

**TOYOTA**  
**TOYOTA MOTOR NORTH AMERICA, INC.**

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September 22, 2006

Mr. Thomas Z. Cooper  
Chief – Vehicle Integrity Division  
Office of Defects Investigation  
National Highway Traffic Safety Administration  
400 Seventh St., SW  
Washington, DC 20590

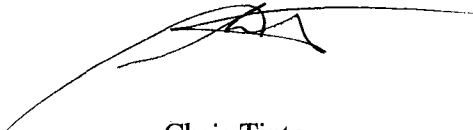
Re: NVS-212lhs; PE06-024

Dear Mr. Cooper:

This letter is being sent in response to your July 12, 2006 letter regarding PE06-024. This letter completes our response to your inquiry.

Enclosed you will find two copies of this response, including a redacted version of "Attachment-Response 8." The document identified as "Attachment-Response 8" is confidential and a request for confidential treatment has been made to the Office of Chief Counsel. 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

1. State, by model year, the number of subject vehicle manufactured by TMNA 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. Make;
  - c. Model;
  - d. Model Year;
  - e. Date of manufacture;
  - f. Date warranty coverage commenced; and
  - g. 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."

**Response 1**

The number of MY 2005-2006 Toyota Scion tC vehicles Toyota has manufactured for sale or lease in the United States by model year is as follows.

Model	Model Year	Total
Scion tC	2005	62,358
	2006	80,594
Total		142,952

In addition, detailed information for each vehicle is provided electronically on CD-ROM, in Microsoft Access 2000 format entitled "PRODUCTION DATA(PE06-024).mdb" stored in the folder "Attachment-Response 1".

2. State itemized separately for the subject retractable and stationary moonroof panels, the number of each of the following, received by TMNA, or of which TMNA is otherwise aware, that relate to or may relate to, the alleged defect 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 an injury or death, notices received by TMNA alleging or proving that an injury or death was related to or resulted from the alleged defect in a subject vehicles;
  - d. Property damage claims, including claims of a loss of vehicle control and/or accident in which catastrophic breakage of the moonroof are alleged to have contributed to the occurrence;

- e. Third-party arbitration proceedings where TMNA is or was a party to the arbitration; and,
- f. Lawsuits, both pending and closed, in which TMNA is or was a defendant or codefendant.

For subparts “a” through “c,” state the total number of each item (e.g., consumer complaints, field reports, etc.) separately. Multiple incidents involving the same vehicle, or separate moonroof panels on 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 TMNA’s assessment of the problem, with a summary of the significant underlying facts and evidence. For item “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**

- a. Using the counting methodology described in your question, there are 50 consumer complaint reports that may relate to the alleged defect in the subject vehicles. Since some customers complained about multiple incidents, the total number of unique vehicles in the consumer complaints is 47. This includes 4 vehicles which are duplicated with the NHTSA VOQs attached to the inquiry letter.
- b. There are 4 field reports that may relate to the alleged defect in the subject vehicles. This includes 2 vehicles which are duplicated with the consumer complaints and one vehicle which is duplicated with the NHTSA VOQ attached to the inquiry letter.
- c. There are no reports alleging a crash or a fatality had occurred. However in the consumer complaints, 3 incidents have been reported where a minor injury had occurred.
- d. There are no property damage claims which may relate to the alleged defect.
- e. There are no third party arbitration proceedings where Toyota is or was a party to the arbitration.
- f. There are no lawsuits in which Toyota is defendant.

The total count of the unique incidents for each item by model year and the specific moonroof panel (Center panel: retractable, or Rear panel: stationary), which may relate to the alleged defect in the subject vehicles is provided electronically on CD-ROM in Microsoft Excel 2000 format entitled “Total Number.xls” stored in the folder “Attachment- Response 2”.

- 3. For each item (complaint, report, claim, notice, or matter) within the scope of TMNA’s response to Request No. 2, state the following information:
  - a. TMNA’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. Vehicle's make, model and model year;
- f. Vehicle's mileage at time of incident;
- g. Incident date;
- h. Report or claim date;
- i. Whether the incident involved the retractable or stationary moonroof panel;
- j. Whether a crash is alleged;
- k. Whether property damage is alleged;
- l. Number, type, and severity of alleged injuries, if any; and,
- m. Number of alleged fatalities, if any.

Provide this information in Microsoft Access 2000, or a compatible format, entitled "REQUEST NUMBER TWO DATA."

### **Response 3**

The information 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(PE06-024).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 TMNA used for organizing the documents.

