

August 3, 2012

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 Ave., SE
Washington, DC 20590

**Re: DP12-002
2005 Honda Pilot
Vehicle Stability Assist (VSA) system malfunctions**

Dear Mr. Quandt:

In reply to your letter dated June 8, 2012, we are submitting our response regarding the allegations of Vehicle Stability Assist (VSA) system malfunctions in model year (MY) 2005 Honda Pilot vehicles. We are submitting a separate request for confidential treatment of selected attachments to this document. Attachments for which we seek confidential treatment are identified directly on the attachment file.

1. State, by model, engine and model year, the number of subject vehicles Honda has manufactured for sale or lease 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) Model;
 - c) Model Year;
 - d) Date of manufacture;
 - e) Date warranty coverage commenced;
 - f) If the vehicle is equipped with VSA; and
 - g) The State in the United States, or the federalized territory, where the vehicle was originally sold or leased (or delivered for sale or lease).

Provide the table in Microsoft Access 2007, or a compatible format, entitled "PRODUCTION DATA."

Response:

The data elements "a" through "g" are provided in the file titled "PRODUCTION DATA" on the enclosed CD. We have provided production data for the following Pilot trim levels: EX-L, EX-L with RES and EX-L with Navi. We have excluded the Pilot LX trim level which is only equipped with ABS, not VSA.

Model	Model Year	# Manufactured for Sales/Lease
Pilot	2005	87,083

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 2003, 2007, 2010, or a compatible format, entitled "SERVICE PLAN DATA."

Response:

The data elements "a" through "f" are provided in the file titled "SERVICE PLAN DATA" on the enclosed CD.

3. State 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, based on claims against the Honda involving a death or injury, notices received by the Honda 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;
 - e) Third-party arbitration proceedings where Honda is or was a party of to the arbitration; and
 - f) Lawsuits, both pending and closed, in which Honda 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 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" are stated in the table below. Honda did not identify any relevant reports for items "c" through "f".

Note: Honda does not have any fleets of nor did we engage in fleet sales of the 2005 Pilot.

Model	Model Year	A Owner/ Fleet Reports	B Field/ Dealer Reports	C-1 Crash Reports	C-2 Injury Reports	C-3 Fatality Reports	D Property Damage	E Third-Party Arbitration	F Lawsuits
Pilot	2005	87	193	0	0	0	0	0	0

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:
- Honda's file number or other identifier used;
 - The category of the item, as identified in Request No. 3 (i.e., consumer complaint, field report, etc.);
 - Vehicle owner or fleet name (and fleet contact person), address, and telephone number;
 - Vehicle's VIN;
 - Vehicle's model and model year;
 - Vehicle's mileage at time of incident;
 - Incident date;
 - Report or claim date;
 - Whether a road or lane departure is alleged;
 - Whether a crash is alleged;
 - Whether property damage is alleged;
 - Number of alleged injuries, if any; and
 - Number of alleged fatalities, if any.

Provide this information in Microsoft Access 2003 or 2007, 2010, or a compatible format, entitled "COMPLAINT DATA."

Response:

The data elements "a" through "m" are provided in the file titled "COMPLAINT DATA" on the enclosed CD.

Source(s): Customer Relations, Tech Line, Field Reports, Claims and Lawsuits.
As of: June 20, 2012

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 20, 2012

6. State, by model and model year, a total count 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 goodwill 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 and total cost per claim;
- b) Vehicle owner or fleet name (and fleet contact person) and telephone number;
- c) Vehicle's VIN;
- d) Vehicle's model and 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) Whether parts were returned for analysis by Honda,
- l) Concern stated by customer;
- m) Diagnostic trouble code(s) identified during the repair;
- n) Cause and Correction stated by dealer/technicians; and
- o) Additional comments, if any, by dealer/technicians relating to a claim and/or repair

Provide this information in Microsoft Access 2003 or 2007, 2010, or a compatible format, entitled "WARRANTY DATA."

