QUANDT

EA99-013

QUANDT

EA99-013

DATE	SUBJECT	PAGE NUMBERS
03-14-00	MEMO TO FILE COPY OF NCAP TEST REPORT NHTSA TEST # MY0303 DATED 1/6/00	(161) (162-447)
3-17-00	MEMO TO FILE COPY OF SAFETY COMPLIANCE TEST FDR FMVSS NO. 214 "SIDE IMPACT PROTECTION" REPORT #	(448) (449-719)
03-08-00	Letter to DaimlerChrysler from ODI. Request for information.	(720-729)
03-08-00	Letter to Ford from ODI. Request for information	(730-736)
03-08-00	Letter to General Motors from ODI. Request for information	(737-743)
03-08-00	Letter to Honda from ODI. Request for information	(744-750)
03-08-00	Letter to Nissan from ODI. Request for information	(751-757)
03-08-00	Letter to Toyota form ODI. Request for information	(758-764)
03-08-00	Letter to Kautex/Textron from ODI. Request for information	(765-774)
03-08-00	Letter to Norma Products from ODI. Request for information	(775-785)
03-08-00	Letter to Solvay Automotive from ODI. Request for information	(786-796)
03-31-00	Letter to Ford from ODI. Request for more information ATTACHMENT	(797) (798-800)
03-31-00	Letter to Chrysler from ODI. Request for more information ATTACHMENT	(801-805) (806-812)

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DATE	SUBJECT	PAGE NUMBERS

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ODI Action Number: **EA99-013**

Date: **06-11-99**

Subject: **DAIMLERCHRYSLER CORPORATION**

1996 - 1999 DODGE CARAVAN AND GRAND CARAVAN, PLYMOUTH VOYAGER AND GRAND VOYAGER, AND CHRYSLER TOWN AND COUNTRY

ALLEGED POST-COLLISION FUEL SYSTEM INTEGRITY FAILURES

This file contains consumer letters received by the National Highway Traffic Safety Administration which complain of the alleged defect that is the subject of this Engineering Analysis. It also contains correspondence between this agency and the manufacturer on the subject. Portions of that correspondence may be withheld where the manufacturer has claimed that they are confidential pursuant to the Freedom of Information Act, 5 U.S.C. § 552(b)(4), which exempts from disclosure confidential commercial and financial information. Additional documents relating to this Engineering Analysis may exist, but have not been included in this public file.

If you have any information or concerns you would like to discuss with NHTSA staff, please call the

toll free AUTO SAFETY HOTLINE

800-424-9393

(in the Washington, DC metropolitan area, please call 202-366-0123)

Also, if you wish to discuss the investigation with NHTSA staff, the HOTLINE contact representative will have a technical staff member return your telephone call.

U.S. Department of Transportation

National Highway Traffic Safety Administration

ODI RESUME

INVESTIGATION: EA99- 013 DATE OPENED: 11 -Jun-99
SUBJECT: Post-Collision Fuel System Integrity
PROMPTED BY: PE99-010
PRINCIPAL ENGINEER: J. L. Quandt

MANUFACTURER: DaimlerChrysler Corporation
MODELS: NS-minivans (Dodge Caravan and Grand Caravan, Plymouth Voyager and Grand Voyager, and Chrysler Town and Country)
MODEL YEARS: 1996-99
VEHICLE POPULATION: 2,074,393 produced through April 3, 1999

PROBLEM DESCRIPTION: The filler tube assembly may be damaged or separate from the tank in certain crash modes.

FAILURE REPORT SUMMARY

	ODI	MANUFACTURER	TOTAL
COMPLAINTS:	0	0	0
FIRES:	0	0	0
INJ INCID:	0	0	0
FAT INCID:	0	0	0
OTHER:	2	0	2

DESCRIPTION OF OTHER: FMVSS 214/SINCAP left-side impact tests resulting in filler neck assembly leakage.

ACTION: An Engineering Analysis has been opened.

ENGINEER: ~~DIV CHF~~ DIV CHF: OFC DIR:

6/9/99 6/11/99 6/11/99
DATE DATE DATE

SUMMARY: On January 5, 1999, a 1999 Dodge Caravan 3-door minivan was crash tested at the MGA Proving Ground in Burlington, Wisconsin to assess compliance with Federal Motor Vehicle Safety Standard No. 214, Side Impact Protection, NHTSA No. CX0305 (Figure 1). During the crash test the fuel filler assembly hose separated from the fuel tank fill nipple allowing approximately 11 gallons of test fuel to spill from the tank assembly (Figure 2). The tank, which has a nominal capacity of 20 gallons, had been filled with 18.43 gallons of Stoddard solvent for the test.

Prior to the FMVSS 214 crash test, two long wheelbase NS-minivans (1999 Dodge Grand Caravan 4-door minivans) had been crash tested at MGA in NHTSA's Side Impact New Car Assessment Program

6/11/99

continued

SUMMARY: (SINCAP). The first test, conducted on November 30, 1998 (MX0301), did not acquire the required dummy injury data and another test was scheduled. The second test was conducted on December 18, 1998 (MX0307), and resulted in trace leakage from an unidentified source in the vicinity of the fuel filler assembly. Subsequent inspection of filler assembly components identified the source of the leak as a small split in a plastic segment of the filler vent tube sandwiched between the steel filler tube and the left frame rail.

NHTSA SINCAP tests are conducted with the same 3,000 pound Moving Deformable Barrier and crash configuration as required by the dynamic portion of FMVSS 214. The FMVSS 214 dynamic impact test is conducted in a 27 degree "crabbed" configuration with a barrier impact speed of 33.5 mph. The test is meant to represent a side impact collision in which the striking vehicle is traveling 30 mph and the struck vehicle 15 mph. The SINCAP test is conducted with the same "crabbed" configuration and a barrier impact speed of 38.5 mph, representative of a collision in which the striking vehicle is traveling 34 mph and the target vehicle 17 mph.

The purpose of FMVSS 214 is to specify performance requirements for the protection of occupants in side impact crashes. All passenger cars built on or after September 1, 1993 (model year 1994) and all multi-purpose passenger vehicles, light trucks, and vans built on or after September 1, 1998 (model year 1999) are required to meet the side impact occupant protection requirements of FMVSS 214. Since September 1993, NHTSA has conducted 116 FMVSS 214 dynamic side impact tests with the first and only fuel leakage incident occurring in the test that prompted this investigation. Since September 1996, NHTSA has conducted 77 SINCAP tests with only two fuel leakage incidents, a fuel tank puncture in a 1999 Chevrolet S-10 pickup truck (PE99-009) and the previously cited 1999 Dodge Grand Caravan (MX0307).

Although NHTSA has considered the FMVSS 214 dynamic test as a possible replacement for the lateral impact portion of FMVSS 301, Fuel System Integrity, there currently is no fuel system performance requirements associated with FMVSS 214[1]. There are no performance requirements of any kind associated with the SINCAP tests, which are conducted each model year to provide consumers with new vehicle side impact crash performance information.

The subject filler neck assembly is routed from the filler door through the forward portion of the left-rear wheelhouse. A plastic liner covers the assembly in the wheelhouse. The assembly extends forward from the bottom of the wheelhouse, through a space between the inner sill wall and the left rail structural member, to the fuel fill and vent fittings of the fuel storage tank (Figure 3). The tank is mounted inboard the left rail structural member forward of the rear axle.

The filler neck assembly consists of the fuel filler tube and the fuel tank vent tube. A five inch long hose connects the steel filler tube to a 40 mm (1.6 inch) ID high-density polyethylene

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[1] Chrysler has submitted comments to NHTSA in favor of replacing the current FMVSS 301 lateral test with the FMVSS 214 dynamic impact test on at least two occasions. Most recently, in a June 19, 1995 letter responding to an Advanced Notice of Proposed Rulemaking published by NHTSA in the April 12, 1995 Federal Register, Chrysler submitted the following comments in favor of using the FMVSS 214 dynamic impact test to assess fuel system integrity in lateral impacts:

> **Based on testing experience with both standards and comparison of the test conditions and impact energies of both tests, Chrysler agrees that the FMVSS 214 test is more directly related to motor vehicle safety and more practicable.**

(HDPE) spud on the side of the tank. The hose is secured to the filler tube and tank spud by standard worm drive type hose clamps.

ODI's analysis of the filler hose separation incident finds that the crash resulted in substantial collapse/buckling of the sill. Sill buckling resulted in collapse of the front wheelhouse structure and some torsional deformation of the rail member. Wheelhouse collapse forced the filler neck assembly into the rail member (Figure 4) and pushed the park brake cable tight against the lower section of the filler tube (Figure 5). Some downward displacement of the tank spud was also evident, apparently resulting from rail deformation. The relative displacement of the filler tube and tank spud produced a tensile load in the connecting hose (i.e., stretched the hose) which was great enough to cause the hose to slide up the tank spud and off the bead (Figure 7).

Factors believed to contribute to the risk of hose separation are: (1) the packaging/routing of the filler neck assembly near body components which experienced substantial crush deformation in the crash; (2) the relatively short length of the filler hose (approximately 3¼ inches from clamp to clamp) resulting in greater joint loads per unit displacement between the spud and filler tube; and (3) several aspects of the tank spud hose joint design and manufacture which reduce its ability to resist hose pull-off forces, including low spud modulus, spud bead design, and the use of lubricants as assembly aids.

ODI's analysis of the two SINCAP test vehicles found evidence of similar filler tube loading and movement, rail deformation, hose stretch, and hose slippage on the tank spud. ODI's analysis of peer vehicle (Ford Windstar, Chevrolet Venture, and Toyota Sienna) performance in FMVSS 214 and SINCAP dynamic left-side impact tests found no similar evidence of fuel filler tube loading, hose stretch, or hose slippage.

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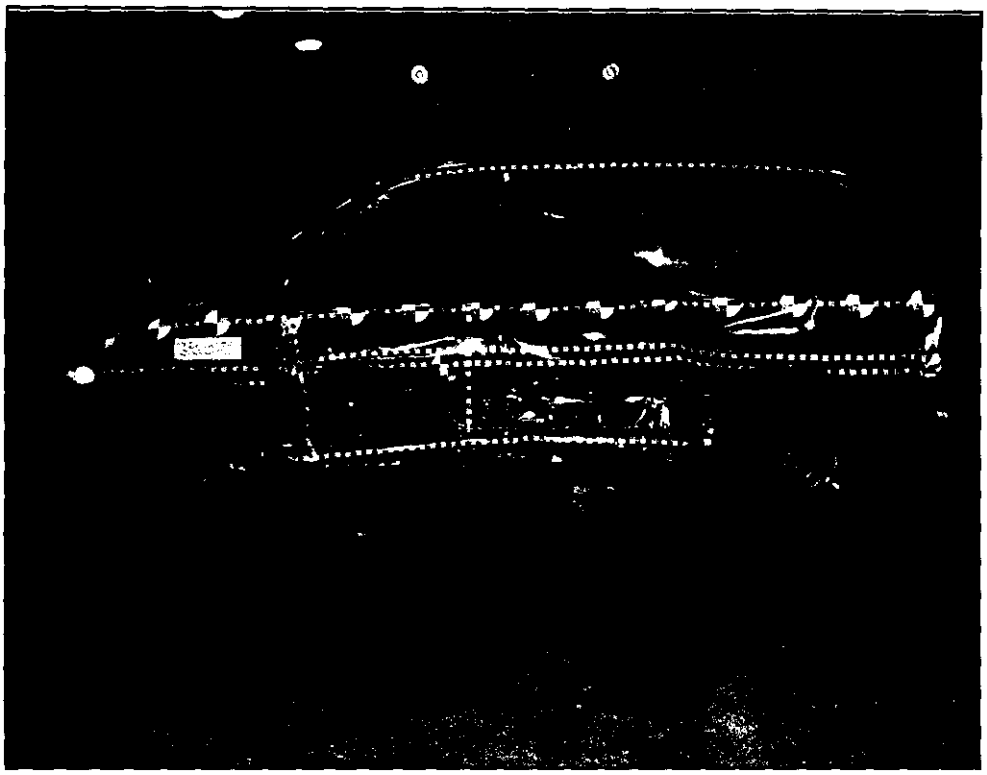

Figure 1 - Post-Test Body Crush (CX0305).

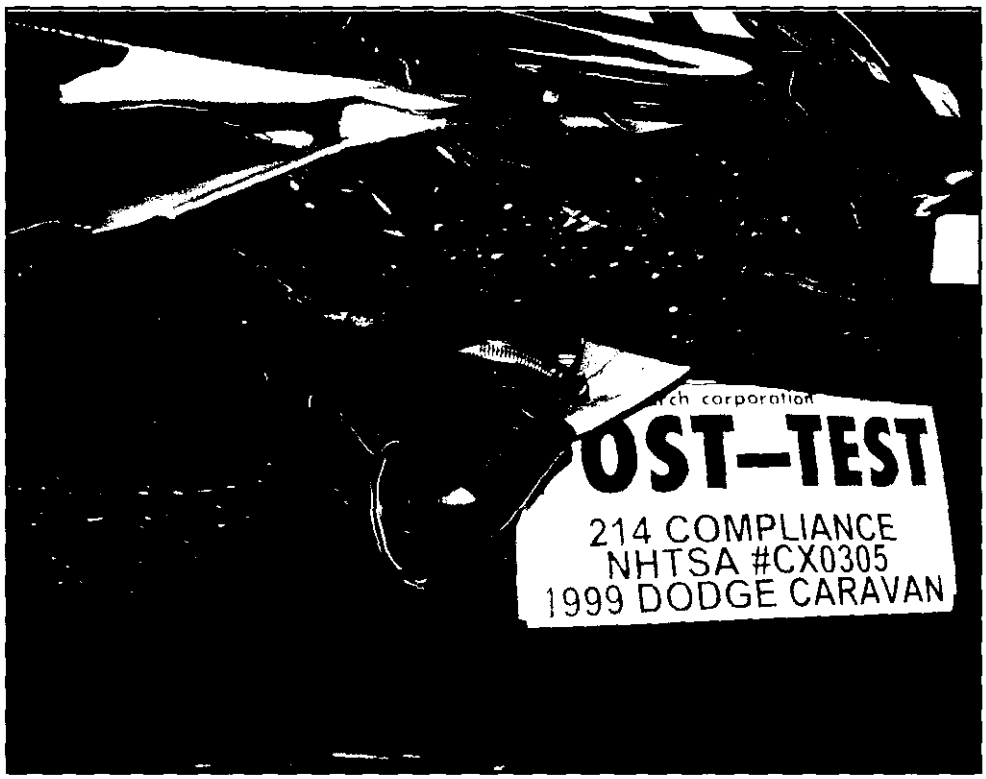

Figure 2 - Post-Test Filler Hose Separation (CX0305).

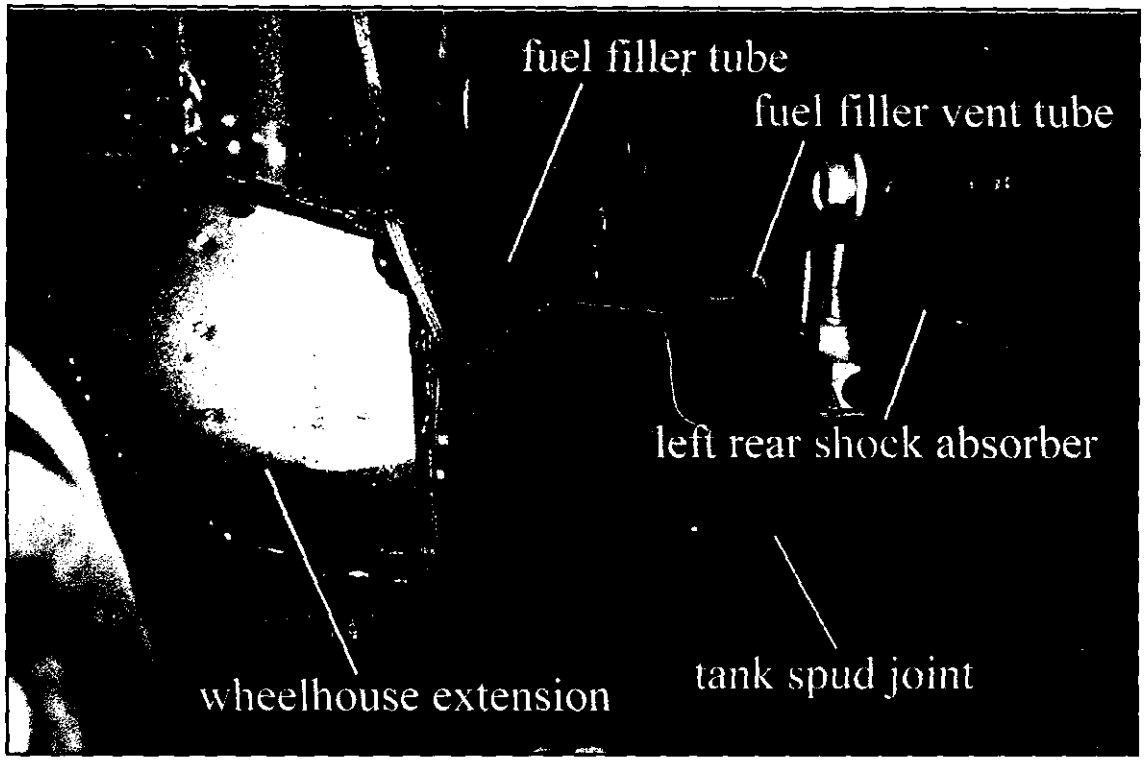

Figure 3 - Filler Neck Assembly Packaging/Routing (Exemplar Vehicle).

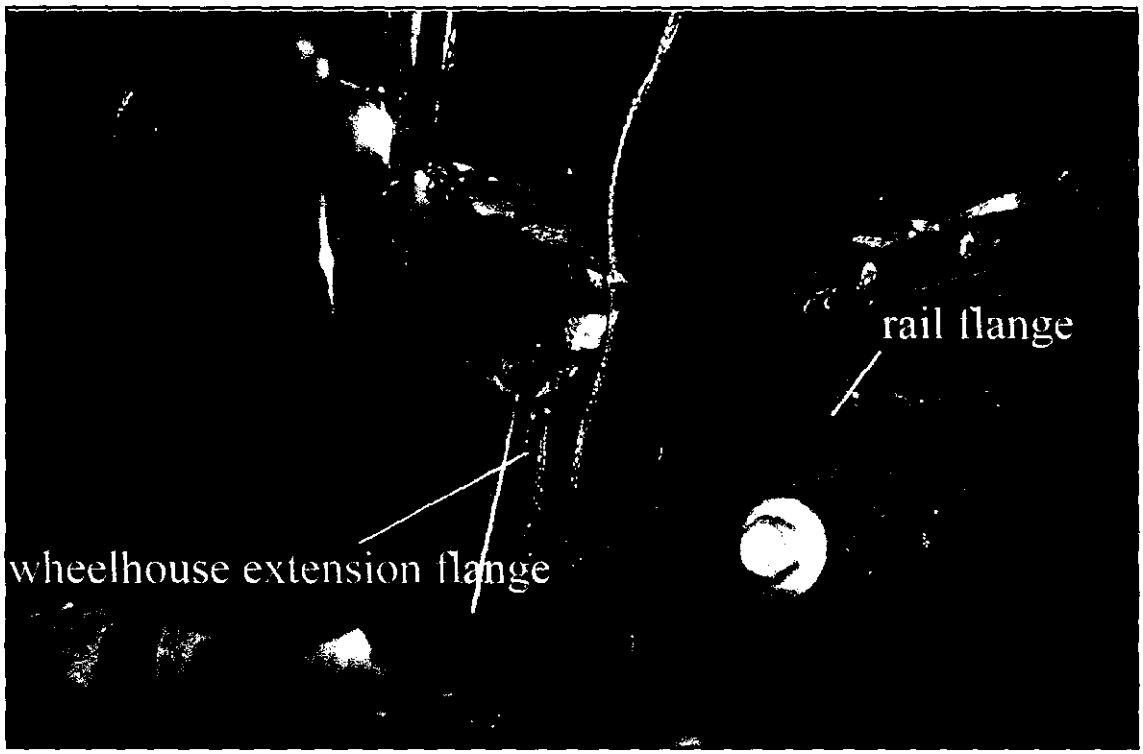

Figure 4 - Filler Tube Loading from Wheelhouse Extension (CX0305).

