

VOLKSWAGEN



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OFFICE OF
DEFECTS INVESTIGATION

February 25, 2005

3800 Hamlin Road
Auburn Hills, MI 48326
Tel. (248) 754-5000

Thomas Z. Cooper, Chief
Office of Defects Investigation
US Department of Transportation
National Highway Traffic Safety Administration
400 Seventh Street, S.W.
Washington, DC 20590

Subject: PE04-081 NVS-212pco; "Inadvertent" Deployment of Side Airbag

Dear Mr. Cooper,

Attached is our response to your letter dated December 22, 2004 requesting information concerning allegations of inadvertent deployment of side-impact airbag/curtains in certain Volkswagen vehicles.

VW is responding to this request based upon NHTSA's definition of the alleged defect. Therefore, we are including reports that contain allegations of "inadvertent" deployment, but also contain clear indication that there has been some type of impact either as described by the reporter, or as evidenced by the presence of crash data stored in the airbag control module and/or physical evidence of impact on the undercarriage, suspension, or wheel and tire. VW believes that these reports do not represent true "inadvertent" deployment because the deployments (in aggregate) appear to be consistent with design parameters for the impact sustained, but we are including them as such based upon the definition of alleged defect in your inquiry.

VW notes that the overwhelming majority of cases reported include clear indication of a significant impact to the vehicle, including the presence of crash data stored in the ECM, underbody damage, and damaged wheels/tires.

Volkswagen believes that analysis of the facts clearly demonstrates that the side airbag system in the subject vehicles is not defective, and does not represent an unreasonable risk to motor vehicle safety.

For your convenience, each request is restated verbatim and then followed by our response.

Please contact me if you have any questions regarding this response.

Regards,

A handwritten signature in black ink, appearing to read 'John Maddox', written over a horizontal line.

John Maddox
Compliance Officer
Volkswagen of America

Attachments

Based on the phone conversation on Friday, February 4 with Mr. Peter Ong of your staff, Volkswagen is providing a response for those subject vehicles equipped with the combination side seat and side curtain airbag system.

Request 1.

State, by model and model year, the number of subject vehicles VW has manufactured for sale or lease in the United States. Separately, for each subject vehicle manufactured to date by VW, 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.

In response to this inquiry, Volkswagen has identified the following subject vehicle population produced with a combination of side and curtain airbags:

Model	Model Year		
	2001	2002	2003
Golf	11,188	18,387	16,507
GTI	7,135	13,269	17,546
Jetta	90,674	131,361	133,101
Jetta Wagon	5,104	13,690	15,783

Our response to this request including subparagraphs a. through g. is provided in a Microsoft Access file entitled, "PRODUCTION DATA.mdb" attached hereto as Exhibit to Request 1.

Source: Business Objects. Data Gathered: Through December 22, 2004

Exhibit to Request 1

PRODUCTION DATA

Data is provided in Microsoft Access format on the PE04-081 Data Collection Disc

Request 2.

State the number of each of the following, received by VW, or of which VW 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 manufacturer involving a death or injury, notices received by the manufacturer alleging or proving that a death or injury was caused by a possible defect in a subject vehicle, property damage claims, consumer complaints, or field reports;
- d. Property damage claims (including own vehicle); and
- e. Third-party arbitration proceedings where VW is or was a party to the arbitration; and
- f. Lawsuits, both pending and closed, in which VW 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). Identify reports that duplicate other VW reports/claims or ODI complaints.

In addition, for items "b" through "f," provide a summary description of the alleged problem and causal and contributing factors and VW's assessment of the problem, with a summary of the significant underlying facts and evidence along with any photographs and airbag control module diagnostic result/readout/printout (along with explanation/description). For items "e" and "f," identify the parties to the action, as well as the caption, court, docket number, and date on which the complaint or other document initiating the action was filed.

Response 2.

VW is responding to this request based upon review of the information and allegations contained on the face of the requested reports. Based on NHTSA's definition of the alleged defect, we are including reports that contain allegations of "inadvertent" deployment, but also contain clear indication that there has been some type of impact either as described by the reporter, or as evidenced by the presence of crash data stored in the airbag control module and/or physical evidence of impact on the undercarriage, suspension, or wheel and tire. VW believes that these reports do not represent true "inadvertent" deployment because the deployments (in aggregate) appear to be consistent with design parameters for the impact sustained, but we are including them as such based upon the definition of alleged defect in your inquiry.

- a. In response to this inquiry, Volkswagen has identified 374 non-duplicative Consumer Complaints, none of which are from fleet operators, which contain allegations of side impact airbag/curtain deployment without a physical side impact or crash in the subject vehicles. Volkswagen notes that of the cases which contain information as to whether there was or was not an impact, 98% indicate there was evidence of impact damage, crash data, and damaged wheels and/or tires. Volkswagen is also providing copies of cases which are duplicative of the VOQ cases or, based on the information contained in the report, Volkswagen is unable to determine whether they may or may not relate to the alleged defect in the subject components and vehicles.
- b. In response to this inquiry, Volkswagen has identified six non-duplicative Field Reports, including dealer Field Reports, which contain allegations of side impact airbag/curtain deployment without a physical side impact or crash in the subject vehicles. Volkswagen is also providing copies of cases, which are duplicative of the above cases, or, based on the

information contained in the report, Volkswagen is unable to determine whether they may or may not relate to the alleged defect in the subject components and vehicles.