Response:

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

Model	Model Year	Warranty Claims	Extended Warranty	Goodwill Claims	Warranty Claims - TSB
Pilot	2005	710	20	99	0

Source(s): Warranty claim data.
As of: July 17, 2012

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 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, news or tech tips, 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: See Attachment #Q7

Currently no communication related to this issue involving the subject vehicles is planned within the next 120 days.

8. 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 extended warranty. Indicate which extended service plans would cover components listed in the subject system

Response:

Search Criteria: Using warranty data for all subject vehicles, claims were pulled based on the following part numbers: VSA modulator assembly, Yaw rate sensor, Steering sensor combo switch and Wheel sensor assembly for all four wheels. The contention text description was reviewed for each claim to identify the following symptoms: 1) inappropriate/uncommanded autonomous brake application and/or undesired vehicle deceleration; 2) allegations of steering difficulty associated with VSA system malfunction and 3) other VSA system malfunction resulting in VSA system indicator lamp illumination and/or VSA diagnostic trouble codes.

Coding and Descriptions: See Attachment #Q8

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 or tires which have their own warranties. 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: July 13, 2012

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 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:

- 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.

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:

Document 1: Quality Analysis Request Sheet (QARS)

- a) **Action title or identifier:** QARS AHMA 200501100: VAS_Unintended brake operation during driving (See Attachment #Q9 Document 1)
- b) **The actual or planned start date:** Analysis requested as of document date 2005/06/12
- c) **The actual or expected end date:** No end date is specified on the document

- d) **Brief summary of the subject and objective of the action:**
This document requests analysis of an allegation of unintended brake operation during driving on a US Odyssey minivan. Specifically, this document requests analysis to determine if the US allegation was due to the same root cause or a different cause than the three reported occurrences of "unintended brake operation during driving" that had been reported on Japan market vehicles using the same component as the 2005 US Odyssey. The known condition in Japan was judged acceptable for change at MY06 timing for the US Odyssey, as there had not been any reports of this condition in the US at that time. Not cited on the document is the information that the occurrences reported in Japan were for a short duration and did not cause the vehicle to stop.
- e) **Engineering group(s)/supplier(s) responsible for designing and for conducting the action:**
The QARS requests analysis was conducted by Honda R&D, Tochigi, Japan (HGT) and the investigation was assigned to the Automobile Quality Analysis Office (AQAO) of the Honda Overseas Service Division.
- f) **A brief summary of the findings and/or conclusions resulting from the action:**
The document does not include any conclusion or final disposition.

Document 2: Quality Improvement Sheet (QIS)

- a) **Action title or identifier:** QIS SKVA05072701: 2005 Model Pilot Brakes Apply Unexpectedly (See Attachment #Q9 Document 2)
- b) **The actual or planned start date:** July 27, 2005
- c) **The actual or expected end date:** September 20, 2005
- d) **Brief summary of the subject and objective of the action:**
- i) Recreation testing was performed using 3 returned parts with the alleged defect from the owners' vehicle. Part: VSA Modulator
 - 1. Two returned parts (VSA Modulator), installed in vehicles and driven for approximately 4,000 miles without uncommanded brake application observed.
 - 2. One returned part was installed in a vehicle for testing and had improper brake application four times within approximately 0.5 miles. No additional improper brake application occurred with 230 additional miles of testing.
 - ii) Nine parts that were returned with the alleged defect from owner's vehicles were sent to the VSA Modulator supplier (Nissin) for testing.
 - 1. Disassembly and internal investigation of the returned parts (VSA Modulator), performed by Supplier (Nissin). No abnormalities were found.
 - 2. X-Ray analysis performed by supplier (Nissin), and no abnormalities were found.
- e) **Engineering group(s)/supplier(s) responsible for designing and for conducting the action:**
- i) Honda Manufacturing of Alabama, Lincoln Alabama; Quality Division, Quality Analysis Department
 - ii) Automobile Quality Analysis Office (AQAO)/ Honda R&D Tochigi, Japan (HGT)
 - iii) Nissin Kogyo Co., Ltd.
- f) **A brief summary of the findings and/or conclusions resulting from the action:**
- i) Brake assist function summary – brake pressure is automatically increased to ABS operation range when judged as sudden braking. In the case of the vehicle that initiated this QIS, the modulator registered a 66 and 68 code, the 66 code signals a pressure sensor failure (internal to modulator) and may be the reason for the brake assist failure.

