

# BMW Group

July 21, 2008

Jeffrey L. Quandt  
Chief, Vehicle Control Division  
Office of Defects Investigation  
National Highway Traffic Safety Administration  
1200 New Jersey Ave., S.E.  
Washington, DC 20590

**Re: PE08-032**

Dear Mr. Quandt:

With this letter, BMW is responding to NHTSA's Information Request dated May 7, 2008 in the above captioned matter.

The attachments included with this letter comprise BMW's response to PE08-032. As requested, BMW has repeated each question verbatim and provided our response accordingly. Our detailed responses are contained in the attachments.

Portions of our response contain information that is considered by BMW to be confidential, and accordingly, those materials are not being submitted to your office. As instructed, the portions of our response that are claimed by BMW to be confidential are being submitted to the Office of Chief Counsel, along with our request for confidentiality including supporting material, and the required 49 CFR 512 Certificate.

Additionally, BMW understands that it is NHTSA policy to protect the privacy of individuals under Exemption 6 of the Freedom of Information Act, 5 USC Section 552(b)(6). Certain information requested by NHTSA, such as personal information pertaining to BMW vehicle owners that is contained in the attachments, although not claimed herein to be "BMW Confidential" pursuant to 5 USC Section 552(b)(4) (Exemption 4) and 49 CFR 512, should not be made public by NHTSA in accordance with Exemption 6.

Should you have any questions pertaining to the information enclosed with this letter, please contact me at (201) 573-2071, or Martin Rapaport of my staff at (201) 573-7708.

Sincerely,



Jan Urbahn  
General Manager  
Safety Engineering & Intelligent Transportation Systems

Attachments:

CD No. 1

Cc:

A. Cooke, Esq., NHTSA (Chief Counsel) – Letter Only

**Company**  
BMW of North America, LLC

BMW Group Company

**Mailing address**  
PO Box 1227  
Westwood, NJ  
07675-1227

**Office address**  
300 Chestnut Ridge Road  
Woodcliff Lake, NJ  
07677-7731

**Telephone**  
(201) 307-4000

**Fax**  
(201) 782-0764

**Website**  
bmwusa.com



**BMW Response  
to  
NHTSA PE08-032**

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

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

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

Response:

The source of this information is our production vehicle database and is current as of 31 Mar 2008.

Attachment "P-PRODUCTION DATA" on CD No. 1 contains the requested information. Because the subject vehicles are all Model Year 2007 3-Series with the 335i engine, regardless of model variant (i.e., sedan, coupe, etc.), we believe it is not necessary to populate items (b) and (c).

**2. State the number of each of the following, received by BMW, or of which BMW 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. Reports involving a fire, 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;**
- e. Property damage claims; and**
- f. Third-party arbitration proceedings where BMW is or was a party to the arbitration; and,**
- g. Lawsuits, both pending and closed, in which BMW 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 “g”, provide a summary description of the alleged problem and causal and contributing factors and BMW’s assessment of the problem, with a summary of the significant underlying facts and evidence. For items “f” and “g”, 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 number of reports, claims, complaints, etc. that relate, or may relate, to the alleged defect in the subject vehicles is as follows:

- a. Consumer Complaints – Based upon the search criteria available, the number of consumer complaints that relate, or may relate, to the alleged defect in the subject vehicles, is difficult to determine at this time. Therefore, we are hesitant to speculate as to a specific number that may be appropriate. However, we performed a cursory review of certain consumer complaint file fields in order to attempt to make an initial assessment of the complaints that relate, or may relate, to the alleged defect in the subject vehicles, and in particular, the issue of stalling. Based upon this method, our initial assessment did not produce many complaints that may be related to stalling. The source of this information is our customer contact database and is current as of 27 May 08.
- b. Field Reports including Dealer Field Reports – The number of field reports is 3. The source of this information is our various field report systems / databases and is current as of 10 July 08.
- c. Reports involving a crash, injury, or fatality based upon claims, notices, etc. – The number of these reports is 1. The source of this information is our various systems / databases identified within other subparts of Question 2.
- d. Reports involving a fire, based on claims, notices, etc. – The number of these reports is 0.
- e. Property Damage Claims – The number of property damage claims is 1.
- f. Third-party Arbitration Proceedings – The number of third party arbitration proceedings is 2. The source of this information is our legal database and is current as of 11 Jun 08.
- g. Lawsuits – The number of lawsuits is 0. The source of this information is our legal database and is current as of 11 Jun 08.

For items (c) through (g), a “...summary description of the alleged problem and causal and contributing factors and BMW’s assessment of the problem, with a summary of the significant underlying facts and evidence...” is provided in our response to other questions of this Information Request.

