



September 25, 2012

Mr. Jeffrey L. Quandt, Chief  
Vehicle Controls Division (VCD), NVS-213  
U.S. Department of Transportation

National Highway Traffic Safety Administration (NHTSA)  
Office of Defects Investigation (ODI)  
Room W48-312  
1200 New Jersey Avenue SE  
Washington, D.C. 20590

Reference: NVS-213krh; PE12-020

Dear Mr. Quandt:

Attached is Chrysler Group LLC's response to the referenced inquiry. Note that amended responses have been provided for questions 2,3,4,8 and 9a, including amended data and additional information in response to these questions.

In performing the analysis, reaching its conclusions and by providing the information contained herein, Chrysler Group LLC is not waiving its claim to attorney work product and attorney-client privileged communications. Based on the enclosed information, Chrysler believes there is no unreasonable risk to motor vehicle safety and this investigation should be closed.

Sincerely,

A handwritten signature in black ink, appearing to read "David D. Dillon".

David D. Dillon

Attachment and Enclosures

**Preliminary Statement**

On April 30, 2009 Chrysler LLC, the entity that manufactured and sold the vehicles that are the subject of this Information Request, filed a voluntary petition for relief under Chapter 11 of Title 11 of the United States Bankruptcy Code.

On June 10, 2009, Chrysler LLC sold substantially all of its assets to a newly formed company now known as Chrysler Group LLC. Pursuant to the sales transaction, Chrysler Group LLC assumed responsibility for safety recalls pursuant to the 49 U.S.C. Chapter 301 for vehicles that were manufactured and sold by Chrysler LLC prior to the June 10, 2009 asset sale.

On June 11, 2009, Chrysler LLC changed its name to Old Carco LLC. The assets of Old Carco LLC that were not purchased by Chrysler Group LLC, as well as the liabilities of Old Carco that were not assumed, remain under the jurisdiction of the United States Bankruptcy Court – Southern District of New York (*In re Old Carco LLC, et al.*, Case No. 09-50002).

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**Note: Unless indicated otherwise in the response to a question, this document contains information through July 30, 2012, the date the information request was received.**

**Chrysler is responding to questions 7, 9b, 10 and 11. In addition, Chrysler is amending the response and updating answers for questions 2, 3 and 4 to include only vehicles equipped with the subject components (EHPS), which was specific to vehicles with the 3.6L engine, and has been resubmitted in enclosures 3 and 4. Question 8 is being amended as additional data related to process changes has become available and has been included in Enclosure 8. Question 9a is being amended as an exemplar EHPS pump is being submitted per NHTSA request.**

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- 1. State, by model, engine and model year, the number of MY 2012 Jeep Grand Cherokee Chrysler manufactured for sale or lease in the United States and federalized territories. Separately, for each subject vehicle manufactured to date by Chrysler, state the following:**
  - a. Vehicle identification number (VIN);**
  - b. Model;**
  - c. Engine (displacement and engine code);**
  - d. Model Year;**
  - e. Date of manufacture; Date warranty coverage commenced; and**
  - f. The State in the United States, or federalized territory, where the vehicle was originally sold or leased (or delivered for sale or lease).**

**Provide the table in Microsoft Access 2003, 2007, or a compatible format, entitled "PE12\_020\_ PRODUCTION DATA."**

- A1. The 2012 model year (MY) Jeep Grand Cherokee US market vehicles are designated as the WK model and are built in the Jefferson North Assembly Plant in Detroit, Michigan. The total number of subject vehicles manufactured by Chrysler for sale or lease for the US market was 147,346.

The detailed response that lists the production data is provided in Enclosure 1 as Microsoft Access 2010 tables titled "PRODUCTION DATA (PE12-020).mdb".

