

September 6, 2013

Mr. Jeffrey L. Quandt, Chief
Vehicle Control Division
Office of Defects Investigation
U.S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
1200 New Jersey Avenue, SE
Washington, DC 20590

Re: **PE13-024**
2007-2008 Honda Odyssey
Vehicle Stability Assist (VSA)

Dear Mr. Quandt:

In reply to your letter received on July 8, 2013, we are submitting our response regarding the allegations of inappropriate autonomous brake activation in certain model year (MY) 2007-2008 Honda Odyssey vehicles.

1. **State, by model and model year, the number of subject vehicles Honda has manufactured for sale or lease equipped with VSA in the United States and federalized territories. Separately, for each subject vehicle manufactured to date by Honda, 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 2010, or a compatible format, entitled "PRODUCTION DATA." See Enclosure 1, Data Collection Disc, for a pre-formatted table which provides further details regarding this submission.

Response:

The data elements "a" through "g" are provided in the file titled "PRODUCTION DATA" on the enclosed CD. There are separate tables for each model year.

Model	Model Year	# Manufactured for Sales/Lease
Odyssey	2007	207,235
	2008	135,640

2. State, by model and model year, the number of subject vehicles Honda has manufactured for sale or lease in the United States and federalized territories for which Honda has sold an extended service plan. For vehicles with more than one extended service plan, list the vehicle separately for each plan. Separately, for each vehicle, state the following:

- a. Vehicle Identification number (VIN);
- b. Model;
- c. Model Year;
- d. Name of extended service plan;
- e. Mileage at which the extended service plan expires; and
- f. The number of months from the warranty start date at which the extended service plan expires.

Provide the table in Microsoft Access 2010, or a compatible format, entitled "EXTENDED WARRANTY DATA." See Enclosure 1, Data Collection Disc, for a pre-formatted table which provides further details regarding this submission.

Response:

The data elements "a" through "f" are provided in the file titled "EXTENDED WARRANTY DATA" on the enclosed CD. There are separate tables for each model year.

Model	Model Year	# Manufactured for Sales/Lease with Extended Warranty
Odyssey	2007	48,676
	2008	30,147

3. State, by model year and alleged defect category, the number of each of the following, received by Honda, or of which Honda is otherwise aware, which 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;
- d. Property damage claims;
- e. Third-party arbitration proceedings where Honda is or was a party to the arbitration;
- f. Lawsuits, both pending and closed, in which Honda is or was a defendant or co-defendant.

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 Honda'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:

The total number of reports for items "a" through "f" is stated in the table below. We included rows indicating which of the following categories the complaint or report falls into:

“Braking” - Alleged inappropriate autonomous brake application; “Steering” - Allegations of steering difficulty; “VSA Light On” - Other malfunction resulting in VSA light illuminated and/or VSA diagnostic trouble codes; and “Light on Other” - VSA light or diagnostic trouble code for a problem that is known to not be related to allegation #1.

Honda did not identify any relevant reports for items “c” through “f”.

Note: Honda does not have any fleets or participate in fleet sales.

Model	Model Year	Allegation	A Owner/Fleet Reports	B Field/Dealer Reports	C Crash, Injury, and Fatality Reports	D Property Damage	E Third Party Arbitration	F Lawsuits
Odyssey	2007	Braking	17	77	0	0	0	0
		Steering	0	0	0	0	0	0
		VSA Light On	27	165	0	0	0	0
		Light on Other	0	35	0	0	0	0
Odyssey	2008	Braking	15	96	0	0	0	0
		Steering	0	0	0	0	0	0
		VSA Light On	13	146	0	0	0	0
		Light on Other	0	33	0	0	0	0

*Source(s): Customer Relations, Tech Line, Field Reports, Claims and Lawsuits.
 As of: June 30, 2013*

4. Separately, for each item (complaint, report, claim, notice, or matter) within the scope of your response to Request No. 3, state the following information:
- a. Honda’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 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 2010, or a compatible format, entitled “COMPLAINT DATA.” See Enclosure 1, Data Collection Disc, for a pre-formatted table which provides further details regarding this submission.

Response:

The data elements “a” through “l” are provided in the file titled “COMPLAINT DATA” on the enclosed CD. We included an additional column indicating which of the following categories the complaint or report falls into: 1) Alleged inappropriate autonomous brake application;

2) Allegations of steering difficulty; 3) Other malfunction resulting in VSA light illuminated and/or VSA diagnostic trouble codes; and 3a) VSA light or diagnostic trouble code for a problem that is known to not be related to allegation #1.