For items (f) and (g), “...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...” is provided in Attachment “AP-ARBITRATION PROCEEDINGS” on CD No. 1.

**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. BMW'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 model and model year;**
- f. Vehicle's mileage at time of incident;**
- g. Incident date;**
- h. Report or claim date; and**
- i. Whether a crash is alleged;**
- j. Whether a fire is alleged;**
- k. Whether property damage is alleged;**
- l. Number of alleged injuries, if any; and**
- m. Number of alleged fatalities, if any.**

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

Response:

The source of this information, and its availability date, is as noted above in our response to Question 2/

Attachment "REQUEST NUMBER TWO DATA" on CD No. 1 contains the requested information, except as noted below.

Attachment "REQUEST NUMBER TWO DATA – CONSUMER COMPLAINTS" on CD No. 1 contains the requested information for consumer complaints. At the present time, we are not able to provide information in response to items (g), and (i) through (m) for each possible consumer complaint. However, for items (i) through (m), we believe that any applicable information would be contained within our responses to Question 2(c) through 2(g) and any corresponding information in response to Questions 3 and 4.

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

Response:

The source of this information, and its availability date, is as noted above in our response to Question 2.

Attachment "CC-CONSUMER COMPLAINTS" on CD No. 1 contains copies of the consumer complaints.

Attachment "FR-FIELD REPORTS" on CD No. 1 contains copies of the field reports.

Attachment "AP-ARBITRATION PROCEEDINGS" on CD No. 1 contains copies of the third-party arbitration proceedings.

Attachment "C-CLAIMS" on CD No. 1 contains copies of the claims.

**5. State a total count for all of the following categories of claims, collectively, that have been paid by BMW to date that relate to, or may relate to, the subject component: 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. BMW'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. Whether there was a claim for towing within three days of the repair date for the subject component;**
- h. Labor operation number;**
- i. Problem code;**
- j. Replacement part number(s) and description(s);**
- k. Concern stated by customer;**
- l. Comment, if any, by dealer/technician relating to claim and/or repair;**
- m. BMW's assessment of whether the repair condition involved vehicle operation in limp mode; and**
- n. BMW's assessment of whether the repair condition resulted in an engine stall.**

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

Response:

The source of this information is our warranty claims database and is current as of 30 May 08.

Please note that for items (m) and (n), we have not reviewed each specific claim comment. However, subsequent to our initial search in which we believe we captured all possible relevant claims (as described in response to Question 6), we also performed a key word search in order to attempt to make an initial assessment as to whether or not a claim may have been specifically related to the repair condition in which vehicle operation was in the "stall" mode. Key words such as, "stall, stalled, dies, died" were used. While some of the claim comments included those key words, the vast majority did not. Therefore, we believe that the vast majority of claims involved the repair condition related to engine "limp" mode. Additionally, we have only identified 4 claims for towing.

Attachment "W-WARRANTY" on CD No. 1 contains the requested information.

**6. Describe in detail the search criteria used by BMW 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 BMW 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 BMW offered for the subject vehicles and state by option, model, and model year, the number of vehicles that are covered under each such extended warranty.**

Response:

The search criteria included capturing those warranty claims within the category of claims that pertain to the high-pressure fuel pump and common rail claim group. Within that grouping of claims, a key word search was performed, based upon the wording of the alleged defect, in order to refine those claims thought to be related, or possibly related, to the alleged defect in the subject vehicles. Specifically, key words such as, “stall, sudden, reduction, reduce, power, loss, limp, mode, engine, lite, light, warning, and check” were utilized.

Attachment “W-WARRANTY” on CD No. 1 contains the problem codes, problem code descriptions, labor operation numbers, labor operation number descriptions, part numbers, and part number descriptions.

The terms of the new vehicle warranty coverage offered by BMW on the subject vehicles is contained in Attachment “W-WARRANTY” on CD No. 1.

**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 BMW 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 BMW is planning to issue within the next 120 days.**

Response:

The source of this information is our technical service database and is current as of 14 May 08.

Attachment “SB – SERVICE BULLETINS” on CD No. 1 contains the requested information.

BMW does not plan to issue any communications of the types identified above within the next 120 days.

**8. Describe all assessments, analyses, tests, test results, studies, surveys, simulations, investigations, inquiries and/or evaluations (collectively, “actions”) that relate to, or may relate to, the alleged defect in the subject vehicles that have been conducted, are being conducted, are planned, or are being planned by, or for, BMW. 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:

The source of this information is our various technical development departments at BMW AG and is current as of 10 July 2008.