- c. In response to this inquiry, Volkswagen has identified three reports, all duplicative of other reports in this inquiry, containing allegations of minor injury based on claims or notices provided to VW. VW has not identified any reports of death or crash caused by the alleged defect in the subject vehicles based on claims and notices received by VW.
- d. In response to this inquiry, Volkswagen has not identified any Property Damage Claims, including those from the complainant's vehicle, which relate to, or may relate to, the alleged defect in the subject vehicles.
- e. In response to this inquiry, Volkswagen has not identified any Third-party arbitration proceedings where VW is or was a party to the arbitration.
- f. In response to this inquiry, Volkswagen has identified three non-duplicative breach of warranty lawsuits that relate or may relate to the alleged defect in the subject vehicles.

VW has provided a summary of the significant and underlying facts for items "e" and "f" in REQUEST NUMBER FOUR DATA folder.

Source VW LISTEN, TACS, FRED, Product Liaison. Gathered through December 22, 2004

Request 3.

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

- a. VW'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 driver's or the passenger's side-impact airbag/curtain deployed;
- j. Whether the frontal airbag also deployed;
- k. Whether a crash is alleged;
- l. Whether property damage is alleged;
- m. Number of alleged injuries, if any;
- n. Number of alleged fatalities, if any; and
- o. Whether the airbag control unit/module recorded a "crash pulse."

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

Response 3.

Responses to subparagraphs "a" through "o" are provided in a Microsoft Excel file entitled REQUEST NUMBER TWO DATA.xls attached hereto as Exhibit to Request 3. This document contains a list of Customer Relations and Field Report cases that are not duplicative of those previously stated, and a list of Lawsuit and Injury cases that are duplicative of cases previously reported.

Source, Date Gathered: See Response Two

Exhibit to Request 3

REQUEST NUMBER TWO DATA

Data is provided in Microsoft Excel format on the PE04-081 Data Collection Disc

Request 4.

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

Response 4.

In response to this inquiry, Volkswagen is providing copies of documents identified for each item in Response 3. The documents are provided in the folder entitled REQUEST NUMBER FOUR DATA and hereto as Exhibit to Request 4.

Volkswagen is also providing copies of documents in which the reason for the claim does not contain sufficient information for Volkswagen to determine if they may or may not be related to the alleged defect and also copies of documents that are duplicative. Information on these claims is provided in a folder entitled NON-SPECIFIC AND DUPLICATIVE NUMBER FOUR DATA attached hereto as Exhibit to Request 4.

These documents are organized by category, and in the order provided in REQUEST NUMBER TWO DATA.

Source, Data Gathered: See Response Two

Exhibit to Request 4

REQUEST NUMBER FOUR DATA

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NON-SPECIFIC AND DUPLICATIVE NUMBER FOUR DATA

**Data is provided in the REQUEST NUMBER FOUR DATA and NON-SPECIFIC AND DUPLICATIVE
NUMBER FOUR DATA folders on the PE04-081 Data Collection Disc**

Request 5.

State, by model and model year, a total count for all of the following categories of claims, collectively, that have been paid by VW 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. VW'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. Whether the driver's or passenger's side-impact airbag/curtain deployed;
- k. Whether the frontal airbag also deployed;
- l. Whether the airbag control unit/module recorded a "crash pulse."
- m. Concern stated by customer; and
- n. 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.

In response to this inquiry Volkswagen has identified 17 non-duplicative warranty claims, which have been paid by Volkswagen to date, which contain allegations of side impact airbag/curtain deployment without a physical side impact or crash in the subject vehicles. Volkswagen is also providing copies of claims which are duplicative of the above cases or, based on the information contained in the report, Volkswagen is unable to determine whether they may or may not relate to the alleged defect in the subject components and vehicles.

Our response to this request is provided in Microsoft Excel format in the REQUEST NUMBER FIVE folder attached hereto as Exhibit to Request 5.

Source: Business Objects Warranty Claims Universe. Date Gathered: Through December 22, 2004

Exhibit to Request 5

WARRANTY DATA

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NON-SPECIFIC and DUPLICATIVE WARRANTY DATA

Data is provided in the REQUEST NUMBER FIVE folder on the PE04-081 Data Collection Disc

Request 6.

Describe in detail the search criteria used by VW 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, by make and model year, the terms of the new vehicle warranty coverage offered by VW on the subject vehicles (i.e., the number of months and mileage for which coverage is provided and the vehicle systems that are covered) and if it covers inadvertent side-impact airbag/curtain deployment (without a side-impact crash, but sensor detects a shock pulse). Describe any extended warranty coverage option(s) that VW 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 and if it covers inadvertent side-airbag deployments.

Response 6.

In response to this inquiry, the following methods were used to identify claims in response to request number five.

