TOYOTA

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March 24, 2009

2009 MAR 26 AM 10:26

Mr. Jeffrey Quandt, Chief
Vehicle Control Division (NVS-213, Rm W48-312)
NHTSA, Office of Defects Investigation
1200 New Jersey Avenue, SE
Washington, DC 20590

Re: NVS-213swmc; PE08-072

Dear Mr. Quandt:

This letter is being sent in response to your January 5, 2009 letter regarding PE08-072. Enclosed you will find two copies of this response. Per our agreement, this completes our response to your inquiry. Please note that Toyota considers certain information within the attachments to be confidential, and has requested confidential treatment for this material from the Office of Chief Counsel. We are including copies of this material in redacted format on CD-ROM. Should you have any questions about this response, please contact Mr. Chris Santucci of my staff at (202) 775-1707.

Sincerely,

Chris Tinto
Vice President
TOYOTA MOTOR NORTH AMERICA, INC.

CT:cs
Enclosure
ATT_1

1. State, by model year, the number of subject vehicles Toyota has manufactured for sale or lease in the United States. Separately, for each subject vehicle manufactured to date by Toyota, state the following:

   a. Vehicle identification number (VIN);
   b. Model;
   c. Model Year;
   d. Date of manufacture;
   e. Date warranty coverage commenced; and
   f. The State in the United States where the vehicle was originally sold or leased (or delivered for sale or lease).

   Provide the table in Microsoft Access 2000, or a compatible format, entitled "PRODUCTION DATA." See Enclosure 1, Data Collection Disc, for pre-formatted table which provides further details regarding this submission.

Response 1

The number of MY 2003-2005 Toyota Sequoia vehicles manufactured for sale or lease in the United States by model year is as follows:

Model	2003 MY	2004MY	2005 MY	Total
Sequoia	68,289	61,329	49,259	178,877

In addition, the detailed information responsive to "a" through "f" is provided electronically on CD-ROM in Microsoft Access 2000 format entitled "PRODUCTION DATA (PE08072).mdb" stored in the folder "Attachment-Response 1."

2. State the number of each of the following, received by Toyota, or of which Toyota is otherwise aware, which relate to, or may relate to, the subject system in the subject vehicles:

   a. Consumer complaints, including those from fleet operators;
   b. Field reports, including dealer field reports;
   c. Reports involving a crash, injury, or fatality, based on claims against the manufacturer involving a death or injury, notices received by the manufacturer alleging or proving that a death or injury was caused by a possible defect in a subject vehicle, property damage claims, consumer complaints, or field reports;
   d. Property damage claims; and
   e. Third-party arbitration proceedings where Toyota is or was a party to the arbitration; and
   f. Lawsuits, both pending and closed, in which Toyota is or was a defendant or codefendant.

   For subparts "a" through "d" state the total number of each item (e.g., consumer complaints, field reports, etc.) separately. Multiple incidents involving the same vehicle are to be counted separately. Multiple reports of the same incident are also to be counted separately (i.e., a consumer complaint and a field report involving the same incident in which a crash occurred are to be counted as a crash report, a field report and a consumer complaint).

In addition, for items "c" through "f," provide a summary description of the alleged problem and causal and contributing factors and Toyota's assessment of the problem, with a summary of the significant underlying facts and evidence. For items "e" and "f," identify the parties to the action, as well as the caption, court, docket number, and date on which the complaint or other document initiating the action was filed.

Response 2

Using the methodology described in your question above, the number of reports which relate to, or may relate to, the alleged defect on the subject vehicles are provided electronically on CD-ROM in Microsoft Excel 2000 format entitled "Total Count for Reports.xls" stored in the folder "Attachment-Response 2".

Toyota did not include the complaints and reports which only describe the illumination of the slip indicator, or VSC/TRAC, ABS and/or Brake warning light and do not mention any phenomenon of inappropriate activation of the VSC or Traction system, or sudden and unexpected braking and/or loss of engine power. Those complaints account for approximately 85% of consumer complaints which relate to the VSC system.

In addition, it is unclear if the activation of the VSC or Traction system reported in some of complaints provided in this response may be caused by any malfunction of the VSC system or may be initiated as designed without any malfunction of the system.