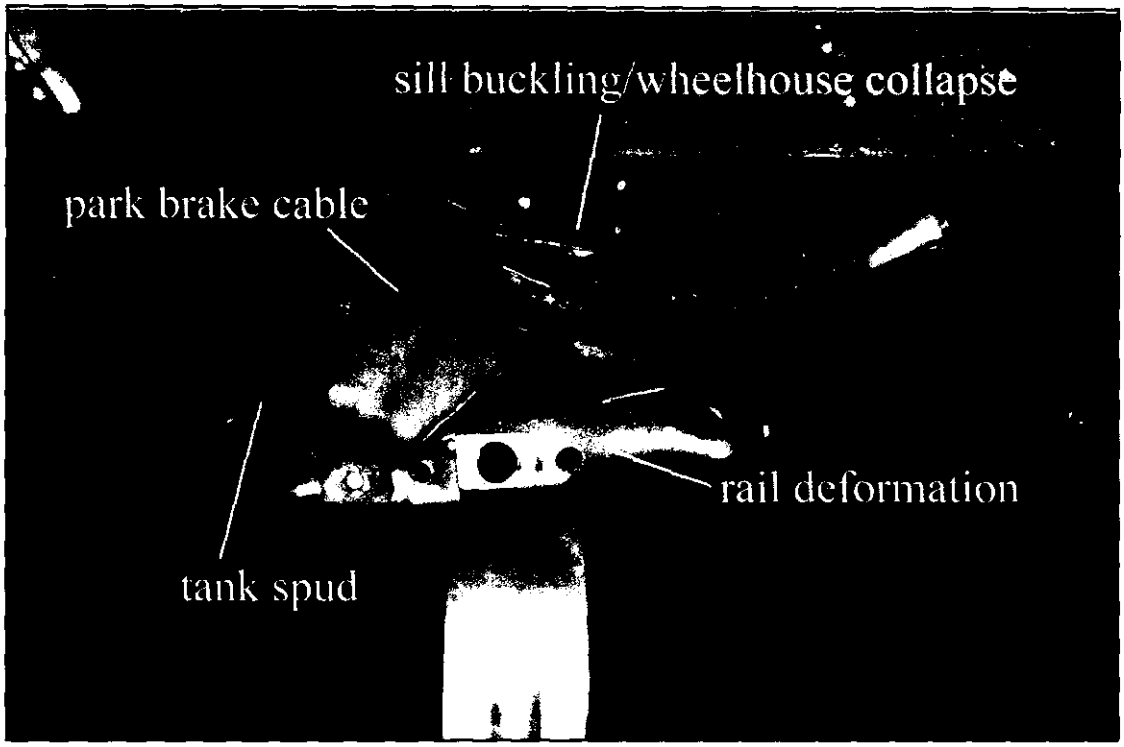

Figure 5 - Filler Tube Loading from Sill/Wheelhouse Collapse and Park Brake Cable (CX0305) - Bottom View, Filler Tube Hidden from View.

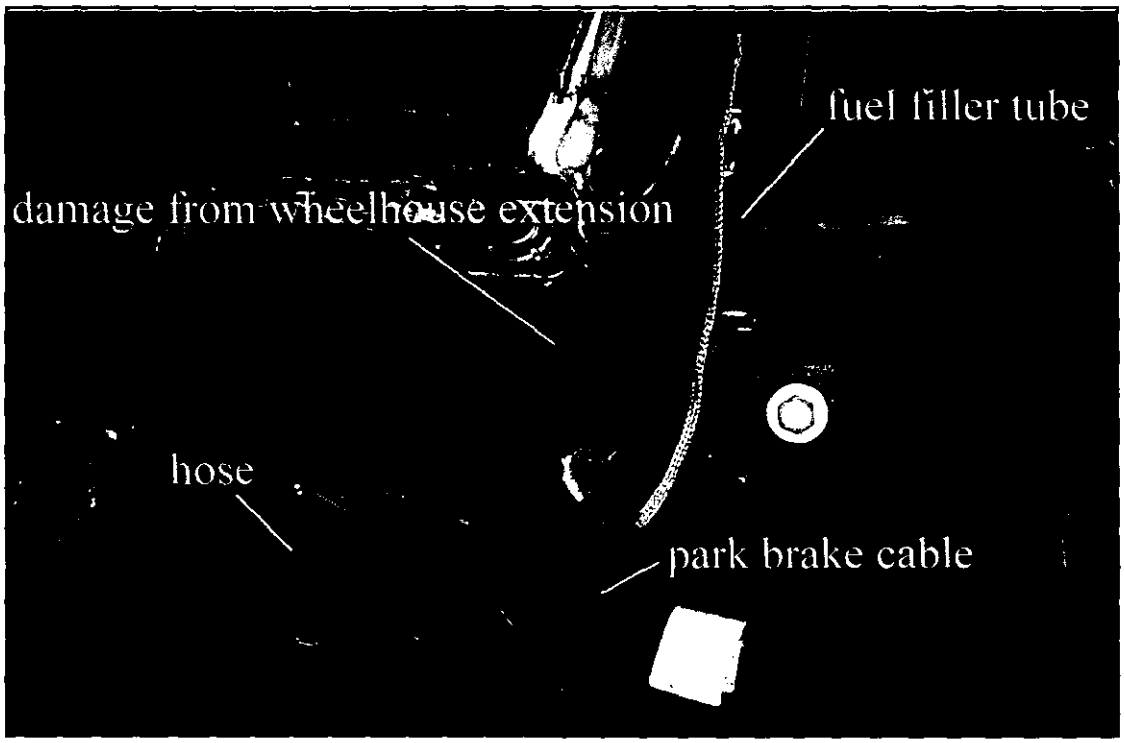

Figure 6 - Filler Neck Assembly Position/Damage (CX0305) - Side View, Body Sheet Metal Removed.

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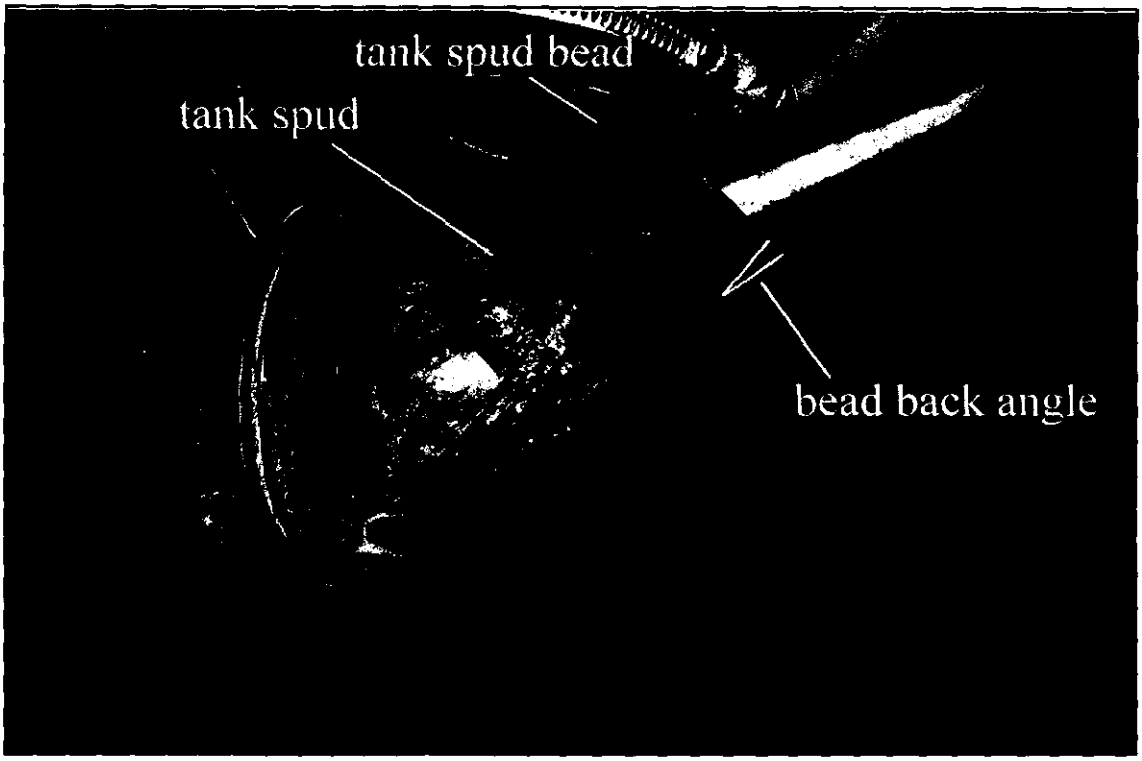

Figure 7 - Fuel Tank Spud (CX0305).

Figure 8 - Tank Spud Deformation - Axial View (CX0305).

OCT 2 3

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Susan M. Cischke, Vice President
Vehicle Certification, Compliance and Safety Affairs
DaimlerChrysler Corporation - CIMS 482-00-91
800 Chrysler Drive
Auburn Hills, MI 48326-2757

NSA-122jlq
EA99-013

Dear Ms Cischke:

This letter is to advise you that the Office of Defects Investigation (ODI) of the National Highway Traffic Safety Administration (NHTSA) has upgraded its investigation (PE99-010) of the potential for the fuel filler neck hose of 1996 through 1999 DaimlerChrysler NS-minivan vehicles to separate from the fuel tank in certain side impact collision modes, and to request certain information.

Unless otherwise stated in the text, the following definitions apply to this information request:

- **Subject vehicles**: all 1996 through current model year DaimlerChrysler NS-minivans.
- **Subject fuel tank assembly**: shall refer to all fuel storage tanks used in subject vehicles.
- **Subject filler neck assembly**: shall refer to the fuel fill and vent tubing and all associated fittings, hose joints (including the subject hose joint), and body attachments for all fuel filler neck assemblies used in the subject vehicles.
- **Subject hose joint**: shall refer to the clamped joint connecting the filler neck hose to the fuel tank spud in the subject filler neck assembly, including the hose, the clamp, the tank spud, and any lubricating agents used to aid in the assembly process.
- **Pull-off force**: shall refer to any twisting, bending, side, or axial force which results in separation of the subject hose joint (i.e., causes any portion of the hose clamp to be pulled over the maximum radius of the tank spud bead).

- **DaimlerChrysler**: DaimlerChrysler Corporation, its predecessors including Chrysler Corporation, all of their past and present officers and employees, whether assigned to their principal offices or any of their field or other locations, including all of their divisions, subsidiaries (whether or not incorporated) and affiliated enterprises and all of their headquarters, regional, zone and other offices and their employees, and all agents, contractors, consultants, attorneys and law firms and other persons engaged directly or indirectly (e.g., employee of a consultant) by or under the control of DaimlerChrysler (including all corporations, business units, and persons previously referred to), who are or, in or after 1990, were involved in any way with any of the following related to the alleged defect in the subject vehicles:

  a. design, engineering, analysis, modification or production (e.g. quality control);
  b. testing, assessment or evaluation;
  c. consideration, or recognition of potential or actual defects, reporting, record-keeping and information management, (e.g., complaints, field reports, warranty information, part sales), analysis, claims, or lawsuits; or
  d. communication to, from or intended for zone representatives, fleets, dealers, or other field locations, including but not limited to people who have the capacity to obtain information from dealers.

- **Alleged defect**: shall refer to collision-induced fuel filler neck assembly failure, leakage, or fire.

- **Documents**: "Document(s)" is used in the broadest sense of the word and shall mean all original written, printed, typed, recorded, or graphic matter whatsoever, however produced or reproduced, of every kind, nature, and description, and all nonidentical copies of both sides thereof, including, but not limited to, papers, letters, memoranda, correspondence, communications, electronic mail (e-mail) messages (existing in hard copy and/or in electronic storage), faxes, mailgrams, telegrams, cables, telex messages, notes, annotations, working papers, drafts, minutes, records, audio and video recordings, data, databases, other information bases, summaries, charts, tables, graphics, other visual displays, photographs, statements, interviews, opinions, reports, newspaper articles, studies, analyses, evaluations, interpretations, contracts, agreements, jottings, agendas, bulletins, notices, announcements, instructions, blueprints, drawings, as-builts, changes, manuals, publications, work schedules, journals, statistical data, desk, portable and computer calendars, appointment books, diaries, travel reports, lists, tabulations, computer printouts, data processing program libraries, data processing inputs and outputs, microfilms, microfiches, statements for services, resolutions, financial statements, governmental records, business records, personnel records, work orders, pleadings, discovery in any form, affidavits, motions, responses to discovery, all transcripts, administrative filings and all mechanical, magnetic, photographic and electronic records or recordings of any kind, including any storage media associated with computers, including, but not limited to, information on hard drives, floppy disks, backup tapes, and zip drives,

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electronic communications, including but not limited to, the Internet and shall include any drafts or revisions pertaining to any of the foregoing, all other things similar to any of the foregoing, however denominated by DaimlerChrysler, any other data compilations from which information can be obtained, translated if necessary, into a usable form and any other documents. For purposes of this request, any document which contains any note, comment, addition, deletion, insertion, annotation, or otherwise comprises a nonidentical copy of another document shall be treated as a separate document subject to production. In all cases where original and any non-identical copies are not available, "document(s)" also means any identical copies of the original and all non-identical copies thereof. Any document, record, graph, chart, film or photograph originally produced in color must be provided in color. Furnish all documents whether verified by the manufacturer or not. If a document is not in the English language, provide both the original document and an English translation of the document.

In order for my staff to evaluate the alleged defect, certain information is required. Pursuant to 49 U.S.C. § 30166, please provide numbered responses to the following information requests. Please repeat the applicable request verbatim above each response. After DaimlerChrysler's response to each request, identify the source of the information and indicate the last date the source updated the information prior to the preparation of the response. Insofar as DaimlerChrysler has previously provided a document to ODI, DaimlerChrysler may either produce it again, or identify the document, the document submission to ODI in which it was included and the precise location in that submission where the document is located. When documents are produced, the documents shall be produced in an identified, organized manner that corresponds with the Information Request letter (including the subparts). When documents are produced and the documents would not, standing alone, be self-explanatory, the production of documents shall be supplemented and accompanied by explanation.

If DaimlerChrysler cannot respond to any specific request or subpart thereof, please state the reason why it is unable to do so. If DaimlerChrysler claims that any document or other information or material responsive to any of the following items need not be provided to NHTSA because it is privileged or the work product of an attorney, separately by information request number, for each such document or other information or material, state the nature of that information or material and identify any document in which it is found by date, subject or title, name and position of the person from, and the person to whom it was sent, and the name and position of any other recipient. DaimlerChrysler must also describe the basis for the claim, and explain why DaimlerChrysler believes it applies.

1. State the number of subject vehicles DaimlerChrysler has sold in the United States by model, wheel base, door option, and model year.

2. State the number and provide copies of all of the following, from all sources, of which DaimlerChrysler is aware and which allege incidents of collision-induced fuel leakage or fire in the subject vehicles.

a. owner/fleet complaints;
b. field reports;
c. fire incident claims;
d. subrogation claims;
e. lawsuits; and
f. third-party arbitration proceedings (where DaimlerChrysler is a party to the arbitration).

Please list and collate your responses for each category ("a" through "f") by model year and date of claim. Please provide for each item in this response the incident date, mileage of vehicle at time of incident (if known), vehicle date of build, disposition of matter, and, where a fleet vehicle is involved, the name of the fleet, and the name and telephone number of a contact person at that fleet. For items "a" through "d," please provide all related information and reports whether or not DaimlerChrysler has verified each one. For items "e" and "f," summaries are acceptable. Please identify in the summary the caption, court, docket number, and filing date of each lawsuit if a copy of the Complaint initiating the lawsuit is not provided.

3. State the number and provide copies of all of the following, from all sources, of which DaimlerChrysler is aware and which allege incidents of non-collision related leakage from the subject hose joint in the subject vehicles.

a. owner/fleet complaints; and
b. field reports.

Please list and collate your responses for each category by model year and date of report. Please provide for each item in this response the incident date, mileage of vehicle at time of incident (if known), vehicle date of build, disposition of matter, and, where a fleet vehicle is involved, the name of the fleet, and the name and telephone number of a contact person at that fleet. Please provide all related information and reports whether or not DaimlerChrysler has verified each one.

4. State the number of all warranty claims, including extended warranty claims, and requests for "good will," field, or zone adjustments received by DaimlerChrysler to date that relate to the subject hose joint, by labor operation number and problem code. This should include all claims coded to the fuel filler neck or fuel tank assemblies which indicate complaints of leakage from, or repairs to, the subject hose joint. Include in your response the warranty terms for the subject fuel filler neck and fuel tank assemblies and copies of all pages from DaimlerChrysler's Warranty Manuals pertaining to the subject hose joint (this should include all pages for the fuel tank and filler neck assemblies).

Provide the following information on a computer diskette in a spreadsheet format (e.g., Microsoft Excel spreadsheet software), and identify the format used:

a. claim number;
b. labor operation number;
c. failure code;
d. vehicle identification number;
e. customer name,
f. customer address and telephone number;
g. dealer name and address;
h. MDH code;
i. vehicle build date;
j. vehicle service start date;
k. date of warranty repairs;
l. vehicle mileage;
m. the repair cost;
n. the customer concern/complaint; and
o. dealer/technician comments.

Include in your response the warranty terms for the subject filler neck assembly and copies of all pages relating to the subject components (fuel tank assembly, filler neck assembly, and tank spud hose joint) from each of the applicable DaimlerChrysler Warranty manuals.

5. State the number of the following components or assemblies that have been sold annually to date by component name, part number (both service and engineering), and supplier (name and address). State all applications for each of the components by platform group (platform code and description), model year, application, and approximate total number of all vehicles for which they were intended.

a. filler neck assembly;
b. filler neck assembly hose; and
c. filler neck assembly hose clamp.

6. Identify and describe all modifications or changes in the design, manufacture, or packaging of the fuel tank or filler neck assembly used in the subject vehicles, from pre-production development to date that may relate in any way to the alleged defect. The following information must be included for each such modification or change:

a. the date, or approximate date on which the modification or change was incorporated into production;
b. a description of the modification or change;
c. the scope of the modification or change (i.e., state which of the subject vehicles were affected by the change);

d. the reasons for the modification or change; and
e. the part numbers of the original and modified parts.

7. Identify and provide copies of all documents related to any study, survey, or investigation pertaining to the alleged defect that are known to DaimlerChrysler. Include in your response all notes, measurements, calculations, reports, photographs (color copies), or other documents related to DaimlerChrysler's analysis of issues pertaining to the alleged defect. State clearly the source of each document. Include all pertinent documents, regardless of whether they are in interim, draft, or final form.

8. Furnish copies of all documents relating to communications between DaimlerChrysler and each supplier of components used in the subject filler neck assembly pertaining to the design, manufacture, performance, durability, quality, testing, or modification of the subject filler neck assembly and/or any of its component parts. If any communications on this subject were oral, provide a written transcript or summary of each such communication, and include a statement that identifies the participants and the date of the communication. Include in your response all documents from each such supplier that are in DaimlerChrysler's files. Furnish this information in a separate enclosure for each supplier.

9. Furnish copies of all DaimlerChrysler documents relating to internal communications which pertain to the design, manufacture, packaging, performance, durability, quality, testing, or modification of the subject filler neck assembly, including all electronic mail messages, memoranda, presentations, test data, photographs (color copies), videotapes, reports, meeting minutes, or notes.

10. Furnish copies of all documents relating to communications between DaimlerChrysler and any and all other entities not covered by Items 8 and 9 and pertaining to the design, manufacture, packaging, performance, durability, quality, testing, or modification of the subject filler neck assembly. If any communications on this subject were oral, provide a written transcript or summary of each such communication, and include a statement that identifies the participants and the date of the communication. Include in your response all documents from each such contact that are in DaimlerChrysler's files. Furnish this information in a separate enclosure for each contact.

11. DaimlerChrysler has indicated that at least some of the subject hose joints are assembled with the aid of power steering fluid or transmission oil. After first suggesting that the practice was inappropriate and discontinued, DaimlerChrysler has subsequently informed NHTSA that the use of lubricants was and is authorized by established procedures and is still part of the assembly process for the subject hose joints. NHTSA's review of information submitted by DaimlerChrysler in response to PE99-010 reveals no such authorization.