- ii) *The VSA software applies brake assist before correctly diagnosing the failed brake pressure sensor.*
- iii) *Design change C4523695 released Sept. 2005 – update to control spec (5715Z-SJA-0030) to prevent improper brake assist control. Software compares brake pressure sensor values and looks for abnormal fluctuations that may cause brake assist to activate and prevents brake assist activation. Changes applied to 2006 Model Year Pilot.*

Document 3: Quality Improvement Sheet (QIS)

- a) **Action title or identifier:** QIS SKVA05072202: 2005 Pilot VSA Code 25 – YAW Rate Sensor (See Attachment #Q9 Document 3)
- b) **The actual or planned start date:** July 22, 2005
- c) **The actual or expected end date:** September 20, 2005
- d) **Brief summary of the subject and objective of the action:**
 - i. *Warranty data was analyzed and it was found that October and November 2004 produced vehicles had an increase in claims in which dealers were replacing the YAW rate sensor. Eight parts with the alleged defect were returned to HMA for testing.*
 - ii. *Four parts with the alleged defect from the owner's vehicles were installed on a test vehicle and were driven. While testing one part improper VSA activation occurred (See iii-1 below).*
 - iii. *Eight parts with the alleged defect from the owner's vehicle were tested using supplier (Akebono) test equipment and two were found to be out of specification.*
 - 1. *One part was found to have improper 0 point voltage at rest. Part was confirmed to cause VSA activation on test vehicle.*
 - 2. *One part was found to be out of specification with continuous testing. VSA activation did not occur with vehicle testing.*
 - iv. *Five parts with the alleged defect from the owner's vehicle were sent to the supplier (Akebono), with the following conclusions:*
 - 1. *GLAT output to 0V: Oxide film failure of ASC Chip.*
 - 2. *FPC Peel: delaminating due to poor bonding and operator rejection error.*
 - 3. *Yaw to 5V: Temperature compensation EEPROM data write error.*
- e) **Engineering group(s)/supplier(s) responsible for designing and for conducting the action:**
 - i. *Automobile Quality Analysis Office (AQAO)/ Honda R&D Tochigi, Japan (HGT)*
 - ii. *Nissin Kogyo Co., Ltd.*
 - iii. *Honda Manufacturing of Alabama, LLC*
 - iv. *Akebono*
- f) **A brief summary of the findings and/or conclusions resulting from the action:**
 - i. *YAW and G Sensor (Part 39960), Supplier Improvement Activity:*
 - 1. *G Sensor Temporary countermeasure: Discard chips with poor holding strength via screening.*
 - 2. *Permanent countermeasure: Start-up of new ASIC supplier (X-BAB), with chip modifications to improve internal circuitry and MASK. Ship from Akebono estimated to be Feb 2006.*
 - ii. *Flexible Printed Circuit Peel, (YAW sensor Part), Supplier Process Improvements:*
 - 1. *Hot bar head change every 50K cycles*
 - 2. *Rejection process revision, disable rejected parts*
 - 3. *Fixture modifications at Hot bar process*

- iii. Yaw to 5V, Supplier Process Improvements:
 - 1. 100% EEPROM data check after temperature compensation
- iv. Manufacturing: G302 SOP confirmation:
- v. Addition of secondary marker check
- vi. Design: HGT/AQAO theme up 3/3/ 2005 to promote software countermeasure – Design change C4523695 released September 05. Update control spec (5715Z-SJA-0030) to prevent improper VSA/TCS/BA control (faulty yaw rate signal detection before activations rather than after). Applied at 2006 model year production start

