

DAIMLERCHRYSLER

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OFFICE OF DEFECTS
INVESTIGATION

DaimlerChrysler Corporation

Stephan J. Speth

Director

Vehicle Compliance & Safety Affairs

September 3, 2004

Ms. Kathleen C. DeMeter, Director
Office of Defects Investigation
National Highway Traffic Safety Administration
U.S. Department of Transportation
400 Seventh Street, SW
Washington, D.C. 20590

Reference: NVS-212mj; EA04-013

Dear Ms. DeMeter:

This document contains DaimlerChrysler Corporation's ("DCC") response to the referenced inquiry regarding airbag clocksprings in certain 1998-2000 model year DCC minivans ("the subject 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 was surprised that NHTSA decided to upgrade this investigation to an Engineering Analysis in light of the comprehensive proposal DCC presented to NHTSA in May of this year to resolve this customer satisfaction concern. This proposal was identical to DCC Safety Recall B24 / Lifetime Extended Warranty, a program which resolved EA01-007.

DCC emphasizes the following:

- The clockspring installed in the 1998-2000 model year minivans is **not the same clockspring** as the one installed in the 1996-1998 model year minivans that were the subject of EA01-007. It is a seven-circuit clockspring, contrasted with a six-circuit clockspring installed in the older minivans. DCC has previously provided NHTSA with evidence from a returned parts analysis showing that the seven-circuit clockspring is not prone to backwinding during

the manufacturing process, as was the six-circuit clockspring. NHTSA has not provided any evidence to the contrary, nor does DCC know of any.

- For this reason, the clockspring replacement rate for the seven-circuit clockspring cannot be used to demonstrate that the seven-circuit clockspring has the same issue as the six-circuit clockspring that was the subject of DCC Safety Recall B24/Lifetime Extended Warranty program. Nor does it demonstrate the presence of a safety-related defect in the seven-circuit clockspring. Rather, the seven-circuit clockspring replacement rate is more likely explained by the tendency of this component to experience increased terminal resistance, as discussed below. To the extent the seven-circuit clocksprings replaced in the field have shown evidence of backwinding, this most likely occurred during an intervening service or repair, rather than during the manufacturing process.
- As DCC has previously shared in detail with NHTSA, the seven-circuit clockspring is known to be prone to an issue involving increased terminal resistance, in which inadequate gold plating allowed brass substrate to oxidize, forming a barrier between the terminals. The barrier between the terminals could result in a condition that illuminates the "air bag warning" lamp and which would be diagnosed as "open circuit at the clockspring." Importantly, this condition is **completely benign** from a safety perspective—the airbag remains available to deploy in a crash if needed. There is absolutely no risk to motor vehicle safety from a "failure" involving increased terminal resistance. DCC believes that the vast majority of the field reports involving alleged failures of the clockspring are, in fact, benign failures of the terminal resistance. This condition strongly influences (and inflates) the number of clocksprings that will ultimately result in an open circuit, which is the subject of this inquiry, but it is not a safety-related condition.
- As part of EA01-007, DCC conducted a comprehensive part return program. The program generated over 1900 1996-2000 MY returned clocksprings for analysis. Over 1000 of the returned clocksprings were of the seven-circuit clockspring vintage, which are the subject components of this investigation. 90% of the seven-circuit clocksprings analyzed were deemed "No Trouble Found", and had a fully functional airbag circuit. Removal of the clockspring from the vehicle will result in cleansing the terminals. Therefore, the increased terminal resistance condition would result in a "No Trouble Found" during component analysis. Less than 3% of the seven-circuit clocksprings from this sample of approximately 1000 returned parts were deemed "Backwound". As part of the same survey, approximately 425 1996 and 1997 MY six-circuit clockspring were analyzed. 71% of the 1996 MY returned six-circuit clocksprings were found to be backwound and 25% of the 1997 MY returned six-circuit clocksprings were found to be backwound. To summarize, this survey clearly demonstrates that the seven-circuit clockspring performs differently than the six-circuit clockspring and is not

prone to the backwinding condition. DCC, therefore, concludes the vast majority of clockspring replacements in the subject vehicle population were likely the result of increased terminal resistance and a very limited number of clockspring replacements were a result of a backwound condition.


