TT410: Big Twin Idle Speed Improvements

August 3, 2009

Engine

APPLIES TO	SYMPTOMS
All 2007 Big Twin Models	• Driveability or Performance Concerns • Abnormal or Erratic Mechanical Operation • Intermittent or Erratic Electrical Operation

2007 Big Twin Idle Speed Improvements

This Tech Tip covers two different conditions on 2007 Big Twin models that relate to idle speed and return-to-idle concerns.

Theory:

Engine speed is controlled by regulating the amount of air that is admitted into the engine. On Delphi fuel injected models, this is done with a throttle plate (or butterfly) and the IAC (Idle Air Controller).

The throttle plate opening is set at the manufacturer. This is done by adjusting the throttle stop screw. When the engine is at idle, part of the air admitted into the engine comes from the throttle plate that is open slightly. The additional air required to maintain the desired idle speed then comes from the IAC passage. This is managed by the ECM.

It is also important to understand that the ECM uses almost all of the engine sensors to manage idle speed. The following sensors however, are the most important in determining how and when to control the idle speed: Throttle position sensor, vehicle speed sensor, and the engine temperature sensor.

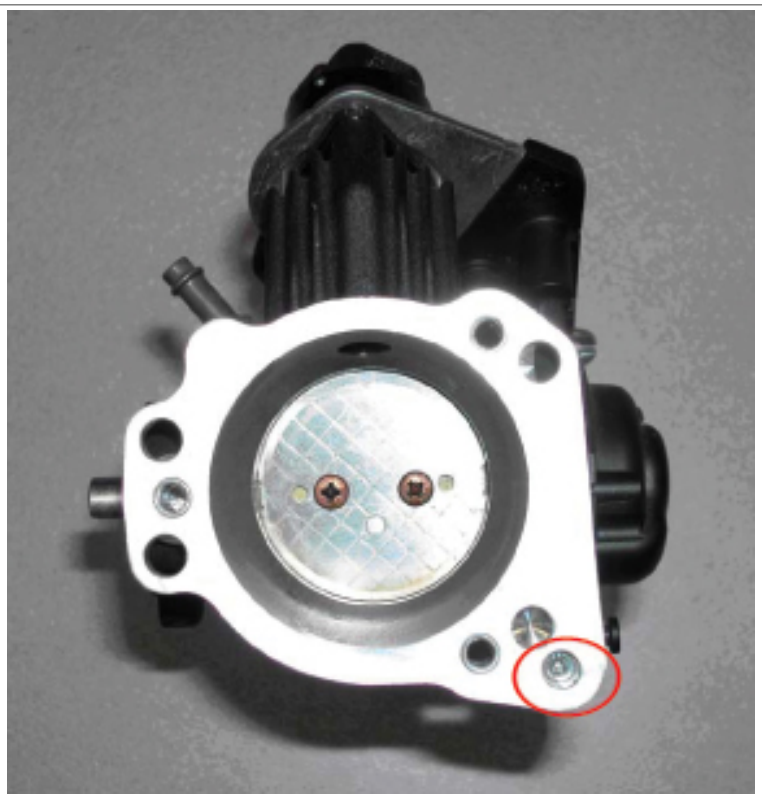

Figure 1. Induction Module and Throttle Stop Screw

Higher Than Normal Idle Speed:

If the engine speed is higher than normal, there are few likely causes. We know that engine must be getting too much air through the IAC, throttle plate, or an air leak.

Intake leaks are generally indicated by unusually low IAC step counts and compensated for by the system without creating an idle or noticeable drive symptom. They are also easily and often misdiagnosed. Carefully follow the Intake Leak Test outlined in the service manual, using the Propane Enrichment Kit (HD-41417), to avoid false positives for manifold seal leaks.

If the IAC is allowing too much air, there is likely an internal issue with the IAC or a wiring issue that prevents the ECM from being able to close the IAC. Before testing wires or replacing any components, install the IAC test lamp (part number H-D-411999-3) and follow the tests described the in Electrical Diagnostic Manual.

A throttle plate that is allowing too much air will have similar symptoms as an intake air leak. The IAC steps will usually be low or 0 and there could be a P0505 code. This could be caused by tight throttle cables, a broken throttle shaft, or a throttle stop screw that has moved out of position.

Tight cables and broken throttle shafts are easy to verify visually and the throttle stop screw can be confirmed by verifying that the throttle position sensor voltage is no higher than .61 VDC.

