

From: Chris Santucci=-WDC/Toyota_NY

Sent: 12/21/2006 8:37 AM

To: [-] <Scott.Yon@dot.gov>

Cc: [-] Jeff.Quandt@dot.gov, Christopher Tinto=-WDC/Toyota_NY@Toyota_NY

Bcc: [-]

Subject: Re: DP06-003: Questions regarding P Codes/Freeze Frame data

Scott,

Please find the attached document that contains our responses to your questions. In addition, attached you will find some pages from the repair manual and the requested case information. Please note that there is a printing error in the repair manual. In the event that the ETC system has a malfunction, the throttle control valve returns to a predetermined opening angle of 6.5 degrees by the force of the return spring. The repair manual notes this angle to be 16 degrees, which is incorrect. If you have any questions, please let me know.

Regards,

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<Scott.Yon@dot.gov>
11/27/2006 04:08 PM
To <CSantucci@tma.toyota.com>
cc <Jeff.Quandt@dot.gov>
Subject DP06-003: Questions regarding P Codes/Freeze Frame data

Chris,

This message is further to our recent phone discussions. The Petitioner is alleging that, earlier this month, a throttle related incident occurred with his vehicle after the installation of the new throttle actuator. During our discussions you requested that I submit in writing any questions NHTSA had regarding this issue and that Toyota would respond (in writing) soon thereafter. Here are the questions regarding the P Code/Freeze frame data that was allegedly extracted from the Petitioner's vehicle after this incident, and the operation of the diagnostic system of the Petitioner's vehicle.

- 1) Based on information provided by the Petitioner, I understand that the following P codes were set: P2111, P2112, and P2119. Is this consistent with Toyota's understanding?
- 2) Based on information provided by the Petitioner, I understand the following Freeze Frame data was stored in the ECM:
 - a. Fuel System: open loop;
 - b. Load Value: 0%;
 - c. Coolant Temp: 177F;
 - d. Short Term Fuel trim: 0%;
 - e. Long Term Fuel Trim: 0.7%;
 - f. Engine RPM: 0;
 - g. Vehicle Speed: 0;
 - h. Ignition Timing Advance: 5 degrees;

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i. Intake Air Temperature: 91F;

j. Air Flow Rate: 0.05 lb/min;

k. Throttle Position: 29%.

Is this consistent with Toyota's understanding?

3) For each item in the list above (11 in total);

a. Describe in detail what the item means or represents (what engine/vehicle parameter is it monitoring/indicating);

b. State the unique values, or the max/min range, that can be stored in Freeze Frame data;

4) Describe any actions that could be undertaken by a subject vehicle (SV) owner (such as unplugging an engine sensor and turning the ignition on, etc) which could explain, and result in, the P Codes and Freeze Frame data that was allegedly stored in the Petitioner's vehicle.

5) I need to better understand the sequence of events that occur when the ECU detects that a fault has occurred, sets P Codes, and stores Freeze Frame data. Explain in detail the timing and sequence of events that occur during the detection of P codes and recording of Freeze Frame data in the SV ECM.

a. Is the Freeze Frame data representative of the exact conditions at the precise moment the fault is detected, or the conditions before, or after, and how much before or after.

b. When in this sequence is the Service/Check Engine light illuminated; does illumination occur as soon as the fault is detected, and before or after the Freeze Frame data is written?

6) State the values for each item in Request 2 that would be expected to be stored in the Freeze Frame data if a P code(s) were detected under the following vehicle operating conditions: the vehicle is stationary and has been parked for a 2 to 3 hour period at ambient temperatures of about 60F, the engine is started and immediately goes to 3000 rpm for 7 seconds, and simultaneously the Service/Check Engine light illuminates, and the engine then stalls.

a. In this scenario, what affect would the act of restarting the vehicle (without a key-off event) have on any fail safe mode of operation that may have been set due to a P code being detected; would it reset or clear the failsafe mode?

b. In general, when a fail safe mode of operation has been enabled, does the ignition switch need to be fully switched off to clear the fail safe mode, and is there any minimal amount of time that the ignition key must be switched off to clear/reset the fail safe mode, or will simply turning the key off and immediately back on again clear the fail safe?

7) State all P codes and Freeze Frame data which would be expected to be stored if:

a. The throttle actuator was disconnected while the ignition switch was in the on/run state with the engine off and the vehicle stationary;

b. The throttle actuator was disconnected while the engine was at idle and the vehicle stationary;

c. The ignition switch was turned on after the throttle actuator was disconnected (while the vehicle was stationary);

d. And under the above scenarios, if code P2102 and P2103 would not be detected or stored in the ECU, state why not?

8) Convert 29% throttle position to degrees throttle blade angle, and convert 16 degrees throttle blade angle to % throttle position.

9) State the typical (or typical range of) Throttle Position, Load Value, Air Flow Rate and Ignition Timing for a 4 cylinder engine at idle in Park gear?

10) State the typical Throttle Position, Load Value, Air Flow Rate and Ignition Timing for a 4 cylinder engine when the ignition key is on, the engine is off, and the vehicle is at rest in Park gear?

11) State what engine conditions (engine speed/RPM and load value) an Air Flow Rate of .05 lb/min represents?

12) The Petitioner provided NHTSA a copy of a repair invoice from Fred Anderson Toyota in Raleigh, NC (dated 11/6/2006) which referenced case # TA063100058. Advise whether TA063100058 is a Toyota case ID and if so, provide a copy of all information related to it.

Additionally, we discussed using a SV and diagnostic equipment to demonstrate, at Toyota's local office, what occurs under some of the various scenarios described above. Please advise the status of this request.

Lastly, regarding the Petitioner's original equipment throttle actuator which is currently in Japan with the component manufacturer, please continue with the destructive phase of the assessment program ASAP. Please provide the results of this assessment when available/completed.

Please advise any questions,
Scott

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