Furnish the following information regarding DaimlerChrysler's use of lubricants in the assembly of the subject hose joints:

a. Provide copies of all documents which relate to the use of lubricants in the assembly of fuel tank hose joints in all DaimlerChrysler vehicles. Identify the specific controlling documents applicable to the assembly of the subject hose joints, and cite all sections authorizing each of the lubricating agents used by DaimlerChrysler in the assembly of the subject hose joints;
b. Explain any conflicts between DaimlerChrysler Engineering Process Standard PS-8952, "Leak Check and Assembly of Fuel Tanks," and documents furnished in response to item "a" relative to the use of lubricants as assembly aids for fuel tank assembly hose joints;
c. Describe the development of DaimlerChrysler Engineering Process Standard PS-8952, "Leak Check and Assembly of Fuel Tanks," including the reasons and bases for Sections 2.2.4.3 and 2.2.4.4, and identify who is responsible for the standard;
d. Describe in detail the processes used to assemble the subject tank, filler neck, and hose joints at each of the assembly plants which produce subject vehicles, from Job#1 to date, including all types of lubricants that have been used by each plant, all methods used for applying each lubricant to the hose and/or spud at each plant, and all methods used to control the amount of lubricant applied to the hose and/or spud at each plant for each method of application;
e. Describe in detail the processes used to assemble the subject hose joints in each of the crash test vehicles identified in Enclosure 4 of DaimlerChrysler's April 9, 1999, letter responding to PE99-010. Include in your description an identification of who assembled the fuel tank and filler neck assembly components (e.g., assembly plant, engineering, etc.), the location where the components were assembled, and how the components were assembled, including an identification of any lubricant used to aid in the assembly of the subject hose joint;
f. Provide DaimlerChrysler's assessment of the influence of each lubricant used in the assembly of the subject hose joint on the pull-off forces for the joint as assembled;

g. Provide DaimlerChrysler's assessment of the reasons for the variance in pull-off forces recorded in testing of lubricated joints that were subjected to temperature aging cycles, as shown in Enclosure 7 of DaimlerChrysler's response to PE99-010 (i.e., the difference between the lowest and highest pull-off forces recorded in Report No. 201-99);
h. State whether DaimlerChrysler is aware of more appropriate fluids to aid in assembly of the subject hose joints (e.g., water or water-based wetting agents) and describe the advantages of each such fluid over those used in the assembly of the subject joints; Include in your response a description of the composition of wetting agent MS-3881;
i. State whether DaimlerChrysler has ever considered the safety implications of the use of lubricants in the assembly of the subject hose joint and provide copies of all related documents; and
j. Provide copies of any other documents related to the use and effects of lubricants in the assembly of the subject hose joint that were not provided in response to items "a" through "i."

12. NHTSA calculates the back angle of the tank spud bead in the subject hose joints to be less than 15 degrees, based on measurements of two sample spuds provided by DaimlerChrysler. Furnish the following information regarding the design of the tank spud bead in the subject vehicles:

a. Explain the design basis for DaimlerChrysler's bead back angle design on the subject tank spud and provide copies of all documents referenced in the design process which authorize, recommend, or depict appropriate bead back angles;
b. State whether the subject hose joint bead design geometry is unique to the subject fuel tank spud. If not, provide copies of any and all documents depicting or describing tank spud bead designs of similar geometry in any other tank designs by DaimlerChrysler or any other manufacturer;
c. Provide DaimlerChrysler's assessment of the influence of the spud bead back angle on the subject hose joint pull-off forces;
d. State whether DaimlerChrysler has ever considered the safety implications of the design of the tank spud bead back angle, either during the design of the spud or at any time since; and
e. Provide copies of any and all additional documents that are related in any manner to items "a" through "d," or to any other aspect of the bead design of the subject tank spud.

13. Furnish the following information regarding the construction and structural properties of the tank spud in the subject vehicles:

a. State whether DaimlerChrysler has ever considered reinforcing the tank spud with metal, or by any other means. Describe all reinforcement options considered by, or for, DaimlerChrysler and state the reasons each option was considered and the reasons for rejection, as applicable;

b. Describe all structural properties that were considered by DaimlerChrysler in the design of the tank spud. Identify all structural property specifications for the subject hose joint (e.g., spud wall thickness, spud flexural modulus, etc.) and state the reasons for each;
c. Provide DaimlerChrysler's assessment of the influence of the spud structural properties (e.g., reinforcement, or lack thereof, and wall thickness) on the subject hose joint pull-off forces;
d. Provide DaimlerChrysler's assessment of the factors responsible for the disparity in pull-off performance between the subject hose joint and the metal filler tube end hose joint in the test data furnished in Enclosure 7 of DaimlerChrysler's April 9, 1999 response to PE99-010 (Test Report No. 200-99);
e. Describe the location where the metal filler tube end hose joint is assembled (i.e., state whether the filler tube end joint is assembled at the vehicle assembly plant or by the filler neck assembly supplier) and describe any and all lubricants used in the assembly of the metal filler tube end joint;
f. State whether DaimlerChrysler has ever considered the safety implications of the spud structural properties, either during the design of the spud or at any time since; and
g. Provide copies of all documents that are related in any manner to items "a" through "f," or to any other aspect of the tank spud structural properties.

14. Provide the following information regarding the design tolerances of the hose and tank spud used in the subject hose joint:

a. State the engineering bases for the design tolerances established by DaimlerChrysler for the hose inner diameter and tank spud;
b. State whether the design tolerances for the hose and spud allow for a clearance fit condition to exist between the hose and spud (i.e., can the hose inner-diameter dimension be greater than the outer-diameter of the spud land/shank);
c. Provide DaimlerChrysler's assessment of the influence of a clearance fit condition on the sealing performance and pull-off forces for the subject hose joint;
d. State whether DaimlerChrysler has ever considered the safety implications of a tolerance stack-up condition which results in a clearance fit condition for the subject hose joints, either during the design of the joint or at any time since;
e. State whether DaimlerChrysler ever consulted with any hose or hose clamp suppliers concerning appropriate ranges of interference fit or any other aspect of clamped hose joint design and provide copies of all relevant materials and descriptions of all oral discussions regarding such subjects by date and names of participants; and
f. Provide copies of all documents that are related in any manner to items "a" through "e," or to any other aspect of the subject hose joint dimensional tolerances.

15. Furnish the following information regarding the packaging/routing of the fuel filler neck assembly in the subject vehicles:

    a. Provide DaimlerChrysler's assessment of the propensity for sill buckling to occur in the subject vehicles in FMVSS 214 type side impact collisions;
    b. Provide DaimlerChrysler's assessment of the influence of sill buckling on the deformation of the left-rear wheelhouse structure in FMVSS 214 type side impact collisions;
    c. Identify and describe all modifications or changes made by DaimlerChrysler in the pre-production vehicle design process that were specifically intended to improve the performance of the subject vehicles in FMVSS 214 dynamic side impact testing. For each such change, state the date of the change, the reasons for the change, the effect on the test results, whether the effect on fuel system integrity was considered during the change process, and provide copies of all relevant documents;
    d. Provide DaimlerChrysler's assessment of the potential for the inner sill wall, wheelhouse structure, or other body components to contact the fuel filler neck assembly in FMVSS 214 type left-side impact collisions. Provide the same assessment for FMVSS 301 type side impacts;
    e. State whether DaimlerChrysler has ever reviewed, or considered the safety implications of, the packaging of the fuel filler neck assembly in the subject vehicles; and
    f. Provide copies of all documents that are related in any manner to items "a" through "e," or to any other aspect of the packaging of the subject filler neck assembly.

16. Furnish the following information concerning Mercedes Benz engineering standards, design specifications, and spud designs for plastic tank filler hose connections used in motor vehicles produced for sale in the United States:

    a. Provide copies of all Mercedes Benz engineering standards, specifications, design guides, or equivalent material that relate in any way to the crash performance of fuel tank and fuel filler neck assemblies, including any and all performance requirements or specifications regarding filler neck assembly separation forces;
    b. Furnish a table listing all plastic fuel tanks used by Mercedes Benz since September 1993, by tank capacity, tank supplier, tank material, tank part number, and vehicle model and model year in which used;
    c. For each fuel tank identified in Item "b" which has a plastic tank spud, furnish a drawing or sketch of the bead design and state the bead back angle dimension and tolerance range;
    d. For each fuel tank identified in Item "c," furnish a table showing the following information: (1) whether the spud incorporates any type of metal reinforcement, such as a sleeve or ferrule; (2) the dimensional tolerances of the spud wall thickness; (3) the dimensional tolerances of the spud land diameter; (4) the dimension tolerances of the hose clamped to the tank spud; (5) the dimensional tolerances of the spud bead; and (6) all lubricants used in the assembly of the spud hose joint; and
    e. State what lubricants are permitted by Mercedes Benz in the assembly of clamped fuel tank assembly hose joints and provide copies of all relevant documents.

17. Provide tables listing the same information requested in Items 16.b through 16.d for all DaimlerChrysler plastic fuel tanks used since September 1993 other than the subject vehicles.

18. Provide the following information regarding DaimlerChrysler's lack of a pull-off force standard for the subject hose joint:

    a. Explain why DaimlerChrysler does not have a pull-off force standard for the subject hose joint; and
    b. State whether DaimlerChrysler has specified pull-off force requirements for any other passenger vehicles produced from January 1, 1990, to present and, if so, state the specifications by platform, model years, fuel tank size, and pull-off requirement.

19. Furnish the following information regarding DaimlerChrysler's participation on the SAE Fuel Containment Standards Committee which published the SAE Information Report "Passenger Car and Light Truck Fuel Containment," SAE J1664 (copy enclosed), in January 1994:

    a. Identify by name and title each of DaimlerChrysler's representatives on the SAE Fuel Containment Standards Committee;
    b. State how each of DaimlerChrysler's representatives voted in the balloting for the final SAE J1664 Information Report; and
    c. Explain the reasons for any votes by DaimlerChrysler representatives opposing the final SAE J1664 Information Report and identify who made the decision for any such votes.

20. Furnish ten samples of the fuel tank spud used in the subject hose joint.

This letter is being sent to DaimlerChrysler pursuant to 49 U.S.C. § 30166, which authorizes NHTSA to conduct any investigation that may be necessary to enforce Chapter 301 of Title 49. DaimlerChrysler's failure to respond promptly and fully to this letter could subject DaimlerChrysler to civil penalties pursuant to 49 U.S.C. § 30165 or lead to an action for injunctive relief pursuant to 49 U.S.C. § 30163. Other remedies and sanctions are available as well.

DaimlerChrysler's response to this letter, in duplicate, must be submitted to this office by November 26, 1999. Please include in DaimlerChrysler's response the identification codes referenced on page one of this letter. If DaimlerChrysler finds that it is unable to provide all of the information requested within the time allotted, DaimlerChrysler must request an extension from Mr. Thomas Z. Cooper at (202) 366-5218 no later than five business days before the response due date. If DaimlerChrysler is unable to provide all of the information requested by the original deadline, it must submit a partial response by the original deadline with whatever information DaimlerChrysler then has available, even if DaimlerChrysler has received an extension.

If DaimlerChrysler considers any portion of its response to be confidential information, 49 CFR Part 512, "Confidential Business Information," requires that DaimlerChrysler submit two copies of those document(s) containing allegedly confidential information (except only one copy of blueprints) and

one copy of the documents from which information claimed to be confidential has been deleted, to the Office of Chief Counsel, National Highway Traffic Safety Administration, Room 5219 (NCC-30), 400 Seventh Street, SW, Washington, D.C. 20590. In addition, DaimlerChrysler must provide supporting information for the request for confidential treatment in accordance with part 512.4(b) and (e) and include the name, address, and telephone number of a representative to receive a response from the Chief Counsel.

If you have any technical questions concerning this matter, please call Mr. Jeff Quandt of my staff at (202) 366-5207.

Sincerely,

191

Kathleen C. DeMeter, Director
Office of Defects Investigation
Safety Assurance

Enclosure

PASSENGER CAR AND LIGHT TRUCK FUEL CONTAINMENT—SAE J1664 JAN94

SAE Information Report

Report of the SAE Fuel Containment Standards Committee approved January 1994.

Foreword—The integrity of the fuel containment system has been a longstanding concern of automotive engineers throughout the industry and has been specifically addressed by government regulatory authorities in the U.S., Europe, and Japan. This document is intended to point out design aspects that are important and thus offer an opportunity for overall improvement in system design.

a. Vehicle manufacturers should conduct proving ground and customer fleet tests to confirm their fuel system design will meet the regulated time or mileage requirements. The proving ground durability tests should include stone pecking (gravel impingement) and ground clearance tests as appropriate. Any fuel-system shielding should be evaluated to the same durability standards (including corrosion resistance) that apply to the fuel containment components.

b. Failure Mode and Effects Analysis (FMEA)—As a useful tool for design, manufacturing, and assembly evaluation, FMEA or a similar methodology is suggested for application during the development of the fuel containment system.

(1) In addition to meeting government standards, consideration should be given to all reasonably likely "real world" causes of fuel containment failure including reasonably foreseeable crashes, long-term corrosion effects, and other abnormalities such as failure of other vehicle components, assembly or service errors, and failures or abnormalities on other vehicles which might be involved in a crash situation.

(2) It would not be reasonable or practical to design fuel containment systems that would completely eliminate all risks of failure in any condition identified in a FMEA study; however, a disciplined FMEA approach can eliminate many "real world" failure modes and reduce the frequency of many others.

1. Scope—The scope of this SAE Information Report is the liquid fuel containment system for gasoline or flexible fuels (up to 85% methanol in gasoline), along with their associated vapors, as designed for use on passenger cars and light trucks. For purposes of this document, fuel containment addresses the fuel tank and components that are directly attached to the fuel tank. These components may include the filler neck, tank, fill vent tube, fuel cap, pump-sender, and rollover control valve closure seals, insofar as they act as closure or containment mechanisms. Emphasis will be on fuel containment and the required system closures. Furthermore, emphasis will be placed on design recommendations as they relate to performance. Mounting and shielding of the "system" components are included only to the extent they affect the containment aspects.

1.1 Purpose—The purpose of this document is to suggest design practices for automotive fuel tanks and any related components that directly close the fuel tank. This document incorporates the consensus of the SAE Fuel Containment Standards Committee as to those practices that are reasonable, practicable, and appropriate.

2. References

2.1 Applicable Documents—The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply.

2.1.1 SAE PUBLICATION—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J1681—Gasoline Methanol Mixtures for Materials Testing

2.1.2 ASTM PUBLICATION—Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM B 117—Method of Salt Spray (Fog) Testing

2.1.3 FEDERAL PUBLICATION—Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

FMVSS 301

2.1.4 ECE PUBLICATION—Available from Commission of the European Communities, 200, Rue de La Loi, B-1049 Brussels, Belgium.

ECE 34

2.1.5 NHTSA PUBLICATION—Available from Superintent of Documents, U.S. Government Printing Office, Washington, DC 20402.

"Fires and Burns in the Towed Light Vehicle Crashes," 1992, Susan Partyka

2.2 Related Publications—The following publications are provided for information purposes only and are not a required part of this document.

EPA Evaporative Regulation 40 CFR Part 86

CARB Regulation Evaporative Emission - Title 13 California Code of Regulations Sect 1976

3. Principles—This section details the general principles suggested by the Fuel Containment Standards Subcommittee. If the Guidelines in Section 6 are incomplete, or if there appears to be inconsistency or ambiguity in the application of the Guidelines, the Principles should be applied to resolve the uncertainty.

3.1 Normal Use Principle—The fuel containment system should provide for a lifetime of customer service without maintenance or fuel leakage and with continuing compliance to applicable emission or safety regulations.

3.1.1 Furthermore, current Environmental Protection Agency (EPA) requirements for fuel system useful life are 10 years or 160 900 km (100 000 miles), whichever comes first for all passenger cars and light trucks below 1701 kg (3750 lb) gross vehicle weight and 11 years or 193 080 km (120 000 miles) for all other light-duty trucks. No fuel leaks or increase in evaporative emissions above those allowed by regulation are permitted throughout the useful life.

3.2 Abnormal Use Principle—The fuel containment system should be designed in anticipation of certain abnormalities which could occur in customer usage so as to prevent, to the extent practicable, the release of fuel even in such abnormal conditions. Each design should be subjected to a FMEA to identify abnormal failure modes and to suggest approaches to eliminate, to the extent practicable, system failures or misuse that could release fuel.

3.3 Collision Damage Principle—An automotive vehicle and its fuel containment system are subject to collision damage in an infinite variety of situations including various angles, speeds, and fixed or moving objects impacted, multiple impacts, and rollovers with or without preceding or subsequent impacts. A FMEA should be performed and consideration given to vehicle package and fuel containment system design in order to eliminate or minimize collision-related fuel spillage to the extent practicable.

4. Guidelines

4.1 Durability Guideline—Laboratory bench tests and proving-ground vehicle-durability tests under conditions representative of worst-case customer use should be performed to confirm fuel-system lifetime capability.

4.2 Corrosion Guideline—The fuel-containment system must be robust with respect to exterior corrosion so as to provide high confidence in passing expected use over the vehicle's lifetime.

Attention should be given to not only material selection but also protective coatings and galvanic interactions between dissimilar metals.

4.2.1 Some manufacturers utilize accelerated vehicle proving-ground corrosion tests that subject vehicles to a fairly corrosive environment over several months as a simulation of lifetime corrosion exposure. A minimum of 2000 h salt-spray test (per ASTM B 117) is suggested for evaluating exterior-corrosion protection. In addition, various fuel soaks and laboratory exposure tests are suggested for determining interior-corrosion performance of fuel-containment components, as discussed in more detail as follows:

4.2.2 Provisions should also be made through proper material selection and, if necessary, the use of protective coatings for the fuel containment interior surfaces to provide appropriate corrosion and fuel resistance, including resistance to additives, water, or other contaminants.

4.2.3 There should be no component-related contribution to fuel contamination from lead, silicone, phosphorus, aluminum, plasticizers, barrier treatments, or from material-corrosion by-products.

4.2.4 Verification of successful performance of internal- and external-corrosion protection should take place after completing proving ground durability or corrosion tests and laboratory soak tests using recommended fuels from SAE J1681. A minimum of 4000 h of internal component exposure to these SAE fuels is suggested. Note that for some applications, corrosion requirements may need revision to meet more stringent situations (e.g., worldwide use).

4.2.5 Verification should include component visual inspection inside and out plus system testing for evaporative emissions using a full vehicle size Sealed Housing for Evaporative Determination (SHED) or a mini-SHED large enough to contain the fuel system. Tests should be conducted according to California or Federal evaporative regulations.

NOTE—The fuel constituents (particularly alcohol levels used during durability or soak tests) can affect SHED test results.

4.3 Aging Guideline—Accelerated corrosion tests, proving-ground durability tests, and rapid accumulation of mileage through commercial-fleet testing are methods used to simulate real-world effects of time and mileage. These can be augmented by various laboratory bench tests (e.g., long-term fuel soaks, ozone tests, and pressure-cycle fatigue tests). Also, knowledge gained during reviews of customer units that have been in use for long periods is helpful to fuel system engineers. It is difficult, however, to predict precisely how a new material or process will perform after 10 or more years based on the previous tests. Consequently, a certain degree of "overdesign" may be advisable.

4.4 Fatigue Guideline—Fuel-containment components should be subjected to laboratory fatigue tests with inputs derived from customer applications using instrumented vehicles. The primary fatigue loadings are from system pressure and vacuum cycles coupled with those from road-induced mechanical input. Consideration should be given to extreme loading situations, vibration inputs, and cold- and hot-ambient operating conditions.

4.5 Permeation Guideline—Evaporative losses must be within state (e.g., California) and Federal requirements (total vehicle not just the fuel system). Check to insure latest state and Federal requirements are reviewed. Addresses and telephone numbers of interest:

a. Environmental Protection Agency
Regulation Development and Support Division
2565 Plymouth Rd.
Ann Arbor, MI 48105-2425
Telephone: (313) 741-7828

b. State of California
Air Resources Board
Haagen-Smit Laboratory
9528 TelStar Avenue
El Monte, CA 91731-2990
Telephone: (818) 575-6800

4.5.1 An initial (24-h test) target for the fuel-containment system should be established low enough to allow the total vehicle to meet the requirement at the end of the necessary time, 10 years (Car) and 11 years (Light Truck), or the mileage shown previously. Vehicle background hydrocarbons (e.g., from tires, paint, plastics, and interior trim) affect the total vehicle hydrocarbon evaporative emission results.

4.5.2 It is important to insure the fuel containment system is properly "stabilized" relative to hydrocarbon permeation prior to testing (e.g., lab soak at 40 °C for 8 weeks or 90 days minimum vehicle soak and driving). It may be advisable to soak the fuel containment system for 8 weeks, or more, to attain equilibrium and then stabilize at room temperature for 12 to 24 h prior to SHED tests to avoid abnormal peaks in HC data. As a general rule, the more resistant a material is to permeation, the longer it will take to stabilize at its equilibrium rate.

4.6 Fuel Compatibility Guideline—Fuel compatibility with respect to fuel system components should receive appropriate attention. Of concern should be tank/pump/other component interior corrosion effects as well as effects of fuels on various elastomers (especially with regard to property reduction, swell after exposure, shrink after dry out, and leaching out of plasticizers). The 4000-h test suggested in 4.2.4 is applicable here.