3. Separately, for each item (complaint, report, claim, notice, or matter) within the scope of your response to Request No. 2, state the following information:

   a. Toyota's file number or other identifier used;
   b. The category of the item, as identified in Request No. 2 (i.e., consumer complaint, field report, etc.);
   c. Vehicle owner or fleet name (and fleet contact person), address, and telephone number;
   d. Vehicle's VIN;
   e. Model Year;
   f. Vehicle's mileage at time of incident;
   g. Incident date;
   h. Report or claim date;
   i. Whether a crash is alleged;
   j. Whether property damage is alleged;
   k. Number of alleged injuries, if any; and
   l. Number of alleged fatalities, if any.

   Provide this information in Microsoft Access 2000, or a compatible format, entitled "REQUEST NUMBER TWO DATA." See Enclosure 1, Data Collection Disc, for a pre-formatted table which provides further details regarding this submission.

Response 3

The information "a" through "l" for each item (complaint, report, claim, notice, or matter) is provided electronically on CD-ROM in Microsoft Access 2000 format entitled "REQUEST NUMBER TWO DATA (PE08072).mdb" stored in the folder "Attachment-Response 3".

4. Produce copies of all documents related to each item within the scope of Request No. 2. Organize the documents separately by category (i.e., consumer complaints, field reports, etc.) and describe the method Toyota used for organizing the documents.

Response 4

Lists of the consumer complaints, the copies of the field reports, and the documents related to the legal related claim are all provided electronically on CD-ROM in Microsoft Excel 2000, or PDF format stored in the folder "Attachment-Response 4." (The list of consumer complaints is stored in the sub-folder "Consumer Complaint." The copies of the field reports are stored in sub-folder "Field Report." The copies of the documents for the legal related claim are stored in the sub-folder "Legal Related Claims.")

5. A total count for all of the following categories of claims, collectively, that have been paid by Toyota to date that relate to, or may relate to, the subject system in the subject vehicles: warranty claims; extended warranty claims; claims for good will services that were provided; field, zone, or similar adjustments and reimbursements; and warranty claims or repairs made in accordance with a procedure specified in a technical service bulletin or customer satisfaction campaign.

   Separately, for each such claim, state the following information:

   a. Toyota's claim number;
   b. Vehicle owner or fleet name (and fleet contact person) and telephone number;
   c. VIN;
   d. Model Year;
   e. Repair date;
   f. Vehicle mileage at time of repair;
   g. Repairing dealer's or facility's name, telephone number, city and state or ZIP code;
   h. Labor operation number;
   i. Problem code;
   j. Replacement part number(s) and description(s);
   k. Concern stated by customer;
   l. Cause and correction; and
   m. Additional comment, if any, by dealer/technician relating to claim and/or repair.

   Provide this information in Microsoft Access 2000, or a compatible format, entitled "WARRANTY DATA." See Enclosure 1, Data Collection Disc, for a pre-formatted table which provides further details regarding this submission.

Response 5

The total count of warranty claims, extended warranty claims and claims for good will services paid by Toyota for the subject vehicles that relate to the subject components are provided electronically on CD-ROM in Microsoft Excel 2000 format entitled "Total Count for Claims.xls" stored in the folder "Attachment-Response 5".

The detailed information for each claim is also provided electronically on CD-ROM in Microsoft Access 2000 format entitled "Warranty Data (PE08072).mdb" stored in the folder "Attachment-Response 5".

6. Describe in detail the search criteria used by Toyota to identify the claims identified in response to Request No. 5, including the labor operations, problem codes, part numbers and any other pertinent parameters used. Provide a list of all labor operations, labor operation descriptions, problem codes, and problem code descriptions applicable to the alleged defect in the subject vehicles. State the terms of the new vehicle warranty coverage offered by Toyota on the subject vehicles (i.e., the number of months and mileage for which coverage is provided and the vehicle systems that are covered). Describe any extended warranty coverage option(s) that Toyota offered for the subject vehicles and state by option, model, and model year, the number of vehicles that are covered under each such extended warranty.

Response 6

The search criteria used by Toyota to identify the claims is the following:

Toyota searched the warranty database for those claims that replaced any of the parts identified in Microsoft Excel file entitled "Search Criteria, Operation & Problem Codes.xls" stored in the folder "Attachment- Response 6" on CD-ROM. In addition, a list of all labor operations, labor operation descriptions, problem codes and problem code descriptions identified in these warranty claims are also provided in the same Microsoft Excel file described above.

The terms that Toyota offers for new vehicle warranty coverage on MY 2003-2005 Sequoia vehicles are as follows;

For the VSC system
36 months or 36,000 miles from the vehicle's date-of-first-use, whichever occurs first.