1. All subject vehicles made available for sale or lease in the United States with claims starting in calendar week one of 1999 through the calendar week of the inquiry.
2. All warranty claims containing the following Part Identifier:

<u>Number:</u>	<u>Description:</u>
6953	Airbag Triggering Unit
6961	Rear Left Side Airbag Unit
6962	Rear Right Side Airbag Unit
6963	Front Left Side Airbag Unit
6964	Front Right Side Airbag Unit
6965	Lateral Acceleration Sensor
6966	Head Airbag

Resultant claims were screened individually using the following keywords to identify potential conditions, which relate or may relate to the alleged defect in the subject vehicles:

Key Words:
Deploy*
Blew
Blown
Crash Code
Crash Data
Went off
Explode
Set off
Gone off
Inadvertent*

Volkswagen has identified, through screening the resultant claims, a list of all problem codes and problem code descriptions applicable to the alleged defect in the subject vehicles. The following overviews these findings:

Damage Codes with Description:

- 10 - Mechanical defect
- 11 - Incorrectly adjusted
- 40 - Electrical Malfunction

66 - Upon instruction from Volkswagen
88 - Vehicle towed in to dealership

The following is a list, by make and model year, of the terms of the new vehicle warranty coverage offered by Volkswagen on the subject vehicles:

Model Year	Warranty Terms and Vehicles	Coverage Type
2001	2 years / 24,000 miles: Golf/GTI, Jetta	Bumper to Bumper
2002	4 years / 50,000 miles: Golf/GTI, Jetta	Bumper to Bumper
2003	4 years / 50,000 miles: Golf/GTI, Jetta	Bumper to Bumper

The Volkswagen Bumper to Bumper Limited New Vehicle Warranty does not cover deployment of airbags when there is indication of impact to the vehicle.

VW does not offer any extended warranty options related to the alleged defect in the subject vehicles.

Source: VWoA. Date Gathered: Through December 22, 2004

Request 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 VW 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 VW is planning to issue within the next 120 days.

Response 7.

In response to this inquiry, Volkswagen has identified two documents, which are provided in Adobe Acrobat format in the REQUEST NUMBER SEVEN folder attached hereto as Exhibit to Request 7.

Additionally, Volkswagen is not aware of any communication being planned within the next 120 days relating to the alleged defect in the subject vehicles.

Source: VESIS. Date Gathered: Through February 7, 2005

Exhibit to Request 7

TECHNICAL BULLETIN 69 03-01

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TECHNICAL BULLETIN 69 05-03

Data is provided in the REQUEST NUMBER SEVEN folder on the PE04-081 Data Collection Disc

Request 8.

Provide a description along with diagrams outlining the design and operation of the side-impact airbag/curtain system, time allowed for the electronic algorithm to "make decision" and total time to full-deployment. Diagrams should include locations of these components.

Response 8.

Some 2001 model year Volkswagen Jetta, Golf and GTI vehicles were manufactured with both front seat mounted thorax side airbags in combination with Side Curtain Protection™ airbags. All 2002 and 2003 model year Jetta, Golf and GTI models were equipped with the combination side seat and side curtain airbag system. The subject vehicles, defined by NHTSA, are those equipped with the combination thorax and side curtain airbags.

Combination Thorax and Side Curtain Protection™ Airbag System:

- The thorax portion of the combination airbag system consists of two side airbags and hybrid gas generators located in the padding of the outboard sides of the front backrests. The general location is identified by the word "AIRBAG" in the upper region of the outboard side of the backrests (Figure 1). When fully inflated, the side airbag has a volume of approximately 12 liters.
- The thorax supplemental side airbags inflate between the occupant and the door panel on the side of the vehicle that is struck in certain side collision. When the system is triggered, the airbag is filled with propellant gas and breaks through a seam on the side of the seatback identified by the "AIRBAG" label. It inflates between the side trim panel and the passenger.
- The Side Curtain Protection™ portion of the combination airbag system consists of the curtain airbags and hybrid gas generators in the header area above the front and rear side windows between the A and C pillars. When fully inflated, the Side Curtain Protection™ airbag has a volume of approximately 15 liters (Figure 1).
- When the Side Curtain Protection™ inflates, the airbag is filled with propellant gas and breaks through the header above the front and rear side windows and center door pillar and deploys downwards.