Low Idle or Return to Idle Stall:

Improvements were made to the calibrations for 07 Big Twin models to improve the IAC (Idle Air Controller) function. These parameters were later improved in all stock, stage, and race calibrations for these models and are now available in the latest calibrations from the Digital Technician II, Race Tuner, and Super Tuner.

The following symptoms may indicate that the ECM calibration needs to be updated: Engine stalling when coming to a stop, low idle speed or rough idle when stopping, a historic P0505 DTC for loss of idle speed control.

If the bike is also hard to start when the engine is at running temperature, check the throttle position sensor voltage. If it is lower than .57 VCD, it is recommended that the factory specified voltage is maintained at .57 VDC. See the instructions below

Maintaining the throttle stop screw:

NOTE

The stop screw should not be disturbed unless the vehicle has one of the following symptoms and has been flashed with the latest ECM calibration.

1. High idle
2. Low idle
3. Return to idle stalling

Many vehicles operate properly with a TP voltage as low as .49 up to .61 VDC and require no repositioning.

The throttle plate can be positioned by maintaining the factory specification through use of tool HD-49827 while monitoring TP voltage with Digital Technician II.

The stop screw is located in the lower right hand side of the induction module and may be covered by a seal. See the image on page one for the location. A reading of .57 volts, as seen in the image below, will verify a properly positioned throttle stop screw.

After the position has been verified, start the engine and verify idle speed. When the engine is running at operating temperature, the IAC steps should read between 20 and 60 steps. Always peen the area around the stop screw and add a thread locker if screw maintenance was necessary.

Please remember the importance of maintaining the factory specified idle within these tolerances for the purpose of emissions compliance in the respective market region.

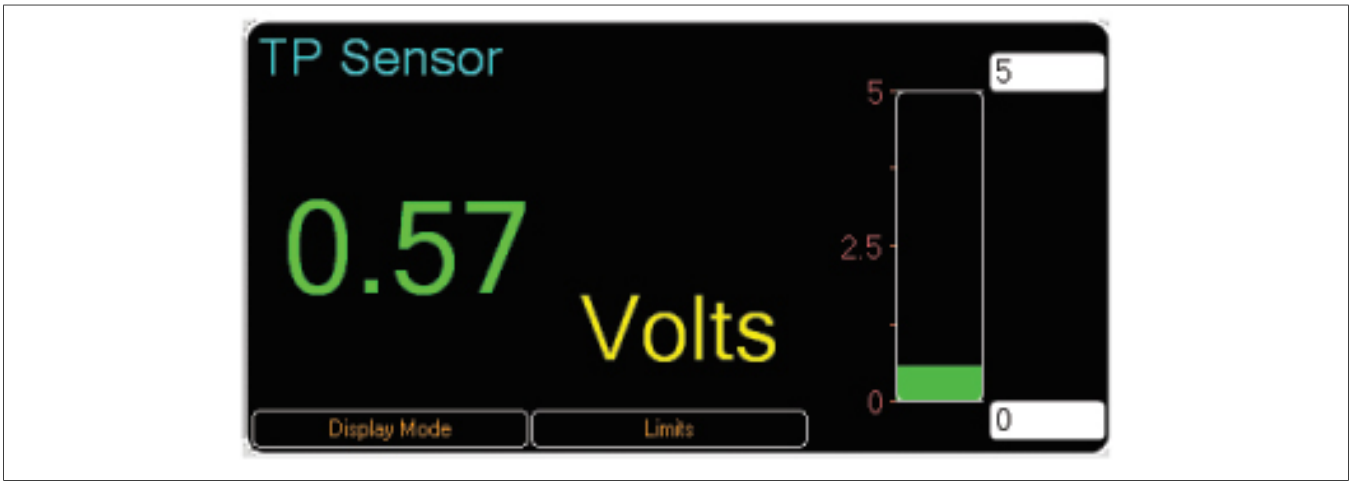

Figure 2.

- For in-warranty-vehicles, credit will be allowed for reflashing the calibration at the usual rate.
- For OE calibrations, file a MC claim using labor code 7804 for 0.2 hours labor.
- For SWR'ed P&A calibrations, file a PNA claim using labor code 8209 for 0.2 hours labor. Non-registered P&A performance calibrations will require preauthorization for warranty credit. Updating calibrations from the EFI Race Tuner or Super Tuner is NOT covered under warranty.

NOTE

NOTE: Labor code 8209 is a new code and may need to be downloaded into your system.