- 2. State, by model, engine and model year, the number of each of the following, received by Chrysler, or of which Chrysler is otherwise aware, which relate to, or may relate to, the alleged defect in MY 2012 Jeep Grand Cherokee 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;**
  - f. Third-party arbitration proceedings where Chrysler is or was a party to the arbitration; and**
  - g. Lawsuits, both pending and closed, in which Chrysler is or was a defendant or codefendant.**

**For subparts “a” through “e” 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” provides a summary description of the alleged problem and causal and contributing factors and Chrysler’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.**

- A2. The following summarizes the reports identified by Chrysler that relate to, or may relate to, the alleged condition in the subject vehicles. Within the subject vehicles, only vehicles equipped with the 3.6L engine contain the subject component(s). Chrysler has conducted a reasonable and diligent search of the normal repositories of such information.
- a. There are 34 consumer complaints (Customer Assistance Inquiry Request or CAIR) that may relate to the alleged condition for the subject vehicle, which represent 26 unique VINs.
  - b. There are a total 20 field reports that may relate to the alleged condition for the subject vehicles, which represent 18 unique VINs.
  - c. There are no reports alleging a crash in the subject vehicles that may relate to the alleged condition.
  - d. There are no reports alleging a fire in the subject vehicles that may relate to a malfunction in the EHPS system.
  - e. There are no reports alleging property damage in the subject vehicles that may relate to the alleged condition.
  - f. There are no third-party arbitration proceedings involving Chrysler for the subject vehicles.
  - g. There are no legal claims involving the subject vehicles that may relate to the alleged condition.

Based on the analysis of these complaints for the subject vehicles, Chrysler has determined that all of the responsive complaints (CAIRs and field reports) comprise 37 unique VINs

A2. Amended Response

The following summarizes the reports identified by Chrysler that relate to, or may relate to, the alleged condition in the subject vehicles. Within the subject vehicles, only vehicles equipped with the 3.6L engine contain the subject component(s) (For the initial submission, a total of five vehicles with the 5.7L engine were inadvertently submitted. The data has been updated to include only vehicles equipped with the subject components (EHPS), which was specific to vehicles with the 3.6L engine, and has been resubmitted in enclosure 3). Chrysler has conducted a reasonable and diligent search of the normal repositories of such information.

- There are 30 consumer complaints (Customer Assistance Inquiry Request or CAIR) that may relate to the alleged condition for the subject vehicle, which represent 23 unique VINs.
- There are a total 18 field reports that may relate to the alleged condition for the subject vehicles, which represent 16 unique VINs.
- No changes
- There are no reports alleging a fire in the subject vehicles that may relate to a malfunction in the EHPS system. The two VOQs alleging a fire are unrelated as both vehicles are not equipped with EHPS and were not power steering related.
- No changes
- No changes
- No changes

Based on the analysis of these complaints for the subject vehicles, Chrysler has determined that all of the responsive complaints (CAIRs and field reports) comprise 32 unique VINs.

- 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. Chrysler's file number or other identifier used;**
  - b. The category of the item, as identified in Request No. 3 (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;**
- i. **Whether a crash is alleged;**
- j. **Whether a fire is alleged;**
- k. **Whether smoke is alleged;**
- l. **Whether property damage is alleged;**
- m. **Number of alleged injuries, if any; and**
- n. **Number of alleged fatalities, if any.**

**Provide this information in Microsoft Access 2003 or 2007, or a compatible format, entitled "PE12\_020\_REQUEST NUMBER THREE DATA."**

A3. The detailed response that lists the customer complaints and field reports (there are no legal claims) from Request No. 2, as requested in Items a. through n. is provided in Enclosure 3 in a Microsoft Access 2010 table, titled "PE12-020\_REQUEST NUMBER THREE DATA.mdb".

A3. Amended Response

Information has been updated per the Amended Response found in A2 and is provided in Enclosure 3 in a Microsoft Access 2010 table, titled "PE12-020\_REQUEST NUMBER THREE DATA.mdb".

**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 Chrysler used for organizing the documents.**

A4. Copies of all documents within the scope of Question No. 2 are provided in Enclosure 4 – Field Data. The documents for the subject vehicles contain CAIR reports, and field reports (there are no legal claims). The CAIR summaries are submitted in one .pdf file and the related documents are arranged in folders by CAIR number.

