

# DAIMLERCHRYSLER

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OFFICE OF VEHICLE  
INVESTIGATION

DaimlerChrysler Corporation

Stephan J. Speth

Director

Vehicle Compliance & Safety Affairs

March 28, 2006

Mr. Jeffrey Quandt, Chief  
Vehicle Control Division  
Office of Defects Investigation  
National Highway Traffic Safety Administration  
U.S. Department of Transportation  
400 Seventh Street, SW  
Washington, D.C. 20590

Dear Mr. Quandt:

Reference: NVS-213kmb, PE06-004

This document contains DaimlerChrysler Corporation's ("DCC") response to the referenced inquiry regarding alleged front lower ball joint separation on some 2003, 2004, 2005 and 2006 model year Jeep Liberty ("KJ") vehicles. In reaching our analysis and conclusions, and by providing the information contained herein, DCC is not waiving its claim to attorney work product and attorney-client privileged communications.

DCC's investigation is still ongoing and it has yet to reach a final conclusion as to why the ball joints in the subject vehicles may have separated. Analysis of returned parts suggests a number of possible causes, including: 1) physical damage to the seal (50%); 2) contamination entering the ball joint through the roll crimp seal (38%); and 3) creep corrosion between the seal and housing (12%). Included among these reported separations are instances where a broken ball stud was noted. The failure to recognize the signs of ball joint wear and/or not follow reasonable maintenance and inspection of the lower ball joint assemblies, unnecessarily increases the possibility of a separation in Jeep Liberty or any manufacturer's vehicles.

DCC's analysis of events alleging lower ball joint separation for which there is sufficient information (inspection reports, photographs and witness statements) revealed that in excess of 75% of separation events, the separation occurred at low speeds (under 20 MPH) and almost always involved a slow-moving turning event. These low speed incidents pose minimal risk to vehicle owners and the public

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because the vehicle comes to a stop almost immediately. Moreover, in none of these reported events was there a confirmed detachment of the wheel and tire from the vehicle, thereby posing no risk of injury to others or property damage. In these events, there were no fatalities reported and in only three instances were injuries claimed (3 occupants, soft tissue injuries). Because a lower ball joint separation event is unlikely to occur at higher speeds or during abrupt driving maneuvers, and no confirmed wheel detachments have occurred, there does not appear to be an unreasonable risk to vehicle occupants, bystanders or the property of others.

DCC has instituted a number of engineering design and assembly process changes in the subject lower ball joints in an effort to improve ball joint performance. It is believed these changes will improve ball joint performance, but further experience is required before a definitive conclusion can be reached. DCC will continue to monitor the performance of the ball joints at issue.

Sincerely,



Stephan J. Speth

Attachment and Enclosures

1. **State, by model and model year, the number of subject vehicles DCC has manufactured for sale or lease in the United States. Separately, for each subject vehicle manufactured to date by DCC, state the following:**
  - a. **Vehicle identification number (VIN);**
  - b. **Make;**
  - c. **Model;**
  - d. **Drivetrain configuration;**
  - e. **Transfer case type;**
  - f. **Model Year;**
  - g. **Date of manufacture;**
  - h. **Date warranty coverage commenced;**
  - i. **The State in the United States where the vehicle was originally sold or leased (or delivered for sale or lease); and**
  - j. **Whether the vehicle is included in the subject recall.**

**Also, provide the above information for any and all subject recall vehicles identified within the scope of your response to Request No. 2. 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 that provides further details regarding this submission.**

**Note: Unless otherwise indicated in the question response, all data contained in this response is through February 7, 2006, date of the information request.**

**The detailed response that lists the production data is provided in "Enclosure 01 - Production Data" as a Microsoft Access 2000 file, titled "PRODUCTION DATA (PE06-004) SUBJECT" & "PRODUCTION DATA (PE06-004) RECALL."**

2. **State the number of each of the following, received by DCC, or of which DCC 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;**
  - e. **Third-party arbitration proceedings where DCC is or was a party to the arbitration; and**
  - f. **Lawsuits, both pending and closed, in which DCC is or was a defendant or codefendant.**

Also, state the number of each of the above items, received by DCC, or of which DCC is otherwise aware, which relate to, or may relate to, any and all alleged front suspension lower ball joint separation incident(s) that occurred in the subject recall vehicles after the subject recall remedy was performed.