- While DCC agrees that a backwound clockspring can fail prematurely in a manner that could, in some cases, present a safety-related defect, DCC has no evidence to support a conclusion that the subject vehicles are experiencing a disproportionate number of backwound clocksprings. In the absence of such information, neither DCC nor NHTSA has any basis on which to determine that the clockspring failure rate in the subject vehicles is evidence of a defect that presents an unreasonable risk to motor vehicle safety. To the contrary, the evidence strongly suggests that clockspring replacements in the subject vehicles are driven by benign failures related to terminal resistance, or driven by dealer desire to participate in the financial benefits that flow from identifying a vehicle ostensibly "eligible" for a clockspring replacement. DCC's financial reimbursement protocols for recall/warranty work do not provide sufficient safeguards against such opportunistic claims.
- DCC has previously shared all of the technical facts relating to this issue with NHTSA on several occasions, including that the subject parts are internally identical to those that have been used on millions of other DCC products for many years without issue. The causal factors that can lead to a backwound clockspring include random assembly plant installation errors and improper assembly following any service procedure that involves decoupling the steering linkage. Due to the nature of the condition, it is difficult to determine when the damage occurred, especially on older vehicles such as these. However, all information available to DCC strongly supports a conclusion that a clockspring that is backwound during factory installation will fail early in the life of the vehicle. Moreover, when the condition does manifest itself, it will always provide notice through illumination of the mandated cluster warning lamp, as will the benign condition of increased terminal resistance.
- The data clearly demonstrate that the increase in the number of complaints on 1998.5 to 2000 model year minivans directly correlates to both the release of recall B24 in November 2002 and the RQ04-001 announcement in March 2004. Approximately 80% of the complaints included on the RQ04-001 response were reported since the announcement of recall B24. Approximately 83% of the complaints included in the EA04-013 response have occurred since the announcement of RQ04-001, indicating a significant influence from publicity, which cannot be disaggregated. The primary consumer complaint is the cost of the repair, in which they request reimbursement from DCC.

- A significant number of the extended warranty repairs completed under recall B24 directly correlate to the recall process established at our dealerships. Because of the desire to improve customer satisfaction and the implications of federal law, DCC and our dealerships have worked diligently to assure all open recalls are completed on all serviced vehicles. It is DCC's strong belief that the dealership service centers are replacing clocksprings on vehicles because the recall system has established B24 as an open recall on the vehicle. Based on the indicator data and analysis completed during the original investigation, it is DCC's conclusion that the majority of clocksprings replaced under recall B24 on vehicles over 70,000 miles were in fact replaced due to dealership behavior, and were in no way defective. These data are simply an artifact of DCC's dealer notification and warranty-billing systems.
- In the unlikely event of a backround fatigue of the clockspring conductive ribbon, all DCC vehicles have a mandated warning light system that alerts the driver that the airbag system needs immediate attention from a trained dealership technician, as noted in the vehicle owners manual. As was also shown during the original investigation, this condition would typically manifest itself initially through intermittent illumination of the lamp, during which time the driver air bag system remains completely functional. In fact, the warning lamp can even be continuously illuminated for some period of time and the system remains fully functional.
- In the very limited number of single side deployments that have occurred, it is known that the vehicle's warning lamp was on for a significant amount of time without being serviced by a trained dealership technician. Only a small number of alleged injuries, all minor in nature, have been reported and cannot be attributed to the non-deployment of the driver airbag. Additionally, in no cases has the alleged condition occurred as a result of a crash. The facts show that most owners, while dissatisfied with the out of pocket cost, are actually having the repair completed in a timely manner while the airbag is still functional. Only in rare and isolated cases where an owner ignores the clear notice is there any risk to motor vehicle safety. Considering that there are approximately 1.2 million of these vehicles on the road, and that they are from 5 to 7 years old, the lack of evidence of a safety problem from this condition is strong support for DCC's conclusion that there is no safety-related defect in the subject vehicles. If this condition were widespread, clearly a trend should have developed by this point in time.
- Performing a recall to replace the clocksprings on the entire population of the subject vehicles will likely induce additional customer complaints. Historically in a repair of this nature, approximately 1% of the repairs, completed by trained dealership technicians, require a repeat repair because the service itself induced a new problem with the clockspring or related components. Therefore, by repairing the total population of the subject vehicles, trained

dealership personnel would likely induce far more conditions requiring additional clockspring replacements than the total number of conditions that would occur without any action taken. Even if the clockspring issue in the subject vehicles could be deemed to present a risk to motor vehicle safety, that risk cannot be deemed "unreasonable" under the Vehicle Safety Act if the safety consequences of reducing that risk is worse than the underlying risk to safety. A remedy structured after recall B24 is the right solution to resolve this issue.