There are some extended warranty coverage options that Toyota offered for purchase with the subject vehicles. Detailed information about these options is provided electronically on CD-ROM, in PDF format, entitled "Extended Warranty Option.pdf" stored in the folder "Attachment-Response 6."

The number of vehicles that are covered under each such extended warranty option, by option, model, and model year is provided as "Attachment-Response 6-1". Please note that this "Attachment-Response 6-1" contains trade secret and commercial information, therefore, Toyota believes that this document must be afforded confidential treatment. A request for confidential treatment of this document has been sent to the Office of Chief Counsel. A public version of this document is included with this response.

7. Produce copies of all service, warranty, and other documents that relate to, or may relate to, the subject system in the subject vehicles, that Toyota has issued to any dealers, regional or zone offices, field offices, fleet purchasers, or other entities. This includes, but is not limited to, bulletins, advisories, informational documents, training documents, or other documents or communications, with the exception of standard shop manuals. Also include the latest draft copy of any communication that Toyota is planning to issue within the next 120 days.

Response 7

Toyota has issued five service bulletins that relate to the subject system. Three of them are cited in your Information Request letter (NVS-213swmc) which are BR002-03, BR003-03 and BR006-06. Other two bulletins are intended to clarify the Repair Manual procedures and inform dealers when and how zero point calibration of sensors and sensor check must be performed.

Copies of the service bulletins are provided electronically on CD-ROM in PDF format stored in the folder "Attachment-Response 7".

8. Describe all assessments, analyses, tests, test results, studies, surveys, simulations, investigations, inquiries and/or evaluations (collectively, "actions") that relate to, or may relate to, the subject system in the subject vehicles that have been conducted, are being conducted, are planned, or are being planned by, or for, Toyota. For each such action, provide the following information:

   a. Action title or identifier;
   b. The actual or planned start date;
   c. The actual or expected end date;
   d. Brief summary of the subject and objective of the action;
   e. Engineering group(s)/supplier(s) responsible for designing and for conducting the action; and
   f. A brief summary of the findings and/or conclusions resulting from the action.

   For each action identified, provide copies of all documents related to the action, regardless of whether the documents are in interim, draft, or final form. Organize the documents chronologically by action.

Response 8

Toyota has summarized in a table the actions that relate to three TSBs submitted with this response; BR002-03, BR003-03, BR006-06. We are providing this information as "Attachment-Response 8" stored in the folder "Attachment- Reponse8" on CD-ROM. All of the documents related to these actions are being provided in the same folder. Please note that the documents provided in this portion of the response are confidential, and a request for confidential treatment has been submitted to the Office of Chief Counsel. A public version of these documents is included with this response to your office, provided on CD-ROM, in the folder "Attachment-Response 8." Please see the Office of Chief Counsel for the confidential version of these documents.

9. Describe all modifications or changes made by, or on behalf of, Toyota in the design, material composition, manufacture, quality control, supply, or installation of the subject components, from the start of production to date, which relate to, or may relate to, the alleged defect in the subject vehicles. For each such modification or change, provide the following information:

   a. The date or approximate date on which the modification or change was incorporated into vehicle production;
   b. A detailed description of the modification or change;
   c. The reason(s) for the modification or change;
   d. The part number(s) (service and engineering) of the original component;
   e. The part number(s) (service and engineering) of the modified component;
   f. Whether the original unmodified component was withdrawn from production and/or sale, and if so, when;
   g. When the modified component was made available as a service component; and
   h. Whether the modified component can be interchanged with earlier production components.

   Also, provide the above information for any modification or change that Toyota is aware of which may be incorporated into vehicle production within the next 120 days.

Response 9

Toyota has summarized in a table all modifications or changes made by Toyota, or on behalf of Toyota in the design, material composition, manufacture, quality control or installation of the subject components, which may relate to the alleged defect or three TSBs. We are providing this information as "Attachment- Response 9." Please note that some of the information included in "Attachment-Response 9" is confidential, and a request for confidential treatment has been submitted to the Office of Chief Counsel. A public version of "Attachment-Response 9" is included with this response to your office, provided on CD-ROM stored in the folder "Attachment-Response 9." Please see the Office of Chief Counsel for the confidential version of this document.

10. State the number of each of the following that Toyota has sold that may be used in the subject vehicles by component name, part number (both service and engineering/production), and month/ year of sale (including the cut-off date for sales, if applicable):

    a. Subject components; and
    b. Any kits that have been released, or developed, by Toyota for use in service repairs to the subject component/assembly.

