be identified by recording a monitor log during the operation of the engine. Normal operation would show a steady gradual engine temperature changes as the engine warms up.

We recommend that all ECM related wiring connectors, system relays and ECM fuses are inspected and cleaned by swabbing with alcohol and Q-Tip to remove scale and oxidation build-up. Then, apply a light coat of dielectric grease on the connector before reconnecting.

This will improve conductivity by preventing future corrosion or scale from forming.

**It is highly recommended to do the same for the fuse box and all fuse spades.**



**Replace severely corroded parts**

### 3. Service the Battery

Often overlooked or assumed in good order, yet roughly 50% of the vehicle we see at Rallies have loose battery cables or improper mounting of ancillary connectors on the battery which will give you problems.

A) **REMOVE ECM FUSE** then the battery cables; clean and prepare them before re-installation.

- B) Always make sure the battery cables are secured directly against the terminal, clean, tight and routed correctly.
- C) All non-original electrical accessories wired on the vehicle are connected to a second, separate mount on the battery, (see image below). Temporarily removing or bypassing any non O.E accessory device may be a valid test when troubleshooting for odd problems.



#### 4. Road Test

After you have performed all of these tasks you can road test to confirm you have remedied the problem, in addition read the Diagnostic Trouble Codes again within the ThunderMax® software to verify that there are no other problems pending on the motorcycle. If you have a question from this point send in a module data collection which will read everything stored within your module, sending it directly to the TMax product support desk