*Source(s): Customer Relations, Tech Line, Field Reports, Claims and Lawsuits.
As of: June 30, 2013*

5. **Produce copies of all documents related to each item within the scope of Request No. 3. Organize the documents separately by category (i.e., consumer complaints, field reports, etc.) and describe the method Honda used for organizing the documents.**

Response:

See Attachment #Q5 for copies of all documents on enclosed CD.

The documents are organized by category (i.e., consumer complaints, field reports, etc.) and within each category the documents are organized by model year then the last six digits of the VIN.

*Source(s): Customer Relations, Tech Line, Field Reports, Claims and Lawsuits.
As of: June 30, 2013*

6. **State, by model year and alleged defect category, counts for all of the following categories of claims, collectively, that have been paid by Honda to date that relate to, 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. Honda's claim number;
- b. Vehicle owner or fleet name (and fleet contact person) and telephone number;
- c. Vehicle's VIN;
- d. Vehicles model and model year;
- e. Repair date;
- f. Vehicle mileage at time of repair;
- g. Repairing dealers 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. Diagnostic trouble code(s) identified during the repair;
- m. Cause and Correction stated by dealer/technician; and
- n. Additional comments, if any, by dealer/technician relating to claim and/or repair.

Provide this information in Microsoft Access 2010 or a compatible format, entitled "WARRANTY DATA."

Response:

The total warranty counts are provided in the table below. The data elements "a" through "n" are provided in the file titled "WARRANTY DATA" on the enclosed CD.

Model	Model Year		Warranty Claims	Extended Warranty	Goodwill Claims	Warranty Claims TSB
Odyssey	2007	Braking	16	16	12	0
		Steering	0	0	0	0
		VSA Lamp/DTC	855	198	264	0
Odyssey	2008	Braking	33	15	17	0
		Steering	0	0	0	0
		VSA Lamp/DTC	970	119	125	0

Source(s): Warranty claim data.
 As of: June 30, 2013

7. Describe in detail the search criteria used by Honda to identify the claims identified in response to Request No. 6, 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 by make and model year, the terms of the new vehicle warranty coverage offered by Honda 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 Honda 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. Indicate which extended service plans provide coverage for the subject component.

Response:

Search Criteria: Using warranty data for all subject vehicles, claims were compiled based on part numbers for the VSA modulator assembly, Steering and Body Switch Sensor Assembly, and the Sensor Cluster Assembly. The contention text description was reviewed for each claim to identify the following symptoms: 1) Inappropriate autonomous brake application; 2) Steering difficulty; and 3) VSA light illuminated or VSA diagnostic codes.

Coding and Descriptions: See Attachment #Q7

Warranty Coverage: All subject vehicles are covered by a new vehicle limited warranty for three years or 36,000 miles, whichever comes first. Under the terms of the new vehicle limited warranty, Honda will repair or replace any part that is defective in material or workmanship under normal use. This warranty covers all systems except emission control systems, accessories, battery, tires or IMA system, each of which has their own warranty. Honda has not issued extended warranty coverage related to the alleged defect in any of the subject vehicles.

Source(s): Warranty claim data.
 As of: June30, 2013

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

Response:

Currently no communication is planned within the next 120 days. As no communication or other actions have been taken by Honda, there are no copies of documents related to this request.

9. 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, Honda. For each such action, provide the following information:
- Action title or identifier;
 - The actual or planned start date;
 - The actual or expected end date;
 - Brief summary of the subject and objective of the action;
 - Engineering group(s)/supplier(s) responsible for designing and for conducting the action; and
 - A brief summary of the findings and/or conclusions resulting from the action.

The response to this request should include a detailed description of all past, present and future actions by any and all engineering working groups (e.g., vehicle dynamics control task force) of which Honda is an active member or is otherwise aware. This includes, at a minimum, all of the information requested in items "a" through "f."

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:

The following summaries describe 1 document in Attachment #Q9.