### **Response 4**

A list of all of the consumer complaints stored in the database is provided electronically on CD-ROM, in Microsoft Excel format, stored in the folder "Attachment-Response 4". In addition, copies of the field reports are provided electronically on CD-ROM in PDF format stored in the folder "Attachment-Response 4". (The list of the consumer complaints is stored in sub-folder "a. Consumer Complaint." Copies of the field reports are stored in sub-folder "b. Field Report".)

5. State, itemized separately for the subject retractable and stationary moonroof panels, a total count for all of the following categories of claims, collectively, that have been paid by TMNA to date that relate, or may relate, to the alleged defect 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. TMNA's claim number;
- b. Vehicle owner or fleet name (and fleet contact person) and telephone number;
- c. VIN;
- d. Repair date;
- e. Vehicle mileage at time of repair;
- f. Repairing dealer's or facility's name, telephone number, city and state or ZIP code;
- g. Labor operation number;
- h. Problem code;
- i. Replacement part number(s) and description(s);
- j. Concern stated by customer; and,
- k. 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."

### **Response 5**

The total counts of warranty claims and claims for good will services paid by Toyota for the subject vehicles that may relate to the alleged defect by model year and specific moonroof panel (Center panel: retractable, or Rear panel: stationary) are provided electronically on CD-ROM, in Microsoft Excel 2000 format entitled "Total Count for Claims.xls" stored in the folder "Attachment-Response 5". Toyota has received no extended warranty claims which may relate to the alleged defect.

The detailed information for each claim is provided electronically on CR-ROM, in Microsoft Access 2000 format entitled "WARRANTY DATA(PE06-024).mdb" stored in the folder "Attachment-Response 5".

6. Describe in detail the search criteria used by TMNA 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 TMNA 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) related to the alleged defect that TMNA offered for the subject vehicles and state 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 glass panels identified in the Microsoft Excel file entitled "Search Criteria, Operation & Problem Codes.xls" stored in the folder "Attachment-Response 6" on CD-ROM. Toyota then reviewed the claim comments to determine if the claims may be related to the alleged defect and to identify the glass moonroof panel involved in the incident.

However, the moonroof panel could not be identified in some claims due to the limited information in the warranty and goodwill claim database. Therefore, for those claims, Toyota attempted to contact owners to ask them which glass moonroof panel had shattered or broken. As a result, we were able to contact some of the owners and identify the panel.

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 is 36 months or 36,000 miles on MY 2005-2006 Scion tC vehicles 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 as follows.

Model	MY	Gold	Platinum	Powertrain	Total
Scion tC	2005	1,882	12,739	7	14,628
	2006	1,578	14,744	6	16,328
Total		3,460	27,483	13	30,956

7. Produce copies of all service, warranty, and other documents that relate to, or may relate to, the alleged defect in the subject vehicles, that TMNA 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 such communication that TMNA planning to issue within the next 120 days.

**Response 7**

Toyota has not issued any service or technical bulletins, advisories, or other communications to dealers, regional or zone offices, field offices, fleet purchasers, or other entities that relate to, or may relate to, the alleged defect in the subject vehicles.

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 alleged defect in the subject vehicles that have been conducted, are being conducted, are planned, or are being planned by, or for, TMNA. 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 performed by Toyota, the supplier of the moonroof assembly, and the supplier of the moonroof glass panels. We are and providing this information as "Attachment- Response 8." All of the documents related to these actions are being provided within "Attachment-Response 8." Please note that the documents provided in this portion of the response contain design and technical specifications, trade secrets and commercial information, therefore, Toyota believes that these documents must be afforded confidential treatment. A request for confidential treatment of these materials has been sent to the Office of Chief Counsel.

9. Describe all modifications or changes made by, or on behalf of, TMNA in the design, material composition, manufacture, quality control, supply, or installation of the subject components, from the start of production to date, which relate, 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 numbers (service and engineering) of the original component;
  - e. The part number (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 TMNA is aware of which may be incorporated into vehicle production within the next 120 days.

### **Response 9**

Toyota has made no modifications or changes to the subject component in the design and manufacture that relate or may relate to the alleged defect in the subject vehicles. However, for your information, Toyota has slightly increased in thickness of all three moonroof panel glasses from 2007 model year Scion tC vehicles. The purpose of this change is to improve the insulation of noise from the outside of the vehicle, such as wind noise, in order to obtain a better score in the Initial Quality Survey conducted by the JD Power and Associates.

10. Provide a complete engineering description and appropriate engineering specifications of the subject component installed in the subject vehicles. 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, all other vehicles of which TMNA is aware, that are equipped with identical moonroof and wind deflector assemblies as the subject vehicles, whether installed in production or in service, and state the applicable dates of production or service usage.