4.6.1 Fuel-system components themselves may be adversely affected by fuels (e.g., some of the residual constituents may be dissolved by fuel and carried forward through the pump, filter, and injectors). It is important to subject various fuel components to the range of expected fuels and additives to understand any deleterious effects on materials.

4.6.2 Reference SAE fuels are advisable for use in testing because they represent recognized, reasonable worst-case conditions and to allow uniform comparison with other industry available information. The SAE has a subcommittee addressing appropriate fuel formulations, including additives (reference SAE J1681).

4.6.3 In the case of flexible fuels, the engineer should consider a range of fuels from M0 to M85 (100% unleaded fuel to 85% methanol + 15% unleaded gasoline) as well as various levels of ethanol in the fuel. Further, the oxygenate Methyl Tertiary Butyl Ether (MTBE) is coming into more widespread use, and its effects alone and in combination with ethanol or methanol are worth considering.

4.7 Service Guidelines—It is advisable to instruct users that fuel-containment components must not be repaired, but should be replaced with Original Equipment Manufacturer (OEM) or OEM recommended parts if evidence of a leak exists or replacement is necessary. Warning labels or other indicators with this information placed on the components and in appropriate sections of service manuals are suggested. Design engineers should be aware that fuel tanks are sometimes cleaned by non-OEM repair shops that may use aggressive cleaners.

4.8 Manufacturing Guidelines—Tank manufacturers must provide strict attention to process parameters to assure leak-free parts. Care must be taken not to damage protective surface finishes during the manufacturing process. For plastic tanks, process effects on interior treatments for permeation resistance (e.g., sulfonation or fluorination) must be considered. Uniform coverage on interior surfaces (especially on complex tank shapes) must be provided.

4.8.1 Several sources of contamination exist. Manufacturing and assembly engineers should be cognizant of these: (a) residuals from the tank manufacturing or assembly process that are not properly removed (e.g., die lube, weld spatter, machining chips for High Density Polyethylene (HDPE) tank openings), (b) contaminants introduced by assembly plant fuel fill, and (c) contaminants introduced as a result of the tank leak test process (usually residual water).

4.8.2 Appropriate filtration of in plant fuel and quality checks of incoming fuel should suffice for item 4.8.1(b). Surveys of fuels available in the field should help determine what foreign matter must be handled by the fuel system. Understanding these factors is important to be able to protect the fuel system and provide long-service life.

4.8.3 Specification and verification methods for contamination should be agreed on by the tank supplier and purchasing or engineering.

4.9 Leak Testing and Pressure Resistance—No residual water must be left in the tank (e.g., from weld-cooling process on steel tank) prior to leak testing. Such water can plug pin-hole leaks and give a false "pass." Two possible leak test methods are: (a) pressure decay test or (b) air-under-water test with no leaks at manufacturer-determined internal tank pressurization. Leak tests with water must be evaluated for post-test residual water that might remain inside the tank. Current test procedures and leak rates are 13.79 to 27.58 kPA (2 to 4 psi) under water and no pressure loss for 2 min or no evidence of air bubbles. With the tighter standards for evaporative emissions, current methods of leak detection are inadequate. These will identify identify gross leaks. The only known method to find very small leaks is via helium gas leak detection.

4.10 Abnormal Use Guideline—Among the abnormalities that should be considered are misassembly, either in production or in subsequent service, vent system failure, engine or fuel system malfunction, exhaust system leakage or failure, overfilled fuel tanks, possible combinations of these, and other abnormalities identified by the FMEA.

4.11 Heat-Protection Guideline—Proximity of the fuel-containment components to exhaust system and other sources of heat must be given careful attention early in the design stage. Design clearance standards, if available to the engineer, should be confirmed on the specific design via vehicle testing. Component surface temperature and fuel-temperature monitoring is suggested.

4.11.1 Care must be taken to examine extreme vehicle use situations (those which will create maximum temperatures) and maximum expected ambient conditions (including altitude effects). Extreme limit conditions could be the effects of 1 h of operation with reasonably severe engine malfunctions (e.g., single failed spark plug or exhaust system leakage) with maximum in-tank fuel temperature of 60 °C. Effect of failed components or lack of proper maintenance should be factored into the FMEA.

4.11.2 In a malfunction condition that develops excessive heat, consider effects on the contained fuel temperatures, vapor generation rates, and resulting fuel system pressures.

4.12 Packaging Guideline—As government standards become more stringent in either impact speed or location, the design engineer will become increasingly challenged to protect the fuel containment system. A combination of analytical/computer modeling, lab testing, and actual vehicle tests is advisable. Unfortunately, models have not progressed to the stage where actual design confirmation crash tests can be eliminated.

4.12.1 Crash testing required by FMVSS 301 is one method to assess the crashworthiness of a vehicle's fuel system. The intent of the regulation is to minimize the risk of injury or death due to crash induced fuel fires. Crash tests other than those prescribed by FMVSS 301 may be necessary to evaluate fuel system performance.

4.12.2 Packaging aspects of the fuel-containment system are very design dependent. What "works" (passes crash testing) for one tank or component design may not be acceptable for another design or location.

4.12.3 Design considerations as to tank location (forward in chassis, mid-vehicle, or rearward in vehicle), tank shape (rectangular, long and narrow, or "pancake" design) should receive considerable **up front** evaluation in the platform design. Requirements for crash protection may differ with tank or component location in the vehicle and may also depend on vehicle intended use. The package location and surrounding environment of the fuel tank should also

be included in the FMEA to eliminate, to the extent practicable, fuel spillage in a collision due to tank puncture or rupture from intrusion by other vehicle components.

4.12.4 Package must also consider the location and failure susceptibility of the fuel filler pipe and cap, the fuel pump and sender, and of vent valves and other devices that require openings and closures to the main storage tank.

4.13 Tank Pressure Resistance Guideline—Most containment systems include a safety pressure relief device to prevent fuel system damage if the normal vent system fails to function properly. Testing of the fuel system to maximum pressure expected under failed tank vapor control (i.e., pinched line) in the "as-installed" condition is advisable.

4.13.1 Some typical pressure resistance tests follow:

a. Zero - Safety relief pressure [usually 17.24 kPa (2.5 psi)] (with tank in "as-installed" constraint). Acceptance criteria are no leak under water and no distortion that affects function (e.g., gage indication, ground clearance, or fatigue resistance).

b. 17.24 to 31.03 (2.5 to 4.5 psi) (European requirement with tank in "as-installed" constraint). Acceptance criteria are no leaks under water and no permanent deflection beyond agreed upon percentage.

c. To monitor the manufacturing process, some manufacturers test fuel tanks pressurized above 31.03 kPa (4.5 psi) with the tank in an unrestrained condition under water. Acceptance criteria (leak or burst requirement) is as determined by agreement between the tank supplier/vehicle manufacturer.

4.13.2 Vacuum applied to the system can cause adverse effects, even if only of a dimensional nature. Vacuum cycling effects may become more significant as On Board Diagnostic (OBD) regulations phase in. Some strategies will utilize regular application of a vacuum to the system to verify evaporative system integrity. Such designs should account for the dimensional effects of the pressure fluctuations on the tank in the installed condition. Also, the pressure-cycling tests developed to prove tank fatigue capability must consider added fatigue damage from OBD.

4.14 Containment Integrity Guidelines—Under crash event per FMVSS 301 or other reasonable crash circumstance, there should be no component rupture, puncture, or closure element separation from the fuel tank. It is suggested the engineer test design sensitivity to a variety of reasonable crash circumstances.

4.14.1 GENERAL DESIGN CONSIDERATIONS TO PREVENT FUEL LOSS IN REASONABLY SEVERE CRASHES—Most importantly, fuel containment components should be packaged in a "friendly" environment. Material selection should consider puncture resistance, material thickness requirements, and burst pressure strength. Laminate or composite materials may have useful application, especially in providing a "shielding" function.

4.14.2 Key causes of fuel loss during or immediately after a crash:

a. Hydrodynamic Rupture—In selecting the fuel tank placement in the vehicle, the engineer must consider vehicle structural collapse insofar as such collapse may affect the hydrodynamic rupture characteristics of the tank. It might be necessary in a given location to strengthen the structure surrounding the tank to prevent or limit the amount of tank deformation in a specific crash mode. Other factors to consider are:
   (1) Shape of tank.
   (2) Vapor space when tank is filled to design maximum (allowing for fuel expansion with temperature—the larger the amount of vapor space versus liquid fuel, the greater the ability of the tank to withstand crush).
   (3) Material properties (e.g., tensile strength, ductility, including visco-elasticity, if present, and impact strength). (A ductile material will absorb more energy.)

b. Filler neck or other component separation from tank. Key elements to consider are:
   (1) Joint structural properties to resist leaking from twist, bending, or axial loads, or combinations of these.
   (2) Relative separation or crush loads experienced during a crash. The filler pipe and its attachments to the tank and the outer body at the filler inlet should be designed to prevent, to the extent possible, separating the pipe from the tank. For example, the pipe to body separation force should be significantly less than the pipe to tank separation force.
   (3) Fuel caps are often subjected to prying forces and direct impact during crashes. Reasonable design efforts are suggested with the objective of maintaining system integrity when fuel caps are subjected to these loading mechanisms.

c. Puncture—Basically, the fuel tank should be protected from intrusion by other components. Emphasis should be placed on the following considerations with respect to overall crash integrity:
   (1) Shielding and shield shape when it contacts the fuel tank in a crash.
   (2) Tank material and thickness.
   (3) Location of "unfriendly" surfaces/components (and the path they travel during a crash).
   (4) Vehicle structural collapse characteristics in relation to the fuel tank location (considering the variety of impact directions) as well as to other fuel containment components (e.g., fill neck).
   (5) Penetration by a striking object external to the vehicle.

4.15 Open Flame Resistance Guidelines—When considering resistance of the fuel containment system to open flame, design engineers are advised to address: (a) fire size and duration as established by the size of the assumed fuel spill (possibly from another vehicle per 4.15.3), (b) size and location of possible punctures in the fuel containment system caused from a collision, and (c) potential effects on the system from grass fires underneath the vehicle (a specific concern in some countries such as Australia).

4.15.1 Europe has an open flame test standard (part of ECE 34) which is required for plastic fuel tank equipped vehicles. Such vehicles manufactured in the U.S. for sale in Europe must also meet ECE 34, Annex 5, which requires no liquid fuel release after 2 min of fire exposure.

4.15.2 To conform to proposed requirements, fuel filler pipes for use with methanol (e.g., flexible fuel vehicles) must have anti-siphon capability. It may also be advisable to incorporate a flame arrestor on tanks designed for flexible fuel vehicles and to consider an anti-siphon capability on all new tank designs as an added safety feature.

4.15.3 Based on a 1992 NHTSA report, "Fires and Burns in Towed Light Vehicle Crashes" by Susan Partyka, 24% of fires came from outside the vehicle or unknown causes. Also from the same report (using data collected on 1979 to 1986 models and 1988 to 1990 models), 59% of fires involving crashes were frontal impacts, 12% rear impacts, 12% side impacts, and 14% from rollovers. Therefore, it may be advisable to apply the ECE 34, Annex 5, criteria for all new tank designs, regardless of material.

NOV 23 1999

Susan M. Cischke, Executive Director
Vehicle Compliance and Safety Affairs
Chrysler Corporation - CIMS 482-00-91
Auburn Hills, MI 48326-2757

NSA-12jlq
EA99-013

Dear Ms. Cischke:

We have reviewed Chrysler's fax transmittal dated November 18, 1999, requesting an extension for Chrysler's reply to the Office of Defects Investigation's (ODI's) information request letter dated October 20, 1999. This letter is to inform you that ODI has granted the request for an extension of the due date. The reply due date, originally November 26, 1999, is now extended to December 23, 1998. If DaimlerChrysler is able to provide any material responsive to the subject information request letter before the revised due date, please provide that information as partial submission.

Sincerely,

Thomas Z. Cooper
Vehicle Integrity Division
Office of Defects Investigation

DAIMLERCHRYSLER

November 26, 1999

DaimlerChrysler Corporation
Susan M. Cischke
Sr. Vice President
Regulatory Affairs &
Passenger Car Operations

Kathleen C. DeMeter, Director
Office of Defects Investigation, Safety Assurance
National Highway Traffic Safety Administration
400 Seventh Street S.W. (NSA-12; Room 5326)
Washington, D.C. 20590

Re: NSA-122jlq; EA99-013

Dear Ms. DeMeter:

This responds partially to your October 20, 1999 information request for Engineering Analysis (EA) 99-013 investigating fuel system integrity with 1996 through 2000 model year DaimlerChrysler minivan vehicles in FMVSS 214 side impact collision tests.

Design, development, and production of DaimlerChrysler vehicles have always considered fuel containment in a variety of crash situations as a very important requirement. Substantial engineering work and testing are invested to assure post collision fuel system integrity on all vehicle designs. These assurance efforts are confirmed by our vehicles' exemplary real world performance.

DaimlerChrysler has reviewed substantial information since receiving notification concerning leakage in NHTSA's January 1999 FMVSS 214 test. DaimlerChrysler continues to study this issue to both answer the questions posed in this information request and to assess the risk to motor vehicle safety that is represented by this test result.

Several questions ask for information that is confidential. Responses to those will be supplied separately to the NHTSA Chief Counsel's Office with a request for treatment as confidential business information. Additional details associated with the balance of the information request will be provided by December 20, 1999.

We welcome discussion of questions you have during your review of this information.

Sincerely,

SM Cischke

Susan M. Cischke

Attachment
Enclosures

cc: Heidi Coleman

0000126

DaimlerChrysler Corporation
800 Chrysler Drive CIMS 484-12-14
Auburn Hills MI USA 48326-2757
Phone 248.576.7301
Fax 248.576.7321
e-mail: smc16@daimlerchrysler.com

ATTACHMENT

Q1 State the number of subject vehicles DaimlerChrysler has sold in the United States by model, wheel base, door option, and model year.

A1 The numbers of vehicles built for sale in the United States through November 6, 1999 are provided in Enclosure 1.

Q2 State the number and provide copies of all of the following, from all sources, of which DaimlerChrysler is aware and which allege incidents of collision-induced fuel leakage or fire in the subject vehicles.

a.owner/fleet complaints;
b.field reports;
c.fire incident claims;
d.subrogation claims;
e.lawsuits; and
f.third-party arbitration proceedings (where DaimlerChrysler is a party to the arbitration).

Please list and collate your responses for each category ("a" through "f") by model year and date of claim. Please provide for each item in this response the incident date, mileage of vehicle at time of incident (if known), vehicle date of build, disposition of matter, and, where a fleet vehicle is involved, the name of the fleet, and the name and telephone number of a contact person at that fleet. For items "a" through "d," please provide all related information and reports whether or not DaimlerChrysler has verified each one. For items "e" and "f," summaries are acceptable. Please identify in the summary the caption, court, docket number, and filing date of each lawsuit if a copy of the Complaint initiating the lawsuit is not provided.

A2a Since the initiation of this investigation (and the publicity it received), DaimlerChrysler has received two reports alleging side collision fuel leakage. Both involved 1999 model year vehicles and both occurred during May 1999. Copies of these reports and additional documents related to them are provided in Enclosure 2. Some documents are in digital image format in the Enclosure 2 Folder on a Compact Disc (CD) bound into Enclosure 2, and the remainder are supplied as paper copies.

DaimlerChrysler is conducting a thorough investigation of these reports. Our current assessment of them follows:

DaimlerChrysler received notice of the first incident in a June 11, 1999 letter from an insurance company. The severe crash resulted in a fire, but no fire-related injuries were reported. As the minivan traveled at five mph through an intersection its rear half was struck by a full size pick-up truck travelling at 55 mph. Because the minivan was substantially burned, we cannot conclusively determine at this time the cause of the fire. The condition of the fuel tank, however, establishes that fuel from the tank did not start the fire. The tank was not consumed, but only burned along one edge, melting as the fire smoldered. The bulk of the fuel tank exhibited no heat damage, even to components with relatively low melting points, and several paper labels were intact after the fire. Accordingly, our review of this incident suggests that fuel leakage was not a contributing source of the fire. We believe that the fuel integrity system remained intact during this crash event.

The second report was received by DaimlerChrysler on June 29, 1999 as a letter from the owners of the minivan. No fire resulted from this crash, although the belted right front passenger did suffer a facial cut requiring stitches, apparently from his head striking the instrument panel. The minivan was struck as it pulled out of a gas station by a full size, four-door sedan travelling at a reported 40 mph. The left front corner of the sedan collided with the left rear door of the minivan. The sedan drove deep into the rear door and floorpan of the minivan. Although some fuel leakage was noted by the responding emergency workers, it is clear that if

any leakage in fact occurred, it did not arise from the fuel filler hose separating from the tank inlet spud. Investigation has confirmed that the fuel filler hose separated from the steel fuel filler tube, leaving the hose attached to the plastic tank inlet spud, as confirmed by the repairing body shop. Test results provided in our April 9, 1999 Confidential Enclosure 7 response for PE99-010 show that the load required to separate this joint may be more than double that to separate the hose joint at the fuel tank spud. This observation reveals the complexity of real world crashes, and the impracticality of relying on component specifications to predict fuel system integrity performance in the broad range of geometry and impact severity encompassed by those crashes.

These two reports are the only reports DaimlerChrysler has received alleging potential fuel leaks from side impact collisions before or since this investigation was opened. It is important to note that both of these crashes were significantly more severe than either the FMVSS 301 fuel system integrity test or the FMVSS 214 side impact test, in terms of the speed, energy, and direction of the collisions.

A2b DaimlerChrysler has received no other field reports of side collision-induced fuel leakage or fire.

A2c DaimlerChrysler has searched our fire investigation database in response to this question. No additional claims were found as a result of that search.

A2d An insurance company submitted a subrogation claim for the first incident referenced above. The claim letter is included in the document copies provided in Enclosure 2. Although the subrogation claim speculates that fuel filler tube separation occurred in this crash, the claim does not include any additional facts on which that speculation could be based. As noted above, DaimlerChrysler's investigation has revealed that the fire did not ignite as a result of leakage from the fuel tank.

A2e DaimlerChrysler is aware of no lawsuits related to this issue.

A2f DaimlerChrysler is not a party to any arbitration related to this issue.

Q3 State the number and provide copies of all of the following, from all sources, of which DaimlerChrysler is aware and which allege incidents of non-collision related leakage from the subject hose joint in the subject vehicles.

a.owner/fleet complaints; and
b.field reports.

Please list and collate your responses for each category by model year and date of report. Please provide for each item in this response the incident date, mileage of vehicle at time of incident (if known), vehicle date of build, disposition of matter, and, where a fleet vehicle is involved, the name of the fleet, and the name and telephone number of a contact person at that fleet. Please provide all related information and reports whether or not DaimlerChrysler has verified each one.

A3a Enclosure 3 provides one customer complaint claiming non-collision leakage from the subject hose joint after the fuel tank was replaced for having foreign material in it. DaimlerChrysler received this complaint three months after the fuel tank was replaced on December 30, 1997 at 35,502 miles, the same time several other warranty repairs were made. The only recall that has been performed on the vehicle is # 670, which added an electrical grounding strap to the fuel filler tube on February 21, 1996, without any reason to disturb the fuel-carrying connections. As the complaint provided notes, the dealership had not been informed of the complaint concerning their repair, and was to contact the owner to resolve the complaint. DaimlerChrysler has received no subsequent related warranty claims, indicating that the concern was most likely related to an incorrect repair by the dealership, probably not completely securing any of several attachments to the replaced fuel tank.

ATTACHMENT

A3b Enclosure 4 provides details of three field reports concerning non-collision-related leaks at one of the fuel filler hose-to-filler neck joints. These reports were found by searching through narrative texts provided by a selected sample of dealerships that provide additional descriptions to DaimlerChrysler for warranty repairs they perform. Each relates to one of the two clamped joints at the ends of the fuel filler hose, but whether at the fuel tank or the fuel filler tube end cannot be determined by available information.

Q4 State the number of all warranty claims, including extended warranty claims, and requests for "good will," field, or zone adjustments received by DaimlerChrysler to date that relate to the subject hose joint, by labor operation number and problem code. This should include all claims coded to the fuel filler neck or fuel tank assemblies which indicate complaints of leakage from, or repairs to, the subject hose joint. Include in your response the warranty terms for the subject fuel filler neck and fuel tank assemblies and copies of all pages from DaimlerChrysler's Warranty Manuals pertaining to the subject hose joint (this should include all pages for the fuel tank and filler neck assemblies).