At the present time, we are not able to provide copies of, "...all documents related to the action". However, we believe that Attachment "R-Q8" provides comprehensive and sufficiently detailed information that will allow NHTSA to perform a meaningful assessment of the issue.

Attachment "R-Q8" on CD No. 2 contains the requested information.

**9. Provide the following information regarding service bulleting SI B 13 03 08:**

- a. **A chronology of events and actions related to the issuance of the bulletin;**
- b. **Copies of all documents related to the subject bulletin, including the review of field data (e.g., complaints, field reports and warranty data), the development of the new high-pressure pump, predicted failure rates, and all related meetings, briefing material and presentations;**
- c. **An explanation why BMW decided to address the high-pressure fuel pump failures with the subject bulletin Service Action rather than a safety recall, and**
- d. **An indication whether or not owners of the vehicles indicated in SI B 13 03 08 were informed of the Service Action, and if so, by what method(s) they were informed.**

The source of this information is our various technical development departments at BMW AG and is current as of 10 July 2008.

- a. Attachment "R-Q9" on CD No. 2 contains the requested information.
- b. Attachment "R-Q9" on CD No. 2 contains a brief summary of the documentation requested. At the present time, we are not able to provide copies of "...all documents related to the subject bulletin".
- c. BMW decided to conduct a Service Action (replace the high-pressure fuel pump at the next dealer visit) to all affected vehicles because the vast majority of cases result in engine operation in the "limp" mode, difficulty in starting during a cold start, or rough running, not a stall condition.
- d. The Service Action did not include customer notification.

**10. Provide the following information regarding the effects of engine stall on braking performance in the subject vehicles:**

- a. **Describe the operation of the brake power assist system in the subject vehicles and state the effects of engine stall on system operation;**
- b. **Describe how BMW measures brake system performance in the following conditions: (1) following engine stall; and (2) with complete loss of brake power assist;**
- c. **Provide copies of all documents related to BMW engineering standards, specifications or design guidelines, that relate to 10.b;**
- d. **Provide copies of all test reports related to 10.b for the subject vehicles;**
- e. **Describe and provide copies of all documents relating to, studies, tests, analyses, technical papers or other reference material showing the maximum braking pedal force capabilities of male and female drivers (show for the low end, 5th percentile and 50th percentile for each demographic group);**
- f. **Provide graphs showing (1) brake line pressure (at the left front wheel), (2) vehicle deceleration (describe the road surface used and its coefficient of friction), and (3) brake pedal travel as functions of brake pedal force for normal system operation and for the first application after the engine has stalled and for each successive application until the source of power assist is fully depleted; and**
- g. **A table showing the brake pedal force and travel required to achieve decelerations of 0.1 to 0.9 g's, in increments of 0.1g, for normal system operation and for operation with no brake power assist, and describe the road surface used and its coefficient of friction.**

- a. Power assisted braking is achieved via a vacuum brake booster. The brake booster is being evacuated by a mechanical vacuum pump. The pump is powered by the engine's crankshaft with a gear ratio of 1:1.81. If the engine stalls, there is no more vacuum supply. If the engine stops, the remaining vacuum in the brake booster is sufficient for a minimum of one full power assisted braking application using a driver's typical pedal application force on the brake pedal. If further braking is required, then subsequent applications of the brake pedal will require additional force. However, it is still possible to apply the brakes and achieve full braking capability.
- b. BMW conducts measurements of brake performance with an intact brake system and with booster failure according to the regulatory requirements contained within FMVSS 135, as well as, ECE – R13. These requirements include engine stalling. Therefore, all service brake system performance requirements will be met with a stalled engine, including a brake booster failure.
- c. Details are contained within FMVSS 135 and ECE – R13H.
- d. Attachment "R-Q10" on CD No. 1 contains the requested information. At the present time, the attachment is in German text. However, a corresponding translated English text document will be forthcoming.
- e. BMW believes that these requirements are contained within both FMVSS 135 and ECE R13. We do not have any information regarding an analysis of the different percentile drivers.
- f. BMW does not have any information regarding item (f).
- g. BMW does not have any information regarding item (g).

