

# AFTERMARKET POWERTRAIN CONTROL MODULE CALIBRATION—NON-FACTORY MODIFICATION OR AFTERMARKET COMPONENTS

TSB 11-7-7

## **FORD:**

2011-2012 Mustang  
2011 F-150

## **ISSUE**

Some 2011 F-150 and 2011-2012 Mustang vehicles equipped with 5.0L engine may have unauthorized modifications to the powertrain hardware and/or calibration which may result in exceeding component design limits. Such modifications could cause damage to the powertrain and/or void the factory powertrain warranty.

## **ACTION**

Follow the Service Guidelines.

## **SERVICE GUIDELINES**

Inform owners that the current 5.0L calibrations adjust fuel and spark settings for maximum performance with production hardware, while protecting the engine over a wide range of operating conditions. This includes a knock sensor calibration enabling optimized performance based on fuel grade usage see Owner's Guide for details. Aftermarket hardware and calibrations risk damage to the engine.

Unauthorized calibration modifications may or may not be detectable using standard tools Integrated Diagnostic System (IDS), Portable Diagnostic Software (PDS), NGS+ VCM. Changes can be made to the calibration and flashed to the powertrain control module (PCM) through the on-board diagnostics (OBD) port. Physical modifications to the hardware may or may not be present. If aftermarket power/torque-increasing modifications are suspected, care should be taken to record and store the following items: Permanent diagnostic trouble codes (DTCs), pending DTCs, freeze frame data, mode 6 and mode 9 data. The data should be printed and attached to the repair order for later reference.

The DTCs, freeze frame data, mode 6 and 9 data can be obtained by using the IDS, PDS or NGS+VCM under tool box selection. The powertrain tab will provide the OBD test modes tab and mode 6 and 9 data selection after the vehicle has been identified.

Attempting to increase the engine output via recalibrating the PCM may result in poor drivability, DTCs, or component failures. A partial list of calibration induced component failures is given below:

### **Excessive Cylinder Pressure And Temperature**

- Piston damage
- Spark over-advanced (knock-induced damage)
- Insufficient enrichment
- Catalyst damage

### **Increased RPM Limit/Overspeed**

- Piston damage
- Connecting rod damage
- Oil pump damage
- Catalyst damage
- Clutch damage

### **Knock Sensor Calibration Changes**

- Piston and/or ring damage due to improper knock control

### **Hardware Modifications:**

The following list contains items that are frequently modified in an effort to increase the engines torque/power output. Modifying these items may, or may not improve the performance, but can lead to drivability issues, DTCs and possibly component failures:

- Air induction system (air box, air filter, zip tube)
- Super chargers

**NOTE:** The information in Technical Service Bulletins is intended for use by trained, professional technicians with the knowledge, tools, and equipment to do the job properly and safely. It informs these technicians of conditions that may occur on some vehicles, or provides information that could assist in proper vehicle service. The procedures should not be performed by "do-it-yourselfers". Do not assume that a condition described affects your car or truck. Contact a Ford or Lincoln dealership to determine whether the Bulletin applies to your vehicle. Warranty Policy and Extended Service Plan documentation determine Warranty and/or Extended Service Plan coverage unless stated otherwise in the TSB article. The information in this Technical Service Bulletin (TSB) was current at the time of printing. Ford Motor Company reserves the right to supersede this information with updates. The most recent information is available through Ford Motor Company's on-line technical resources.

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- Nitrous oxide systems
- Throttle bodies
- Exhaust air path/system

### Review Engine Damage:

Common failures associated with unauthorized modifications have included:

- DTCs present indicating cylinder misfires (P0300 - P0308)
- Cylinder/piston damage resulting in a misfire, low compression, noise
- Unusual Clutch wear/damage
- Piston damage - light knock (Figure 1)
- Piston damage - heavy knock (Figure 2)
- Evaluation Guidelines Chart (Figure 3)



Figure 1 - Article 11-7-7



Figure 2 - Article 11-7-7