    For each component part number, provide the supplier's name, address, and appropriate point of contact (name, title, and telephone number). Also identify by make, model and model year, any other vehicles of which Toyota is aware that contain the identical component, whether installed in production or in service, and state the applicable dates of production or service usage.

Response 10

The number of the subject component that Toyota has sold that may be used in the subject vehicles are provided electronically on CD-ROM in Microsoft Excel 2000 format entitled "Number of components sold in the US.xls" stored in the folder "Attachment-Response 10".

In addition, the supplier's name, address, and appropriate point of contact (name, title, and telephone number) for the subject component part number are also provided electronically in Microsoft Excel 2000 format entitled "Supplier Information.xls".

As for other vehicles which contain the identical component, Toyota is providing make, model, model year and the applicable dates of production electronically in Microsoft Excel 2000 format entitled "Other vehicles using identical parts.xls".

11. Provide the following information regarding the subject bulletins:

    a. A chronology of events related to the issuance of the bulletin, including a detailed description of when and how Toyota first recognized the concerns described in the bulletins, what actions were taken to investigate the concern and all meetings conducted to review the concerns and make the decision to issue the bulletins and each revision thereof; and
    b. Copies of all documents related to investigation and review of the concerns addressed by the subject bulletins, including all material presented at all meetings conducted to review the investigation and analysis of field data (e.g., complaints, field reports, and warranty data), the development of the correction, predicted failure rates, and the potential safety consequences.

Response 11

a. Because of the age and nature of three issues related to TSB BR002-03, BR003-03 and BR006-06, most of the documents related to issues have already been discarded in accordance with internal document retention policy. Therefore, we cannot identify when and what actions and meetings were conducted for each issue. However, in general, Toyota begins its investigation on a concern reported by a Field Technical Report, and after the investigation is completed, a meeting is held with the relevant departments of Toyota (in some cases, with an overseas affiliate and/or a supplier) to discuss a countermeasure and the necessity of any field action. After the countermeasure is taken and it is incorporated into the vehicle production, Toyota provides the distributor in the U.S. with the information about the problem, countermeasure, and the first vehicle into which the countermeasure is incorporated. In addition, a TSB is made and issued to dealers from the distributor if it is decided that the information about the change of the part number, countermeasure timing and repair method is necessary for dealers to be informed.

As for the three issues, the brief chronology of principal events is as follows.

TSB#	First Field Report	Countermeasure	Informed Distributor	TSB
BR002-03	March 2003	June 2003	June 2003	September 2003
BR003-03	November 2002	April 2003	April 2003	November 2003
BR006-06	January 2005	September 2005	September 2005	March 2006

b. As noted above, Toyota has not retained most of the documentation related to the three TSB issues. Only the documents which we found, that are related to the investigation and review of each issue and may have been used in some meeting, are submitted in Response 8 as attachments. Please see the attachments for Response 8.

12. Provide a detailed description of the VSC system used in the subject vehicles, including:

a. A description of system operation, including a diagram showing all sensor inputs, all control modules and all controls;
b. Copies of all electrical schematics and circuit diagrams;
c. Copies of all failure modes and effects analyses;
d. A detailed description of the full range of braking and throttle control authorities of the VSC system during stability control events and the maximum vehicle deceleration that can result from such events;
e. Describe and provide copies of all documents related to tests or other analyses conducted by, or for, Toyota regarding the effects of inappropriate VSC activation on vehicle control in various driving conditions;
f. A description of all visual and audible indicators available to the vehicle operator to signal VSC activation or a fault in the VSC system;
g. A listing of all trouble/fault codes associated with the VSC system and a description of how each is detected;
h. A detailed description of the VSC system self diagnostics and all faults/conditions that will cause the system to deactivate;
i. A detailed description of how contaminated rear wheel speed sensors can affect VSC operation;

and

j. The maximum time duration of a VSC activation event in the subject vehicles.