A4. Amended Response

Information has been updated per the Amended Response found in A2 and copies of all documents within the scope of Question No. 2 are provided in Enclosure 4 – Field Data. The documents for the subject vehicles contain CAIR reports, and field reports (there are no legal claims). The CAIR summaries are submitted in one .pdf file and the related documents are arranged in folders by CAIR number.

- 5. State, by model, engine and model year, total counts for all of the following categories of claims, collectively, that have been paid by Chrysler to date that relate to, or may relate to, the alleged defect in MY 2012 Jeep Grand Cherokee 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. Chrysler's claim number;**
- b. Vehicle owner or fleet name (and fleet contact person) and telephone number;**
- c. VIN;**
- d. Repair date;**
- e. Whether a claim for towing was made within five days of the claim 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 and description;**
- i. Problem code and description;**
- j. Replacement part number(s) and description(s);**
- k. Concern stated by customer;**
- l. Cause and Correction stated by dealer/technician; and**
- m. Additional comments, if any, by dealer/technician relating to claim and/or repair.**

**Provide this information in Microsoft Access 2003 or 2007, or a compatible format, entitled "PE12\_020\_WARRANTY DATA."**

**Describe in detail the search criteria used by Chrysler 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 Chrysler on the subject vehicles (i.e., the number of months and mileage for which coverage is provided and the vehicle systems that are covered).**

A5. The total number of warranty claims for the subject component, in the subject vehicles is listed below.

Claim Description (may relate to the subject component):		Number of Warranty Claims
05154409AE	Hose, Power Steering	1
05154409AD	Hose, Power Steering	9
05154458AC	Hose, Power Steering Return	3
52124650AE	Hose, Power Steering Return	6
68069651AC	Cooler, Power Steering	11

Additionally, not all of the warranty claims are necessarily related to the alleged condition as there are other reasons for power steering pressure or return line replacement. Therefore, the number of responsive warranty claims may be artificially high with regard to the alleged condition. Thus, Chrysler has not drawn conclusions regarding trends for the subject components in subject vehicles, based on warranty data alone.

The part numbers, labor operations, and failure codes used by Chrysler to identify warranty claims are noted in the charts below. In conducting its search, Chrysler included warranty claims where:

- A power steering pressure or return line was replaced as part of the warranty claim; and
- A warranty claim narrative was potentially related to the alleged condition or was not clear enough for it to be ruled out.

EHPS Pressure and Return Hose Part Numbers & Description	
05154409AE	Hose, Power Steering
05154409AD	Hose, Power Steering
05154409AC	Hose, Power Steering
05154409AB	Hose, Power Steering
05154409AA	Hose, Power Steering
05154458AC	Hose, Power Steering Return
05154458AA	Hose, Power Steering Return
52124635AG	Hose, Power Steering Return
52124635AF	Hose, Power Steering Return
52124635AD	Hose, Power Steering Return
52124650AE	Hose, Power Steering Return
52124656AF	Hose, Power Steering Pressure
52124656AD	Hose, Power Steering Pressure
68069651AC	Cooler, Power Steering
68069651AA	Cooler, Power Steering



Description of Repair	Labor Operation
Hose, pump pressure - Replace All others	19501015
Hose, pump/reservoir return - Replace Return line-Cooler to reservoir	19501534
Hose, pump/reservoir return - Replace Return line-Gear to cooler	19501535
Hose, pump supply - Replace All others	19501711
Hose, pump supply - Replace 5.7-6.4 liter engine	19501713
Cooler, power steering oil - Replace All others	19502001

Failure Code	Description
X2	Split, Cut or Torn
08	Blocked or Restricted
11	Broken or Cracked
71	Oil Leak

The standard warranty coverage offered for the subject vehicles was 36 months / 36,000 miles.