Document 1: Quality improvement sheet (QIS) for the subject vehicle

- Action title or identifier: QIS (HMA 13042301)*
 - The actual or planned start date: April 23, 2013*
 - The actual or expected end date: A target date for identifying a countermeasure has been set for September 3, 2013. That target was not achieved.*
 - Brief summary of the subject and objective of the action: The document requests analysis of parts received from vehicles reported by the owner to exhibit the named symptoms of unintended brake application.*
 - Engineering group(s):
Honda Manufacturing of Alabama (HMA) Market Quality (MQ) Department,
Honda R&D Americas, Ohio
Supplier: Continental Automotive Corporation*
 - A brief summary of the findings and/or conclusions resulting from the action: This investigation is continuing at this time and no conclusions have been reached.*
10. Describe all modifications or changes made by, or on behalf of, Honda in the design, software, material composition, manufacture, quality control, supply, or installation of the subject system, 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:
- 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

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

Response:

No manufacturing changes occurred during the specified time; however design changes applied prior to the start of the 2007 model year and after completion of 2008 model year production are outlined in Attachment #Q10 and summarized below.

Document 1

A change was made to the initial diagnostics software to prevent the ES valve from opening. The actuation condition for the pump was also changed during initial diagnostics to help prevent the negative pressure condition. Both of these changes were applied from the start of production for the 2007 model year.

- a. August 8, 2006
- b. • Cycle time for pump drive was reduced
• The timing for initial pump actuation was increased
• Allowing the ES valve to open was discontinued, preventing the negative pressure condition from occurring. See Attachment #Q10 "Document 1(a)" for the details.
- c. This change was made to reduce noise generated by the ABS/VSA modulator during initial diagnostics.
- d. Part number 57110-SHJ-9620-M1 applied to 2005 and 2006 model year Odyssey vehicles.
- e. Part number 57110-SHJ-9640-M1 applied to 2007 and 2008 model year Odyssey vehicles.
- f. The production end date was July 10, 2007. Service part number 57110-SHJ-9620-M1 was superseded by service part number 57110-SHJ-9640-M1 in September, 2007.
- g. Part number 57110-SHJ-9640-M1 was made available as a service part for 2007 model year Odyssey vehicles as the 2007 Odyssey was introduced for retail sale in August, 2006.

Document 2

Opening ES valve was added in 09MMC.

- a. August 7, 2008
- b. The ES valve is opened after pump actuation during initial diagnostics. See Attachment #Q10 "Document 2(a)" for the details.
Correct the TCS valve movement program.
See Attachment #Q10 "Document 2(b)" for the details.
- c. This modification was made to prevent the hydraulic circuit from making negative pressure condition that may result in a gradually increasing pedal stroke.
- d. Part number 57110-SHJ-9640-M1 applied to 2007 and 2008 model year vehicles.
- e. Part number 57110-SHJ-A611-M1 applied to 2009 model year vehicles.

- f. *The production end date: July 25, 2008. These components were removed from service shortly after production ended and were superseded by part number 57110-SHJ-A611-M1 which was also applied to 2009 model year Odyssey vehicles as a new mass production part.*
- g. *Part number 57110-SHJ-A611-M1 was made available as a service part for 2005 through 2009 model year Odyssey vehicles at the time that the 2009 Odyssey was introduced for retail sale in August, 2008.*

11. State the number of the following components that Honda has sold for use in the subject vehicles by component name, part number (both service and engineering/production), model and model year of the vehicle in which it is used and month/year of sale (including the cutoff date for sales, if applicable).
- a. VSA control modules;
 - b. SAS, and
 - c. other VSA system sensors.

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 Honda 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:

See Attachment #Q11

Supplier Contact Information

Continental Automotive GmbH

One Continental Drive

Auburn Hills, Michigan 48326

Technology strategy, Research & Regulations: David Agnew

(248) 393-5903

12. Produce one sample of each of the following:
- a. VSA control module with both sides of the pin connector;
 - b. SAS sensor with both sides of the pin connector;
 - c. Yaw rate sensor; and
 - d. Representative samples of each VSA system component returned from the field for analysis, which may be related to the alleged defect.

Response:

Honda is shipping under separate cover one sample of each subject component along with samples returned from the field.