While additional media driven complaints have been reported since the investigation was upgraded, it is DCC's continuing position that the clockspring field replacement rate for the subject vehicles results from the benign condition of increased terminal resistance or from a backround condition introduced by subsequent service on the vehicle. Moreover, the evidence shows that customers respond to the mandated warning lamp that alerts the driver that the airbag system needs immediate attention from a trained dealership technician. For these reasons, DCC believes that the alleged condition is not a defect that presents an unreasonable risk to motor vehicle safety. Nonetheless, in an attempt to resolve any customer concerns and to avoid a possible prolonged dispute with the agency over this position, DCC is preparing to move forward with the proposal presented to NHTSA in May of this year to resolve this customer satisfaction concern. DCC staff intends to recommend that a service action identical to the one employed as to recall B24 (limited replacement and lifetime extended warranty) at DCC's regularly scheduled September Vehicle Regulations Committee meeting for decision. While DCC still feels that this issue is not a safety-related defect that requires a safety recall, DCC is willing to undertake this action as a good faith gesture to resolve this issue, and feels this action is in the best interest of our customers. This campaign will assure the greatest likelihood of addressing the field incidences of clockspring open circuits with the least invasive action. It will also impress upon consumers the need to seek proper diagnosis when a warning lamp is illuminated and provide a no-cost remedy for the life of the vehicle, regardless of the cause of damage to the clockspring assembly. We urge NHTSA to agree that this action is sufficient to resolve the agency's concerns, and to close EA04-013.

Sincerely,


for Stephan J. Speth

Attachment and Enclosures

- Q1. State, by model and model year, the number of subject vehicles DaimlerChrysler has manufactured for sale or lease in the United States. Separately, for each subject vehicle manufactured to date by DaimlerChrysler, state the following:**
- a. Vehicle identification number (VIN);**
 - b. Make;**
 - c. Model;**
 - d. Model Year;**
 - e. Date of manufacture;**
 - f. Place or plant of manufacture;**
 - g. Date warranty coverage commenced; and**
 - h. 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."**
- A1. The MY 1998, 1999 and 2000 DaimlerChrysler Corporation ("DCC") minivans (Dodge Caravan/Grand Caravan, Plymouth Voyager/Grand Voyager, and Chrysler Town & Country) built since March 1, 1998 are similar vehicles and have the same subject clockspring. These vehicles are collectively referred to as the NS model. The total number of subject NS vehicles manufactured for the US market is 1,280,934.**
- The detailed response that lists the market production data as requested in Items a. through g. is provided in Enclosure 1 as a Microsoft Access 2000 table, titled "PRODUCTION DATA."**
- Q2. State the number of each of the following, received by DaimlerChrysler, or of which DaimlerChrysler are 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;**
 - d. Property damage or personal injury claims; and**

- e. Third-party arbitration proceedings where DaimlerChrysler is or was a party to the arbitration; and
- f. Lawsuits, both pending and closed, in which DaimlerChrysler is or was a defendant or codefendant.

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

In addition, for items "c" through "f," provide a summary description of the alleged problem and causal and contributing factors and DaimlerChrysler'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.

- A2.** The following summarizes the non-privileged reports received by DCC that relate to, or may relate to, the alleged condition in the subject vehicles since the RQ04-001 response on March 31, 2004. DCC has conducted a reasonable and diligent search of our normal repositories of such information.

- a. There are a total of 898 customer complaints, which include 130 NHTSA reports (VOQ's) that may relate to the alleged condition. The 768 other (non-VOQ) customer complaints contain 700 unique vehicles.

The original list of VOQ's received from NHTSA contained 130 VOQ's but 81 VOQ's do not have vehicle identification numbers and they cannot be verified by DCC. Two of the 49 VOQ's with identification numbers reference the same vehicle. Eighteen of the 49 VOQ's with vehicle identification numbers have related customer complaints in the DCC system. The remaining 31 VOQ's are unique reports which do not have related complaints in the DCC system.

- b. There are 20 field reports that contain 18 unique vehicles.
- c. There is one claim alleging injury that is responsive to this inquiry.

- d. There are no reports that allege property damage that are responsive to this inquiry.
- e. There are no third-party arbitration proceedings involving DCC that are responsive to this inquiry.
- f. There is 1 lawsuit and 1 claim, involving DCC that are responsive to this inquiry. Both have related customer complaints in the DCC system.

The data clearly demonstrates that the increase in the number of complaints directly correlates to both the release of recall B24 in November 2002 and the RQ04-001 announcement in March 2004. Approximately 80% of the complaints included on the RQ04-001 response were reported since the announcement of recall B24. Approximately 83% of the complaints included in the EA04-013 response have occurred since the announcement of RQ04-001, indicating a significant influence from a publicity, which cannot be disaggregated. In the very limited number of single side deployments that have occurred (less than 0.4% of all complaints), it is known that the vehicle's warning lamp was on for a significant amount of time without being serviced by a trained dealership technician. The limited reported injuries cannot be attributed to the non-deployment of the driver airbag.

DCC's analysis of customer complaints, post the RQ04-001 response, indicates approximately 40% of the complaints may be attributed to other random issues such as terminal resistance, the airbag control module, or the driver airbag module. Due to the lack of information, it is impossible to discriminate the alleged condition (backround clockspring) from other random issues such as terminal corrosion, an airbag control module issue, or a driver airbag module issue.