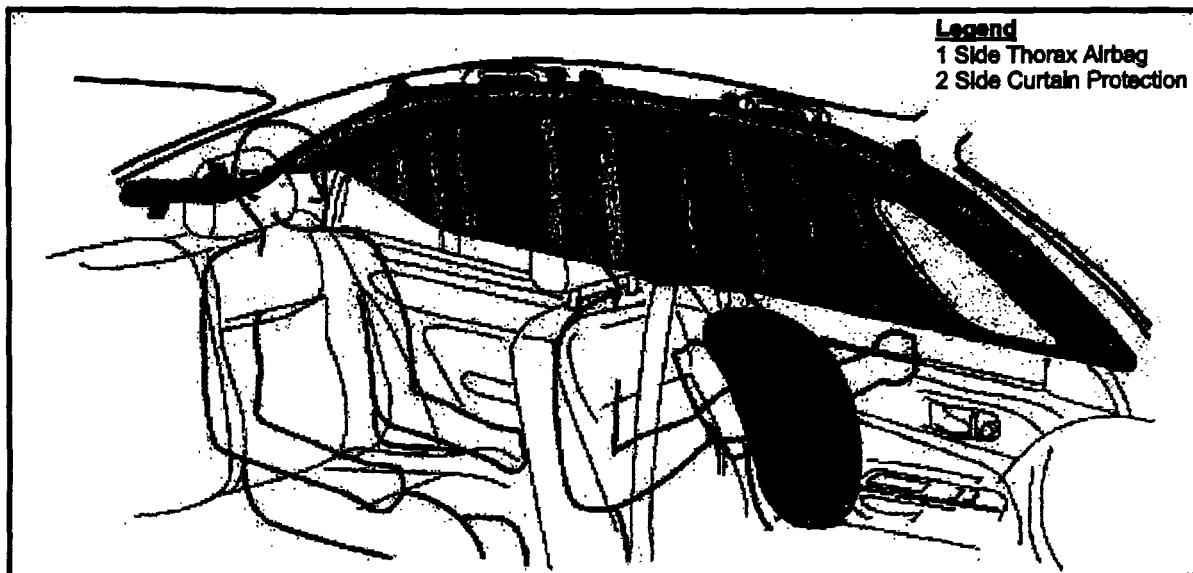


Fig. 1-Combination Side Seat and Side Curtain Airbag System

Furthermore the combination Thorax and Side Curtain Protection™ airbag system consists of:

- The ECM (electronic control module) with 8 firing circuits (2x front, 2x side, 2x curtain, 2x pretensioners), located in the forward portion of the frame tunnel inside the passenger compartment.
- The satellite sensors located under the front seats (Figure 2-7, 10) as well as two additional satellite side impact sensors located at the base of the C pillar (Figure 2-5, 8), under the outboard rear seating positions (Figure 2).
- The airbag indicator light in the instrument panel. Each time the ignition is turned on, the airbag system indicator light will come on for a few seconds during self-diagnostic testing. The airbag system is monitored electronically to make certain that it is functioning properly.

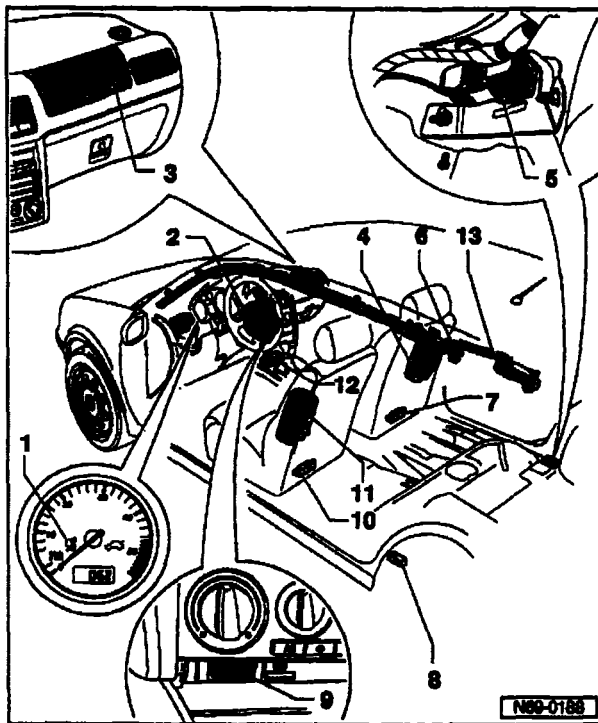


Fig. 2: Side Curtain Protection™, Side Thorax Airbag and Front Airbag Systems
1 – Airbag Warning Light, 2 – Driver Front Airbag, 3 – Passenger Front Airbag, 4 – Passenger Side Airbag, 5 – Rear Satellite Passenger Side, 6 –Curtain Airbag, 7 – Front Satellite Passenger Side, 8 – Rear Satellite Driver Side, 9 – Connector for Diagnostics Computer, 10 – Front Satellite Driver Side, 11 – Driver Side Airbag, 12 – Side Airbag Control Module, 13 – Curtain Airbag Inflator

The combination thorax and Side Curtain Protection™ airbag system is not deployed:

- If the ignition is turned off
- In side collisions when the acceleration measured by the sensor is too low,
- In front-end collisions that have insufficient lateral collision forces
- In rear-end collisions that have insufficient lateral collision forces
- In rollovers, where the lateral forces exerted on the sensor do not exceed the deployment threshold

The thorax airbag in the seat back and the Side Curtain Protection™ system in the header will deploy if a satellite sensor under a front seat or a rear satellite sensor under a rear outboard seating position at the base of the C pillar and the airbag control module detect an impact within

defined threshold parameters. Furthermore, both rear satellite sensors are able to detect a side impact in the vehicle's rear and initiate an airbag deployment. Based on the timing of the impact signals, the control module determines the side of the vehicle on which the deployment will be initiated. This additional protective feature was implemented because the mechanical impact pulse reaches the second satellite earlier than the control module. This method saves valuable time and gives the control module more time to "decide" and deploy the airbags.

In any case, two sensors must detect an impact that exceeds defined thresholds for the thorax and Side Curtain Protection™ airbags to deploy.