Response 12

Toyota provides all attachments for this response stored in the folder "Attachment-Response 12" on CD-ROM. In this folder, there are sub-folders for each response and attachment(s) for each response is in the sub-folder. Please note that some attachments include confidential information, and a request for confidential treatment has been submitted to the Office of Chief Counsel. A public version of each attachment is included with this response to your office. Please see the Office of Chief Counsel for the confidential version of this document.

a. Toyota provides the appropriate pages of the New Car Features for descriptions of VSC system operation, which includes a diagram showing all components utilized by the system in the subject vehicles, as "Attachment-Response 12-a-1" for the 2001MY Sequoia and "Attachment-Response 12-a-2" for the 2003MY Sequoia which has a modified VSC system.

b. Toyota provides the appropriate pages of the Repair Manual which show all electrical schematics and circuit diagrams as "Attachment-Response 12-b".

c. Toyota provides copies of the failure modes and effects analyses (FMEA), which relate to failure modes which may cause improper VSC or Traction control, as "Attachment- Response 12-c".

d. Toyota provides a result of the vehicle dynamic test which the braking/throttle control and the vehicle deceleration could become nearly maximum during stability control event as "Attachment-Response 12-d". This attachment shows the test conditions, such as steering maneuvers and vehicle speed, charts of the vehicle speed, steering angle, accelerator input, engine torque and brake pressures during the test, and a result of the maximum brake pressure, the engine torque decline value and the maximum of the deceleration.

e. The supplier of the VSC ECU (Continental) as well as Toyota has not conducted tests or other analyses regarding the effects of inappropriate VSC activation. The supplier only conducted the FMEA during the development stage as provided in this response. Please see Attachment-Response 12-c.

f. Toyota provides appropriate pages of the Owner's Manual which shows visual and audible indicators available to the vehicle operator to signal VSC activation or a fault in the VSC system, as "Attachment-Response 12-f"

g. Toyota provides appropriate pages of the Repair Manual which shows a list of all Diagnostic Trouble Code (DTC) associated with the VSC/Traction system and Brake/ABS system as "Attachment-Response 12-g-1". Toyota also provides appropriate pages of the system specification document which describes how failure related to each DTC is detected, as "Attachment-Response 12-g". In addition, Toyota provides charts showing DTCs, failure part/mode and system conditions for each DTC and related page numbers of the system specification document for each DTC, and a chart of warning lamps which illuminate by each failure mode, for your reference as "Attachment-Response 12-g-2".

h. Toyota provides detailed description of the VSC system self diagnostics by component as "Attachment-Response 12-h". All faults/conditions that will cause the VSC system to deactivate are included in Attachment-Response 12-g-2.

i. Toyota provides an explanation of the contaminated rear wheel speed sensor issue, including a cause, countermeasure and speed sensor mechanism, and a description of how contaminated rear wheel speed sensor(s) can affect VSC operation as "Attachment-Response 12-i".

j. Toyota provides a chart which shows the maximum duration of the VSC and Traction activation event in the subject vehicles as "Attachment-Response 12-j".

13 Furnish Toyota's assessment of the alleged defect in the subject vehicle, including:

a. The causal or contributory factor(s);
b. The failure mechanism(s);
c. The failure mode(s);
d. The risk to motor vehicle safety that it poses;
e. What warnings, if any, the operator and the other persons both inside and outside the vehicle would have that the alleged defect was occurring or subject component was malfunctioning; and
f. The reports included with this inquiry.

Response 13

Overview

Toyota has reviewed the reports on the subject vehicles regarding the Vehicle Stability Control (VSC) system, received by both the agency and Toyota, and believes that there are several issues present in these reports. In addition, in a number of the reports, it is Toyota's opinion that the VSC system was operating as designed, and that the reports are most likely related to the application of Traction Control rather than VSC. Since 2003, Toyota has issued a number of service bulletins related to, or affecting in some way, the VSC system. Only one of the conditions described in one of the bulletins can result in inappropriate VSC activation, albeit at a very low speed. Another one of the bulletins describes a condition that can cause inappropriate activation of the Traction Control system, which manifests itself to the operator in a manner similar to driving on a slippery surface. At this time, Toyota has not determined that a safety-related defect exists in the design or manufacture of the Toyota Sequoia vehicles. We believe that all of the issues addressed by the service bulletins are minor inconveniences that in no way adversely affect motor vehicle safety.

Design

Since the introduction of the Toyota Sequoia as a new model in the 2001 model year, all were equipped with the VSC system as standard equipment. The VSC system is part of Toyota's Star Safety System™, a combination of five safety features that comes standard in every Toyota Sequoia: Vehicle Stability Control, Traction Control, Anti-lock Brakes, Electronic Brake-force Distribution, and Brake Assist.

Vehicle Stability Control

If the vehicle is about to experience an unexpected skid (yaw), such as a sudden change in the road conditions or while making an emergency avoidance maneuver, this function automatically controls the brake fluid pressure applied to specific wheels and regulates the engine output in order to help maintain traction.