As discussed in the numerous responses to the prior investigation, DCC's analysis of clockspring terminals indicated a reduced thickness of gold plating on the terminals. Gold plating with a thickness of below 15 microinches results in the diffusion of the base metal through the plating resulting in an increase in resistance. This increase in resistance could cause the airbag warning light to illuminate but will not obstruct the operation of the airbag system and is therefore completely benign from a safety perspective.

Also, the airbag warning light system mandated by FMVSS 208 is designed to alert the driver that the airbag system needs immediate attention from a trained dealer. Very specific warnings are given in the vehicle owner's manual in the

event that the airbag warning light is illuminated for a period longer than the normal 8 seconds at vehicle startup or illuminated as you drive, as mandated in FMVSS 208. The driver's decision to disregard the warning lamp and the Owner's Manual warnings and not have the airbag system inspected at a dealer is out of the control of DCC.

Q3. Separately, for each item or report (consumer complaint, field report, claim, notice, or matter) within the scope of your response to Request No. 2, state the following information:

- a. DaimlerChrysler'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;
- l. Number of alleged fatalities, if any; and

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

A3. The detailed response that lists the customer complaints and field reports, from Request No. 2, as requested in Items a. through l. is provided in Enclosure 2 as a Microsoft Access 2000 table, titled "REQUEST NUMBER THREE DATA".

Q4. Produce copies of all documents within the scope of Request No. 2. Organize the documents separately by category (i.e., consumer complaints, field reports, etc.) and describe the method DaimlerChrysler used for organizing the documents. Clearly identify DaimlerChrysler's file number, vehicle owner or fleet name, and VIN for each item responsive to this request.

A4. Copies of all documents within the scope of Request No. 2 are provided in Enclosure 3 – COMPLAINTS AND FIELD REPORTS, on the enclosed CD-ROM.

Q5. State, by model and model year, a total count for all of the following categories of claims, collectively, that have been paid by DaimlerChrysler to date that relate to, or may relate to, the alleged defect in the subject vehicles: warranty claims; extended warranty claims; claims for good will services that were provided; field, zone, or similar adjustments and reimbursements; and warranty claims or repairs made in accordance with a procedure specified in a technical service bulletin or customer satisfaction campaign.

Separately, for each such claim, state the following information:

- a. DaimlerChrysler's claim number;
- b. Vehicle owner or fleet name (and fleet contact person) and telephone number;
- c. VIN;
- d. Repair date;
- e. Vehicle mileage at time of repair;
- f. Repairing dealer's or facility's name, telephone number, city and state or ZIP code;
- g. Labor operation number;
- h. Problem code;
- i. Replacement part number(s) and description(s);
- j. Concern stated by customer; and
- k. Comment, if any, by dealer/technician relating to claim and/or repair.

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

A5. The total number of warranty claims for Clockspring replacement (Labor Operation 19-85-25) for the 1998 through 2000 model years for the NS vehicles is shown in the chart below:

NS	3,007	10,226	7,079

It should be noted that a multitude of conditions not related to this inquiry (noise, terminal plating, misdiagnosis, etc.) often result in replacement of the subject component. No conclusions can be drawn from this warranty data relative to the alleged condition.

The detailed response that lists the warranty claims, as requested in Items a. through k. is provided in Enclosure 4 as a Microsoft Access 2000 table, titled "WARRANTY DATA".

- Q6. For each subject vehicle that had more than one repair or warranty claim filed related to the alleged defect in the subject component, please state the following:**
- a. Vehicle's make, model and model year;**
 - b. Vehicle owner or fleet name (and fleet contact person), address and telephone number;**
 - c. Vehicle's VIN;**
 - d. Vehicle's mileage at time of the repair or claim; and**
 - e. Date of each repair or claim.**

Provide this information in Microsoft Access 2000, or a compatible format, entitled "MULTIPLE FAILURE DATA."

In addition, provide DaimlerChrysler's assessment as to why, or for what reason, these vehicles required, or were the subject of, multiple repairs or claims.

- A6. DCC can not state the exact reason any particular vehicle was the subject of multiple repairs. However, DCC has explained to NHTSA numerous times that clockspring replacement is a sensitive repair. Additionally, improper assembly during any service procedure that involves decoupling the steering linkage can damage the clockspring assembly.**

The detailed response that lists the multiple warranty claims, as requested in Items a. through e. is provided in Enclosure 5 as a Microsoft Access 2000 table, titled "MULTIPLE FAILURE DATA".