For subparts "a" through "d," state the total number of each item (e.g., consumer complaints, field reports, etc.) separately. Multiple incidents involving the same vehicle are to be counted separately. Multiple reports of the same incident are also to be counted separately (i.e., a consumer complaint and a field report involving the same incident in which a crash occurred are to be counted as a crash report, a field report and a consumer complaint).

In addition, for items "c" through "f," provide a summary description of the alleged problem and causal and contributing factors and DCC's assessment of the problem, with a summary of the significant underlying facts and evidence. For items "e" and "f," identify the parties to the action, as well as the caption, court, docket number, and date on which the complaint or other document initiating the action was filed.

The following summarizes the reports of events identified by DCC that relate to, or may relate to, the alleged defect. DCC has conducted a reasonable and diligent search of the normal repositories of such information. The following definitions apply to the information provided in response to this question:

- Subject Recall Vehicle(s): Any and all MY 2002 through 2003 Jeep Liberty vehicle(s) manufactured for sale or lease in the United States and included in the subject recall population after the recall remedy was performed.
- Subject Vehicle(s): Any and all MY 2003 through current production Jeep Liberty vehicle(s) manufactured for sale or lease in the United States and NOT included in the subject recall.

Customer Complaints										
Category	Subject Vehicles					Subject Recall Vehicles				
	Quantity	Alleged Crash <sup>1</sup>	Property Damage	Alleged Injury	Alleged Fatality	Quantity	Alleged Crash <sup>1</sup>	Property Damage	Alleged Injury	Alleged Fatality
Separation	106	16	1	2	0	394	58	0	0	0
Unknown	9	1	0	0	0	45	2	0	1	0
NHTSA IR	8	0	0	0	0	NA	NA	NA	NA	NA
Total:	123	17	1	2	0	439	60	0	1	0

There are 111 unique vehicles associated with the 123 subject vehicle population and 355 unique vehicles associated with the 439 subject recall population.

Field Reports										
Category	Subject Vehicles					Subject Recall Vehicles				
	Quantity	Alleged Crash <sup>1</sup>	Property Damage	Alleged Injury	Alleged Fatality	Quantity	Alleged Crash <sup>1</sup>	Property Damage	Alleged Injury	Alleged Fatality
Separation	13	0	0	0	0	10	0	0	0	0

Lawsuits & Legal Claims										
Category	Subject Vehicles					Subject Recall Vehicles				
	Quantity	Alleged Crash <sup>1</sup>	Property Damage	Alleged Injury	Alleged Fatality	Quantity	Alleged Crash <sup>1</sup>	Property Damage	Alleged Injury	Alleged Fatality
Separation	11	3	1	2	0	23	7	0	1	0
Unknown	1	0	0	0	0	1	0	0	0	0
<b>Total:</b>	<b>12</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>24</b>	<b>7</b>	<b>0</b>	<b>1</b>	<b>0</b>

<sup>1</sup>For purposes of this table, crash is defined as deformation of sheet metal or damage to the fascia or fender flare of the subject vehicle.

DCC has not identified any third party arbitration proceedings where DCC is or was a party to the arbitration. DCC has identified two lawsuits (Stark & Munz, included in the table above) in which it is or was a defendant or co-defendant.

DCC has identified 21 additional customer complaints and 17 additional lawsuits and legal claims related to a total of 21 unique vehicles where the owner/claimant was involved in a crash and claimed that the front lower ball joint separated. DCC has reviewed available file materials for these incidents and has concluded, based on the nature of the crash and damage to the front lower ball joint, that either the ball joint separation was the result of forces related to an impact with another vehicle or object or that no separation of the front lower ball joint occurred. Based on this review, DCC has concluded in 4 of these incidents that front lower ball joint separation occurred as a result of forces related to an impact with another vehicle or object and 17 incidents where it concluded that no front lower ball joint separation occurred. DaimlerChrysler Corporation has not individually identified these incidents because it believes they are unrelated to this investigation. Materials relating to these incidents will be made available to the ODI upon 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. DCC's file number or other identifier used;