The detailed response that lists the warranty claims is provided in Enclosure 5 – “PE12\_020\_WARRANTY DATA.mdb”

**6. Produce copies of all service, warranty, and other documents that relate to, or may relate to, the alleged defect in the subject vehicles, that Chrysler has issued to any dealers, regional or zone offices, field offices, fleet purchasers, or other entities. This includes, but is not limited to, bulletin, 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 Chrysler is planning to issue within the next 120 days.**

A6. There are no GPOP tech tips, Technical Service Bulletins or informational documents related to the alleged condition for the subject vehicles that have been issued to Chrysler dealers, Business Centers, fleet purchasers or other such entities. There are also no such communications or informational documents currently planned for the next 120 days.

**7. 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, Chrysler. 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., engine damage task force) of which Chrysler 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.

- A7. Chrysler has conducted or is conducting the following assessments related to the alleged condition

**Assessment 1:** Power Steering Oil Cooler Warranty Part Return Analysis

Start Date	End Date	Engineering Group Responsible
3/14/2012	3/14/2012	Supplier: Dana
3/14/2012	3/14/2012	Supplier: Dana

Part Return Analysis Objective: The complete power steering hose system was returned from VINs CC [REDACTED] and CC [REDACTED] for root cause analysis as the vehicles experienced a hose blow-off at the power steering cooler.

Part Return Analysis Results: Analysis of several subject components are provided in Enclosure 7A - Part Return Analysis CONF BUS INFO which has been submitted under separate cover to the NHTSA Chief Counsel's Office with a request for confidential treatment.

Analysis of both power steering hose systems identified a loose turbulator fin from one of the four turbulators installed within the power steering cooler. The turbulators are used to create turbulent flow of the power steering fluid for enhanced cooling efficiency. In both cases, the fin was found downstream of the cooler and lodged within the return hose assembly. When this occurs, the fin restricts the flow of fluid which then creates excess backpressure within the

power steering system. This may eventually cause the return hose at the power steering cooler to blow off.

VIN CC2 [REDACTED] exhibited a missing fin from one of the turbulators which was found downstream in the return hose. Analysis of VIN CC [REDACTED] found a loose fin downstream in the return hose but all turbulator fins were intact within the cooler. Based on investigation, it was determined that a fin can become dislodged in the cooler assembly process and be transferred to a subsequent cooler during assembly.

In summary, a dislodged fin can occur when the turbulator is inserted into the cooler. A fin can also become dislodged from the turbulator when being loaded into the assembly machine prior to being inserted into cooler. The dislodged fin can then be transferred into a subsequent cooler during the insertion process.

**Assessment 2: Power Steering Oil Cooler Warranty Part Return Analysis**

Start Date	End Date	Engineering Group Responsible
8/9/2012	8/9/2012	Chrysler Materials Engineering
8/13/2012	8/22/2012	Supplier: Dana

Part Return Analysis Objective: Power steering oil coolers from VIN CC [REDACTED] (VOQ 10465379 – Mr. [REDACTED]) were returned for root cause analysis as the vehicle experienced a hose blow-off at the power steering cooler.

Part Return Analysis Results: Analysis of several subject components are provided in Enclosure 7B Assessments – Part Return Analysis CONF BUS INFO which has been submitted under separate cover to the NHTSA Chief Counsel's Office with a request for confidential treatment.

Both power steering oil coolers underwent radiographic testing at Chrysler to determine if a missing fin was present from the turbulators within the oil cooler. Analysis was not totally conclusive as the turbulators may have been oriented in such a manner the fins could not be clearly seen. Parts were given to Dana for further analysis. Both visual inspection and flushing of the coolers for debris showed no abnormalities. The coolers were cut apart to visually inspect the turbulators. All turbulator fins were intact and no loose, additional turbulator fins were found inside the coolers.

Chrysler believes a loose turbulator fin was dislodged from a prior turbulator as it was being transferred within the assembly machine. During this transfer, the loose turbulator fin migrated into the original power steering cooler. The loose turbulator fin migrated downstream and caused a blockage in the return hose.

This increased the power steering fluid backpressure and eventually caused the hose to blow off at outlet of the cooler. The second cooler was procured through MOPAR and was manufactured on January 18, 2012.