- Q7. State, by model and model year, a total count for all of the vehicles repaired under DaimlerChrysler Safety Recall No. B24 separated by labor operation code 19-B2-41-82 and labor operation code 19-B2-41-83.**

Separately, for each such claim, state the following information:

- a. DaimlerChrysler's claim number;**
- b. Vehicle owner or fleet name (and fleet contact person) and telephone number;**
- c. VIN;**
- d. Repair date;**
- e. Vehicle mileage at time of repair;**
- f. Repairing dealer's or facility's name, telephone number, city and state or ZIP code;**
- g. Labor operation number;**
- h. Problem code;**
- i. Replacement part number(s) and description(s);**
- j. Concern stated by customer; and**
- k. Comment, if any, by dealer/technician relating to claim and/or repair.**

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

- A7. The total number of vehicles repaired under DaimlerChrysler Safety Recall No. B24 for the 1996 through 1998 model years for the NS vehicles is shown in the chart below:**

19-B2-41-81 Inspect clockspring	28,784	24,786	12,830
19-B2-41-82 Replace clockspring (vehicles with LESS than 70,000 miles)	47,425	72,714	74,571
19-B2-41-83 Check DTC's and replace clockspring (vehicles with a failed clockspring and MORE than 70,000 miles)	133,723	121,769	61,685

The detailed response that lists the vehicles repaired under Recall No. B24, as requested in Items a. through k. is provided in Enclosure 6 as a Microsoft Access 2000 table, titled "RECALL DATA".

Q8. If any of the vehicles you identified in response to Request No. 7 above and Request No. 6 of DaimlerChrysler's March 31, 2004 response to the ODI information request in RQ04-001, required additional repairs, or were the subject of additional warranty claims, due to or in any relation to the alleged defect, after their repair under Safety Recall No. B24, please state the following as to each of those vehicles:

- a. DaimlerChrysler's claim number;
- b. Vehicle owner or fleet name (and fleet contact person) and telephone number;
- c. VIN;
- d. Repair Date;
- e. Vehicle mileage at time of repair;
- f. Repairing dealer's or facility's name, telephone number, city and state or ZIP code;
- g. Labor operation number;
- h. Problem code;
- i. Replacement part number(s) and description(s);
- j. Concern stated by customer; and
- k. Comment, if any, by dealer/technician relating to claim and/or repair.

Provide this information in Microsoft Access 2000, or a compatible format, entitled "ADDITIONAL RECALL DATA."

In addition, state the total number of vehicles subject to these additional repairs or claims, and provide DaimlerChrysler's assessment as to why, or for what reason(s), these vehicles required, or were the subject of, additional repairs or claims.

A8. DCC can not state the exact reason any particular vehicle was the subject of multiple repairs. However, DCC has explained to NHTSA numerous times that clockspring replacement is a sensitive repair. Additionally, improper assembly during any service procedure that involves decoupling the steering linkage can damage the clockspring assembly.

The detailed response that lists the vehicles requiring additional repairs, or were subject of additional warranty claims, due to or in any relation to the alleged defect, after their repair under Safety Recall No. B24 is provided in Enclosure 7 as a Microsoft Access 2000 table, titled "ADDITIONAL RECALL DATA".

- Q9. Describe in detail the search criteria used by DaimlerChrysler 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 DaimlerChrysler 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 DaimlerChrysler 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.**
- A9. The search criteria used by DCC to identify claims to Request No. 5, can be found in the chart below:**

Clockspring, Airbag – Replace	19-85-25-01
Diagnostics	19-85-25-00
Diagnostics – Procedure Manual	19-85-25-68
Diagnostics – MOPAR Diagnostics System Procedure	19-85-25-78
Apply Dielectric Grease to Clockspring	19-85-25-90
Apply Dielectric Grease to Clockspring and Replace Clockspring	19-85-25-91

Fault codes for the above reference labor operations are provided below.

D4	No Cancel
D5	Turn Signal Defect
11	Broken or Cracked
18	Open Circuit
51	Improperly Installed
58	Internal Defect
67	Noisy Rattles (loose)
68	Noisy

The two fault codes "Open Circuit" and "Internal Defect" (fault codes 18 & 58) may directly impact the ability of the driver airbag circuit to properly function in the case of a deployment. The other fault codes, such as "Noisy", "Broken or Cracked", and "Improperly Installed" will not affect the warning lamp. It should also be noted as previously explained in prior submissions that "Open Circuit" and "Internal Defect" fault codes may be assigned to parts with terminal plating issues. Diagnostic tools used by the dealership are unable to distinguish between parts experiencing an increase in resistance due to terminal corrosion versus those that are experiencing a true open circuit. The increase in resistance due to inadequate terminal plating could cause the airbag warning lamp to illuminate but will not obstruct the operation of the airbag system. Therefore it cannot be assumed that the provided warranty data shows any conclusive evidence of a trend related to backround clocksprings.