Traction Control

This function controls engine torque output and braking of the slipping wheel(s). It helps avoid drive wheel slippage that tends to occur when accelerating from a stop, or under heavy acceleration, to maintain an optimal driving force according to the road surface conditions.

Anti-lock Brakes

This function controls the brake fluid pressure to help prevent the wheels locking and helps to maintain good directional stability and steerability on slippery surfaces and during panic braking.

Electronic Brake-force Distribution
Based on input from the wheel speed sensors, this function detects the difference in the speed between the front and rear wheels, and controls brake fluid pressure in order to distribute the appropriate amounts of front and rear wheel braking force in accordance with the driving conditions.

Brake Assist
Adopted in the 2003 model year for Sequoia, the Brake Assist System interprets a quick push of the brake pedal as emergency braking and supplements the amount of braking power applied if the driver has not stepped hard enough on the brake pedal.

In general terms, the VSC functionality is carried out by the skid control ECU and the translate ECU, using inputs from the wheel speed sensors, the yaw-rate/lateral acceleration sensor, and the steering wheel angle sensor. VSC activation is designed to only occur at vehicle speeds above 9mph. Based on inputs from these sensors, the VSC system can reduce engine power and/or apply brake force to specific wheels to prevent vehicle skidding. Various strategies are adopted based on understeering or oversteering conditions, vehicle speed, steering wheel angle, etc. Anti-lock brakes work to help prevent wheel lock-up by monitoring wheel speed. Traction control works to help prevent wheel slip by applying brake pressure to the slipping wheel, and/or by reducing engine power. When VSC activates, an audible chime is heard in the vehicle cabin, combined with the flashing of the "SLIP" indicator lamp. When Traction Control activates, only the "SLIP" indicator lamp flashes; there is no audible chime.

Analysis of the Failure Modes – Vehicle Stability Control System

When reviewing the reports of inappropriate VSC activation (the alleged defect), it became clear that there were several scenarios being described. Toyota believes that in many of the cases, VSC activation most likely did not occur. This is, in part, due to the design of the VSC system to sound an audible chime in the vehicle cabin when it is functioning. Only three of the complaint reports received by your office and noted in the IR letter specifically mention the audible chime.

Toyota believes that in many of the complaint reports that allege activation of VSC, the Traction Control system is activating either appropriately, or in some cases, exacerbated by an issue with the rear axle bearing (See Attachment-Response 13 (TSB DL001-05)). However, a number of the complaint reports simply report illumination of the VSC/TRAC warning lamp without any activation while driving. These reports are most likely related to one of the following three TSB's submitted with this response:

BR002-03: VSC COMMUNICATION BETWEEN SKID CONTROL COMPUTER AND ECM - DTC C1203
Vehicles exhibiting this condition had the VSC/TRAC warning lamp illuminate (predominantly in cold weather) with DTC C1203 stored in the skid control ECU. Due to electrical noise generated from the ignition coil, the translate ECU incorrectly identified a communication malfunction (C1203) between the Engine Control Module (ECM) and the translate ECU. A revised translate ECU was developed to correct this condition, which cannot activate the VSC system inappropriately. The repair involves the replacement of the translate ECU.

BR006-06: M.I.L. ON" DTC C1247 & C1310: SKID CONTROL COMPUTER LOGIC CHANGE
Vehicles exhibiting this condition had the red-colored Brake warning lamp and the yellow VSC/TRAC warning lamp illuminate with DTC C1247 and/or C1310 stored in the skid control ECU. In this

instance, the delta-S sensor is incorrectly judged to have failed by the Skid Control ECU and/or the brake booster vacuum level is incorrectly judged as a failure in high altitude. The delta-S sensor is used in the Brake Assist system to calculate brake pedal application speed. VSC cannot activate inappropriately due to these conditions. A revised skid control ECU was developed to correct these issues. The repair involves the replacement of the skid control ECU.

As mentioned above, there is only one condition, addressed by one of the service bulletins, which, in rare conditions, can cause inappropriate activation of the VSC system. In most cases, the issue manifests itself as the illumination of the VSC/TRAC warning lamp. That TSB is the following:

BR003-03: VSC COMPUTER LOGIC MODIFICATION FOR DTC C1231
Vehicles exhibiting this condition had the VSC/TRAC warning lamp illuminate with DTC C1231 stored in the skid control ECU. This is due to the steering angle value being calculated incorrectly under a certain condition. While there are a number of warranty claims which can be attributed to this issue, inappropriate VSC activation requires specific conditions to be met. In only a few of the reports does Toyota believe VSC activated as a result of this issue; most resulted in the illumination of the warning lamp and C1231 being stored in the ECU. Inappropriate VSC activation can occur only if the steering wheel neutral position is not correctly understood by the ECU.