Document 4: Quality Improvement Sheet (QIS)

- a) **Action title or identifier:** QIS MV20051104084836: The vehicle was Decelerated Without Applying the Brake During Driving (See Attachment #Q9 Document 4)
- b) **The actual or planned start date:** November 4, 2004
- c) **The actual or expected end date:** August 11, 2007
- d) **Brief summary of the subject and objective of the action:**
 - i. Visual inspection performed of part (VSA Modulator) with alleged failure with no abnormality of the connector terminal area found.
 - ii. Recreation testing was performed on a test vehicle and found to have normal vehicle function.
 - iii. Measured P sensor and SVCC with oscilloscope: confirmed condition of wave form to be clearly unstable as compared to healthy parts.
- e) **Engineering group(s)/supplier(s) responsible for designing and for conducting the action:**
 - i. Automobile Quality Analysis Office (AQAO)/ Honda R&D Tochigi, Japan (HGT)
 - ii. Nissin Kogyo Co., Ltd.
- f) **A brief summary of the findings and/or conclusions resulting from the action:**
 - i. Cause was found to be unclear and no countermeasure was applied.

Document 5: Quality Improvement Sheet (QIS)

- a) **Action title or identifier:** QIS S9VA5010501: VSA Light On (See Attachment #Q9 Document 5)
- b) **The actual or planned start date:** May 5, 2005
- c) **The actual or expected end date:** November 16, 2005
- d) **Brief summary of the subject and objective of the action:**
 - i. Customers are reporting VSA light illumination with Diagnostic Trouble Code (DTC) of 27-1 indicating a steering angle sensor connection. A total of 26 claims had been reported to date.
- e) **Engineering group(s)/supplier(s) responsible for designing and for conducting the action:**
 - i. Honda Canada Manufacturing, QI department.
- f) **A brief summary of the findings and/or conclusions resulting from the action:**
 - i. The wiring harness branch connecting connecting to the VSA system from the steering column was reportedly very tight on some similar vehicles. This was identified as a possible cause of these contentions.

Document 6: Quality Improvement Sheet (QIS)

- a) **Action title or identifier:** QIS S9VA5022401: VSA Activation (See Attachment #Q9 Document 6)
- b) **The actual or planned start date:** February 24, 2005
- c) **The actual or expected end date:** March 14, 2005

- d) **Brief summary of the subject and objective of the action:**
 - i. Customers are reporting that the VSA light illuminates, with Diagnostic Trouble Code (DTC) of 25-1. Customer contentions range from loss of vehicle control to pulling left while driving, brake lock-up or other symptoms. Determine root cause.
- e) **Engineering group(s)/supplier(s) responsible for designing and for conducting the action:**
 - i. Automobile Quality Analysis Office (AQAO)/ Honda R&D Tochigi, Japan (HGT)
- f) **A brief summary of the findings and/or conclusions resulting from the action:**
 - i. Bench testing yields a 320ms interruption of the VSA modulator ground wire (G302) or failures internal to yaw sensors.

Document 7: Quality Improvement Sheet (QIS)

- a) **Action title or identifier:** QIS S3VA6100701 (See Attachment #Q9 Document 7)
- b) **The actual or planned start date:** July 10, 2005
- c) **The actual or expected end date:** October 25, 2005
- d) **Brief summary of the subject and objective of the action:**

Customers contend that the VSA malfunction indicator light is illuminated. A number of components from the subject vehicles have been returned for analysis, but the contention could not be duplicated. Determine root cause.
- e) **Engineering group(s)/supplier(s) responsible for designing and for conducting the action:** Nissin Kogyo Co., Ltd.
- f) **A brief summary of the findings and/or conclusions resulting from the action:**

Within the pressure sensor a missing weld between the circuit board and the pressure sensor results in an intermittent connection, it is possible that the weld process was bypassed during component production and was mishandled at the rejection step resulting in shipping of unsuitable components. The cause of non-communication appears to results from a capacitor that is out of spec due to a crevice between the cathode frame and the tantlum chip due to insufficient silver solder.