- b. **The category of the item, as identified in Request No. 2 (i.e., consumer complaint, field report, etc.);**
- c. **Vehicle owner or fleet name (and fleet contact person), address, and telephone number;**
- d. **Vehicle's VIN;**
- e. **Vehicle's make, model and model year;**
- f. **Vehicle's mileage at time of incident;**
- g. **Incident date;**
- h. **Report or claim date;**
- i. **Whether a crash is alleged;**
- j. **Whether property damage is alleged;**
- k. **Number of alleged injuries, if any; and**
- l. **Number of alleged fatalities, if any.**

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

The detailed summary of all requested information in response to Request 2 is provided in "Enclosure 02 - Request Number Two Data" as a Microsoft access 2000 compatible format, titled "REQUEST NUMBER TWO DATA\_Q3 Recall" & "REQUEST NUMBER TWO DATA\_Q3 Subject."

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 DCC used for organizing the documents.**

Copies of all documents within the scope of Request 4 are provided in "Enclosure 03 - Cust Complaints, Field Reports, Legals." Subject vehicle population and subject recall population breakdowns are supplied in separate folders labeled: Cust Complaints, Field Reports and Legal

5. **State, by model and model year, a total count for all of the following categories of claims, collectively, that have been paid by DCC to date that relate to, or may relate to, the subject component 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. **DCC'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 the vehicle was towed to the dealer for the repair;
- h. Labor operation number;
- i. Problem code;
- j. Replacement part number(s) and description(s);
- k. Concerns stated by customer; and
- l. Comment, if any, by dealer/technician relating to claim and/or repair.

Also, state a total count for each of the above items that have been paid by DCC to date that relate to, or may relate to, any and all alleged front suspension lower ball joint separation incident(s) that occurred in the subject recall vehicles after the subject recall remedy was performed.

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 that provides further details regarding this submission.

The detailed response that lists the warranty claim information is provided in "Enclosure 4 – Warranty Data" as a Microsoft Access 2000 compatible format, titled "WARRANTY DATA (PE06-004) Subject".

There are 199 claims that have been paid by DCC to date that relate to, or may relate to, the alleged front suspension lower ball joint separation that occurred in the subject recall vehicles after the subject recall remedy was performed.

6. To the extent that is possible, state a total count for all such claims identified in response to Request No. 5 that relate to a subject component that maintained its joint retention capability. Separately, state a total count for all such claims identified in response to Request No. 5 that relate to the alleged defect.

There are 1904 claims that relate to the subject component related that maintained their joint retention capability. There are 362 claims that relate to the alleged defect.

7. Describe in detail the search criteria used by DCC 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 and subject recall vehicles. State, by make and model year, the terms of the new vehicle warranty coverage offered by DCC 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 DCC 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.**

The search criteria used by DCC to identify claims in response to Request No. 5 can be found in the chart below:

<b>Repair Description</b>	<b>Labor Operation</b>
Ball Joint/Ball Socket, Lower 4 X 4 Right	02101008
Ball Joint/Ball Socket, Lower 4 X 4 Left	02101009
Ball Joint/Ball Socket, Lower 4 X 2 Right	02101012
Ball Joint/Ball Socket, Lower 4 X 2 Left	02101013

<b>Failure Code</b>	<b>Description</b>
K4	Loose
X8	Stripped-Threads
07	Binds, Sticks or Seized
11	Broken or Cracked
51	Improperly Installed
60	Insufficient Lubrication
68	Noisy
SE	Shortage Part

The standard warranty offered by DCC on all 2003, 2004, 2005 and 2006 model year Jeep Liberty vehicles is 36 months / 36,000 miles. There is no extended warranty coverage option related specifically to the subject vehicles. Owners may have purchased additional warranty coverage through DCC or third-party providers not affiliated with DCC. Third-party warranty data is not available to DCC and is not included with this response.

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

There has been one Service Information Update published and distributed to the field on 9/8/04 instructing technicians the ball joint plastic shipping cover must be in place over the ball joint boot while pressing the ball joint into the knuckle. A copy of this publication can be found in "Enclosure 05 - TSBs."

- 9. Describe all assessments, analyses, tests, test results, studies, surveys, simulations, investigations, inquiries and/or evaluations (collectively, "actions") that relate to, or may relate to, the alleged defect in the subject vehicles that have been conducted, are**



being conducted, are planned, or are being planned by, or for, DCC. 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.