After a loss of battery power, the steering wheel neutral position is initialized in the skid control ECU. Logic in the skid control ECU identifies the initial position of the steering wheel as the initial neutral (straight ahead) position upon restoration of battery charge. If, at the time of battery power restoration, the wheel is turned, the initial position will not reflect the correct straight ahead position. However, the neutral position is recalculated based on vehicle sensor inputs prior to the initiation of the VSC system. The neutral position is recalculated, as an offset to the initial position, when the vehicle speed is above 6.75mph and the yaw rate value is less than about 0.5 deg/s for a few seconds. Once these conditions are met, a steering wheel offset is calculated, and VSC becomes "Ready." When the vehicle is stopped, the VSC system does a "self-test" and when the ignition is turned off, the calculated neutral steering offset is stored in the skid control ECU.

However, if the vehicle is brought to a complete stop and within 1.5 seconds the ignition is turned off, the calculated neutral steering wheel offset will not be stored in the skid control ECU. The previous value will be used the next time the vehicle is started and so on, as the process repeats. In most cases, when starting driving, only the warning lamp will be illuminated by the VSC system check and the VSC system will be disabled. In some cases, such as if the vehicle is driven initially with turning the steering wheel, VSC can improperly activate once the vehicle speed is above 9mph.

It is important to note that all of the conditions need to be met for VSC to activate. In addition, VSC will only activate beginning at 9mph; it will not suddenly activate at a speed higher than 9mph. For this reason, Toyota does not consider such activation to pose an unreasonable risk to motor vehicle safety.

Contamination of the Rear Wheel Speed Sensor
In November of 2005, Toyota issued a service bulletin (DL001-05) to address an issue with Rear Axle Bearing Noise on the subject vehicles. Due to water intrusion into the rear axle housing, corrosion could occur, causing the bearing to become noisy. After prolonged operation, Toyota found that corrosion products could contaminate one or both of the rear wheel speed sensors. Rear wheel speed data is used by the systems to determine if VSC, Traction Control, or ABS should be applied.

In certain cases, iron particles generated from the corrosion of the housing, could affect the signal from

the rear wheel speed sensor to the ECU. The wheel speed sensor is a magnetic pickup sensor that basically calculates the time between teeth of a rotor gear in the rear axle housing. The signal is electrical, and the ECU applies filters to the signal to generate a pulse waveform where each pulse can be counted. The system expects a fixed number of pulses per revolution of the axle. Using fixed data, such as tire size parameters, wheel speed can be approximated. At low wheel speeds, the iron particles can affect the signal in such a way that additional pulses can be generated between the teeth of the rotor gear. At higher speeds, axle revolution is too fast for the iron particles to cause signal interference.

The Traction Control system, for a 2WD vehicle, estimates vehicle speed from the front wheel speed sensors. If one of the rear wheel speed sensors is contaminated, and the signal is affected, essentially increasing rear wheel speed, the Traction Control system will activate, in such a case, inappropriately. From a stop, traction control will manifest as a grinding sound, as the system applies the brake to the wheel it believes is slipping. Vehicle acceleration will be reduced, but not through the reduction of engine power by the Traction Control system. Only above specific speeds will the Traction Control system reduce engine power for one wheel slip. When the Traction Control system judges both rear wheels are slipping, engine power will be reduced before brake actuation. Such conditions would require two contaminated sensors, or one wheel slipping and the other wheel with a contaminated sensor that is sending an affected signal. This condition will appear as engine loss of power or hesitation to the operator. The 4WD vehicles use more complex strategies for traction control, but in general, can be affected by this condition in a similar way.

Inspection of the vehicle can easily confirm the presence of contamination on the rear wheel speed sensors. However, the affect this condition has on vehicle operation is the same as when the vehicle is operating normally and there is actual wheel slip. After a short time, actual rear wheel speed will increase to a point where the sensor signal is no longer affected by the contamination, and vehicle operation will be as normal. Furthermore, actual wheel slip can occur when accelerating aggressively from a stop on dry surfaces, especially when making a turn. Toyota believes that some of the complaint reports may fall under such a scenario, where the Traction Control system is operating normally.