Document 8: Quality Improvement Sheet (QIS)

- a) **Action title or identifier:** QIS S3VA6100702 (See Attachment #Q9 Document 8)
- b) **The actual or planned start date:** July 10, 2005
- c) **The actual or expected end date:** June 4, 2007
- d) **Brief summary of the subject and objective of the action:**

The VSA failsafe software and yaw rate sensor appear to be generating a G302 DTC. Of the 8 returned parts the contention could be duplicated on only 1 out of the 6 that were confirmed to have the communication failure.
- e) **Engineering group(s)/supplier(s) responsible for designing and for conducting the action:** Automobile QualityAnalysis Office (AQAO) / Honda R&D Tochigi, Japan (HGT)
- f) **A brief summary of the findings and/or conclusions resulting from the action:**

The failures appear to be due to loss of electrical ground at the VSA modulator or a failure of the yaw rate or lateral G sensors. The occurrence of misactivation can be prevented through modification to the failsafe logic.

Document 9: Supplier Report

- a) **Action title or identifier:** Pilot (NK11V) "Brakes Applying on their Own" Market Claim Initial Analysis Report (See Attachment #Q9 Document 9)
- b) **The actual or planned start date:** This summary was issued on March 10, 2008
- c) **The actual or expected end date:** This summary was issued on March 10, 2008

- d) **Brief summary of the subject and objective of the action:**
This document summarizes an investigation of claims of uncommanded application of brakes in Pilot vehicles. A total of 8 components were returned from the market. The investigation focused on a tantalum capacitor in the control unit, based on previous experience with a similar concern in the Japan market Odyssey RV (a different vehicle than the US Odyssey minivan).
- e) **Engineering group(s)/supplier(s) responsible for designing and for conducting the action:** *Nissin Kogyo Co., Ltd.*
- f) **A brief summary of the findings and/or conclusions resulting from the action:**
The conclusion was that based on measurement of the parts returned from the market for analysis, no abnormalities were observed and no cause of the allegations that the brakes were applying on their own was found. The final page compares the Pilot components to those of the Japan-market Odyssey RV, stating that a conclusion that the components have the same tin plating condition on the tantalum condenser cannot be reached.

Document 10: Quality Improvement Sheet (QIS)

- a) **Action title or identifier:** *QIS S9VA5021002: VSA Activation (FPC Peel)(See Attachment #Q9 Document 10)*
- b) **The actual or planned start date:** *February 10, 2006*
- c) **The actual or expected end date:** *February 14, 2006*
- d) **Brief summary of the subject and objective of the action:**
Request for investigation for Yaw/G Sensor made by Akebono to conclude investigation of root causes related to VSA light on/VSA activation which has been documented separately.
- e) **Engineering group(s)/supplier(s) responsible for designing and for conducting the action:** *Automobile Quality Assurance Office (AQAO)/ Honda R&D Tochigi, Japan (HGT)*
- f) **A brief summary of the findings and/or conclusions resulting from the action:**
Yaw/G Sensor production factors were identified that would result in interruption of 5V ground. If this condition is present on the inner connector terminals (Yaw, VCC and Ground) VSA activation is possible. If outer two terminals (lateral and longitudinal sensor) the only symptom will be illumination of the VSA malfunction indicator.

Document 11: Quality Improvement Sheet (QIS)

- a) **Action title or identifier:** *QIS S9VA6082803: VSA Activates in Turns (See Attachment #Q9 Document 11)*
- b) **The actual or planned start date:** *August 28, 2006*
- c) **The actual or expected end date:** *September 5, 2006*
- d) **Brief summary of the subject and objective of the action:** *Customer contention of vehicle slowing when turning.*
- e) **Engineering group(s)/supplier(s) responsible for designing and for conducting the action:** *Not identified in document, dealer technician identified and addressed concern.*
- f) **A brief summary of the findings and/or conclusions resulting from the action:**
This document summarizes a dealer report that the rear wheel speed sensors had been reversed, likely during a prior repair. As a result VSA engaged and slowed the vehicle when turning.