A detailed summary of all pertinent front lower ball joint assessments, analyses, tests, test results, studies, surveys, simulations, investigations, inquiries information is being submitted as "Enclosure 00 – Surveys, Testing & Photos, CONFIDENTIAL" to the NHTSA Office of the Chief Counsel, under separate cover with a request for confidential treatment.

10. Describe all modifications or changes made by, or on behalf of, DCC 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. 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 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 DCC is aware of which may be incorporated into vehicle production within the next 120 days.

All modifications or changes made by DCC 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 are summarized in

attachment. This information is being submitted as "Enclosure 01 - Change History CONFIDENTIAL" to the NHTSA Office of the Chief Counsel, under separate cover with a request for confidential treatment.

The original unmodified component was withdrawn from production 11/26/2002. The original component was superseded to the next level without obsolescence.

**11. Produce one of each of the following:**

- a. Exemplar sample of each design version of the subject component;
  - b. Field return sample of a subject vehicle subject component that exhibits the alleged defect. If DCC has identified more than one failure mechanism that relate to, or may relate to, the alleged defect in the subject vehicles, please provide one field return sample ball joint of each;
  - c. Two field return samples of subject components that are representative of the most severe levels of wear in non-separated parts replaced – provide service age and mileage information for each;
  - d. Front Suspension Lower Ball Joint Package, identified as part number CBTF361 in a December 2003 document DCC issued to dealers regarding the subject recall; and
  - e. Any kits that have been released, or developed, by DCC for use in service repairs to the subject component/assembly which relate, or may relate, to the alleged defect in the subject vehicles.
- 
- a. Exemplar ball joint samples of prior level design levels as outlined in the Question 10 are no longer available through MOPAR. Tooling to produce these levels has been modified and can no longer produce the prior levels. Ball joints are backward compatible; therefore, once a new version is introduced all previous iterations are serviced with the latest/newest part. Production of the previous level ceases. If the implementation of the latest part is launched without obsolescence, it is possible to have two levels within MOPAR inventory existing concurrent. This condition occurs until the prior/old level MOPAR inventory is exhausted. Latest levels (OEM PN# 52088762AH, MOPAR PN#05114037AF and OEM PN# 52088762AI, MOPAR PN# 05114037AG) are being provided. Additionally, DCX was able to locate one sample of OEM PN# 52088762AG, MOPAR PN# 05114037AD.
  - b. In addition to the alleged defect (4W225009), DCX is providing samples of the following failure mechanisms that are related to the alleged defect:
    1. Cut ball joint boot seal. (3W683775)
    2. Housing roll crimp leakage. (2W251832)
    3. Seal/shell interface creep corrosion. (4W157948)
  - c. Reference samples labeled: "IIC – Severe wear on non-separation." Sample 4W122326 in-service 2/16/04, repaired 8/19/05 – 19,312 miles. Sample 2W252598 C36 1/6/04. repaired 7/29/05 – 14,398 miles.
  - d. Front Suspension Lower Ball Joint Package CBTF361 is a prior design level that has been replaced by CBTF361AB as outlined in Question 10. A sample of CBTF361AB is being provided.

- e. Service repair kits released as a part of C36 include CBLFC362 which contains two lower ball joint heat shields and CBLFC363 which contains one lower ball joint and three retaining nuts. These kits were released for vehicles built between October 4, 2002 and March 25, 2003 per C36. Kits CBLFC362, CBLFC363 & CBLFC363AB are being provided.

**12. State the number of each of the following that DCC 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):**

- a. Subject component; and
- b. Any kits that have been released, or developed, by DCC for use in service repairs to the subject component/assembly.

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

- a. Part sales information is provided in "Enclosure 12 - Service Part Sales" file "MOPAR Sales." Cut off dates for sales not applicable.
- b. Kits that have been released or developed by DCC for use in service repairs for the subject vehicles and subject recall vehicles are outlined and summarize in Question 10.

Supplier contact information is provided in "Enclosure 12 - Service Part Sales" file "Supplier Information." There are no other DCC vehicles that contain the identical ball joint.