**Assessment 3: Power Steering Hose Assemblies Warranty Part Return Analysis**

Start Date	End Date	Engineering Group Responsible
8/9/2012	09/18/2012	Supplier: YH America

Part Return Analysis Objective: Power steering hose assemblies from VIN CC [REDACTED] (VOQ 10 [REDACTED] – Mr. [REDACTED]) were returned for root cause analysis as the vehicle experienced a hose blow-off at the power steering cooler.

Part Return Analysis Results: Analysis of several subject components are provided in Enclosure 7C Assessments – Part Return Analysis CONF BUS INFO which has been submitted under separate cover to the NHTSA Chief Counsel's Office with a request for confidential treatment.

The power steering hoses were inspected, flushed and tested for cleanliness. Small particulate matter was observed during this process. The sizes of the particles are measured in microns (0.001mm). The size of the restrictor in the return hose assembly has an inside diameter of 2.77mm. Because the particle size is on the order of 1000x smaller than the restrictor, they did not have a contributory affect to the hoses blowing off the power steering cooler.

**Assessment 4: Complaint Analysis by Report Open, Build Dates, Mileage, Months in Service**

Start Date	End Date	Engineering Group Responsible
7/30/2012	9/17/2012	Chrysler Product Investigations & Recall Administration

Complaint Analysis Assessment Objective: Determine if there are any identifiable trends in the number of complaint vehicles (any subject vehicle with a CAIR, field report or legal claim associated with the alleged condition) sorted by open date (date of complaint), build date of the vehicle and by the mileage of the vehicle when the complaint occurred.

Complaint Analysis Assessment Results: See Enclosure 7D Assessments – Complaint Analysis for details on the results.

Complaint Analysis Assessment Summary: The complaint analysis of the responsive field inputs (blow offs and leaks) by mileage shows the conditions occurring very early in vehicle life with 65% of the complaints occurring with less

than 2000 miles, and 97% of the complaints occurring with less than 8000 miles. When analyzing the complaints by months in service (MIS), 62% occurred at less than 2 MIS, and 91% occurred with less than 4 MIS.

The complaint analysis for the 8 reports of power steering fluid leaks shows they occur early in life, with 75% occurring in less than 2000 miles and all claims occurred in 4 MIS or less. The analysis of inputs vs. build date indicates a low level of random inputs with multiple causes and no identifiable trends, based on dealer inquiries.

Chrysler's analysis of the 8 leaks shows that:

- 1 vehicle leaked due to a loose power steering pressure hose tube nut to steering gear connection
- 2 vehicles had hoses leaking at one of the quick connect joints
- 5 incidents were unclear as to the location of the leak

As a result, the power steering leaks are considered random and isolated incidents with no identifiable trend and are considered unrelated to the blow off condition.

Chrysler believes the condition of most interest is related to hose blow offs which are caused by the dislodged turbulator fin. When analyzing the data for the blow off condition, it is noted that 65% occur at less than 2000 miles and 96% occur with less than 8000 miles. When analyzing the data by MIS, 88% occur with less than 4 MIS. Analysis by vehicle build date shows an increase of blow off inputs starting November 22, 2011 through December 23, 2012 (referred to as "December" for identifying the time period in the analysis). Over 50% of the blow off complaints occurred during this timeframe.

Chrysler notes that while the mileage on CAIR number 21946231 was originally reported as 18,017 miles, the mileage should have been 1,817 miles (see attached information in Enclosure 7D Assessments – Complaint Analysis). The information in enclosure 7D was completed with this updated information. The access database in enclosure 3 was also updated as mentioned previously.

#### **Assessment 5: Statistical Analysis of Complaints**

<b>Start Date</b>	<b>End Date</b>	<b>Engineering Group Responsible</b>
9/12/2012	9/18/2012	Chrysler Group LLC

Complaint Analysis Assessment Objective: Analysis to Predict Future Repairs Related to Hose Leaks and Blow-offs

Complaint Analysis Assessment Results: See Enclosure 7E Assessments – Complaint Analysis CONF BUS INFO for details on the results.

Complaint Analysis Assessment Summary: The complaint analysis indicates that out of the 112,294 vehicles equipped with EHPS that were produced, there could be on the order of up to 14 additional vehicles that may experience the hose blow off condition which is the equivalent of 0.12 C/1000.