The standard warranty offered on all NS-model vehicles was 36 month / 36,000 miles. There were no extended warranty coverage options related specifically to the subject components. Owners may have purchased additional warranty coverage through third-party providers not affiliated with DaimlerChrysler; this warranty data is not available to DaimlerChrysler and is not included in this response.

- Q10. Produce copies of all service, warranty, recall, and other documents that relate to, or may relate to, the alleged defect in the subject vehicles, that DaimlerChrysler 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 manufacturer's short name is planning to issue within the next 120 days.**

- A10.** Two Service Bulletins were previously supplied to NHTSA in Enclosure 6 – SERVICE BULLETINS in the RQ04-001 response that may be responsive to this inquiry. No additional service bulletins have been issued since the RQ04-001 submission to NHTSA.
- Q11.** Furnish copies of all communications between DaimlerChrysler and each supplier of the subject components for the subject vehicles pertaining to the design, manufacture, performance, durability, quality, testing, or modification of the subject components that relate to, or may relate to, the alleged defect. If any communications on this subject were oral, provide a written transcript or summary of each such communication, and include a statement that identifies all participants and the date of the communication.
- A11.** There have been no communications between DCC and the subject component supplier for the subject since EA01-007 was closed. Any relevant documents were previously submitted to NHTSA as part of PE00-032 or EA01-007.
- Q12.** 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, DaimlerChrysler. 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. If an action is not complete, provide a detailed schedule for the work to be done, tentative

findings and/or conclusions, and provide an update within 10 days of completion of the action.

- A12. There have been no assessments, analyses, tests, studies, surveys, simulations, investigation, inquiries and/or evaluations conducted by or for DCC since EA01-007 was closed. Any relevant documents were previously submitted to NHTSA as part of PE00-032 or EA01-007.**

Since the opening of RQ04-001, DCC initiated a Part Retention Survey in order to obtain seven circuit clockspring field return samples for analysis. In late May, 2001, DCC initiated a second field return program to obtain parts replaced under Recall B24/Lifetime Extended Warranty. The objective of the second survey is to determine the percentage of returned recall parts currently being replaced that show signs of the backround condition. As previously discussed with NHTSA during the June 10, 2004 Quarterly review, a significant portion of the clocksprings were replaced within the first few months of the launch of the Recall/Lifetime Extended Warranty. DCC believes this is due to the fact that the owner notification for Recall B24 could not distinguish between vehicles less than 70,000 miles and vehicles over 70,000 miles and therefore all consumers received recall notices. Additionally, the system shows an open recall for all vehicles in the population and dealers have been trained to complete any open recall on vehicles as they come into their shop for any service. Because of this, DCC believes that the vast majority of the parts replaced under the Lifetime Warranty was not defective but, were replaced because of the above described characteristics of Recall B24/Lifetime Extended Warranty. For these reasons, DCC emphasizes that the current part returns cannot be used to draw conclusions about the parts previously replaced as part of the campaign.

A detailed summary of the ongoing part retention surveys is included as Enclosure 08 – SURVEY.

- Q13. Describe all modifications or changes made by, or on behalf of, DaimlerChrysler 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 and MY 2000 minivans. 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.

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

- A13.** A detailed summary of all pertinent design change information for the subject components, as requested in sections a. through h., was included as Enclosure 7 – CHANGE HISTORY in the RQ04-001 response.
- Q14.** Describe how the subject components are different in manufacture, design, material composition, quality control, or installation from the components that were recalled in Safety Recall No. B24.
- A14.** The differences between the clockspring components installed on the 1998.5-2000 NS Minivans and the clockspring components installed on the 1996-1998.5 NS Minivans is as follows:
- A 7-circuit clockspring was implemented to accommodate the remote radio control feature
 - A new clockspring housing to accommodate the 7-circuit connector
 - New copper wire configuration in the Mylar tape, i.e., narrow and taller than the 6-circuit Mylar tape
- Q15.** In its May 18, 2001, response to an ODI information request in EA01-007, DaimlerChrysler reported that the clocksprings under investigation incorporated a locking tab system to ensure that the clocksprings could

not rotate prior to installation of the steering wheel during the assembly process. In addition, DaimlerChrysler noted that the steering columns on the vehicles were equipped with pins that lock the columns in place so that rotation was not possible prior to connection of the columns to the steering intermediate shaft during the assembly process.

Please state whether the subject components incorporate, or are subject to, the same assembly processes as the previously investigated clocksprings and vehicles. If so, explain whether and how, if at all, the subject components can become uncentered or wound and unwound during the assembly process in light of the locking tabs and locking pins. If not, please describe what, if any, components or processes were present or incorporated into the subject components and subject vehicles to prevent or minimize any unwinding or winding of the subject components during the assembly process. Please then explain whether and how, if at all, the subject components can become uncentered or wound and unwound during the assembly process in light of these measures.