**13. Furnish DCC's assessment of the alleged defect in the subject vehicles, 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 failure rate and trend in comparison to the rates and trends associated with the subject recall vehicles at the time DCC notified the agency of the subject recall;
- f. State the maximum end-play specified for the subject components and the design service life/mileage; and
- g. The reports included with this inquiry.

DCC's investigation is still ongoing and it has yet to reach a final conclusion as to why the ball joints in the subject vehicles may have separated. Analysis of returned parts suggests a number of possible causes, including: 1) physical damage to the seal (50%); 2) contamination entering

the ball joint through the roll crimp seal (38%); and 3) creep corrosion between the seal and housing (12%). Included among these reported separations are instances where a broken ball stud was noted. The failure to recognize the signs of ball joint wear and/or not follow reasonable maintenance and inspection of the lower ball joint assemblies, unnecessarily increases the possibility of a separation in Jeep Liberty or any manufacturer's vehicles.

Non-impact related ball joint separation occurs when the ball joint internal sealing environment is compromised. Significant product and process improvements have been on-going over the past year to eliminate compromised sealing. DCC is currently evaluating the impact of these improvements (see question #9 for testing history). The ball joint protective shipping cap has been lengthened to enhance the engagement of the cap to housing. A newly designed and implemented assembly protective cap (super cap), which bridges forces between the ball stud and the knuckle, is installed to the knuckle/ball joint assembly to protect the ball joint seal. Additionally the ball joint staging operation was optimized to reduce press installation variation. The roll crimp leak path has been eliminated with the implementation of 100% leak testing and addition of sealant. Creep corrosion has been addressed by the addition of a two layer coating of Geomet plus topcoat on the ball joint housing undercut. Coupled with the corrosion protection coatings; the sealing snap ring has been increased to two full wraps to maximize the compressive loads within the sealing area. The ball stud and housing throat undercut have been induction hardened to significantly improve the wear characteristics in the event of a compromised seal. The housing throat has been reduced to create additional interference in tension. The amount of grease within the joint has nearly tripled to delay the internal contamination onset if the sealing environment becomes compromised. To address broken ball studs, assembly plant process controls have been implemented to ensure proper stud pull up is achieved. Additionally, the coating on the fastener has been changed to reduce assembly variation.

The maximum ball joint endplay specification for the subject vehicles is 0.060" or 1.5mm. The design life of the subject component which maintains internal seal integrity is 10 years 120,000 miles under normal customer usage.

DCC has not undertaken an analysis of the rates or trends of the alleged defect in the subject vehicles as compared to the subject recall population at the time DCC notified the agency of the subject recall. Determination of such rates or trends in the subject vehicle population requires adequate time in service accumulation; therefore, mature data for the subject population does not exist to make a meaningful trend comparison to the subject recall population at the time NHTSA was notified of the subject recall. DCC has provided information regarding vehicle population and the occurrence of the alleged defect in its response to questions 1, 2 and 5.

DCC's analysis of events alleging lower ball joint separation for which there is sufficient information (inspection reports, photographs and witness statements) revealed that in excess of 75% of separation events, the separation occurred at low speeds (under 20 MPH) and almost always involved a slow-moving turning event. These low speed incidents pose minimal risk to vehicle owners and the public because the vehicle comes to a stop almost immediately. Moreover, in none of these reported events was there a confirmed detachment of the wheel and tire from the vehicle, thereby posing no risk of injury to others or property damage. In these

Mr. Jeffrey Quandt  
Reference: NVS-213kmb; PE06-004  
March 28, 2006

ATTACHMENT

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events, there were no fatalities reported and in only three instances were injuries claimed (3 occupants, soft tissue injuries). Because a lower ball joint separation event is unlikely to occur at higher speeds or during abrupt driving maneuvers, and no confirmed wheel detachments have occurred, there does not appear to be an unreasonable risk to vehicle occupants, bystanders or the property of others.

DCC has instituted a number of engineering design and assembly process changes in the subject lower ball joints in an effort to improve ball joint performance. These changes are summarized above. It is believed these changes will improve ball joint performance, but further experience is required before a definitive conclusion can be reached. DCC will continue to monitor the performance of the ball joints at issue in the subject vehicles and subject recall vehicles.