### **Response 10**

The engineering description and appropriate engineering specifications of the subject component installed in the subject vehicles have been provided in the Toyota's response to the NHTSA's Peer Vehicle Information Request (EA06-001). Please refer to the Response 5 and relevant attachments in Toyota's response submitted on July 14, 2006.

In addition, Toyota provides the appropriate pages of the New Car Features and Owners Manual for descriptions of the basic operation of the moonroof system, including the operation flow, the system diagram and functions, electronically on CD-ROM, in PDF format, stored in the folder "Attachment-Response 10".

The information on the supplier for each component part number of the subject system is provided electronically on CD-ROM in Microsoft Excel format entitled "Supplier Information.xls" stored in the folder "Attachment-Response 10".

There are no other vehicles which are equipped with identical moonroof and wind deflector assemblies as the subject vehicles.



11. Provide TMNA'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 11**

### **Overview**

Since receiving the opening resume for this investigation, Toyota has been evaluating the scope of the issue. This evaluation has included an analysis of all applicable field data that we have in our possession, a review of our design criteria and specification (including a review of manufacturing quality records), and testing regarding the operational environment of the Scion tC moonroof. All of this information was utilized in evaluating the risk to motor vehicle safety, and at this time, Toyota does not believe that a safety-related defect exists with the glass panels of the Scion tC's moonroof.

We have learned that some customers who have experienced a shattering of a moonroof panel indicated that the event was prefaced by a loud noise or an impact with a foreign object. We have found no crashes or serious injuries directly caused by the shattering of a moonroof panel. And we have found that the moonroof glass has been manufactured to our tolerances and specifications, and continue to meet the industry accepted standards for the mitigation of injury from shattered glass.

### **Field Analysis**

Since responding to the Peer Vehicle Information Request for EA06-001, Toyota has conducted a follow-up survey in order to obtain more details from owners who have experience a shattering of a moonroof panel. As a result, we were able to identify which panel was broken in a majority of the complaint reports. As we noted in our response, we have received fifty (50) complaint reports, of which forty-seven (47) unique vehicles identified that one of the moonroof panels had shattered. Included in our reports were reports from four (4) of the vehicle owners that filed Vehicle Owner's Questionnaires (VOQ's) with NHTSA. If we include the five other vehicles identified the VOQ's, there are potentially fifty-two (52) vehicles that have reported a shattering of one of the two moonroof panels to either Toyota or NHTSA.

In the Toyota reports and our survey, we have confirmed that:

- five (5) of the vehicles were parked at the time the moonroof shattered, and of these five vehicles, one was clearly damaged by hurricane, one noted a foreign object on the roof, and one noted vandalism.

- one (1) also indicated that the moonroof shattered during a hurricane, but it is unclear if it occurred while the vehicle was moving or parked.
- one (1) indicated that a moonroof panel shattered during a crash.
- one complaint alleged that a misalignment panels possibly may have caused an interference condition that resulted in a chipped glass panel.
- in our survey, two (2) customers mentioned that the glass panel shattered by the impact with a foreign object while driving.

In addition, after reviewing the nine VOQ's, three involve vehicles that were parked at the time of the incident. None of these three reports were reported to Toyota. In summary, of all the complaint reports, including those only reported to NHTSA, we note that thirteen (13) of the fifty-two (52) vehicles were either not moving at the time of the failure, or that the moonroof panel shattered as a result of a vehicle crash, a hurricane, misalignment of the panels, or a foreign object. When evaluating any evidence or trend that may indicate the existence of a motor vehicle defect, Toyota considers these incidents separately. As such we are noting these thirteen (13) complaints separately in the table below.

Of the remaining thirty-nine (39) vehicles that reported the shattering of a moonroof panel, for five (5) vehicles, we were unable to determine if the panel shattered while the vehicle was moving or not. In the remaining thirty-four (34) vehicles that we were able to confirm were moving at the time a panel shattered, twenty-four (24) reported that the center panel shattered, two (2) reported that the rear panel shattered, and three (3) reported that both panels had shattered. For five (5) of these vehicles (moving), it is unknown at this time which panel shattered. The following table summarizes these findings:

Driving	Center Panel	24	34
	Rear Panel	2	
	Both	3	
	Unknown	5	
Unknown	Center Panel	1	5
	Rear Panel	2	
	Unknown	2	
Parked, Crash or Hurricane Damage, Misaligned, Impact with Foreign Object			13
<b>Total</b>			<b>52</b>

When reviewing the thirty-four (34) complaints that reported a moonroof panel had shattered while driving, we found various differences and inconsistencies that, at this time, lead us to believe that there is no clear evidence of the existence of a defect trend. We believe that, in general, these incidents were most likely caused by random impacts with foreign objects. As mentioned above, in reviewing the complaints, we found some customers stated that something hit the moonroof prior to it shattering. Many reported that they did not see anything hit the moonroof, but heard a loud crack or popping sound at the time the glass shattered. This is still consistent with impact from debris; at speed it may be difficult to see a small, fast-moving object, especially one on a trajectory above or to the side of the sightline (which could impact the moonroof) of the driver.