**11. Provide the following information regarding the effects of engine stall on steering performance in the subject vehicles:**



- a. **Describe the operation of the steering power assist system in the subject vehicles and state the effects of engine stall on system operation;**
  - b. **Describe how BMW measures steering system performance in the following conditions: (1) following engine stall; and (2) with complete loss of steering power assist;**
  - c. **Provide copies of all documents related to BMW engineering standards, specifications or design guidelines, that relate to 13.b;**
  - d. **Provide copies of all test reports related to 13.b for the subject vehicles;**
  - e. **Describe and provide copies of all documents relating to, all studies, tests, analyses technical papers or other reference material showing the maximum steering effort capabilities of male and female drivers (show for the low end, 5<sup>th</sup> percentile and 50<sup>th</sup> percentile for each demographic group);**
  - f. **State by model, model year, and any other distinguishing factor the diameter of the steering wheel;**
  - g. **Describe and provide test data showing the effects of engine stall on steering wheel force as a function of lateral acceleration for normal system operation and after loss of assist; and**
  - h. **Describe, and provide copies of all related documents, all testing or analyses conducted by BMW to assess assisted and unassisted steering efforts with and without assist in low speed (less than 10 mph) and stationary turning maneuvers, such as turns at high steering angular inputs (e.g., full lock turns from a stop).**
- 
- a. Power assisted steering is supported by a hydraulic steering pump. The pump, powered by a belt at the transmission, supplies the power assisted steering system with hydraulic pressure and a flow rate. A cylinder and piston converts / transfers the hydraulic pressure to a force which acts upon a steering gear. The steering gear then applies a torque to the vehicle's wheels. If the engine fails, the pump will be unable to supply hydraulic pressure. As a result, power assisted steering will no longer be available. However, conventional steering is still possible.
  - b. BMW conducts measurements of steering performance with an intact steering system and with steering pump failure according to the regulatory requirements contained within EU Directive 70/311/EEC. There is no equivalent standard in the US. However, the subject vehicles comply with these regulatory requirements. These requirements include engine stalling. Therefore, all steering system performance requirements will be met with a stalled engine, including a steering pump failure.
  - c. Details are contained within EU Directive 70/311/EEC, which included within Attachment "R-Q11" on CD No. 1.
  - d. Attachment "R-Q11" on CD No. 1 contains the requested information.
  - e. BMW does not have any information regarding item (e).
  - f. BMW does not have any information regarding item (f).
  - g. BMW does not have any information regarding item (g).
  - h. BMW does not have any information regarding item (h).

**12. Describe all modifications or changes made by, or on behalf of, BMW 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;
- b. A detailed description of the modification or change;
- c. The reason(s) for the modification or change;
- d. The part number(s) (service and engineering) of the original component;
- e. The part number(s) (service and engineering) of the modified component;
- f. Whether the original unmodified component was withdrawn from production and/or sale, and if so, when;
- g. When the modified component was made available as a service component; and
- h. Whether the modified component can be interchanged with earlier production components.

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

Response:

The source of this information is our various technical development departments at BMW AG and is current as of 10 July 2008.

Attachment "R-Q12" on CD No. 2 contains the requested information.

**13. Produce one field return sample of the subject component and an exemplar sample of the latest redesign version of the subject component.**

Response:

Samples will be provided under separate cover.

**14. State the number of subject components that BMW 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 sale (*including the cut-off date for sales, if applicable*).**

**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 BMW is aware that contain the identical component, whether installed in production or in service, and state the applicable dates of production or service usage.**

The source of the parts sales information is our parts sales database and is current as of 28 May 2008.

Attachment "PS" on CD No. 2 contains the requested information. We are only able to provide parts sales information for a specific part number and calendar year. All information pertains to the Model Year 2007 BMW 3-Series vehicles with the 335i engine.

Supplier contact information is as follows:

Mr. Cornelius Schneller.  
Continental Automotive GmbH  
Siemensstr. 12  
93055 Regensburg / Germany  
P.O. Box 100943  
Email address: Cornelius.Schneller@continental-corporation.com  
Phone: +49-(0)941-790-4859

Identical components have been installed in production in Model Year 2008 BMW 5-Series vehicles, specifically, the 535i sedan, 535xi sedan, and 535xi sports wagon, starting in March 2007.

**15. Furnish BMW's assessment of the alleged defect in the subject vehicle, including:**

- a. **The causal or contributory factor(s) in the failure or malfunction of the subject component and the factors contributing to whether such failures or malfunctions result in: (1) limp mode operation; or (2) engine stall;**
- b. **The failure mechanism(s);**
- c. **The failure mode(s);**
- d. **Using statistical modeling of warranty data or other analytical methods give BMW's assessment of the rates of subject component failure/malfunction at 1, 3, and 5 years in service – include a detailed description of the statistical method used and a copy of the input data and the results (e.g., if Weibull analysis is used, give the output shape and scale parameters);**
- e. **Give BMW's assessment of the percentages of the subject component failure rates given in response to 15.d that would result in (1) limp mode; and (2) engine stall;**
- f. **For subject component failures resulting in engine stall, state BMW's assessment of the range of driving speeds where such incidents could occur and the ability of the operator to restart the engine;**
- g. **The risk to motor vehicle safety that it poses;**
- h. **What warnings, if any, the operator and the other persons both inside and outside the vehicle would have that the alleged defect was occurring or subject component was malfunctioning; and**
- i. **The reports included with this inquiry.**

Response:

Before addressing the specific subparts of Question 15, BMW wishes to state that this issue was transferred and investigated by a Task force since the first reports from the field were received. The technical findings and recommendations of this have been implemented into series production. A Service Action, which is continuing, was initiated in April 2008, in order to repair vehicles in the field so as to address potentially affected owners. The Task Force continues to be active in order to monitor the field situation, analyze field data, and make any necessary recommendations.