10. Describe all modifications or changes made by, or on behalf of, Honda in the design, material composition, manufacture, quality control, supply, software, or installation of the subject systems, 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;
 - A detailed description of the modification or change;
 - The reason(s) for the modification or change;
 - The part number(s) (service and engineering) of the original component;
 - The part number(s) (service and engineering) of the modified component;
 - Whether the original unmodified component was withdrawn from production and/or sale, and if so, when;
 - 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:

a-c) *Attachment #Q10a-c describes the changes that were applied to the Honda Pilot VSA system between December 8, 2004 and December 14, 2007, spanning the 2005 through early 2008 model years. Included in Attachment #Q10a-c are the date each change was applied to mass production, a description of the modification or change including an explanation of why it was changed, as well as the part numbers affected by the change.*

d) *VSA Modulator: 57110-S9V-A61*

Yaw Rate Sensor: 39960-S3V-A02

Steering Angle Sensor: 35251-S9V-A21

e) *There were no modified component parts*

f) *The VSA modulator specific to the model year 2005 Honda Pilot, 57110-S9V-A61, was modified to incorporate new logic to prevent application of the brake assist feature, unless specific operating criteria are met, late in the 2005 model year. The change was considered small, and did not cause the part number to be changed.*

The part number for the 2006 model year Honda Pilot VSA modulator is different due to other significant changes to the vehicle, including different gear ratios and other modifications that necessitated corresponding changes to the VSA system.

The VSA modulators for the 2005 and 2006 model years are not interchangeable.

g) *Due to the level of modification during the 2005 model year being judged as a small change to the VSA system, the inventory of the original unmodified component was offered as a service part until the supply was depleted. After that point, the modified 57110-S9V-A61 components were offered for sale, and continue to be provided today.*

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 cut-off date for sales, if applicable).

- VSA control modules; and
- 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:

Attachment #Q11 includes a table that describes the service part sales history for the components that comprise the VSA system for the 2005 Honda Pilot.

The supplier contacts for each listed component are as follows:

Continental – Rear Wheel Speed Sensors

Kathleen Kane

NAFTA BU Quality

Cell phone 574-596-6326

Desk phone 248-393-5812

email: Kathi.Kane@continental-corporation.com

Nissin Brake – VSA Modulator, Front Wheel Speed Sensors

John Gabel, Quality Assurance Manager, jmgabel@nissinbrake.com

(419) 420-3850

Nozomi Yoshizawa, Quality Senior Engineer, nyoshizawa@nissinbrake.com

(419) 420 -3850

Akebono – Sensor Assembly – including Yaw Rate Sensor and G-Sensor

Akebono Brake Industry Co.,Ltd.

5-4-71 Higashi,Hanyu-City,Saitama 348-8508,Japan

Manager ,Quality & Production Engineering Section

Sensor Business Unit

Tadao Shimazaki

TEL : +81-48-560-1473(Ext 73-2151)

FAX : +81-48-560-1469

Email : t-shimazaki@akebono-brake.com

Weastec – Steering wheel angle sensor combination switch assembly

Brian Gilbert Supervisor Quality Engineering Department

Weastec, Inc.

1600 N. High Street

Hillsboro, OH 45133

Office – (937) 840-1234

Mobile – (937) 763-7084

Brian.Gilbert@weastec.com

12. Produce one sample of each of the following:

- a) VSA control module with pin connector;
- b) Yaw rate sensor; and
- c) Representative samples of each VSA system component returned from the field for analysis, which may be related to the alleged defect.