- A15.** The clockspring components and the steering column components for the 1998.5-2000 NS Minivans have the identical installation procedure as the 1996-1998.5 NS Minivans. The installation procedure is outlined in EA01-007 Enclosures #14 & #15.

A clockspring may become uncentered or wound and unwound during the assembly process in light of the locking tabs and locking pins if the locking pin, located on the steering column, is inadvertently removed on the assembly line prior to the intermediate shaft connection to the steering column. This condition would allow the steering column, including the steering wheel and clockspring, to rotate freely until the connection to the intermediate shaft.

- Q16.** Describe how, if at all, the subject components in the subject vehicles are different from the driver's air bag clockspring assemblies provided in the MY 2001 versions of the subject vehicles.
- Q16.** The MY2001 RS clockspring is similar to the 1998.5-2000 NS clockspring in that both are spiral wound clocksprings with the internal circuit carrying tape welded to inserts at each end. Its construction, however, is made of totally new components. It is a 10 circuit device driven by a slot to pin arrangement with the steering wheel and is mechanically fastened down to its mounting on the steering column.

The following list gives a more detailed description of the differences between the MY2001 RS clockspring and the MY1998.5-2000 clockspring:

MY1998.5-2000 NS Clockspring:

- Seven circuit mylar tape used for carrying circuits (MY1998.5-2000)
- Driven by the hub of the steering wheel
- The clockspring is locked in position for shipping via spring loaded plungers that are depressed by the steering wheel when both are mounted to the steering column
- Mounted via a snap fit to the mounting housing of the steering column
- All lower circuit leads are terminals for direct connect of the I/Panel wiring harness
- All upper leads from the clockspring have wiring pigtailed welded to an upper clockspring insert (i.e. airbag, horn, radio, speed control)
- Terminal plating consisted of 3 micro-inches of gold on airbag circuit terminals.

MY2001 Clockspring:

- Ten circuit mylar taped used for carrying circuits
- Driven by engagement of a pin on the clockspring rotor to a slot in the steering wheel
- The clockspring is locked into position by a grenade pin that is removed once the clockspring and steering wheel are both mounted to the steering column
- Mechanically fastened to the mounting housing of the steering column
- All lower circuit leads are terminals for direct connect of the I/Panel wiring harness
- Interconnect used between airbag squib connectors and clockspring to allow for manufacturing of a family of clocksprings meeting specific wiring requirements for numerous vehicle lines
- Terminal plating increased to 15 micro-inches approximately April 2001

Q17. Explain the basis for, and identify any information that demonstrates or supports, DaimlerChrysler's assertion that the terminal resistance issue it noted on the 7-circuit clockspring built into the subject vehicles "could likely have a substantial influence on the [subject vehicles'] complaint rate."

A17. DCC's analysis of clockspring terminals indicates a reduced thickness of gold plating on the terminals. Gold plating with a thickness of below 15 micro-inches results in the diffusion of the base metal through the plating resulting in an increase in resistance. This increase in resistance could cause the airbag warning light to illuminate but will not obstruct the operation of the airbag system. DCC increased the terminal plating to 15 micro-inches approximately April 2001. This implementation date would correspond to MY2001 vehicles. Therefore, the subject vehicles with the airbag light on warning lamp illuminated may be the result of terminal plating, approximately 39% of customer complaints. Due to the lack of information, it is impossible to determine the root cause of the customer complaints. Details of the analysis of this condition were supplied to NHTSA with EA01-007 responses.

Q18. State whether DaimlerChrysler ever considered an alternative design(s) or component(s) or installation procedure for the subject components in the subject vehicles due to, or in any relation to, the alleged defect in the subject vehicles. If so, identify and describe each such alternative design or component or procedure, and state:

- a. The date it was first proposed;
- b. The disposition of that proposal (i.e., approved, disapproved, or still being evaluated); and
- c. The reasons for that disposition.

A18. DCC has not considered substituting an alternative design, component or installation procedure for the subject components in the subject vehicles.

Q19. Furnish DaimlerChrysler'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.

A19. DCC's analysis of customer complaints indicates the increase in the number of complaints correlates to the release of Recall B24 and the announcement of RQ04-001. The number of customer complaints increased 3.5 times after the release of Recall B24 and increased 5 times after the announcement of RQ04-

001. The data indicates customers learned about the recall and associated any condition in the vehicles airbag system or steering wheel with the clockspring. DCC's analysis of customer complaints indicates a large percentage of complaints can not be confirmed to be related to the subject component. In addition, as was previously submitted, a large percent of the complaints and parts sold could be due to increased resistance in the system caused by terminal corrosion. This corrosion can be sufficient to illuminate the warning lamp, but it will not impede driver airbag deployment in the event that it is necessary.