Because of the inherent physical characteristics of all passenger vehicles, airbags intended to provide supplemental protection in certain side impacts must react more quickly than airbag systems for frontal collisions. The thorax and Side Curtain Protection™ airbag system installed in the 2001 – 2003 Volkswagen Jetta, Golf and GTI vehicles has a 'decision time' of 4 to 5 milliseconds. The total time to full deployment of the thorax airbags is approximately 20 milliseconds. The total time to full deployment of the Side Curtain Protection™ airbags is approximately 35 milliseconds.

The deployment thresholds are described in attachment 8-1. Attachment 8-2 depicts the side airbag firing and safing concept for both the thorax and the Side Curtain Protection™ airbag systems. Both attachments are provided in Adobe Acrobat format in the REQUEST NUMBER EIGHT folder attached hereto as Exhibit to Request 8.

Source: VWAG. Data Gathered through December 22, 2004

Exhibit to Request 8

ATTACHMENT 8-1

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ATTACHMENT 8-2

Data is provided in the REQUEST NUMBER EIGHT folder on the PE04-081 Data Collection Disc

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 (including development/production tests of vehicle travel over rough roads, bumpy roads, curbs, potholes, obstacles, loose gravels etc...), are being conducted, are planned, or are being planned by, or for, VW. 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 9.

In response to this inquiry VW is providing two categories of information; (A) information regarding airbag testing during the course of vehicle design, development, and verification, and (B) other studies, surveys, and investigations related to the alleged defect in the subject vehicles.

(A) Testing during the course of vehicle design and development:

The development of the Volkswagen front seat mounted thorax side airbags in combination with Side Curtain Protection™ airbags can be divided into four major areas:

1. Dynamic crash testing including both no fire and must fire test conditions
2. Abuse testing
3. Algorithm computation
4. Validation

Subsequent to the collection of acceleration pulses from both dynamic testing and abuse testing the so-called "algorithm adaptation process" is conducted. A computer program develops an algorithm based on the abovementioned test results. Each test will have either a "no fire" requirement (all abuse tests) or a "must fire" requirement. If it is a "must fire" test, the exact time to fire (TTF) will be determined through high-speed film analysis. A computer simulation performs several runs to optimize the algorithm. Volkswagen's development process also includes amplitude variation testing in order to verify the robustness of the algorithm. Finally, a validation of the algorithm during whole vehicle full scale testing, including crash testing, is performed. After successful completion of the development process the algorithm is approved and released for use in production vehicles.

Documents relating to this vehicle's design, development, and verification testing will be submitted under separate cover with a Request for Confidentiality.

(B) Studies, Surveys, and Analyses

Action Identifier	Approximate Start Date	Approximate End Date	Objective of Action	Action Conducted By	Brief Results / Conclusion
Air Bag ECU Analyses Attachment 9-16	Jan-01	Present	Vehicle Inspection and Analysis	Product Liaison, VWoA	56 inspections showing Crash Data and/or Vehicle Damage; three inspections showing Deployment without Crash Data or Damage, two Cases without sufficient information
Response to Transport Canada Inquiry Attachment 9-17	Nov-03	Jul-04	Presentation to Transport Canada and backup calculation	VWoA Product Compliance	The majority of reports include evidence of impact. Incident rate is well below competitive recall rate. Raising thresholds may result in non-deploys/late deploys for some harmful events, increasing potential for serious injury.

Documents relating to these actions are being provided in the REQUEST NUMBER NINE folder attached hereto as Exhibit to Request 9.

VWoA did not identify any specific plans for current or future studies, testing, or other actions related to the alleged defect in the subject vehicles.

Source: VWAG. Date Gathered through December 22, 2004

Exhibit to Request 9

ATTACHMENT 9-16

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ATTACHMENT 9-17

Data is provided in the REQUEST NUMBER NINE folder on the PE04-081 Data Collection Disc

Request 10.

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

- a. The date or approximate date on which the modification or change was incorporated into vehicle production (includes hardware and/or software changes);
- 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 VW is aware of which may be incorporated into vehicle production within the next 120 days.

Response 10.

In response to this inquiry, VW did not identify any changes made to the airbag system specifically to address "Inadvertent" deployment, or deployment without a physical side impact or crash.

Volkswagen is providing the history of changes for the airbag components in the subject vehicles, because VW cannot determine whether they may relate to the deployment of the airbag system in the attached Adobe Acrobat file entitled "PART HISTORY.pdf" attached hereto as Exhibit to Request 10.

Source: VWAG. Date Gathered Through December 22, 2004

Exhibit to Request 10

PART HISTORY

Data is provided in Adobe Acrobat Format on the PE04-081 Data Collection Disc

Request 11.

State the number of each of the following that VW has sold that may be used 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:

- a. OEM replacement wheel (by style, wheel size and intended tire size);
- b. Side-airbag module;
- c. Side-curtain airbag module; and
- d. Electronic airbag control unit/module (specify hardware and software versions).

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 VW 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 11.

Volkswagen is providing the requested part sales information in the PART SALES DATA folder attached hereto as Exhibit to Request 11.

Volkswagen is unable to determine if the sale of any given service part is related to the alleged defect in the subject vehicles.