Response:

We are in the process of obtaining the requested components. At this time we are able to provide new service parts for each of the requested components. However, the VSA modulator we are able to obtain at this time includes the countermeasure software that was adopted and applied near the end of the 2005 model year, prior to the start of the 2006 model year, which includes logic that prevents application of the brake assist function unless specific criteria are met. We have not been able to locate a new VSA modulator incorporating the original 2005 model year software at this time, but we are continuing to look for this component.

In addition, due to the timing of this request relative to failures that have been reported to Honda, we have not yet procured components subject to this defect petition from vehicles alleging the conditions specified by NHTSA. However, we are in the process of scheduling inspections of vehicles that have recently been alleged to exhibit this condition and we plan to obtain the requested components so we may provide them to NHTSA.

We will remain in contact with NHTSA ODI until the requested components can be provided.

13. Provide the following information regarding the operation and diagnostics associated with the subject system:
- a) A description of system operation, including the following diagrams:
 - i) Vehicle diagram showing the location of all VSA components;
 - ii) Wiring diagram(s);
 - iii) Brake system hydraulic diagrams for each mode of system operation;
 - iv) Block diagram of the system including communication buses;
 - b) A detailed description of how the system controls vehicle braking and throttle, including:
 - i) A detailed explanation of how throttle command is calculated, communicated, and controlled;
 - ii) The maximum braking that can be commanded by the system and a detailed explanation of how braking forces are calculated, communicated, and controlled;
 - iii) The maximum vehicle deceleration that can result from VSA intervention;
 - iv) The maximum duration of a VSA activation;
 - c) Describe all visual and audible indicators available to the vehicle operator to signal VSA activation or a fault in the VSA;
 - d) Provide a listing of all diagnostic trouble codes by code, description, a detailed description of the conditions that will set the code, and the effect of the code on system 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 subject vehicle VSA and the VSA for immediately preceding and following model years for the Honda Pilot.

Response:

The VSA system for the 2005 model year Honda Pilot consists of a VSA modulator (an ESC computer and electronic/hydraulic actuator) that collects data from front and rear wheel speed sensors, the steering wheel angle sensor and a combination Yaw rate and lateral acceleration (G) sensor. The data from these sensors is then processed using a proprietary algorithm to calculate the vehicle side slip derivative (with respect to time) from the sensors listed above. If the vehicle exceeds the side slip derivative brake force pulses

are modulated to individual or combinations of wheels to return the vehicle to within the acceptable criteria.

- a) *See Attachment #Q13a*
- b) *i,ii, iv) See Attachment #Q13b*
 - ii) *0.94G is the maximum deceleration G from the result of ABS A-requirement*
- c) *See Attachment #Q13c*
- d) *See Attachment #Q13d*
- e) *See Attachment #Q14a*
- f) *See Attachment #Q13f*

14. Provide the following design, development and test information related to the subject system:

- a) Honda or supplier specification requirements document;
- b) Honda or supplier vehicle-level test requirements document;
- c) System DRBFM, D-FMEA, or fault tree in IQ-FMEA, Excel or PDF;
- d) System design verification (DV) and product validation (PV) test matrix, test plan and final reports;
- e) List and briefly describe all system elements and interfaces-ABS, TC (traction control), IMU (inertial measurement unit) ... etc;
- f) Complete PCB (printed circuit board) assembly drawings including stencil, layout, assembly, and electrical schematic PDF files. If function is integrated into another control module such as airbags, ABS, or IMU, then provide drawings for the complete PCB;
- g) All software diagnostic routines and test cycles performed at runtime and power-up, include controller and sensors;
- h) A list for all system sensors (Yaw, XY, speed... etc) in the system, include part numbers and suppliers. Provide yaw sensor datasheet and specifications;
- i) Bill of Material (BOM) including part numbers, component description, component quantity in system, and supplier names for each and every component in the system;
- j) Controller test-mode CAN/USB/RS-232 executable file, load-box if any, manual, and appropriate cable; and
- k) System (software and hardware) verification strategies including any online (real-time)/offline (algorithm) hardware-in-the-loop (HIL) simulations and list any model interoperability across different platforms. Include all system or ASIC state diagrams.