DCC has a warning lamp system, as mandated in FMVSS 208, incorporated in the entire airbag system to alert the driver that the airbag system needs immediate attention from a trained dealership technician.

At vehicle key-on, the airbag electronic control module (AECM) sends out a diagnostic pulse approximately every 100 milliseconds to test the airbag circuits for potential open or shorted conditions. If an open or short is detected, the airbag warning lamp is illuminated and a fault code flag is set in the module. If the fault is corrected, the airbag lamp is extinguished and normal operation resumes. Normal lamp operation is "on" for 6-8 seconds at key-on, then off. If an intermittent problem is encountered lamp illumination can be substantially longer. If the fault "matures" and the lamp remains illuminated, a fault code timer is activated and the AECM keeps track of the number of minutes the fault has existed with the key on. The airbag lamp "on" is notification to the customer that a problem exists in the system and requires diagnosis by a trained professional. Depending on the fault in the system, an airbag lamp "on" may mean that the system is non-functional from a deployment standpoint or that the system is unpredictable, or in some cases that it will still function as intended. The driver's behavior to disregard the warning and not have the airbag system inspected at a dealer is out of the control of DCC.

The clockspring utilized in the subject vehicles has a centered pre-determined length of conductive ribbon that allows the steering wheel to rotate an equal number of turns in either direction. If the clockspring is turned in the counterclockwise direction when the steering intermediate shaft is disconnected or with the steering wheel removed, a backwound condition will exist. This condition causes the conductive ribbon to fold over on itself and may cause fatigue in the conductive circuits. If the clockspring is turned in the clockwise direction when the intermediate shaft is disconnected or with the steering wheel removed, an overwound condition will exist. This condition results in the shortening of the conductive ribbon and will cause it to break. Either of these conditions could cause the conductive circuits located in the clockspring to

become an open circuit. When an open circuit condition is detected in the driver airbag circuit the cluster will illuminate the airbag warning light.

The NS electrical system has a low threshold for increased airbag circuit resistance. Vehicles with backround clocksprings provide significant warning to the vehicle operator if the clockspring does fatigue. As the clockspring fatigues, there will be a significant time period where the airbag warning light will be turning on and off abnormally, indicating that the circuit is suspect and requires inspection and service. During this time period of the airbag warning light turning on and off abnormally, there is no loss of airbag function if the operator responds to the warning light within a reasonable amount of time.

In the very limited number of single side deployments that have occurred, it is known that the vehicle's warning lamp was on for a significant amount of time without being serviced by a trained dealership technician. Only a small number of alleged injuries, all minor in nature, have been reported and cannot be attributed to the non-deployment of the driver airbag. Additionally, in no cases has the alleged condition occurred as a result of a crash. The facts show that most owners, while dissatisfied with the out of pocket cost, are actually having the repair completed in a timely manner while the airbag is still functional. Only in rare and isolated cases where an owner ignores the clear notice is there any risk to motor vehicle safety. In addition, this level of input is virtually zero. Considering that there are approximately 1.2 million of these vehicles on the road, and that they are from 5 to 7 years old, the lack of evidence of a safety problem from this condition is strong support for DCC's conclusion that there is no safety-related defect in the subject vehicles. If this condition were widespread, clearly a trend should have developed by this point in time.

As DCC has previously shared in detail with NHTSA, the seven-circuit clockspring is known to be prone to an issue involving increased terminal resistance, in which inadequate gold plating allowed brass substrate to oxidize, forming a barrier between the terminals. The barrier between the terminals could result in a condition that illuminates the "air bag warning" lamp and which would be diagnosed as "open circuit at the clockspring." Importantly, this condition is **completely benign** from a safety perspective—the airbag remains available to deploy in a crash if needed. There is absolutely no risk to motor vehicle safety from a "failure" involving increased terminal resistance. DCC believes that the vast majority of the field reports involving alleged failures of the clockspring are, in fact, benign failures of the terminal resistance. This condition strongly influences (and inflates) the number of clocksprings that will ultimately result in

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an open circuit, which is the subject of this inquiry, but it is not a safety-related condition.

As part of EA01-007, DCC conducted a comprehensive part return program. The program generated over 1900 1996-2000 MY returned clocksprings for analysis. Over 1000 of the returned clocksprings were of the seven-circuit clockspring vintage, which are the subject components of this investigation. 90% of the clocksprings analyzed were deemed "No Trouble Found", and had a fully functional airbag circuit. Removal of the clockspring from the vehicle will result in cleansing the terminals. Therefore, the increased terminal resistance condition would result in a "No Trouble Found" during component analysis. Less than 3% of the clocksprings were deemed "Backwound". DCC, therefore, concludes the vast majority of customer complaints were likely the result of increased terminal resistance and not a backwound condition.