Supplier name and address information for subject airbag system components:

Supplier/Production
Siemens AG
Automobiltechnik
Postfach 100955
93009 Regensburg
Germany

Phone: +49 941-790-0

Contact Person
Siemens AG
Mr. Michael Popp
Werner-von-Siemens-Strasse 50
91052 Erlangen
Germany

Phone: +49(0)9131 / 7 43 612
Fax: +49(0)9131 / 7 29 001

VW notes that wheel part sales closely correlate with the part sales of the subject airbag module components, as shown in Attachment 11-02 in the PARTS SALES DATA folder, attached hereto in Exhibit to Request 11. This is further discussed in Response 12.

Source: VWAG. Date Gathered: Through December 22, 2004

Exhibit to Request 11

PARTS SALES DATA

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ATTACHMENT 11-02

Data is provided in the PARTS SALES DATA folder on the PE04-081 Data Collection Disc

Request 12.

Furnish VW'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. The reports included with this inquiry.

Response 12.

Volkswagen was one of the first manufacturers to offer a side airbag protection system consisting of a thorax airbag and a side curtain airbag as standard equipment in a compact vehicle. The combined side impact protection system was introduced as a running change in Jetta, Golf and GTI vehicles during the 2001 model year. Side airbags in combination with side curtain airbags represent an important advance in the state of the art by providing vehicle occupants with greater protection than thorax airbags alone in a wide variety of collisions. Because of the size and inherent packaging limits of deformable structures on the sides of passenger cars in general, and compact vehicles in particular, side impact airbag systems must deploy in the limited space between the occupant and the side of the vehicle in a very short period of time if they are to deploy properly and be in place in a timely manner to be able to provide increased protection in side collisions that meet 'must fire' criteria. The 'decision time' available for deployment under these conditions is also much shorter than that which is available for the deployment of front airbag systems. These factors place exacting demands on the hardware and software and require significant precision to assure deployment when needed and prevent deployment in other impacts registered by the sensors and transmitted to the electronic control module where the fire / no fire decision is made within milliseconds of their occurrence.

The 2001 – 2003 Jetta, Golf and GTI vehicles with thorax and Side Curtain Protection™ airbags had 4 satellite sensors installed on stiff transverse members of the platform structure under the outboard seating positions in the front and rear. The addition of the rear sensors to the side airbag system helped to shorten the crash pulse transmission time to the control module in those lateral impacts occurring to the rear side of the vehicle and simultaneously potentially provided additional data inputs to the ECM for the fire / no fire decision. This sensor configuration helped the outboard rear seat occupants to benefit from the presence of the Side Curtain Protection™ airbag that included the rear portion of the passenger compartment between the B and C pillars in rear side collisions that might otherwise have not been detected early enough with a dual front satellite sensor configuration.

Volkswagen does not believe that reported incidents of deployment of side impact protection airbags after significant undercarriage impact to 2001 – 2003 Jetta, Golf and GTI can be called inadvertent or be deemed to constitute a defect in the context of the inherent structural constraints and characteristics of passenger cars in general or with respect to the compact Jetta, Golf and GTI vehicles. In the extremely short decision time available, significant undercarriage impacts cannot be differentiated and distinguished from other impacts within the 'must fire' universe for side airbag system deployment.

Based on its review of information available in the public domain, Volkswagen believes that the basis for NHTSA's inquiry into alleged inadvertent deployment in the subject vehicles is very similar to comparable deployment events reported to and investigated by NHTSA. In the vast majority of these incidents significant undercarriage impacts have been reported and verified by vehicle inspections and other available information. Such impacts exceed the severity of abuse testing that is designed to prevent unwanted side airbag deployment in situations that themselves constitute severe exposures that can but do rarely occur during everyday driving. Volkswagen's investigation of such incidents involving the subject vehicles has shown significant damage to undercarriage structures, steering and suspension components, wheel rims and other

components. Volkswagen believes that the results of its inspections of its vehicles involved in such events are consistent with the results of inspections reported by other manufacturers of their vehicles that were involved in incidents of alleged unintended side airbag deployment. The abuse testing program that Volkswagen has developed and conducts during side airbag system development is designed to prevent in-use deployments under severe on and off-road conditions while assuring reliable and predictable deployment at the established 'must fire' threshold. While it would have been possible to 'design out' very severe exposures documented during inspections of 2001 – 2003 Jetta, Golf and GTI vehicles by raising associated parameters, doing so would have compromised the effectiveness of the system and the protection afforded vehicle occupants by either raising the 'must fire' threshold or causing the system to deploy too late at the existing 'must fire' level. Thus deployments under impact conditions with such severe forces exerted on the vehicle cannot be deemed to be a defect that presents an unreasonable risk to motor vehicle safety.

Volkswagen believes that smaller vehicles characterized by comparatively stiff undercarriage structures may 'communicate' impact pulses faster and better than larger, 'softer' vehicles. Larger, comparatively 'softer' vehicles may be able to 'absorb' the same undercarriage impact more effectively so that the associated pulses do not reach the levels that require an ECM decision to deploy the side airbags. Considering the relatively longer distance from the point of undercarriage impact to a sensor, particularly if there are only two, may permit the pulse to dissipate more than it can in a smaller, stiffer undercarriage. Such a phenomenon may explain why in combination with their size and consequent necessity to make such a rapid deployment decision, smaller vehicles appear to be more frequently associated with reports of side airbag deployment as the result of impact with highway obstacles than larger vehicles. This, of course, does not mean that larger vehicles are 'less safe' than smaller vehicles. Vehicle manufacturers apply the same criteria to their vehicles, large and small and tune the airbag systems correspondingly during the development process.