Response:

- a) *See Attachment #Q14a*
- b) *See Attachment #Q14b*
- c) *See Attachment #Q14c*
- d) *See Attachment #Q14d*
- e) *See Attachment #Q14e*
- f) *See Attachment #Q14f*
- g) *See Attachment #Q14a*
- h) *See Attachment #Q14h*
- i) *See Attachment #Q14i*
- j) *See Attachment #Q14j*
- k) *See Attachment #Q14c*

15. 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 warning, 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) The causal or contributory factor(s): To date, Honda has not evaluated a vehicle or components from a vehicle with a contention of unintended brake application causing the vehicle to come to a complete stop. Accordingly, we have not been able to reproduce this contention, and therefore have not been able to determine the root cause of such contentions. We are now in the process of contacting vehicle owners who have made this allegation in NHTSA Vehicle Owner Questionnaires for the purpose of evaluating the vehicles and determining the root cause. We anticipate that this process may require one or more months of analysis to determine the root cause once we have procured a vehicle exhibiting this condition.

Regarding claims of vehicle steering anomalies associated with VSA activation on a selected wheel, we have provided information about our analysis and conclusion that this can be caused by faulty combination Yaw-rate and Lateral Acceleration (G) sensor units due to production at the supplier.

b) The failure mechanism(s): With respect to allegations of vehicles coming to a stop due to VSA activation independent of service brake application by the driver, we have not determined the failure mechanism, as explained in response to question 15(a).

With respect to allegations of vehicle steering anomalies associated with VSA activation we believe the failure mechanism is an incorrect Yaw-rate signal being sent from a faulty yaw-rate sensor causing the VSA system to incorrectly calculate the side slip angle and initiate corrective VSA activation, in this case inappropriately.

c) The failure mode(s): With respect to allegations of vehicles coming to a stop due to VSA activation independent of service brake application by the driver, we have not evaluated a vehicle associated with this contention and are not able to reach any conclusions until we have evaluated a vehicle exhibiting this condition.

Vehicles equipped with a faulty Yaw-rate sensor could experience application of braking forces at one or more wheels as the VSA system attempts to reduce the side slip angle until it is below the VSA activation threshold. This could result in unanticipated directional change of the vehicle to some degree, though we have not yet measured the degree of directional change that could result from this condition. Similarly, we have not yet evaluated how this would affect the driver's ability to control the vehicle if this condition exists.

d) The risk to motor vehicle safety that it poses, including: As described above, we are unable to answer question 15(d) at this time, until we have had an opportunity to evaluate a vehicle exhibiting this condition. We have provided the maximum calculated deceleration that may result from VSA activation if the brake assist function is engaged in response to 13(b)ii. We consider that a worst case condition, and until

receipt of this defect petition we understood that VSA activation could only occur for a short duration with a maximum average of 0.2 G of braking. We cannot fully respond to this question until we have completed evaluation of a vehicle exhibiting these conditions.

e) What warning, 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.

According to the allegations included in the defect petition and the Vehicle Owner Questionnaires provided to Honda by NHTSA, we are not aware of any indication to the driver or other persons inside or outside of the vehicle prior to a vehicle exhibiting the alleged defect. According to the descriptions of these conditions in the materials provided to Honda by NHTSA it appears that the driver would be alerted to this condition by the deceleration of the vehicle, as well as illumination of the flashing VSA activation indicator, and possibly a malfunction indicator following VSA activation. People outside of the vehicle could also observe the vehicle's deceleration.

We will provide a more complete response to the questions included in section 15 of this information request after we have evaluated a vehicle exhibiting this condition.

Sincerely,

AMERICAN HONDA MOTOR CO., INC.



Jay Joseph
Senior Manager
Product Regulatory Office

JWJ:nis

Attachments