Provide the following information on a computer diskette in a spreadsheet format (e.g., Microsoft Excel spreadsheet software), and identify the format used:

a.claim number;
b.labor operation number;
c.failure code;
d.vehicle identification number;
e.customer name;
f.customer address and telephone number;
g.dealer name and address;
h.MDH code;
i.vehicle build date;
j.vehicle service start date;
k.date of warranty repairs;
l.vehicle mileage;
m.the repair cost;
n.the customer concern/complaint; and
o.dealer/technician comments.

Include in your response the warranty terms for the subject filler neck assembly and copies of all pages relating to the subject components (fuel tank assembly, filler neck assembly, and tank spud hose joint) from each of the applicable DaimlerChrysler Warranty manuals.

A4 The number of warranty claims paid through November 9, 1999 for repairs which might possibly be related to the fuel filler hose joint with the fuel tank, or with the fuel filler tube, or to the hose itself or clamps holding it, is 1,534. The warranty claim system does not include distinctions that can isolate repairs directly related to the alleged defect. The warranty system does not distinguish between repairs to the subject hose joint, defined as that between hose and fuel tank, and the other hose joint, to the steel filler tube. Instances of damage or manufacturing faults in the hose itself would also fit the labor operation and problem coding required to find the requested claims.

Enclosure 5 provides the requested copies from warranty Labor Operation Manuals pertaining to the fuel tank, fuel filler tube assembly, and fuel filler hose, these being the most common warranty terms for the parts referenced in Question 4. These components are covered by the general three year or 36,000 mile warranty coverage applicable for all 1996 through 2000 model year DaimlerChrysler vehicles.

ATTACHMENT

Enclosure 6 provides requested warranty claim details on the computer CD bound with Enclosure 2, in a folder on that disk named Enclosure 6, in Microsoft Excel spreadsheet format. Please note that DaimlerChrysler Corporation's warranty system does not directly associate a customer name, address, or telephone number with a warranty claim, since warranty coverage is related to vehicle time-in-service and mileage, not ownership. The customer information provided is the best match available from a distinct customer information database related through the vehicle identification number. Also note that the MDH code related to a warranty claim vehicle is not directly available, but the Build Date and Build Hour are provided. The MDH code would provide the same information as the two provided fields (Build Date and Build Hour) in the slightly different format of MMDDHH.

DaimlerChrysler does not receive or maintain information reflecting customer concern/complaint and dealer/technician comments that might be recorded at the repairing dealership, except for the field reports provided in answer to Q3b, above. Accordingly, no other such documents are included in this response.

Q5 ***State the number of the following components or assemblies that have been sold annually to date by component name, part number (both service and engineering), and supplier (name and address). State all applications for each of the components by platform group (platform code and description), model year, application, and approximate total number of all vehicles for which they were intended.***

a.filler neck assembly;
b.filler neck assembly hose; and
c.filler neck assembly hose clamp.

A5 The requested information is provided in Enclosure 7. For this particular list of components, Service and Engineering Part numbers are the same.

Q6 ***Identify and describe all modifications or changes in the design, manufacture, or packaging of the fuel tank or filler neck assembly used in the subject vehicles, from pre-production development to date that may relate in any way to the alleged defect. The following information must be included for each such modification or change:***

a.the date, or approximate date on which the modification or change was incorporated into production;
b.a description of the modification or change;
c.the scope of the modification or change (i.e., state which of the subject vehicles were affected by the change);
d.the reasons for the modification or change; and
e.the part numbers of the original and modified parts.

A6 The requested information was provided in the April 9, 1999 response to Question 8 of PE99-010 except for the part number of the original single-layer fuel tank design, which was 04682491.

Documentation for the assembly plant process used to connect the fuel filler hose to the fuel tank inlet (spud) was revised May 20, 1999 to clarify and document that MS-5931 is an accepted assembly aid, per PS-4114, to ease installation of the filler hose. This documentation change was not associated with a change to production processes, so no subject vehicles were affected, and no part numbers changed. This modification to the description of the assembly technician's job was done to better ensure consistency.

Additional related details will be provided in the answer to Question 11.

ATTACHMENT

Q7 Identify and provide copies of all documents related to any study, survey, or investigation pertaining to the alleged defect that are known to DaimlerChrysler. Include in your response all notes, measurements, calculations, reports, photographs (color copies), or other documents related to DaimlerChrysler's analysis of issues pertaining to the alleged defect. State clearly the source of each document. Include all pertinent documents, regardless of whether they are in interim, draft, or final form.

A7 DaimlerChrysler provided all documents available at the time of the April 9, 1999 response to PE99-010 except for some photographs of the NHTSA test vehicles taken during a January 19, 1999 review at MGA. Copies of the photographs are provided as digital files in the folder named Enclosure 8 on the CD.

DaimlerChrysler has conducted a search to analyze accident-reporting databases for post-collision fuel leak reports or post-collision fires in side impacts involving the subject and competing minivans. Interim results from that study are provided in Enclosure 9. This data identifies that DaimlerChrysler minivans evidence no more real world occurrence of post collision fires after side impact crashes than any other minivans. As the preliminary data make clear, such occurrences are extremely rare, evidencing the strength of fuel integrity systems that comply with the applicable Federal Motor Vehicle Safety Standards. Only one DaimlerChrysler minivan side crash fire incident was found. That one involved an impact to the right front side of the vehicle, far from the fuel filler and tank, as described in the accident database information also in Enclosure 9. Only two other competitive minivan incidents with post-side-impact fires were found among the more than 18,000 minivan side-impact collisions examined.

DaimlerChrysler also conducted a preliminary review of competitive minivan design parameters. Enclosure 10 provides the available documents related to that review. Although design features and system packaging geometry appear to differ widely, no correlated difference is discernable in data concerning real world performance.

Q16 Furnish the following information concerning Mercedes Benz engineering standards, design specifications, and spud designs for plastic tank filler hose connections used in motor vehicles produced for sale in the United States:

a Provide copies of all Mercedes Benz engineering standards, specifications, design guides, or equivalent material that relate in any way to the crash performance of fuel tank and fuel filler neck assemblies, including any and all performance requirements or specifications regarding filler neck assembly separation forces;

b Furnish a table listing all plastic fuel tanks used by Mercedes Benz since September 1993, by tank capacity, tank supplier, tank material, tank part number, and vehicle model and model year in which used;

c For each fuel tank identified in Item "b" which has a plastic tank spud, furnish a drawing or sketch of the bead design and state the bead back angle dimension and tolerance range;

d For each fuel tank identified in Item "c," furnish a table showing the following information: (1) whether the spud incorporates any type of metal reinforcement, such as a sleeve or ferrule; (2) the dimensional tolerances of the spud wall thickness; (3) the dimensional tolerances of the spud land diameter; (4) the dimension tolerances of the hose clamped to the tank spud; (5) the dimensional tolerances of the spud bead; and (6) all lubricants used in the assembly of the spud hose joint; and

e State what lubricants are permitted by Mercedes Benz in the assembly of clamped fuel tank assembly hose joints and provide copies of all relevant documents.

A16 DaimlerChrysler Corporation does not have custody, possession, or control of the detailed Mercedes Benz engineering documents sought in this request. DaimlerChrysler Corporation and Mercedes Benz USA are separate and distinct corporate entities. To the extent this request is intended as a peer review, please send the request separately to Mercedes Benz USA.

ATTACHMENT

Q20 Furnish ten samples of the fuel tank spud used in the subject hose joint.

A20 The requested samples are being separately shipped to your attention.

To respond to this investigation DaimlerChrysler conducted thorough searches of locations likely to have relevant documents and inquired of responsible persons likely to know relevant information, in the same manner as we have cooperated with other NHTSA investigations. The scope of this search did not, nor could it reasonably, include all of DaimlerChrysler as defined in NHTSA's October 20, 1999 information request.

PRODUCTION FOR U.S.A. THROUGH NOVEMBER 6, 1999

Model Year	Model Code	4 Doors	3 Doors
1996	NS H H 52	23482	4265
1996	NS H H 53	85440	8865
1996	NS H K 52	38058	8449
1996	NS H K 53	102329	12380
1996	NS L H 52	14118	38927
1996	NS L H 53	6001	2792
1996	NS L K 52	26488	53623
1996	NS L K 53	7253	4334
1996	NS P K 52	6089	1
1996	NS P K 53	89945	22
1996	NS P Y 52	5459	0
1996	NS P Y 53	42138	5
1996	NS S Y 53	59789	0
1997	NS H D 53	1887	0
1997	NS H H 52	18086	1031
1997	NS H H 53	76552	1155
1997	NS H K 52	33070	3290
1997	NS H K 53	115412	3892
1997	NS L H 52	25126	17525
1997	NS L H 53	8840	1838
1997	NS L K 52	40250	26686
1997	NS L K 53	12154	3302
1997	NS P C 53	2138	0
1997	NS P D 53	4375	0
1997	NS P K 52	3426	0
1997	NS P K 53	44302	0
1997	NS P Y 52	2807	0
1997	NS P Y 53	22328	0
1997	NS S C 53	7018	0
1997	NS S Y 53	45153	0
1998	NS H D 53	4436	0
1998	NS H H 52	20026	0
1998	NS H H 53	78452	0
1998	NS H K 52	41991	0
1998	NS H K 53	122313	0
1998	NS L H 52	26060	21486
1998	NS L H 53	10484	0
1998	NS L K 52	41832	34689
1998	NS L K 53	15321	0
1998	NS P C 53	1379	0
1998	NS P D 53	2516	0
1998	NS P K 52	1985	0
1998	NS P K 53	31705	0
1998	NS P Y 52	1622	0
1998	NS P Y 53	17978	0
1998	NS S C 53	6749	0
1998	NS S Y 53	48966	0
1999	NS E H 52	2	0

PRODUCTION FOR U.S.A. THROUGH NOVEMBER 6, 1999

1999	NS E K 52	210	0
1999	NS H D 53	4915	0
1999	NS H H 52	14372	0
1999	NS H H 53	71558	0
1999	NS H K 52	32084	0
1999	NS H K 53	133879	0
1999	NS L H 52	25381	25624
1999	NS L H 53	13257	0
1999	NS L K 52	43275	49629
1999	NS L K 53	21825	0
1999	NS P C 53	3173	0
1999	NS P D 53	1098	0
1999	NS P K 52	1061	0
1999	NS P K 53	12405	0
1999	NS P Y 52	993	0
1999	NS P Y 53	35779	0
1999	NS S C 53	4236	0
1999	NS S Y 53	24149	0
1999	NS X D 53	1109	0
1999	NS X K 53	8002	0
2000	NS H C 53	566	0
2000	NS H D 53	1337	0
2000	NS H H 52	4435	0
2000	NS H H 53	16399	0
2000	NS H K 52	10731	0
2000	NS H K 53	42025	0
2000	NS H Y 53	8542	0
2000	NS L H 52	9292	9325
2000	NS L H 53	5430	0
2000	NS L K 52	15651	15326
2000	NS L K 53	8709	0
2000	NS P C 53	1094	0
2000	NS P D 53	351	0
2000	NS P K 53	2932	0
2000	NS P Y 53	11412	0
2000	NS S C 53	1817	0
2000	NS S Y 53	8743	0
2000	NS X D 53	310	0
2000	NS X K 53	2879	0

NOTE: Wheelbase is indicated by the last two characters of the Model Code; 52 is for Short Wheel Base (SWB), 53 indicates Long Wheel Base (LWB)

4th Code =
- H Voyager & Grand Voyager
- P Voyager AWD
- K Caravan & Grand Caravan
- D Caravan AWD
- Y Town & Country
- C Town & Country AWD

DISK

AVAILABLE UPON REQUEST

PAGE(S) 37

Interviewer ces1 Date Nov 10, 1999

Dealer/Customer Contact Interview Form

NHTSA Inquiry # EA99-013

Owner La
Contact
Phone
Home:
Business

Dealer # Quality Auto
Phone
Conta

Vehicle VIN # (last 8 digits): XR221644
Model: NSKH53
Model Year: 1999
Build Date: 11/12/98

Incident Date: 5/27/99
Mileage: 3395
CAIR Date: 6/29/99
CAIR number: 5904779
VOQ #

Interview Content:

Call to Quality Auto, Rocky Mount NC, where vehicle was repaired after crash. Talked to Chris Scarbel, who runs body shop and immediately remembered repair and owners without prompting.

Mr. Scarbel did not have any pre-repair photos taken for his shop's records and knew insurance company did not take any, since he also acts as insurance adjuster for Allstate, insurer. Suggested contacting the since they were on vacation at time of the accident and might have taken photos. Noted that repairs took extraordinary time because several trim parts required were not available. Also noted that damage was very close to totaling vehicle, with floorpan accordioned at least half a foot, but it pulled out well, and high value of nearly new vehicle justified extensive repairs.

Mr. Scarbel confirmed inspection report that fuel filler steel tube was found separated from the fuel filler rubber hose, and hose was still secure on plastic tank nipple. Fuel filler tube assembly was replaced. Upper plastic housing (attachment to body) was broken, and steel tube was bent and would not fit correctly. Filler tube not included on preliminary repair estimate part list (collected at time of inspection), but was added to final repair list.

000038

Interviewer ces1 Date Nov 10, 1999

Dealer/Customer Contact Interview Form

NHTSA Inquiry # EA99-013

Owner Last Name:
Contact: Mrs.
Phone
Home:
Business

Dealer #
Phone
Contact

Vehicle VIN # (last 8 digits): XR221644
Model: NSKH53
Model Year: 1999
Build Date: 11/12/98

Incident Date: 5/27/99
Mileage: 3395
CAIR Date: 6/29/99
CAIR number: 5904779
VOQ #

Interview Content:

Call to home. Talked to Mrs. , who was in same room with Mr. during the call and confirmed some points with Mr.

Mrs. described the accident, explaining she, as driver, was distracted by a semi parked by the road in her way and did not notice the white Buick sedan which hit their minivan. She was pulling out of a gas station, making a left turn, after filling the tank. The speed limit was 45 mph.

People coming to her aid commented that gas was leaking from the minivan, and that it seemed like a lot, but thinking back thought that "a little gas goes a long way." She was focussed on Mr. who had a facial cut near his eye, probably from striking the instrument panel, which required four stitches. The cut has healed well.

Mrs. said they took photos of the minivan after the crash, the next day at the shop where it was towed. She volunteered to mail extra prints of them to DaimlerChrysler to assist the investigation.

Interviewer rdb18 Date Dec 9, 1999

Dealer/Customer Contact Interview Form

NHTSA Inquiry # EA99-013

Owner Last Name:
Contact:
Phone
Home:
Business

Dealer #
Phone
Contact

Vehicle VIN # (last 8 digits): XR196325
Model: NSHL53
Model Year: 1999
Build Date: 10/16/98

Incident Date: 5/8/99
Mileage:
CAIR Date: 6/30/99
CAIR number: 5909595
VOQ #

Interview Content:

Call to l home in St. Petersburg, FL. Talked to both Mr. and Mrs. Both were injured by severe crash, Mr. (driver) with a broken left rib now healed, Mrs. (right front occupant) with cut to forehead between left eye and nose requiring 17 stitches, and bone chip in right knee. Some tightness remains by cut, orthoscopic surgery last week to clean knee joint, has some pain from surgery. Both were wearing seat belts.

Mr. believes impacting vehicle was travelling greatly in excess of 55mph. Fuel tank had been filled just a few miles prior to the crash. He believes impact was perpendicular to the left side, from trailing edge of driver's door rearward. Vehicle was rotated about 360 degrees by the impact to the point of rest. Both were stunned, but claim to remember events well.

About 10 to 15 seconds after vehicle came to rest, Mr. saw flames at area of left front windshield and A pillar. Flames initially constant in size, neither increasing nor decreasing. He did not smell the odor of gasoline. Both exited at right front door and immediately walked 25 to 35 yards down the roadway away from the van. They sat on the lowered tailgate of a passing pickup in sight of the right side of the van. The fire continued about 20 minutes before the Fire Department arrived. They did not devote a lot of attention to the fire, but to Mrs. bleeding, and to insure others were cared for. Neither ever saw any gasoline liquid, spillage, flow, or any other such description. They did not leave the pickup tailgate area until after police and fire departments arrived.

3

CUSTOMER COMPLAINTS

Vin	1B4GP54R1	TB231964	**Cair #**	4745517	**Open Date**	4/1/98	
Model	NSKP53	**Model Year**	96	**Built Date**	9/16/95		
In Service Dt	10/12/95	**Dealer**	41408	**Dealer Zone**	61	**Mileage**	30000
Last Name		**Middle Int**	F	**First Name**	B	**Contact Type**	T
Address				**Home Phone**			
City							
Remark	Leak from filler joint?						

Fuel Tank - Leaks

First owner claims technician who replaced fuel tank advised her that it was due to recall performed that tank was leaking. Owner claims he advised new fuel filler did not fit tank properly. Owner is upset because she was not notified by Chrysler of this and claims filed report with National Highway Traffic Safety Administration. Writer advised owner her concerns are documented. Writer contacted dealership and spoke with Vince, shop foreman, who advised unaware of any problem with recall components. Vince advised would contact owner to resolve issue. Dealer verified.

ENCLOSURE 4

REPORT # BDYMDL LAB.OP RPT.DT VIN MILES ENG ENG BLT
ZONE-DEALER RPTR ID PART # BLT.DT REASON CODE OG TRN TRN BLT

082990452651 NSHH53 14601509UC 99/07/212P4GP44R4VR11517120604EGA 2306
51-08299 T9999UC 04809890 96/08/19 Z2 DGL
CUSTOMER DESCRIPTION OF PROBLEM:
LEAK AT FUEL FILLER NECK

REPORT # BDYMDL LAB.OP RPT.DT VIN MILES ENG ENG BLT
ZONE-DEALER RPTR ID PART # BLT.DT REASON CODE OG TRN TRN BLT

445320961751 NSKL52 14700502UC 99/03/082B4FP2539TR75943524896EFA
32-44532 T9999UC 96/04/13 Z2 DGM
CUSTOMER DESCRIPTION OF PROBLEM:
LEAK FROM FUEL FILLER NECK CLAMP

REPORT # BDYMDL LAB.OP RPT.DT VIN MILES ENG ENG BLT
ZONE-DEALER RPTR ID PART # BLT.DT REASON CODE OG TRN TRN BLT

684314555181 NSKH53 85411400UC 99/06/281B4GP44R4XB803710 8925EGA 3508
66-68431 T9999UC 06035824 99/01/28 DF DGL 3696
CUSTOMER DESCRIPTION OF PROBLEM:
HOSE CONNECTOR AT FUEL FILLER NECK LEAKING

5

FRONT WHEEL DRIVE LABOR OPERATION TIME SCHEDULE

GROUP 14

FUEL

OPERATION DESCRIPTION (Even Number Right Side, Odd Number Left Side, Where Applicable)	VEHICLE LINE: Colt/Summit/Vista Wagon (F)	Colt/Summit (Z)	Sebring Convertible (J)	Stealth (R)	Intrepid/Concorde/Vision (H)	New Yorker/LHS (L)	Neon (N)	Talon (T)	Avenger/Sebring (G)	Cirrus/Stratus/Breeze (C)	Caravan/Voyager/T&C (M)	LABOR OPERATION	LABOR HOURS 1996
PUMP,FUEL–Test and replace (C) (Continued)													
1.5–1.8–2.0–2.4–3.0 liter engine	F	Z	J	R			N	T	G	C	M	14-50-01-77	0.8 0.7 0.6
GASKET, FUEL PUMP–Replace (C)													
Electric–In tank	F	Z	J	R	H	L	N	T	G	C	M	14-50-20-02	0.9 0.4 0.7 0.5
FC X2, 51													
Optional Equipment													
All wheel drive											M	14-50-02-61	0.2
TANK, FUEL–Replace (B)													
	F	Z	J	R	H	L	N	T	G	C	M	14-60-01-09	1.0 2.0 1.4 0.7 0.8 0.9
FC A4, DE, SE, X2, OE, 20, 41, 51, 87													
Optional Equipment													
All wheel drive											M	14-60-01-61	0.2
CAP, FUEL TANK FILLER–Replace (D)													
FC DE, X0, 11, 21, 69	F	Z	J	R	H	L	N	T	G	C	M	14-60-05-01	0.2
DOOR, FUEL TANK FILLER–Replace (C)													
FC 11, 51, 64	F	Z	J	R	H	L	N	T	G	C	M	14-60-08-01	0.2 0.6 0.3