In addition, Volkswagen believes that an analysis of sales figures for compact vehicles offered with side airbags and curtain airbags as standard equipment during the 2001 – 2003 model years will show that the Volkswagen Jetta, Golf and GTI were the most numerous and therefore had the greatest number of miles traveled over those and later years with a higher associated risk of impact with highway obstacles as compared with similar vehicles of the same vintage and equipment.

Analysis of the VOQs

NHTSA forwarded a total of 109 VOQ's with this PE. Fourteen of these VOQs did not contain valid or complete VIN numbers and therefore are excluded from our analysis. VW notes that two of the VOQ's (10097005 and 10087174) do not appear to be related to the alleged defect as they include allegations of a *non-deployment* in a physical side impact or crash, and a deployment due to the presence of water in the airbag control module respectively. VW also notes that VOQ number 10058443 was duplicative of VOQ number 10057793.

VWoA was also able to identify that 77 of the 93 remaining VOQ's alleged that the customer had crash data stored and/or undercarriage damage and/or had impacted an object based on either the face of the VOQ or further information found in VWoA's Customer Relations database.

Analysis of Customer Complaints

As response Question 2 above, Volkswagen reported 374 customer complaints pertaining to side airbag deployment. In virtually all of these (98%) impact damage, damaged tires and/or rims as well as ECM 'crash data stored' was reported. Volkswagen believes that these reports are consistent with its findings that such deployments are attributable to impacts registered by the

sensors and transmitted to the control module that resulted in a deployment decision what was entirely appropriate under the circumstances of the individual impact.

Analysis of Vehicle Inspection Reports

Volkswagen analyzed 61 cases in which inadvertent side airbag deployment was alleged. In 56 cases (92%) vehicle impact damage and/or crash codes were contained, demonstrating that deployment was appropriate.

In three of the remaining five cases neither impact damage nor 'crash data stored' was noted. The cause of these deployments is believed to be isolated hardware-related conditions such as damaged wiring. However, the inspection reports do not provide any further analysis nor a conclusion and the ECMs are not available for further analysis. Volkswagen believes these isolated single incidents do not represent a defect trend.

The remaining two cases do not contain sufficient information to permit a conclusion to be drawn.

Analysis of Warranty Claims

Volkswagen has identified 87 warranty claims pertaining to the subject vehicles. Of these claims only 17 are not duplicative of those analyzed above and relate to incidents in which Volkswagen paid a warranty claim associated with the deployment of a side airbag system. Based on Volkswagen's analysis of the data in conjunction with this PE and particularly based upon the findings from vehicle inspections referred to above, Volkswagen believes that the incidents underlying the warranty claims are attributable to external influences.

Analysis of Parts Sales

VW notes that a comparison of sales of wheels and side airbag modules discloses a striking similarity of trends over time for the subject vehicles. Volkswagen believes that this strong correlation of part sales can only be explained by the occurrence of damage to the wheel caused by significant impacts that contain enough energy to deploy the airbags. Of course wheels are sold for many other reasons, such as normal wear and tear, mounting of winter snow tires, vehicle appearance improvements, etc, and VW notes that the overall rate of wheel sales substantially outnumbers the sales of airbag modules.

Allegations of Injury

Volkswagen notes that the injuries asserted with these reports, where specific, are relatively minor in nature and are minimal when compared to the significant injuries, which can and do occur in real-world vehicle-to-vehicle lateral collisions. These minor injuries; bruises, abrasions, scrapes, ringing in the ears and headaches, etc., are not unexpected or unusual in the context of airbag deployments.

Minor personal injury is alleged in 11 of the 109 VOQs forwarded to Volkswagen in conjunction with this PE. In seven other VOQs no characterization of the nature of the alleged injury is stated. Volkswagen has no medical reports, diagnoses or medical bills from those alleging injury. The information contained in the VOQs does not permit more detailed conclusions to be drawn.

Two additional reports of injury are associated with the incidents underlying two of the vehicle inspections conducted by Volkswagen. The nature of the injuries alleged supports Volkswagen's belief that a risk of even moderate injury does not exist in the context of these deployments.

It has also been asserted in recent media reports that a severe eye injury has been associated with one VOQ report (768952) and a broken bone with another (768626). Closer examination of the VOQ 768952 shows that "an object came through the windshield hitting driver in left side of face". It is VW's assessment that the eye injury was likely related to the penetration of the windshield by a foreign object, and not due to inadvertent side airbag deployment. VW believes the airbag system performed as expected; deploying when the vehicle ran into a ditch after the driver lost control. The broken bone reported in VOQ 768626 was sustained during the deployment of a *frontal* airbag due to an accident while the driver had his/her hand on the horn button, and was not the result of the side airbag deployment.