Risk to Motor Vehicle Safety

Toyota believes that neither condition described in BR002-03 nor BR006-06 cause an unreasonable risk to motor vehicle safety. As we mentioned above, neither of the conditions cause inadvertent VSC activation. Both only illuminate the warning lamp and disable the system. Toyota understands that the condition described in BR003-03 can cause inappropriate VSC activation, per the definition of alleged defect. However, it requires several specific conditions to be met, all of which would easily be confirmed after interviewing a complainant (i.e., occurred just after jump-starting). Also, in this condition, VSC activation will occur at 9mph, a very low speed, and the risk of a loss of control or crash is negligible. At such a speed, path correction interventions by the VSC system using the service brakes would probably not be noticed by the driver, but in any event, would be easily overcome by steering input. Activation at this low speed would more likely appear to the driver as hesitation combined with beeping and grinding sounds along with the flashing of the "SLIP" indicator lamp. After a few seconds of driving straight, the warning lamp would illuminate and VSC would be disabled.

In regards to contamination of the rear wheel speed sensor(s), vehicles experiencing the condition are behaving the same as vehicles starting from a stop on a slippery surface. The Traction Control system is designed to assist the vehicle in such situations. So while vehicle acceleration may be reduced, it is

not entirely eliminated; the vehicle can still be operated in a safe manner.

Conclusion

In summary, while Toyota has identified several issues that can affect the VSC and Traction Control systems, Toyota has not determined the existence of a safety-related defect. In some reports, Toyota believes the vehicle was operating as designed. In other cases, the VSC system is simply being disabled due to a component failure.

Of most concern to vehicle owners, as evidenced in their reports, appears to be the high cost of repair related to the replacement of either the skid control ECU or the translate ECU when the conditions described in BR002-03, BR003-03, and BR006-06 are diagnosed by a servicing facility. Toyota does make repairs on these conditions under warranty, both standard and extended, and may, on a case by case basis, offer to pay for repairs to promote customer good will for those owners outside of the warranty limits. Regardless, the conditions described in BR002-03 and BR006-06 do not pose an unreasonable risk to motor vehicle safety when they occur.

In the case of inappropriate VSC activation as caused by the specific conditions related to BR003-03, as well as Traction Control activation as a result of rear wheel speed sensor contamination, Toyota does not believe that an unreasonable risk to motor vehicle safety exists. Vehicle handling affect is minimal, and Toyota would like to demonstrate these conditions to your office in the near future.

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Regarding privileged documents that may be responsive to this information request, Toyota understands that it is acceptable to the Agency at this stage for Toyota to identify categories of privileged documents rather than any specific document within those categories. These categories include (a) communications between outside counsel and employees of Toyota's Law Department, other Toyota employees, or employees of parties represented by Toyota in litigation or claims; (b) communications between employees of Toyota's Law Department and other Toyota employees or employees of parties represented by Toyota in litigation or claims; (c) notes and other work product of outside counsel or employees of Toyota's Law Department, including work product of employees or consultants done for or at the request of outside counsel or Toyota's Law Department. For any privileged documents that are not covered by these categories, if any, Toyota will provide a privilege log identifying any such documents under separate cover. Toyota is not claiming a legal privilege for any documents provided with this response; however, Toyota does not waive the legal privilege or work product protection with respect to other documents that may have been prepared in connection with a specific litigation or claim. In addition, Toyota may assert the attorney client privilege or claim protection under the work-product doctrine for analyses or other documents that may be prepared in connection with litigation or claims in the future.

Toyota understands that NHTSA will protect any private information about persons that is contained in the Attachments to this response, based on privacy policy considerations. Such private information includes data such as names, addresses, phone or fax numbers, email addresses, license plate numbers, driver's license numbers and last 4 digits of the vehicle's VIN.

Data provided in this document is current as of the following dates:

Response		Dates
Response 1	Production Data	1/21/2009
Response 2 - 4	Consumer Complaint	1/27/2009
	Field Report	2/18/2009
	Lawsuit	1/27/2009
Response 5	Warranty claims	1/19/2009
	Goodwill	1/27/2009
	Extended warranty claims	1/26/2009
Response 7	Dealer communications	1/21/2009
Response 8	Actions	3/1/2009
Response 9	Changes & Modifications	3/1/2009
Response 10	Part sales	2/19/2009