F.C. Failure Codes

A4 – FUEL LEAK-SEAM
DE – I/M TEST FAILURE
SE – SHORTAGE AND/OR ERROR
X0 – VALVE DEFECT
X2 – SPLIT, CUT OR TORN
0E – FUEL LEAK-SENDING UNIT
11 – BROKEN OR CRACKED
20 – COLLAPSED
21 – CONNECTION DEFECT
41 – FOREIGN MATERIAL
51 – IMPROPERLY INSTALLED
64 – MISALIGNED OR MISMATCHED
69 – DISCOLORED
87 – RUSTED

GROUP 14

FUEL

OPERATION DESCRIPTION (Even Number Right Side, Odd Number Left Side, Where Applicable)	VEHICLE LINE: Colt/Summit/Vista Wagon (F)	Colt/Summit (Z)	Sebring Convertible (J)	Stealth (R)	Intrepid/Concorde/Vision (H)	New Yorker/LHS (L)	Neon (N)	Talon (T)	Avenger/Sebring (G)	Cirrus/Stratus/Breeze (C)	Caravan/Voyager/T&C (M)	LABOR OPERATION	LABOR HOURS 1996
TUBE, FUEL TANK FILLER–Replace (B)													
Standard	F		J		H	L	N	T	G	C		**14-60-15-09**	**0.6**
		Z		R							M		**0.5**
FC DE, 11, 43, 51													**0.7**
SEAL, FUEL TANK SENDING UNIT–Replace (B)													
	F	Z	J	R				T		C		**14-60-40-09**	**0.9**
					H	L							**1.0**
							N						**0.7**
									G				**0.8**
FC X2, 43, 51													**0.4**
STRAP, FUEL TANK SUPPORT–Replace (C)													
Single strap					H	L						**14-60-45-01**	**0.7**
Right or left			J							C		**14-60-45-02/03**	**0.3**
											M		**0.2**
FC 11, 51							N						**0.7**
HOSE, FUEL FLEX–Replace (C)													
One	F	Z	J	R			N	T	G	C	M	**14-70-05-02**	**0.2**
FC A5, DE, X2, 08, 51													
PIPE, FUEL INLET–replace													
	F											**14-70-07-01**	**0.3**
FC 06, 11, 43													
HOSE, HIGH PRESSURE FUEL–Replace (B)													
	F											**14-70-08-01**	**0.3**
				R									**0.6**
FC A5, X2, 43													
LINE/TUBE FUEL–Replace (C)													
Includes: Cut and form to size as required.													
To or from tank to engine	F	Z		R				T	G			**14-70-10-01**	**0.5**
			J		H	L	N			C	M		**0.7**

Operation continued on next page

F.C. Failure Codes

A5 – CLAMP BROKEN/IMPROP INSTALL
DE – I/M TEST FAILURE
X2 – SPLIT, CUT OR TORN
06 – BENT
08 – BLOCKED
11 – BROKEN OR CRACKED
43 – FUEL LEAK
51 – IMPROPERLY INSTALLED

FRONT WHEEL DRIVE LABOR OPERATION TIME SCHEDULE

GROUP 14

FUEL

OPERATION DESCRIPTION (Even Number Right Side, Odd Number Left Side, Where Applicable)	VEHICLE LINE											LABOR OPERATION	LABOR HOURS 1996
	Colt/Summit/Vista Wagon	Colt/Summit	Sebring Convertible	Stealth	Intrepid/Concorde/Vision	New Yorker/LHS	Neon	Talon	Avenger/Sebring	Cirrus/Stratus/Breeze	Caravan/Voyager/T&C		
	F	Z	J	R	H	L	N	T	G	C	M		
LINE/TUBE FUEL–Replace (C) (Continued)													
From tank to frame rail–One or all					H	L						14-70-10-05	2.0
FC DE, 06, 08, 11, 43, 9X													
RAIL, FUEL INJECTOR–Replace (B)													
2.0 turbo equipped								T				14-70-14-01	0.3
2.0 DOHC engine							N			C		14-70-14-02	0.4
								T					1.1
2.5 liter–V6 engines			J						G	C		14-70-14-03	0.9
2.4 liter engine	F											14-70-14-04	0.8
			J						G	C	M		0.5
1.5–1.8–2.0–3.0 EFI engine											M	14-70-14-05	1.1
		Z					N	T	G	C			0.3
	F												0.4
3.3–3.8 liter engine					H	L						14-70-14-06	1.1
											M		1.4
3.5 liter engine – One or all					H	L						14-70-14-07	1.4
3.0 liter – Front bank				R								14-70-14-08	0.4
3.0 liter – Rear bank				R								14-70-14-09	0.8
3.0 liter – Intermediate				R								14-70-14-10	0.3
FC DE, ML, 06, 08, 11, 43													
HOSE, FUEL TANK TO FILLER NECK–Replace (C)													
Standard	F	Z		R				T	G			14-70-15-09	0.5
			J		H	L	N			C			0.6
FC DE, X2, 08, 43													
HOSE/PIPE, FUEL TANK VENT–Replace (B)													
					H	L						14-70-29-01	1.9
FC X2, 08, 43													
CLIPS, TRANSMISSION/OR THROTTLE BODY CONTROL RODS–Replace (C)													
One or all			J				N			C	M	14-80-01-01	0.2
FC 11, 51													

F.C. Failure Codes

DE – I/M TEST FAILURE
ML – MALFUNCTION INDICATOR LAMP ON
X2 – SPLIT, CUT OR TORN
06 – BENT
08 – BLOCKED
11 – BROKEN OR CRACKED
43 – FUEL LEAK
51 – IMPROPERLY INSTALLED
9X – ROUTED IMPROPERLY

000048

GROUP 14

FUEL

OPERATION DESCRIPTION (Even Number Right Side, Odd Number Left Side, Where Applicable)	VEHICLE LINE: Sebring Convertible J	Intrepid/Concorde/Vision H	LHS L	Neon N	Talon T	Avenger/Sebring G	Cirrus/Stratus/Breeze C	Caravan/Voyager/TC M	LABOR OPERATION	LABOR HOURS 1997
GASKET, FUEL PUMP–Replace (C)										
Electric–in tank	J	H	L	N	T	G	C	M	14-50-20-02	0.9 0.4 0.7 0.5
FC X2, 51										
TANK, FUEL–Replace (B)										
	J	H	L	N	T	G	C	M	14-60-01-09	*1.0* 2.0 0.7 0.8 0.9
FC A4, SE, X2, OE, 20, 41, 51, 87										
Optional Equipment										
All wheel drive					T				14-60-01-61	0.9
CAP, FUEL TANK FILLER–Replace (D)										
FC X0, 11, 21, 69	J	H	L	N	T	G	C	M	14-60-05-01	0.2
DOOR, FUEL TANK FILLER–Replace (C)										
	J	H	L	N	T	G	C	M	14-60-08-01	0.2 0.6 0.3
FC 11, 51, 64										
Optional Equipment										
Left side sliding door								M	14-60-08-60	0.4
TUBE, FUEL TANK FILLER–Replace (B)										
Standard	J	H	L	N	T	G	C	M	14-60-15-09	0.6 0.5 0.7
FC 11, 43, 51										

F.C. Failure Codes

A4 – FUEL LEAK-SEAM
SE – SHORTAGE AND/OR ERROR
X0 – VALVE DEFECT
X2 – SPLIT, CUT OR TORN
0E – FUEL LEAK-SENDING UNIT
11 – BROKEN OR CRACKED
20 – COLLAPSED
21 – CONNECTION DEFECT
41 – FOREIGN MATERIAL
43 – FUEL LEAK
51 – IMPROPERLY INSTALLED
64 – MISALIGNED OR MISMATCHED
69 – DISCOLORED
87 – RUSTED

GROUP 14

FUEL

OPERATION DESCRIPTION (Even Number Right Side, Odd Number Left Side, Where Applicable)	VEHICLE LINE: Sebring Convertible (J)	Intrepid/Concorde/Vision (H)	LHS (L)	Neon (N)	Talon (T)	Avenger/Sebring (G)	Cirrus/Stratus/Breeze (C)	Caravan/Voyager/T&C (M)	LABOR OPERATION	LABOR HOURS 1997
SEAL, FUEL TANK SENDING UNIT–Replace (B)	J				T	G	C		14-60-40-09	0.9
		H	L	N				M		0.4 0.7 0.8
FC X2, 43, 51										
STRAP, FUEL TANK SUPPORT–Replace (C)										
Single strap		H	L						14-60-45-01	0.7
One or both	J						C		14-60-45-02/03	0.3
				N	T			M		0.2 0.7 1.2
FC 11, 51										
HOSE, FUEL FLEX–Replace (C)										
One	J			N	T	G	C	M	14-70-05-02	0.2
FC A5, DE, X2, 08, 51										
LINE/TUBE FUEL–Replace (C)										
Includes: Cut and form to size as required.										
To or from tank to engine	J	H	L	N	T	G	C	M	14-70-10-01	0.5 0.7
From tank to frame rail–One or all		H	L						14-70-10-05	2.0
FC 06, 08, 11, 43, 9X										
RAIL, FUEL INJECTOR–Replace (B)										
2.0 turbo equipped					T				14-70-14-01	0.3
2.0 DOHC engine				N	T		C		14-70-14-02	0.4 1.1
2.5 liter–V6 engines	J					G	C		14-70-14-03	0.9
2.4 liter engine	J					G	C	M	14-70-14-04	0.5
2.0–3.0 EFI engine				N	T	G	C	M	14-70-14-05	1.1 0.3
3.3–3.8 liter engine		H	L					M	14-70-14-06	1.1 1.4

Operation continued on next page

F.C. Failure Codes

A5 - CLAMP BROKEN/IMPROP INSTALL
DE - I/M TEST FAILURE
X2 - SPLIT, CUT OR TORN
06 - BENT
08 - BLOCKED
11 - BROKEN OR CRACKED
43 - FUEL LEAK
51 - IMPROPERLY INSTALLED
9X - ROUTED IMPROPERLY

GROUP 14

FUEL

OPERATION DESCRIPTION (Even Number Right Side, Odd Number Left Side, Where Applicable)	VEHICLE LINE: Sebring Convertible J	Intrepid/Concorde/Vision H	LHS L	Neon N	Talon T	Avenger/Sebring G	Cirrus/Stratus/Breeze C	Caravan/Voyager/T&C M	LABOR OPERATION	LABOR HOURS 1997
RAIL, FUEL INJECTOR–Replace (B) (Continued) 3.5 liter engine – One or all FC ML, 06, 08, 11, 43		H	L						**14-70-14-07**	**1.4**
HOSE, FUEL TANK TO FILLER NECK–Replace (C) Standard FC X2, 08, 43	J	H	L	N	T	G	C		**14-70-15-09**	**0.5** **0.6**
HOSE/PIPE, FUEL TANK VENT–Replace (B) FC X2, 08, 43		H	L						**14-70-29-01**	**1.9**
CLIPS, TRANSMISSION/OR THROTTLE BODY CONTROL RODS–Replace (C) One or all FC 11, 51	J			N			C	M	**14-80-01-01**	**0.2**
PAD, ACCELERATOR PEDAL–Replace (C) FC 37, 51					T	G			**14-80-09-01**	**0.2**
PEDAL, ACCELERATOR–Replace (C) FC 07, 11, 51	J	H	L	N	T	G	C	M	**14-80-10-01**	**0.4** **0.2**
Optional Equipment Console equipped					T	G			**14-80-10-60**	**0.3**
SPRING, TRANSMISSION ROD/THROTTLE RETURN–Replace (C) FC 11, 51	J				T	G		M	**14-80-16-01**	**0.2**
CABLE, THROTTLE CONTROL–Replace (B) FC 07, 11, 37, 50, 51	J	H	L	N	T	G	C	M	**14-80-25-01**	**0.3** **0.2**

F.C. Failure Codes

ML – MALFUNCTION INDICATOR LAMP ON
X2 – SPLIT, CUT OR TORN
06 – BENT
07 – BINDS, STICKS, OR SEIZED
08 – BLOCKED
11 – BROKEN OR CRACKED
37 – EXCESSIVE WEAR
43 – FUEL LEAK
50 – IMPROPER ADJUSTMENT
51 – IMPROPERLY INSTALLED

FRONT WHEEL DRIVE LABOR OPERATION TIME SCHEDULE

GROUP 14

FUEL

OPERATION DESCRIPTION (Even Number Right Side, Odd Number Left Side, Where Applicable)	VEHICLE LINE: Sebring Convertible (J)	Intrepid/Concorde (H)	1999 LHS/300M (L)	Neon (N)	Talon (T)	Avenger/Sebring (G)	Cirrus/Stratus/Breeze (C)	Caravan/Voyager/T&C (M)	LABOR OPERATION	LABOR HOURS 1998
TANK, FUEL–Replace (B)										
	J				T				14-60-01-09	*1.1*
		H	L				C			0.9
				N						0.7
								M		0.8
FC [A4, ML, SE, X2, 0E, 20, 41, 51, 87]						*G*				*1.4*
Optional Equipment										
All wheel drive					T				14-60-01-61	0.9
CAP, FUEL TANK FILLER–Replace (D)										
FC [X0, ML, 11, 21, 69]	J	H	L	N	T	G	C	M	14-60-05-01	0.2
DOOR, FUEL TANK FILLER–Replace (C)										
				N	T	G			14-60-08-01	0.2
								M		0.6
	J	H	L				C			0.3
FC [11, 51, 64]										
Optional Equipment										
Left side sliding door								M	14-60-08-60	0.4
TUBE, FUEL TANK FILLER–Replace (B)										
Standard				N	T				14-60-15-09	0.6
	J					G	C			0.5
								M		0.7
		H	L							0.4
FC [11, 43, 51, ML]										
SEAL, FUEL TANK SENDING UNIT–Replace (B)										
					T				14-60-40-09	0.9
						G				0.4
FC [X2, ML, 43, 51]										
STRAP, FUEL TANK SUPPORT–Replace (C)										
One or both	J						C		14-60-45-02/03	0.3
		H	L					M		0.2
				N						0.7
					T					1.2
FC [11, 51]										

F.C. Failure Codes

A4 - FUEL LEAK-SEAM
ML - MALFUNCTION INDICATOR LAMP ON
SE - SHORTAGE AND/OR ERROR
X0 - VALVE DEFECT
X2 - SPLIT, CUT OR TORN
0E - FUEL LEAK-SENDING UNIT
11 - BROKEN OR CRACKED
20 - COLLAPSED
21 - CONNECTION DEFECT
41 - FOREIGN MATERIAL
43 - FUEL LEAK
51 - IMPROPERLY INSTALLED
64 - MISALIGNED OR MISMATCHED
69 - DISCOLORED
87 - RUSTED

GROUP 14

FUEL

OPERATION DESCRIPTION (Even Number Right Side, Odd Number Left Side, Where Applicable)	VEHICLE LINE: Sebring Convertible J	Intrepid/Concorde H	1999 LHS/300M L	Neon N	Talon T	Avenger/Sebring G	Cirrus/Stratus/Breeze C	Caravan/Voyager/T&C M	LABOR OPERATION	LABOR HOURS 1998
HOSE, FUEL FLEX–Replace (C)										
One	J			N	T	G	C	M	**14-70-05-02**	**0.2**
FC A5, DE, X2, 08, 51										
LINE/TUBE FUEL–Replace (C)										
Includes: Cut and form to size as required.										
To or from tank to engine	J	H	L	N	T	G	C	M	**14-70-10-01**	**0.5** **0.7**
From tank to frame rail–One or all		H	L						**14-70-10-05**	**2.0**
FC 06, 08, 11, 43, 9X										
RAIL, FUEL INJECTOR–Replace (B)										
2.0 turbo equipped					T				**14-70-14-01**	**0.3**
2.0 DOHC engine				N	T		C		**14-70-14-02**	**0.4** **1.1**
2.5–2.7 liter engines	J	H	L			G	C		**14-70-14-03**	**0.9** **1.1**
2.4 liter engine	J					G	C	M	**14-70-14-04**	***0.5***
2.0–3.0 EFI engine				N	T	G	C	M	**14-70-14-05**	**1.1** **0.3**
3.3–3.8 liter engine								M	**14-70-14-06**	**1.4**
3.2–3.5 liter engine – One or all		H	L						**14-70-14-07**	**1.4**
FC ML, 06, 08, 11, 43										
HOSE, FUEL TANK TO FILLER NECK–Replace (C)										
Standard	J			N	T	G	C		**14-70-15-09**	**0.5** **0.6**
FC X2, 08, 43										
HOSE/PIPE, FUEL TANK VENT–Replace (B)										
FC X2, 08, 43		H	L						**14-70-29-01**	**1.9**
CLIPS, TRANSMISSION/OR THROTTLE BODY CONTROL RODS–Replace (C)										
One or all	J			N			C	M	**14-80-01-01**	**0.2**
FC 11, 51										

F.C. Failure Codes

A5 – CLAMP BROKEN/IMPROP INSTALL
DE – I/M TEST FAILURE
ML – MALFUNCTION INDICATOR LAMP ON
X2 – SPLIT, CUT OR TORN
06 – BENT
08 – BLOCKED
11 – BROKEN OR CRACKED
43 – FUEL LEAK
51 – IMPROPERLY INSTALLED
9X – ROUTED IMPROPERLY

0000053

FRONT WHEEL DRIVE LABOR OPERATION TIME SCHEDULE

GROUP 14

FUEL

OPERATION DESCRIPTION (Even Number Right Side, Odd Number Left Side, Where Applicable)	VEHICLE LINE: Sebring Convertible (J)	Intrepid/Concorde (H)	LHS/300M (L)	Neon (N)	Avenger/Sebring (G)	Cirrus/Stratus/Breeze (C)	Caravan/Voyager/T&C (M)	2000 Neon (P)	LABOR OPERATION	LABOR HOURS 1999
PUMP, FUEL–Test and replace (C) (Continued)										
2.0–2.4–3.0 liter engine							M		14-50-01-67	0.8
					G					0.7
				N		C		P		0.6
Mopar Diagnostic System Procedures allowance										
2.5–2.7–3.2–3.3–3.5–3.8 liter engine	J	H	L		G	C	M		14-50-01-75	0.6
2.0–2.4–3.0 liter engine							M		14-50-01-77	0.8
					G					0.7
				N		C		P		0.6
GASKET, FUEL PUMP–Replace (C)										
Electric–In tank						C			14-50-20-02	0.9
					G					0.4
							M			0.7
				N						0.5
			L					P		0.8
		H								1.1
	J									1.0
FC X2, 51										
TANK, FUEL–Replace (B)										
		H							14-60-01-09	1.2
			L	N		C		P		0.9
					G		M			0.8
	J									1.1
FC A4, ML, SE, X2, OE, 20, 41, 51, 87										
CAP, FUEL TANK FILLER–Replace (D)										
	J	H	L	N	G	C	M	P	14-60-05-01	0.2
FC XO, ML, 11, 21, 69										
DOOR, FUEL TANK FILLER–Replace (C)										
				N	G			P	14-60-08-01	0.2
							M			0.6
	J	H	L			C				0.3
FC 11, 51, 64										
Optional Equipment										
Left side sliding door							M		14-60-08-60	0.4

F.C. Failure Codes

A4 – FUEL LEAK-SEAM
ML – MALFUNCTION INDICATOR LAMP ON
SE – SHORTAGE AND/OR ERROR
XO – VALVE DEFECT
X2 – SPLIT, CUT OR TORN
OE – FUEL LEAK-SENDING UNIT
11 – BROKEN OR CRACKED
20 – COLLAPSED
21 – CONNECTION DEFECT
41 – FOREIGN MATERIAL
51 – IMPROPERLY INSTALLED
64 – MISALIGNED OR MISMATCHED
69 – DISCOLORED
87 – RUSTED

FRONT WHEEL DRIVE LABOR OPERATION TIME SCHEDULE

GROUP 14

FUEL

OPERATION DESCRIPTION (Even Number Right Side, Odd Number Left Side, Where Applicable)	VEHICLE LINE: Sebring Convertible (J)	Intrepid/Concorde (H)	LHS/300M (L)	Neon (N)	Avenger/Sebring (G)	Cirrus/Stratus/Breeze (C)	Caravan/Voyager/T&C (M)	2000 Neon (P)	LABOR OPERATION	LABOR HOURS 1999
TUBE, FUEL TANK FILLER–Replace (B)										
Standard	J			N	G	C	M	P	**14-60-15-09**	**0.4** **0.5** **0.7** **0.4**
		H	L							
FC 11, 43, 51, ML										
SEAL, FUEL TANK SENDING UNIT–Replace (B)										
FC X2, ML, 43, 51					G				**14-60-40-09**	**0.4**
STRAP, FUEL TANK SUPPORT–Replace (C)										
One or both	J	H	L	N		C	M	P	**14-60-45-02/03**	**0.3** **0.2** **0.7**
FC 11, 51										
HOSE, FUEL FLEX–Replace (C)										
One	J			N	G	C	M	P	**14-70-05-02**	**0.2**
FC A5, DE, X2, 08, 51										
LINE/TUBE FUEL–Replace (C)										
Includes: Cut and form to size as required.										
To or from tank to engine	J	H	L	N	G	C	M	P	**14-70-10-01**	**0.5** **0.7**
From tank to frame rail–One or all		H	L						**14-70-10-05**	**2.0**
FC 06, 08, 11, 43, 9X										
RAIL, FUEL INJECTOR–Replace (B)										
2.0 DOHC engine				N		C		P	**14-70-14-02**	**0.4**
2.5–2.7 liter engines	J				G	C			**14-70-14-03**	**0.9** **1.1**
		H	L							
2.4 liter engine	J				G	C	M		**14-70-14-04**	**0.3**
2.0–3.0 liter engines				N	G	C	M	P	**14-70-14-05**	**1.1** **0.3** **0.4**
3.3–3.8 liter engine							M		**14-70-14-06**	**1.4**