### **Design**

The Scion tC's center and rear moonroof glass panels are constructed of tempered glass. Tempered glass has a mechanical strength much higher than other glazing materials. Its rupture modulus is, on average, 108 MPa. When stresses in the tempered glass reach the rupture modulus, it will break, but by design, into small fragments that have relatively dull edges. Many manufacturers have used tempered glass in vehicle roofs for many years and it has performed well in that application. The panels in the subject vehicles utilize ANSI Z26.1 "Item 3 Tempered Glass."

### **Manufacturing Process and Quality Control**

Of course, if not manufactured to the proper specifications, the complaint reports may indicate a quality issue with the production of the glass panels. Toyota began an investigation into the manufacturing process and quality control measures at the glass panel supplier. The supplier runs specific inspections, including some quality assurance tests, during every shift. In addition, the supplier has been regularly conducting shattered piece size and impact tests (See FMVSS 205 and ANSI Z26.1) for compliance. As a result of this investigation, Toyota is confident that the moonroof glass has no inherent defect due to manufacturing and quality control.

### **Operational Environment**

As we noted above, we believe that the most likely cause of moonroof shattering, for any vehicle, is from impact with a foreign object. Similar to what was discussed in PE05-021, and outlined in response 8, Toyota performed impact testing to evaluate the chipping resistance of the moonroof. Using a machine to horizontally launch a test piece that simulates a small stone, we found that the Scion tC's center moonroof glass panel could not be broken up to a very high impact speed. This is not to say that the center moonroof panel cannot be broken because of an impact; a piece of debris of a larger size or of an odd shape could cause the glass to fracture at a lower impact speed. It is, however, one way of assessing damageability of the system. Open or closed, the center moonroof panel has a much shallower angle than the wind deflector that was the subject of PE05-021. As a result, the shallower angle can cause more of a "glancing blow" to occur rather than a "direct hit," which we believe makes it less susceptible, yet not impervious, to damage from debris impact.

In addition, to confirm that ordinary usage could not cause the moonroof to shatter, a series of tests were performed to confirm the stresses on the glass panels. The maximum stress was measured on the glass panels in the various situations, such as immediately after assembly onto the vehicle, under extremely high and low temperatures, driving on rough roads, opening and closing the doors, etc. We found that the stresses on the glass panels do not exceed the rupture modulus of the material, and that the glass panels do not break during normal vehicle operation and driving.

### **Risk to Motor Vehicle Safety**

As we noted above, the use of “Item 3 Tempered Glass” provides a certain amount of injury mitigation. Such glass has been used for many years in automotive glazing, and has limited serious injuries from contact with the shattered pieces in many vehicles.

While some owners reported being startled by the shattered glass, only one customer reports that a loss of control occurred to NHTSA. Toyota does not have any details (other than the VOQ) of the incident because this customer did not mention any loss of control event when contacting the Scion call center regarding this same incident. At this time, Toyota does not believe that the shattering of a moonroof panel poses an unreasonable risk to safety, because Toyota believes that the potential for a loss of control or serious injury from contact with shattered glass fragments is limited.

### **Conclusion**

Based on the above information, Toyota has not determined the existence of a safety related defect at this time. Toyota believes that the most likely cause of moonroof panel shattering is from random impacts with foreign objects, which is an uncontrollable event. We believe that the use of “Item 3 Tempered Glass” is an appropriate material for a vehicle roof. We believe that no serious injuries have occurred as a result of moonroof panel shattering. And finally, we believe that, in general, a loss of control does not immediately follow the shattering of a moonroof panel. For these reasons, and the lack of any single, identifiable trend with the subject component or subject vehicles (aside from random impacts with debris), Toyota does not believe that a safety related defect exists.

\* \* \*

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 1 : Production Data (July 17, 2006)
- Response 2 - 4 : Consumer Complaint (August 3, 2006)
  - Field Report (August 21 17, 2006)
  - Lawsuit (July 31, 2006)
- Response 5 : Warranty claims (July 24, 2006)
  - Goodwill & Extended warranty claims (July 22, 2006)
- Response 7 : Dealer communications (August 23, 2006)
- Response 8 : Actions (September 15, 2006)
- Response 9 : Modifications/changes (Mid August, 2006)