**Assessment 6: Fire Assessment**

<b>Start Date</b>	<b>End Date</b>	<b>Engineering Group Responsible</b>
7/30/2012	9/20/2012	Chrysler Group LLC

Fire Analysis Assessment Objective: Assess the risk of a fire due to a power steering hose blow off at the power steering cooler outlet port.

Engine Compartment Graphics: See Enclosure 10F Assessments –Engine Compartment Analysis for the engineering graphics.

Fire Analysis Assessment Summary:

Review of Chrysler's field data indicates that there are no reported complaints of smoke or fire in the engine compartment that may relate to power steering hose leaks.

Subject vehicle engineering assessment determined the following:

- The power steering cooler is located in the front of the radiator/condenser module which isolates it from the engine compartment in the fore aft direction
- The front closeout panel and lower radiator cross member creates a barrier beneath the power steering cooler to further isolate potential fluid from reaching the engine compartment.
- The inlet and outlet connections on power steering cooler are located on the driver's side of the vehicle and pointed directly downward to the ground.
- A belly pan extends from the lower radiator cross member to the front suspension cross member to further isolate the fluid from migrating into the engine compartment.
- If a blow off were to occur, it is highly unlikely for power steering fluid to reach any of the ignition sources in the engine compartment and result in an engine fire.
- Further, the two VOQs alleging a fire are unrelated as both vehicles are not equipped with EHPS and were not power steering related.

In summary, for the reasons mentioned above, it is highly unlikely for a hose blow off to result in an engine fire. This is supported by the 24 unique VINs with hose blow offs, with no allegations of smoke or fire in the engine compartment.

- 8. Describe all modifications or changes made by, or on behalf of, Chrysler 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**

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

A8. The requested information for the subject components, specifically relating to the alleged defect, is provided in Enclosure 8 – Subject Component Changes – CONF BUS INFO which has been submitted under separate cover to the NHTSA Chief Counsel's Office with a request for confidential treatment.

A8. Amended Responses

Additional information relating to process changes for the subject components, specifically relating to the alleged defect, is provided in Enclosure 8 – Subject Component Changes – CONF BUS INFO which has been submitted under separate cover to the NHTSA Chief Counsel's Office with a request for confidential treatment.

**9. Produce the following sample parts:**

- a. One exemplar sample of each design version of the EHPS supply and return hose assemblies; and**
- b. Representative samples of each EHPS system component returned from the field for analysis, which may be related to the alleged defect.**

A9. The requested information is summarized below.

- a. Chrysler is providing exemplar samples of EHPS pressure/return lines for the 2012 subject vehicles. Chrysler is currently trying to locate previous design levels for the EHPS pressure/return lines. Listed below are the part numbers:

<b>Part Number</b>	<b>Description</b>
05154409AE	Hose, Power Steering
05154458AC	Hose, Power Steering Return
52124635AF	Hose, Power Steering Return
52124650AE	Hose, Power Steering Return
52124656AF	Hose, Power Steering Pressure
68069651AC	Cooler, Power Steering

A9. Amended Response

The requested information is summarized below.

- a. Chrysler is providing exemplar samples of EHPS pressure/return lines for the 2012 subject vehicles, along with an EHPS pump per the request of NHTSA. Chrysler is currently trying to locate previous design levels for the EHPS pressure/return lines. Listed below are the part numbers:

<b>Part Number</b>	<b>Description</b>
05154409AE	Hose, Power Steering
05154458AC	Hose, Power Steering Return
52124635AF	Hose, Power Steering Return
52124650AE	Hose, Power Steering Return
52124656AF	Hose, Power Steering Pressure
68069651AC	Cooler, Power Steering
52124998AH	Pump, EHPS

- b. Chrysler is providing field return samples of EHPS power steering system for the 2012 subject vehicles. Listed below are the part numbers which were returned as of September 21, 2012:



<b>Part Number</b>	<b>Description</b>	<b>VIN</b>
05154409AE	Hose, Power Steering	CC [REDACTED]
05154458AC	Hose, Power Steering Return	DC [REDACTED]
52124650AE	Hose, Power Steering Return	DC [REDACTED]
52124998AH	Pump, EHPS	CC [REDACTED]

10. Provide the following information for the MY 2012 Jeep Grand Cherokee vehicles:
- a. Complete EHPS systems requirements document in Microsoft word or PDF;
  - b. All EHPS system self-diagnostics functions for both active (assembly plants/dealers/workshops) and passive (runtime/power-up) functions. Include DTC definition, test frequency, test criteria, recording mechanisms and system actions;
  - c. Pump failsafe strategies including DFMEA/DRBFM;
  - d. EHPS bill of material (BOM) and sourcing suppliers for each EHPS system component including pump and controller, hoses, clamps, pressure fittings, cooler...etc.
  - e. Power steering fluid temperature profile;
  - f. A diagram of the engine compartment components and location, hose and harness routing, and a listing of all components in the engine compartment;
  - g. Engine compartment thermal profile including CAE/CFD analysis, all exhaust surface temperatures (catalytic converter, shields, de-couplers...etc.) and 38C/45C wind tunnel cooling performance;
  - h. Provide the following specifications for the subject vehicles: (1) curb weight; (2) gross vehicle weight rating; (3) nominal and maximum front axle weights; (4) steering ratio; (5) maximum steering angle; and (6) turning radius;
  - i. Describe, and provide copies of all documents relating to, all steering effort testing of the subject vehicles (e.g., ECE R-79); and
  - j. Provide assisted and unassisted steering efforts, as a steering hand wheel rim force, for the following conditions: (1) static lock-to-lock; (2) 150 degrees of steering wheel angle at 5 mph; and (3) efforts for each combination of the following speeds (20, 40, and 100 km/h) and lateral accelerations (0.0, 0.1 and 0.25 g's).
- A10. The requested information is summarized below and refers to Enclosures as appropriate.

- a. A search was conducted and six documents were found that are responsive to this request. These documents are being provided in Enclosure 10A – EHPS System Requirements CONF BUS INFO which has been submitted under separate cover to the NHTSA Chief Counsel's Office with a request for confidential treatment.
- b. A search was conducted and two documents were found that are responsive to this request: These documents are being provided in Enclosure 10B – EHPS Self Diagnostics CONF BUS INFO which has been submitted under separate cover to the NHTSA Chief Counsel's Office with a request for confidential treatment.
- c. A search was conducted and no documents were found that are responsive to this request.
- d. A search was conducted and one document was found that is responsive to this request. The engineering bill of material document is being provided in Enclosure 10 D – EBOM.
- e. A search was conducted and one document was found that is responsive to this request. This document is being provided in Enclosure 10 E - Power Steering Temperature Profile CONF BUS INFO which has been submitted under separate cover to the NHTSA Chief Counsel's Office with a request for confidential treatment.
- f. A search was conducted and three documents were found that are responsive to this request. These documents depict the steering system in vehicle position and identify some of the major components or systems in the engine compartment area. These documents are being provided in Enclosure 10 F – Engine Compartment Diagram.
- g. A search was conducted and one document was found that is responsive to this request. This document is being provided in Enclosure 10 G – Engine Compartment Thermal Data CONF BUS INFO which has been submitted under separate cover to the NHTSA Chief Counsel's Office with a request for confidential treatment.
- h. Vehicle specifications have been obtained and are listed below. Weight information may be given as a range (if applicable) based on vehicle options, drivetrain (two-wheel drive, four-wheel drive), etc. 1) The curb weight ranges from 4552 to 4995 lbs. 2) The gross vehicle weight rating is 6500 lbs. 3) The nominal front axle weight (front axle base weight averaged amongst all vehicle configurations with a 3.6L engine) was 2434 lbs. The maximum front axle weight (heaviest four-wheel drive vehicle with the highest maximum front GVW weight) was 2786 lbs. 4) The steering ratio is 18.9:1. 5) The maximum steering angle (measured at the road wheel) is  $\pm 39$  degrees. 6) The turning radius is 39 feet.