Operation continued on next page

F.C. Failure Codes

A5 – CLAMP BROKEN/IMPROP INSTALL
DE – I/M TEST FAILURE
ML – MALFUNCTION INDICATOR LAMP ON
X2 – SPLIT, CUT OR TORN
06 – BENT
08 – BLOCKED
11 – BROKEN OR CRACKED
43 – FUEL LEAK
51 – IMPROPERLY INSTALLED
9X – ROUTED IMPROPERLY

FRONT WHEEL DRIVE LABOR OPERATION TIME SCHEDULE

GROUP 14

FUEL

OPERATION DESCRIPTION (Even Number Right Side, Odd Number Left Side, Where Applicable)	VEHICLE LINE: Sebring Convertible J	Intrepid/Concorde H	LHS/300M L	Neon N	Avenger/Sebring G	Cirrus/Stratus/Breeze C	Caravan/Voyager/T&C M	2000 Neon P	LABOR OPERATION	LABOR HOURS 1999
RAIL, FUEL INJECTOR–Replace (B) (Continued)										
3.2–3.5 liter engine – One or all		H	L						**14-70-14-07**	**1.4**
										1.2
FC ML, 06, 08, 11, 43										
HOSE, FUEL TANK TO FILLER NECK–Replace (C)										
Standard					G				**14-70-15-09**	**0.5**
						C				**0.6**
				N				P		**0.3**
	J									**0.2**
FC X2, 08, 43										
HOSE/PIPE, FUEL TANK VENT–Replace (B)		H	L						**14-70-29-01**	**1.9**
FC X2, 08, 43										
CLIPS, TRANSMISSION/OR THROTTLE BODY CONTROL RODS–Replace (C)										
One or all	J			N		C	M	P	**14-80-01-01**	**0.2**
FC 11, 51										
PAD, ACCELERATOR PEDAL–Replace (C)					G				**14-80-09-01**	**0.2**
FC 37, 51										
PEDAL, ACCELERATOR–Replace (C)					G				**14-80-10-01**	**0.4**
	J	H	L	N		C	M	P		**0.2**
FC 07, 11, 51										
Optional Equipment										
Console equipped					G				**14-80-10-60**	**0.3**
SPRING, TRANSMISSION ROD/THROTTLE RETURN–Replace (C)	J				G		M		**14-80-16-01**	**0.2**
FC 11, 51										

F.C. Failure Codes

ML – MALFUNCTION INDICATOR LAMP ON
X2 – SPLIT, CUT OR TORN
06 – BENT
07 – BINDS, STICKS, OR SEIZED
08 – BLOCKED
11 – BROKEN OR CRACKED
37 – EXCESSIVE WEAR
43 – FUEL LEAK
51 – IMPROPERLY INSTALLED

000055

FRONT WHEEL DRIVE LABOR OPERATION TIME SCHEDULE

GROUP 14

FUEL

OPERATION DESCRIPTION (Even Number Right Side, Odd Number Left Side, Where Applicable)	VEHICLE LINE: Sebring Convertible (J)	Intrepid/Concorde (H)	LHS/300M (L)	Avenger/Sebring (G)	Cirrus/Stratus/Breeze (C)	Caravan/Voyager/T&C (M)	Neon (P)	LABOR OPERATION	LABOR HOURS 2000
PUMP, FUEL–Test and replace (C) (Continued)									
2.0–2.4–3.0 liter engine				G	C	M	P	**14-50-01-67**	**0.8 0.7 0.6**
Mopar Diagnostic System Procedures allowance									
2.5–2.7–3.2–3.3–3.5–3.8 liter engine	J	H	L	G	C	M		**14-50-01-75**	**0.6**
2.0–2.4–3.0 liter engine				G	C	M	P	**14-50-01-77**	**0.8 0.7 0.6**
GASKET, FUEL PUMP–Replace (C)									
Electric–In tank	J	H	L	G	C	M	P	**14-50-20-02**	**0.9 0.4 0.7 0.8 1.1 1.0**
FC X2, 51									
TANK, FUEL–Replace (B)	J	H	L	G	C	M	P	**14-60-01-09**	**1.2 0.9 0.8 1.1**
FC A4, ML, SE, X2, 0E, 20, 41, 51, 87									
CAP, FUEL TANK FILLER–Replace (D)	J	H	L	G	C	M	P	**14-60-05-01**	**0.2**
FC X0, ML, 11, 21, 69									
DOOR, FUEL TANK FILLER–Replace (C)	J			G			P	**14-60-08-01**	**0.2**
		H	L		C	M			**0.6 0.3**
FC 11, 51, 64									
Optional Equipment									
Left side sliding door						M		**14-60-08-60**	**0.4**

F.C. Failure Codes

A4 – FUEL LEAK-SEAM
ML – MALFUNCTION INDICATOR LAMP ON
SE – SHORTAGE AND/OR ERROR
X0 – VALVE DEFECT
X2 – SPLIT, CUT OR TORN
0E – FUEL LEAK-SENDING UNIT
11 – BROKEN OR CRACKED
20 – COLLAPSED
21 – CONNECTION DEFECT
41 – FOREIGN MATERIAL
51 – IMPROPERLY INSTALLED
64 – MISALIGNED OR MISMATCHED
69 – DISCOLORED
87 – RUSTED

FRONT WHEEL DRIVE LABOR OPERATION TIME SCHEDULE

GROUP 14 FUEL OPERATION DESCRIPTION (Even Number Right Side, Odd Number Left Side, Where Applicable)	VEHICLE LINE Sebring Convertible	Intrepid/Concorde	LHS/300M	Avenger/Sebring	Cirrus/Stratus/Breeze	Caravan/Voyager/T&C	Neon	LABOR OPERATION	LABOR HOURS 2000
	J	H	L	G	C	M	P		
TUBE, FUEL TANK FILLER–Replace (B)									
Standard	J			G	C			**14-60-15-09**	**0.2**
						M			**0.5**
		H	L				P		**0.7**
									0.4
FC 11, 43, 51, ML									
SEAL, FUEL TANK SENDING UNIT–Replace (B)				G				**14-60-40-09**	**0.4**
FC X2, ML, 43, 51									
STRAP, FUEL TANK SUPPORT–Replace (C)									
One or both	J	H			C			**14-60-45-02/03**	**0.3**
			L			M			**0.2**
							P		**0.7**
FC 11, 51									
HOSE, FUEL FLEX–Replace (C)									
One	J			G	C	M	P	**14-70-05-02**	**0.2**
FC A5, DE, X2, 08, 51									
LINE/TUBE FUEL–Replace (C)									
Includes: Cut and form to size as required.									
To or from tank to engine				G				**14-70-10-01**	**0.5**
	J	H	L		C	M	P		**0.7**
From tank to frame rail–One or all		H	L					**14-70-10-05**	**2.0**
FC 06, 08, 11, 43, 9X									
RAIL, FUEL INJECTOR–Replace (B)									
2.0 DOHC engine					C		P	**14-70-14-02**	**0.4**
2.5–2.7 liter engines	J			G	C			**14-70-14-03**	**0.9**
		H	L						**1.1**
2.4 liter engine	J			G	C	M		**14-70-14-04**	**0.3**
2.0–3.0 liter engines						M		**14-70-14-05**	**1.1**
				G	C				**0.3**
							P		**0.4**
3.3–3.8 liter engine						M		**14-70-14-06**	**1.4**

Operation continued on next page

F.C. Failure Codes

A5 – CLAMP BROKEN/IMPROP INSTALL
DE – I/M TEST FAILURE
ML – MALFUNCTION INDICATOR LAMP ON
X2 – SPLIT, CUT OR TORN
06 – BENT
08 – BLOCKED
11 – BROKEN OR CRACKED
43 – FUEL LEAK
51 – IMPROPERLY INSTALLED
9X – ROUTED IMPROPERLY

GROUP 14 FUEL OPERATION DESCRIPTION (Even Number Right Side, Odd Number Left Side, Where Applicable)	VEHICLE LINE Sebring Convertible (J) Intrepid/Concorde (H) LHS/300M (L) Avenger/Sebring (G) Cirrus/Stratus/Breeze (C) Caravan/Voyager/T&C (M) Neon (P)	LABOR OPERATION	LABOR HOURS 2000
RAIL, FUEL INJECTOR–Replace (B) (Continued) 3.2–3.5 liter engine – One or all FC ML, 06, 08, 11, 43	H L	**14–70–14–07**	**1.2**
HOSE, FUEL TANK TO FILLER NECK–Replace (C) Standard FC X2, 08, 43	J G C P	**14–70–15–09**	**0.5** **0.6** **0.3** **0.2**
HOSE/PIPE, FUEL TANK VENT–Replace (B) FC X2, 08, 43	H L	**14–70–29–01**	**1.9**
CLIPS, TRANSMISSION/OR THROTTLE BODY CONTROL RODS–Replace (C) One or all FC 11, 51	J C M P	**14–80–01–01**	**0.2**
PAD, ACCELERATOR PEDAL–Replace (C) FC 37, 51	G	**14–80–09–01**	**0.2**
PEDAL, ACCELERATOR–Replace (C) FC 07, 11, 51	G J H L C M P	**14–80–10–01**	**0.4** **0.2**
Optional Equipment Console equipped	G	**14–80–10–60**	**0.3**
SPRING, TRANSMISSION ROD/THROTTLE RETURN–Replace (C) FC 11, 51	J G M	**14–80–16–01**	**0.2**
CABLE, THROTTLE CONTROL–Replace (B) FC 07, 11, 37, 50, 51	G C J H L M P	**14–80–25–01**	**0.3** **0.2**

F.C. Failure Codes

ML – MALFUNCTION INDICATOR LAMP ON
X2 – SPLIT, CUT OR TORN
06 – BENT
07 – BINDS, STICKS, OR SEIZED
08 – BLOCKED
11 – BROKEN OR CRACKED
37 – EXCESSIVE WEAR
43 – FUEL LEAK
50 – IMPROPER ADJUSTMENT
51 – IMPROPERLY INSTALLED

7

000060

EA99-013
SERVICE PARTS DEMAND

Part		CALENDAR YEAR				MONTH-YEAR									
No.	NAME	1995	1996	1997	1998	JAN-99	FEB-99	MAR-99	APR-99	MAY-99	JUN-99	JUL-99	AUG-99	SEP-99	OCT-99
04682733	HOSE	24	62	79	32	4	8	11	11	14	13	9	11	7	17
04725925AA	TUBE	0	0	14	57	32	32	17	21	10	18	22	18	19	29
04809331AA	TUBE	0	0	0	0	0	0	3	11	13	9	32	14	15	16
04809434	TUBE	135	166	0	4	4	1	1	1	0	1	6	3	2	1
04809547	TUBE	22	37	35	1	1	1	2	0	4	0	1	0	1	1
04809890	TUBE	0	305	807	105	45	50	28	63	51	54	86	109	120	85
04809891	TUBE	0	188	316	72	26	25	40	35	15	22	21	45	25	45
04809926AA	TUBE	0	0	10	22	11	13	16	12	8	3	11	13	7	13
04880422AA	TUBE	0	0	0	0	1	0	1	4	1	5	2	5	2	8
04880422AB	TUBE	0	0	0	0	0	0	0	0	2	1	2	4	12	8
06502091	CLAMP	98	175	234	62	11	20	10	163	21	7	43	20	21	41

U.S. Traffic Accident Data (NHTSA GES), 1990-98
Vehicle with Fire Rates

All Impacts

Target	Vehicle Model	Accident Vehicles	Vehicles w Fire	Percent Vehicles w Fire	Accident Vehicles (Wtd)	Vehicles w Fire (Wtd)	Percent Vehicles w Fire(Wtd)
Comparison	Chevrolet Astro, 92-99	894	2	0.22	119,744	376	0.31
	Chevrolet Lumina Minivan, 92-96	253	0	0.00	37,392	0	0.00
	Chevrolet Lumina Minivan, 97-99	2	0	0.00	116	0	0.00
	Ford Aerostar, 92-97	1,235	0	0.00	163,043	0	0.00
	Ford Windstar, 95-98	622	0	0.00	85,907	0	0.00
	GMC Safari, 92-99	355	0	0.00	52,341	0	0.00
	Honda Odyssey, 96-98	27	0	0.00	3,831	0	0.00
	Isuzu Oasis, 96-98	16	0	0.00	2,352	0	0.00
	Mazda MPV, 92-99	212	0	0.00	26,422	0	0.00
	Mercury Villager, 93-98	476	0	0.00	63,928	0	0.00
	Nissan Quest, 93-98	277	0	0.00	37,580	0	0.00
	Oldsmobile Silhouette, 92-96	90	1	1.11	12,975	135	1.04
	Oldsmobile Silhouette, 97-99	15	0	0.00	2,594	0	0.00
	Pontiac Trans Sport, 92-96	216	0	0.00	30,135	0	0.00
	Pontiac Trans Sport, 97-99	26	0	0.00	3,713	0	0.00
	Toyota Previa, 92-97	193	0	0.00	22,658	0	0.00
	Volkswagen Eurovan, 93-98	15	0	0.00	1,470	0	0.00
Comparison		4,924	3	0.06	666,202	511	0.08
Target	Chrysler Town & Country SX, 97-99	71	0	0.00	9,252	0	0.00
	Chrysler Town & Country, 96-99	54	0	0.00	7,763	0	0.00
	Dodge Caravan, 96-99	308	1	0.32	43,583	82	0.19
	Dodge Grand Caravan, 96-99	116	0	0.00	15,428	0	0.00
	Plymouth Grand Voyager, 96-99	69	0	0.00	9,694	0	0.00
	Plymouth Voyager, 96-99	103	0	0.00	12,498	0	0.00
Target		721	1	0.14	98,218	82	0.08

U.S. Traffic Accident Data (NHTSA GES), 1990-98
Vehicle with Fire Rates

Side Impacts

Target	Vehicle Model	Accident Vehicles	Vehicles w Fire	Percent Vehicles w Fire	Accident Vehicles (Wtd)	Vehicles w Fire (Wtd)	Percent Vehicles w Fire (Wtd)
Comparison	Chevrolet Astro, 92-99	275	0	0.00	38,081	0	0.00
	Chevrolet Lumina Minivan, 92-96	84	0	0.00	13,603	0	0.00
	Chevrolet Lumina Minivan, 97-99	1	0	0.00	105	0	0.00
	Ford Aerostar, 92-97	379	0	0.00	50,635	0	0.00
	Ford Windstar, 95-98	200	0	0.00	29,138	0	0.00
	GMC Safari, 92-99	107	0	0.00	16,247	0	0.00
	Honda Odyssey, 96-98	9	0	0.00	968	0	0.00
	Isuzu Oasis, 96-98	9	0	0.00	1,162	0	0.00
	Mazda MPV, 92-99	46	0	0.00	4,991	0	0.00
	Mercury Villager, 93-98	150	0	0.00	21,289	0	0.00
	Nissan Quest, 93-98	81	0	0.00	11,633	0	0.00
	Oldsmobile Silhouette, 92-96	39	0	0.00	6,318	0	0.00
	Oldsmobile Silhouette, 97-99	4	0	0.00	574	0	0.00
	Pontiac Trans Sport, 92-96	51	0	0.00	8,050	0	0.00
	Pontiac Trans Sport, 97-99	7	0	0.00	1,192	0	0.00
	Toyota Previa, 92-97	63	0	0.00	6,762	0	0.00
	Volkswagen Eurovan, 93-98	2	0	0.00	323	0	0.00
Comparison		1,507	0	0.00	211,071	0	0.00
Target	Chrysler Town & Country SX, 97-99	21	0	0.00	2,861	0	0.00
	Chrysler Town & Country, 96-99	19	0	0.00	3,131	0	0.00
	Dodge Caravan, 96-99	95	0	0.00	13,053	0	0.00
	Dodge Grand Caravan, 96-99	31	0	0.00	3,314	0	0.00
	Plymouth Grand Voyager, 96-99	29	0	0.00	4,700	0	0.00
	Plymouth Voyager, 96-99	35	0	0.00	4,983	0	0.00
Target		230	0	0.00	32,041	0	0.00

U.S. Traffic Accident Data (NHTSA GES), 1990-98
Vehicle with Fire Rates

Far Side Impacts

Target	Vehicle Model	Accident Vehicles	Vehicles w Fire	Percent Vehicles w Fire	Accident Vehicles (Wtd)	Vehicles w Fire (Wtd)	Percent Vehicles w Fire(Wtd)
Comparison	Chevrolet Astro, 92-99	140	0	0.00	19,755	0	0.00
	Chevrolet Lumina Minivan, 92-96	42	0	0.00	7,227	0	0.00
	Chevrolet Lumina Minivan, 97-99	1	0	0.00	105	0	0.00
	Ford Aerostar, 92-97	184	0	0.00	25,257	0	0.00
	Ford Windstar, 95-98	102	0	0.00	15,204	0	0.00
	GMC Safari, 92-99	60	0	0.00	9,428	0	0.00
	Honda Odyssey, 96-98	1	0	0.00	80	0	0.00
	Isuzu Oasis, 96-98	3	0	0.00	611	0	0.00
	Mazda MPV, 92-99	24	0	0.00	2,306	0	0.00
	Mercury Villager, 93-98	90	0	0.00	12,301	0	0.00
	Nissan Quest, 93-98	37	0	0.00	8,185	0	0.00
	Oldsmobile Silhouette, 92-96	19	0	0.00	2,853	0	0.00
	Oldsmobile Silhouette, 97-99	3	0	0.00	480	0	0.00
	Pontiac Trans Sport, 92-96	25	0	0.00	4,524	0	0.00
	Pontiac Trans Sport, 97-99	5	0	0.00	866	0	0.00
	Toyota Previa, 92-97	30	0	0.00	3,629	0	0.00
	Volkswagen Eurovan, 93-98	1	0	0.00	289	0	0.00
Comparison		767	0	0.00	111,108	0	0.00
Target	Chrysler Town & Country SX, 97-99	13	0	0.00	2,037	0	0.00
	Chrysler Town & Country, 96-99	9	0	0.00	1,640	0	0.00
	Dodge Caravan, 96-99	47	0	0.00	8,488	0	0.00
	Dodge Grand Caravan, 96-99	19	0	0.00	2,343	0	0.00
	Plymouth Grand Voyager, 96-99	12	0	0.00	1,775	0	0.00
	Plymouth Voyager, 96-99	14	0	0.00	1,687	0	0.00
Target		114	0	0.00	15,970	0	0.00

U.S. Traffic Accident Data (NHTSA GES), 1990-98
Vehicle with Fire Rates

Near Side Impacts

Target	Vehicle Model	Accident Vehicles	Vehicles w Fire	Percent Vehicles w Fire	Accident Vehicles (Wtd)	Vehicles w Fire (Wtd)	Percent Vehicles w Fire(Wtd)
Comparison	Chevrolet Astro, 92-99	135	0	0.00	18,326	0	0.00
	Chevrolet Lumina Minivan, 92-96	42	0	0.00	6,376	0	0.00
	Ford Aerostar, 92-97	195	0	0.00	25,378	0	0.00
	Ford Windstar, 95-98	98	0	0.00	13,934	0	0.00
	GMC Safari, 92-99	47	0	0.00	6,819	0	0.00
	Honda Odyssey, 96-98	8	0	0.00	888	0	0.00
	Isuzu Oasis, 96-98	6	0	0.00	551	0	0.00
	Mazda MPV, 92-99	22	0	0.00	2,685	0	0.00
	Mercury Villager, 93-98	60	0	0.00	8,988	0	0.00
	Nissan Quest, 93-98	44	0	0.00	5,448	0	0.00
	Oldsmobile Silhouette, 92-96	20	0	0.00	3,465	0	0.00
	Oldsmobile Silhouette, 97-99	1	0	0.00	94	0	0.00
	Pontiac Trans Sport, 92-96	26	0	0.00	3,527	0	0.00
	Pontiac Trans Sport, 97-99	2	0	0.00	326	0	0.00
	Toyota Previa, 92-97	33	0	0.00	3,133	0	0.00
	Volkswagen Eurovan, 93-98	1	0	0.00	24	0	0.00
Comparison		740	0	0.00	99,863	0	0.00
Target	Chrysler Town & Country SX, 97-99	8	0	0.00	824	0	0.00
	Chrysler Town & Country, 96-99	10	0	0.00	1,491	0	0.00
	Dodge Caravan, 96-99	48	0	0.00	6,565	0	0.00
	Dodge Grand Caravan, 96-99	12	0	0.00	971	0	0.00
	Plymouth Grand Voyager, 96-99	17	0	0.00	2,925	0	0.00
	Plymouth Voyager, 96-99	21	0	0.00	3,296	0	0.00
Target		116	0	0.00	16,071	0	0.00