13. Provide the following information regarding the operation and diagnostics associated with the subject system:
- a. A description of the system operation, including the following diagrams:
 - i) Vehicle diagram showing the location of all VSA components;
 - ii) Wiring diagrams(s);
 - iii) Brake system hydraulic or electrical diagrams for each mode of system operation; and
 - iv) Block diagram of the system including communication buses;

- b. A detailed description of how the system controls vehicle stability using the brake and throttle, including:
 - i) A detailed explanation of how the braking command is calculated, communicated, and controlled;
 - ii) The maximum braking that can be commanded; and
 - iii) The maximum duration of a VSA activation;
- c. Describe all visual and audible indicators available to the vehicle operation to signal VSA activation or a fault in the VSA system;
- d. Provide a listing of all diagnostic trouble codes by the code, description, a detailed description of the conditions that will set the code, and the fault on the systems operation/mode;
- e. A detailed description of all design countermeasures intended to prevent, or reduce the possibility of VSA, activation caused by a system fault; and
- f. Describe the difference between the subject vehicle VSA and the VSA for prior model years.

Response:

- a. See Attachment #Q13a for complete responses to section 13(a)i-iv.
 - b.
 - i) See Attachment #Q13b-i for a complete response.
 - ii) Braking up to the threshold (wheel lockup) level braking of approximately 1.0G or a maximum of 11+4MPa relief pressure, whichever is less, can be commanded by the VSA system under these conditions.
 - iii) The VSA system in these vehicles is designed to activate for a maximum of 15 seconds continuously to address a sensed over-steer (push) condition, or up to a maximum of 30 seconds continuously to address a sensed under-steer (plow) condition.
 - c. See Attachment #Q13c for a complete response.
 - d. See Attachment #Q13d for a complete response.
 - e. The possibility of non-commanded or unintended VSA activation caused by a system fault was verified through the use of FMEA during system design and design countermeasures were implemented to prevent the occurrence of those events.
The system is designed to perform a fail-safe action detected by the self-diagnosis described above in Q13d [against expected failures].
 - f. See Attachment #Q13f for complete a response.
14. Furnish Honda'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, including:
 - i) The maximum deceleration that may result from a VSA activation;
 - ii) Whether VSA braking provides warning to trailing traffic (e.g. brake lamp illumination);
 - iii) The amount of steering compensation (steering wheel rim force and steering angle) required to maintain the vehicle in a straight path during a worst-case VSA false-activation event; and
 - 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.

Response:

- a. Honda is continuing to investigate this matter and at this time has not concluded the causal or contributory factors. Our investigation is focused on the VSA modulator software and the yaw rate – especially as it relates to the diagnostic trouble codes most frequently associated with these symptoms.
- b. The VSA (ESC) system includes a Pre-AYC function that is designed to operate prior to

reaching the active yaw control (AYC) threshold for intervention to reduce the time delay between detection of the need for AYC and activation. In pre-AYC operation the ES valve opened to operate the VSA modulator pump to circulate brake fluid within the system. AYC operation stabilizes the vehicle (matches the measured yaw rate to the steering angle at the operating speed) by applying brake force to a wheel or both wheels on one side of the vehicle when the yaw rate exceeds the programmed threshold and the potential for a vehicle spin is detected. During pre-AYC operation brake fluid is only supposed to circulate within the VSA modulator and brake fluid pressure at each wheel should not increase.

See Attachment #Q14b-1

The 07-08 Odyssey was introduced with the operation to close the TCS valve during initial system self-diagnosis at the start of each drive cycle. This blocks the transmission of pump pressure pulsation to the Master Cylinder. However, the program introduced at that time allowed the brake specification to close the TCS valve, even if not during the initial diagnostic, if pre-AYC was repeated at or above 2Hz.

See Attachment #Q14b-2

If off-set occurs with the YAWR sensor signal, depending on the driving condition, the vehicle mid-point adjustment operation by the software may not be performed properly. This may expand the off-set of the YAWR. Pre-AYC control as described above repeats the ON/OFF while driving straight, causing the brake pressure to increase by error.

See Attachment #Q14b-3

- c. False VSA pre-AYC activation resulting in 4 wheel brake activation.
See Attachment #Q14c*
- d. i) The maximum deceleration that may result from VSA activation is approximately 1.0G.
See Attachment #Q14c
ii) The brake lamps will not illuminate during a VSA activation event.
iii) There is no need for steering compensation during the VSA event since there is equal pressure in all 4 wheels.*
- e. At this time, we have not been able to determine what warnings, if any, the driver or other persons inside and/or outside the vehicle would have to indicate that the alleged defect was occurring. We are currently working towards being able to recreate the event with the symptoms described in the customer allegations.*

Sincerely,

AMERICAN HONDA MOTOR CO., INC.



Jay Joseph
Senior Manager
Product Regulatory Office

JWJ:nis

Attachments