We believe that this course of action is sufficient in addressing this issue. The vast majority of cases result in the "limp home" mode, not an engine stall condition. When the condition occurs in the field, the Malfunction Indicator Lamp (MIL) is illuminated, as an additional alert to the driver. Despite reduced engine power, we believe that safe vehicle operation is possible. This has been addressed in our response to other questions that are a part of this information request, and is further explained in greater detail below.

- a. As has been explained in our response to other questions, there are a number of high pressure fuel pump components which have been the cause of various failures of the pump, and hence, are contributing factors. If the high pressure fuel pump experiences such a failure, the digital engine electronics activate an emergency operation ("limp home") mode at a level of 5 bar low pressure operation, which assures engine operation. Therefore, mobility of the vehicle will be maintained, despite a fault in fuel delivery. In the limp home mode, a limited engine output is provided because, with lower fuel pressure, it is not possible to inject the required amount of fuel in order to achieve maximum engine output. After recognizing the high pressure fault, it is possible that engine misfiring could occur for approximately 500msec during transition to low pressure operation. In very rare cases, this could lead to engine stalling. However, we have been only able to reproduce an engine stall condition with a standing or slowly rolling vehicle at idle speed (and without an engaged drive-train train).
- b. After detection of a high pressure fault, the pump will switch to low pressure mode. During the transition from the high pressure to low pressure operation, a mismatch of the fuel mixture with regard to injection amount and point of injection time occurs for less than one second. This is due to the high fuel pressure gradient. These mismatches can result in a misfiring condition as explained in (a) above. Only in very rare cases, successive misfiring, immediately in firing order, could cause engine stalling. However, we have only been able to reproduce this with a standing or slowly rolling vehicle at idle speed (and without an engaged drive-train).
- c. Please refer to (a) and (b).
- d. Attachment "R-Q15" on CD No. 2 contains the requested information.
- e. Attachment "R-Q15" on CD No. 2 contains the requested information. The percentage of failures which could result in engine stall is very low.
- f. We could only reproduce an engine stall condition at very low vehicle speeds (a maximum of about 10 mph) and without an engaged drive-train, or, with a standing vehicle. After stalling, the engine can be restarted immediately.
- g. BMW strongly believes that this issue, and the conditions that occur in the field, do not pose any risk to motor vehicle safety. During failure of the high pressure pump, the customer should initially experience longer engine starting times or rough engine running. After a distance of approximately 1 to 2 miles, the pump- and engine-emergency operation program is activated, and the Malfunction Indicator Lamp is illuminated. Despite reduced engine power, we believe that safe vehicle operation is possible. Vehicle drivability, steering, and braking systems are not affected and function in normal manner. Only in very rare cases, conditions in which we could reproduce (i.e., a standing or slowly rolling vehicle at idle speed without an engaged drive-train train), could the engine stall. When this condition occurs, there is a loss of power steering. While there is a loss of power steering capability, normal steering capability is retained. With regard to braking, there is enough vacuum in the brake booster for a minimum of one full power assisted braking application with the normal brake assisted pedal force. Subsequent brake applications will require an increase of pedal force. However, braking capability is maintained. Both the steering and braking systems comply with all relevant motor vehicle safety standards world-wide, even with regard to a loss of power steering and braking capability.
- h. A high pressure fault of the high pressure fuel pump is indicated to the driver by the illumination, in yellow, of the Malfunction Indicator Lamp. Illumination of the lamp, in yellow, with the engine symbol, is explained in the Owner's Manual, where it states,

*“Full engine power is no longer available. You can continue your journey, but moderate your speed and exercise due caution. Have the engine checked as soon as possible”.*

- i. The “...reports included with this inquiry...” refer to the Vehicle Owner Questionnaires (VOQs) that were supplied by NHTSA as part of this Information Request. Our assessment of these VOQs is included in our response to other parts of Question 15, is consistent with our analyses of other “non-VOQ” consumer complaints, and has been addressed within other responses to this Information Request.