- i. A search was conducted and the compliance test report was found that is related to steering efforts. This document is being provided in Enclosure 10I – Steering Efforts CONF BUS INFO which has been submitted under separate cover to the NHTSA Chief Counsel's Office with a request for confidential treatment.
- j. Chrysler is providing a copy of an instrumented handling test that was previously conducted. Contained within this document are the steering efforts that Chrysler has measured. This is being provided in Enclosure 10I – Steering Efforts CONF BUS INFO. Chrysler does not, during the course of development, conduct any power steering evaluation without power steering assist.

**11. Furnish Chrysler'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; and**
- e. What warnings, if any, the operator and the other persons both inside and outside the vehicle would have that the alleged defect was occurring or subject component was malfunctioning.**

A11. There have been a combined total of 32 field reports and customer complaints identified with the alleged defect (pressure supply/return line failure or malfunction). There were no reports of smoke or fire related to a malfunction of the EHPS system. Of the 32 field inputs, 24 were hose blow offs and 8 were reported as power steering hose leaks.

As discussed in Q7, Assessment 4, the power steering leaks that have occurred were due to a number of reasons. As a result, the power steering leaks are considered random and isolated incidents with no identifiable trend and are considered unrelated to the blow off condition

Based on the 24 blow offs and a production vehicle build volume of 112,294 vehicles, this yields an incident rate of 0.21 C/1000.

As discussed in A7, Assessment 1, the root cause of the power steering hose blow offs is the result of a dislodged power steering cooler turbulator fin which migrates to the restrictor in the power steering return line. This can block the flow of power steering fluid which creates excess backpressure in the power steering system. The increased backpressure can lead to the possibility of the return hose blowing off at the outlet of the power steering cooler.

A dislodged fin can occur when the turbulator is inserted into the power steering cooler during assembly. A fin can also become dislodged from the turbulator when being loaded into the assembly machine prior to being inserted into the cooler. The dislodged fin can then be transferred into a subsequent cooler during the insertion process.

During the investigation, Chrysler was able to identify occurrences where the power steering return hose would blow off at the power steering cooler. This would allow the fluid to be purged from the power steering system, resulting in the driver experiencing unassisted, manual steering. The physical connection between the steering wheel and steering gear remained intact, allowing the driver to steer the vehicle in a controlled manner.

Further, as noted in Assessment 6, Chrysler has received no reports of engine compartment fire that can be attributed to this condition. For the reason discussed in Q7, assessment 5, it is highly unlikely for a hose blow off to result in an engine fire. This is further supported by the 24 hose blow off field inputs with no reported allegations of smoke or fire in the engine compartment.

As a result, there have been no reported incidents or loss of steering control, crashes, injuries or fires as a result of this condition. Chrysler does not believe this to be an unreasonable risk to motor vehicle safety.

As stated above, this is a condition that occurs early in the life of the vehicle with 65% occurring at less than 2,000 miles and 96% occurring with less than 8,000 miles. The data also shows that 88% of the conditions occurred with less than 4 months in service. None of the conditions occurred with more than 11,000 miles or 7 months in service. In fact, Chrysler's complaint analysis indicates that out of the 112,294 subject vehicles produced, there could be on the order of up to 14 additional vehicles that may experience the hose blow off condition which is the equivalent of 0.12 C/1000.

Chrysler notes that all of the affected vehicles that may have experienced the alleged condition were repaired under Chrysler's 3 year/36,000 mile manufacturer's warranty at no cost to the owner. Moreover, field data suggests that the supplier's process improvements put in place between February 2012 and April 2012 have eliminated the likelihood of power steering hose blow offs.

In summary,

- The power steering hose blow off incident rate is low
- The hose blow off condition occurs very early in life
- Chrysler projects a very low number of future, potential occurrences
- There have been no reported incidents of loss of steering control, crashes or injuries as a result of this condition

For these reasons, Chrysler believes there is no unreasonable risk to motor vehicle safety and this investigation should be closed.