Reports of 'No Impact'

It was sometimes reported that the deployment of the side airbag system occurred in the absence of any impact. Volkswagen believes that this is highly unlikely, and that indeed it is more likely that the vehicle occupants did not notice the impact with the obstacle on the road that triggered the side airbag system. Deployment would begin within 5 milliseconds of such an impact and the deployment as well as the sound of deployment could not be expected to be distinguished from the sound of the impact with an obstacle on the highway. The events are simply too interrelated in time and in the context of the confines of the vehicle itself. It is therefore quite reasonable that vehicle occupants would not notice the impact outside the vehicle. For the airbag sensors and the ECM, these undercarriage impacts are also indistinguishable from the onset of a side impact sufficient to require the side airbag system to be deployed. Indeed the resultant vehicle inspections show that in the majority of these cases there is evidence of impact present on the vehicle.

Comparison of Overall Occurrence Rate

Volkswagen notes that NHTSA has conducted similar investigations on vehicles manufactured by other OEMs. While the details of each situation are not available to VW, it appears that based on available information that these investigations, conditions, and analyses are very similar to this inquiry. VW notes that the overall rate of reports for this investigation, even including those with the presence of clear evidence of impact, are lower than those reported in EA03-014 for example, where NHTSA determined that "a safety-related defect trend has not been identified [...]" Of course NHTSA must judge each situation based on its unique facts, but it is VW's belief that lacking any "defective" component, it is completely appropriate to use a comparative rate analysis to establish an acceptable basis of airbag deployments in underbody impacts versus non-deployments in real-world vehicle-to-vehicle collision events.

Evaluation of Risk to Motor Vehicle Safety

Volkswagen notes that the injuries are all minor in nature and consistent with well-known effects of airbag deployments (e.g., bruises, abrasions, etc.). Moreover, Volkswagen notes that the number of injuries is quite small when placed in the appropriate context of class size. In other words, the quantity of unneeded side airbag deployments is not a "significant" number; it is "de minimus" and thus does not constitute a "defect" within the meaning of the Vehicle Safety Act (see *U.S. v. General Motors Corp.*, 518 F.2d 420, 438 (D.C. Cir. 1975) (requiring "defect" to exhibit "significant number" of performance failures, which means a number of failures that is "non-de minimus"). The actual effects ("cost") of these rare - and minor - injuries is more than outweighed by the significant advantages to the motoring public and society as a whole ("benefit") of enhanced protection afforded by the side impact protection airbag system that Volkswagen installed in the subject vehicles as standard equipment. Absent an unreasonable risk of accident or injury Volkswagen does not believe the alleged defect rises to the level of a "safety-related

defect." In determining whether an "unreasonable risk" exists, established case law instructs consideration of the following three factors: "(1) the severity of the harm that the risk to safety threatens; (2) the frequency with which that harm occurs in the threatened population relative to its incidence in the general population; and (3) the economic, social, and safety consequences of reducing the risk to a so-called 'reasonable' level" (see U.S. v. General Motors Corp., 841 F.2d 400, 410 (D.C. Cir. 1988) (citing U.S. v. General Motors Corp. 1555, 1579 (D.D.C. 1987)). Based on the above considerations, Volkswagen believes that, under any of the three factors, no "unreasonable" risk to motor vehicle safety is present.

Conclusion

Volkswagen was one of the first to offer thorax and side curtain airbags as standard equipment in the compact class and across its entire range of passenger cars. Even today a large number of passenger vehicles offered in the US do not provide both thorax and curtain airbags as standard equipment – they are only available as optional extra-cost equipment. Volkswagen believes that its offering represented an advance in the state of the art and caused other manufacturers to follow its lead resulting in an overall and measurable benefit to motor vehicle safety.

Indeed, the real-world benefit of such airbags to vehicle safety is well documented. Side-impact airbags with head protection reduce fatalities by 45%, according to the Insurance Institute for Highway Safety. NHTSA's own estimates show that if all the vehicles on U.S. roads were equipped with head protection side airbags, such as those offered on the subject vehicles, then 700 to 1,000 lives would be saved per year in side impact crashes. In recognizing the benefits of these airbags, NHTSA also estimates that, in side-impact crashes of vehicles not equipped with side airbags involving at least one fatality, nearly 60 percent of those killed suffered brain injuries.

The physics of side impact collisions dictate that the airbag ECM must make a deployment decision in an extremely short period of time, and indeed this time period is significantly shorter in small cars when compared to larger vehicles. During the development of its thorax and Side Curtain Protection™ airbags introduced as a running change in the 2001 Jetta, Golf and GTI and carried over into the 2002 and 2003 model years, Volkswagen had to strike a balance between high levels of occupant protection in side impacts to compact vehicles and deployment caused by indistinguishable signals from significant and severe undercarriage impacts. VW conducted a very extensive design, development, and verification testing program to arrive at this balance. Volkswagen believes that the balance struck in 2001 was reasonable and appropriate then as it is now.

The overwhelming majority of cases reported include clear indication of a significant impact to the vehicle, including the presence of crash data stored in the ECM, underbody damage, and damaged wheels. VW also notes that there is also a strong correlation of the sales of replacement wheels and replacement side airbag, which can logically be explained by the occurrence of damage to the wheel caused by significant impacts that contain enough energy to deploy the airbags.

Volkswagen believes that analysis of the facts clearly demonstrates that the side airbag system in the subject vehicles is not defective, and does not represent an unreasonable risk to motor vehicle safety.