Alabama 1991-1998

Vehicle Fire Rates for Chrysler Minivans and Other MY 92-99 Comparison Vehicles

All Impacts

Vehicle Group	Make Model	Collision Vehicles	Vehicles w Postcoll Fire	Vehicles w Postcoll Fire Per 1000 Vehicles
Comparison	Chevrolet Astro, 92-99	3,217	10	3.11
	Chevrolet Lumina Minivan, 92-96	763	0	0.00
	Ford Aerostar, 92-97	3,356	4	1.19
	Ford Windstar, 95-98	1,452	1	0.69
	GMC Safari, 92-99	987	0	0.00
	Honda Odyssey, 96-98	83	1	12.05
	Isuzu Oasis, 96-98	10	0	0.00
	Mazda MPV, 92-99	998	0	0.00
	Mercury Villager, 93-98	913	4	4.38
	Nissan Quest, 93-98	955	1	1.05
	Oldsmobile Silhouette, 92-96	218	0	0.00
	Oldsmobile Silhouette, 97-99	30	0	0.00
	Pontiac Trans Sport, 92-96	397	1	2.52
	Pontiac Trans Sport, 97-99	67	0	0.00
	Toyota Previa, 92-97	420	1	2.38
	Toyota Sienna, 98-99	28	0	0.00
	Volkswagen Eurovan, 93-98	15	0	0.00
Comparison		13,909	23	1.65
Target	Chrysler Town & Country SX, 97-99	2	0	0.00
	Chrysler Town & Country, 96-99	332	0	0.00
	Dodge Caravan, 96-99	374	3	8.02
	Dodge Grand Caravan, 96-99	591	0	0.00
	Plymouth Grand Voyager, 96-99	248	0	0.00
	Plymouth Voyager, 96-99	171	0	0.00
Target		1,718	3	1.75

Alabama 1991-1998

Vehicle Fire Rates for Chrysler Minivans and Other MY 92-99 Comparison Vehicles

Side Impacts

Vehicle Group	Make Model	Collision Vehicles	Vehicles w Postcoll Fire	Vehicles w Postcoll Fire Per 1000 Vehicles
Comparison	Chevrolet Astro, 92-99	1,070	0	0.00
	Chevrolet Lumina Minivan, 92-96	268	0	0.00
	Ford Aerostar, 92-97	1,143	0	0.00
	Ford Windstar, 95-98	460	0	0.00
	GMC Safari, 92-99	335	0	0.00
	Honda Odyssey, 96-98	21	0	0.00
	Isuzu Oasis, 96-98	3	0	0.00
	Mazda MPV, 92-99	295	0	0.00
	Mercury Villager, 93-98	307	0	0.00
	Nissan Quest, 93-98	304	0	0.00
	Oldsmobile Silhouette, 92-96	100	0	0.00
	Oldsmobile Silhouette, 97-99	7	0	0.00
	Pontiac Trans Sport, 92-96	144	0	0.00
	Pontiac Trans Sport, 97-99	24	0	0.00
	Toyota Previa, 92-97	148	0	0.00
	Toyota Sienna, 98-99	12	0	0.00
	Volkswagen Eurovan, 93-98	3	0	0.00
Comparison		4,644	0	0.00
Target	Chrysler Town & Country, 96-99	117	0	0.00
	Dodge Caravan, 96-99	129	0	0.00
	Dodge Grand Caravan, 96-98	207	0	0.00
	Plymouth Grand Voyager, 96-99	84	0	0.00
	Plymouth Voyager, 96-99	54	0	0.00
Target		591	0	0.00

Alabama 1991-1998
Vehicle Fire Rates for Chrysler Minivans and Other MY 92-99 Comparison Vehicles

Far Side Impacts

Vehicle Group	Make Model	Collision Vehicles	Vehicles w Postcoll Fire	Vehicles w Postcoll Fire Per 1000 Vehicles
Comparison	Chevrolet Astro, 92-99	583	0	0.00
	Chevrolet Lumina Minivan, 92-96	123	0	0.00
	Ford Aerostar, 92-97	550	0	0.00
	Ford Windstar, 95-98	220	0	0.00
	GMC Safari, 92-99	187	0	0.00
	Honda Odyssey, 96-98	7	0	0.00
	Isuzu Oasis, 96-98	2	0	0.00
	Mazda MPV, 92-99	154	0	0.00
	Mercury Villager, 93-98	140	0	0.00
	Nissan Quest, 93-98	151	0	0.00
	Oldsmobile Silhouette, 92-96	39	0	0.00
	Oldsmobile Silhouette, 97-99	4	0	0.00
	Pontiac Trans Sport, 92-96	65	0	0.00
	Pontiac Trans Sport, 97-99	13	0	0.00
	Toyota Previa, 92-97	67	0	0.00
	Toyota Sienna, 98-99	6	0	0.00
	Volkswagen Eurovan, 93-98	2	0	0.00
Comparison		2,293	0	0.00
Target	Chrysler Town & Country, 96-99	57	0	0.00
	Dodge Caravan, 96-99	51	0	0.00
	Dodge Grand Caravan, 96-99	104	0	0.00
	Plymouth Grand Voyager, 96-99	40	0	0.00
	Plymouth Voyager, 96-99	28	0	0.00
Target		280	0	0.00

Alabama 1991-1998

Vehicle Fire Rates for Chrysler Minivans and Other MY 92-99 Comparison Vehicles

Near Side Impacts

Vehicle Group	Make Model	Collision Vehicles	Vehicles w Postcoll Fire	Vehicles w Postcoll Fire Per 1000 Vehicles
Comparison	Chevrolet Astro, 92-99	487	0	0.00
	Chevrolet Lumina Minivan, 92-96	145	0	0.00
	Ford Aerostar, 92-97	593	0	0.00
	Ford Windstar, 95-98	240	0	0.00
	GMC Safari, 92-99	168	0	0.00
	Honda Odyssey, 98-98	14	0	0.00
	Isuzu Oasis, 96-98	1	0	0.00
	Mazda MPV, 92-99	141	0	0.00
	Mercury Villager, 93-98	167	0	0.00
	Nissan Quest, 93-98	153	0	0.00
	Oldsmobile Silhouette, 92-96	61	0	0.00
	Oldsmobile Silhouette, 97-99	3	0	0.00
	Pontiac Trans Sport, 92-96	79	0	0.00
	Pontiac Trans Sport, 97-99	11	0	0.00
	Toyota Previa, 92-97	81	0	0.00
	Toyota Sienna, 98-99	6	0	0.00
	Volkswagen Eurovan, 93-98	1	0	0.00
Comparison		2,351	0	0.00
Target	Chrysler Town & Country, 96-99	60	0	0.00
	Dodge Caravan, 96-99	78	0	0.00
	Dodge Grand Caravan, 96-99	103	0	0.00
	Plymouth Grand Voyager, 96-99	44	0	0.00
	Plymouth Voyager, 96-99	26	0	0.00
Target		311	0	0.00

Florida 1991-1998
Vehicle Fire Rates for Chrysler Minivans and Other MY 92-99 Minivans

All Impacts

Vehicle Group	Make Model	Collision Vehicles	Vehicles w Postcoll Fire	Vehicles w Postcoll Fire Per 1000 Vehicles
Comparison	Chevrolet Astro, 92-99	6,914	6	0.87
	Chevrolet Lumina Minivan, 92-96	2,049	1	0.49
	Ford Aerostar, 92-97	9,965	2	0.20
	Ford Windstar, 95-98	4,184	0	0.00
	GMC Safari, 92-99	2,049	0	0.00
	Honda Odyssey, 96-98	220	0	0.00
	Isuzu Oasis, 96-98	41	0	0.00
	Mazda MPV, 92-99	2,247	0	0.00
	Mercury Villager, 93-98	2,136	0	0.00
	Nissan Quest, 93-98	2,687	1	0.37
	Oldsmobile Silhouette, 92-96	626	0	0.00
	Oldsmobile Silhouette, 97-99	113	0	0.00
	Pontiac Trans Sport, 92-96	1,626	3	1.85
	Pontiac Trans Sport, 97-99	183	0	0.00
	Toyota Previa, 92-97	1,741	1	0.57
	Toyota Sienna, 98-99	123	0	0.00
	Volkswagen Eurovan, 93-98	60	0	0.00
Comparison		36,984	14	0.38
Target	Chrysler Town & Country SX, 97-99	15	0	0.00
	Chrysler Town & Country, 96-99	771	1	1.30
	Dodge Caravan, 96-99	1,619	0	0.00
	Dodge Grand Caravan, 96-99	2,089	2	0.96
	Plymouth Grand Voyager, 96-99	952	1	1.05
	Plymouth Voyager, 96-99	677	1	1.48
Target		6,123	5	0.82

Florida 1991-1998
Vehicle Fire Rates for Chrysler Minivans and Other MY 92-99 Minivans

Side Impacts

Vehicle Group	Make Model	Collision Vehicles	Vehicles w Postcoll Fire	Vehicles w Postcoll Fire Per 1000 Vehicles
Comparison	Chevrolet Astro, 92-99	1,609	1	0.62
	Chevrolet Lumina Minivan, 92-96	484	0	0.00
	Ford Aerostar, 92-97	2,161	1	0.46
	Ford Windstar, 95-98	938	0	0.00
	GMC Safari, 92-99	522	0	0.00
	Honda Odyssey, 96-98	45	0	0.00
	Isuzu Oasis, 96-98	13	0	0.00
	Mazda MPV, 92-99	424	0	0.00
	Mercury Villager, 93-98	518	0	0.00
	Nissan Quest, 93-98	637	0	0.00
	Oldsmobile Silhouette, 92-96	166	0	0.00
	Oldsmobile Silhouette, 97-99	28	0	0.00
	Pontiac Trans Sport, 92-96	323	0	0.00
	Pontiac Trans Sport, 97-99	44	0	0.00
	Toyota Previa, 92-97	367	0	0.00
	Toyota Sienna, 98-99	24	0	0.00
	Volkswagen Eurovan, 93-98	16	0	0.00
Comparison		8,317	2	0.24
Target	Chrysler Town & Country SX, 97-99	5	0	0.00
	Chrysler Town & Country, 96-99	167	0	0.00
	Dodge Caravan, 96-99	411	0	0.00
	Dodge Grand Caravan, 96-99	518	1	1.93
	Plymouth Grand Voyager, 96-99	252	0	0.00
	Plymouth Voyager, 96-99	163	0	0.00
Target		1,517	1	0.66

Florida 1991-1998
Vehicle Fire Rates for Chrysler Minivans and Other MY 92-99 Minivans

Far Side Impacts

Vehicle Group	Make Model	Collision Vehicles	Vehicles w Postcoll Fire	Vehicles w Postcoll Fire Per 1000 Vehicles
Comparison	Chevrolet Astro, 92-99	892	0	0.00
	Chevrolet Lumina Minivan, 92-96	251	0	0.00
	Ford Aerostar, 92-97	1,075	0	0.00
	Ford Windstar, 95-98	460	0	0.00
	GMC Safari, 92-99	282	0	0.00
	Honda Odyssey, 96-98	26	0	0.00
	Isuzu Oasis, 96-98	6	0	0.00
	Mazda MPV, 92-99	187	0	0.00
	Mercury Villager, 93-98	237	0	0.00
	Nissan Quest, 93-98	306	0	0.00
	Oldsmobile Silhouette, 92-96	83	0	0.00
	Oldsmobile Silhouette, 97-99	15	0	0.00
	Pontiac Trans Sport, 92-96	154	0	0.00
	Pontiac Trans Sport, 97-99	20	0	0.00
	Toyota Previa, 92-97	198	0	0.00
	Toyota Sienna, 98-99	11	0	0.00
	Volkswagen Eurovan, 93-98	10	0	0.00
Comparison		4,213	0	0.00
Target	Chrysler Town & Country SX, 97-99	3	0	0.00
	Chrysler Town & Country, 96-99	90	0	0.00
	Dodge Caravan, 96-99	205	0	0.00
	Dodge Grand Caravan, 96-99	263	1	3.80
	Plymouth Grand Voyager, 96-99	134	0	0.00
	Plymouth Voyager, 96-99	83	0	0.00
Target		778	1	1.29

Florida 1991-1998
Vehicle Fire Rates for Chrysler Minivans and Other MY 92-99 Minivans

Near Side Impacts

Vehicle Group	Make Model	Collision Vehicles	Vehicles w Postcoll Fire	Vehicles w Postcoll Fire *Per 1000* Vehicles
Comparison	Chevrolet Astro, 92-99	717	1	1.39
	Chevrolet Lumina Minivan, 92-96	233	0	0.00
	Ford Aerostar, 92-97	1,086	1	0.92
	Ford Windstar, 95-98	478	0	0.00
	GMC Safari, 92-99	240	0	0.00
	Honda Odyssey, 96-98	19	0	0.00
	Isuzu Oasis, 96-98	7	0	0.00
	Mazda MPV, 92-99	237	0	0.00
	Mercury Villager, 93-98	279	0	0.00
	Nissan Quest, 93-98	331	0	0.00
	Oldsmobile Silhouette, 92-96	83	0	0.00
	Oldsmobile Silhouette, 97-98	13	0	0.00
	Pontiac Trans Sport, 92-96	169	0	0.00
	Pontiac Trans Sport, 97-99	24	0	0.00
	Toyota Previa, 92-97	169	0	0.00
	Toyota Sienna, 98-99	13	0	0.00
	Volkswagen Eurovan, 93-98	6	0	0.00
Comparison		4,104	2	0.49
Target	Chrysler Town & Country SX, 97-99	2	0	0.00
	Chrysler Town & Country, 96-99	77	0	0.00
	Dodge Caravan, 96-99	206	0	0.00
	Dodge Grand Caravan, 96-99	256	0	0.00
	Plymouth Grand Voyager, 96-99	118	0	0.00
	Plymouth Voyager, 96-99	80	0	0.00
Target		739	0	0.00

Idaho 1991-1998
Vehicle Fire Rates for Chrysler Minivans and Other MY 92-99 Minivans

All Impacts

Vehicle Group	Make Model	Collision Vehicles	Vehicles w Postcoll Fire	Vehicles w Postcoll Fire Per 1000 Vehicles
Comparison	Chevrolet Astro, 92-99	273	0	0.00
	Chevrolet Lumina Minivan, 92-96	97	0	0.00
	Ford Aerostar, 92-97	455	0	0.00
	Ford Windstar, 95-98	288	0	0.00
	GMC Safari, 92-99	162	0	0.00
	Honda Odyssey, 96-98	4	0	0.00
	Isuzu Oasis, 96-98	1	0	0.00
	Mazda MPV, 92-99	83	0	0.00
	Mercury Villager, 93-98	120	0	0.00
	Nissan Quest, 93-98	79	0	0.00
	Oldsmobile Silhouette, 92-96	28	0	0.00
	Oldsmobile Silhouette, 97-99	2	0	0.00
	Pontiac Trans Sport, 92-96	55	0	0.00
	Pontiac Trans Sport, 97-99	11	0	0.00
	Toyota Previa, 92-97	66	0	0.00
	Toyota Sienna, 98-99	3	0	0.00
	Volkswagen Eurovan, 93-98	10	0	0.00
Comparison		1,737	0	0.00
Target	Chrysler Town & Country, 96-99	34	0	0.00
	Dodge Caravan, 96-99	57	0	0.00
	Dodge Grand Caravan, 96-99	125	0	0.00
	Plymouth Grand Voyager, 96-99	48	0	0.00
	Plymouth Voyager, 96-99	16	0	0.00
Target		280	0	0.00

Idaho 1991-1998
Vehicle Fire Rates for Chrysler Minivans and Other MY 92-99 Minivans

Side Impacts

Vehicle Group	Make Model	Collision Vehicles	Vehicles w Postcoll Fire	Vehicles w Postcoll Fire Per 1000 Vehicles
Comparison	Chevrolet Astro, 92-99	55	0	0.00
	Chevrolet Lumina Minivan, 92-96	28	0	0.00
	Ford Aerostar, 92-97	90	0	0.00
	Ford Windstar, 95-98	53	0	0.00
	GMC Safari, 92-99	32	0	0.00
	Isuzu Oasis, 98-98	1	0	0.00
	Mazda MPV, 92-99	19	0	0.00
	Mercury Villager, 93-98	27	0	0.00
	Nissan Quest, 93-98	14	0	0.00
	Oldsmobile Silhouette, 92-96	3	0	0.00
	Pontiac Trans Sport, 92-96	8	0	0.00
	Pontiac Trans Sport, 97-99	2	0	0.00
	Toyota Previa, 92-97	15	0	0.00
	Toyota Sienna, 98-99	2	0	0.00
	Volkswagen Eurovan, 93-98	4	0	0.00
Comparison		353	0	0.00
Target	Chrysler Town & Country, 96-99	8	0	0.00
	Dodge Caravan, 96-99	11	0	0.00
	Dodge Grand Caravan, 96-99	21	0	0.00
	Plymouth Grand Voyager, 96-99	6	0	0.00
	Plymouth Voyager, 96-99	2	0	0.00
Target		48	0	0.00

Idaho 1991-1998

Vehicle Fire Rates for Chrysler Minivans and Other MY 92-99 Minivans

Far Side Impacts

Vehicle Group	Make Model	Collision Vehicles	Vehicles w Postcoll Fire	Vehicles w Postcoll Fire Per 1000 Vehicles
Comparison	Chevrolet Astro, 92-99	29	0	0.00
	Chevrolet Lumina Minivan, 92-96	14	0	0.00
	Ford Aerostar, 92-97	42	0	0.00
	Ford Windstar, 95-98	28	0	0.00
	GMC Safari, 92-99	12	0	0.00
	Isuzu Oasis, 96-98	1	0	0.00
	Mazda MPV, 92-99	6	0	0.00
	Mercury Villager, 93-98	15	0	0.00
	Nissan Quest, 93-98	6	0	0.00
	Oldsmobile Silhouette, 92-96	2	0	0.00
	Pontiac Trans Sport, 92-96	4	0	0.00
	Pontiac Trans Sport, 97-99	1	0	0.00
	Toyota Previa, 92-97	9	0	0.00
	Toyota Sienna, 98-99	1	0	0.00
	Volkswagen Eurovan, 93-98	2	0	0.00
Comparison		172	0	0.00
Target	Chrysler Town & Country, 96-99	3	0	0.00
	Dodge Caravan, 96-99	6	0	0.00
	Dodge Grand Caravan, 96-99	12	0	0.00
	Plymouth Grand Voyager, 96-99	2	0	0.00
	Plymouth Voyager, 96-99	1	0	0.00
Target		24	0	0.00

Idaho 1991-1998
Vehicle Fire Rates for Chrysler Minivans and Other MY 92-99 Minivans

Near Side Impacts

Vehicle Group	Make Model	Collision Vehicles	Vehicles w Postcoll Fire	Vehicles w Postcoll Fire Per 1000 Vehicles
Comparison	Chevrolet Astro, 92-99	26	0	0.00
	Chevrolet Lumina Minivan, 92-96	14	0	0.00
	Ford Aerostar, 92-97	48	0	0.00
	Ford Windstar, 95-98	25	0	0.00
	GMC Safari, 92-99	20	0	0.00
	Mazda MPV, 92-99	13	0	0.00
	Mercury Villager, 93-98	12	0	0.00
	Nissan Quest, 93-98	8	0	0.00
	Oldsmobile Silhouette, 92-96	1	0	0.00
	Pontiac Trans Sport, 92-96	4	0	0.00
	Pontiac Trans Sport, 97-99	1	0	0.00
	Toyota Previa, 92-97	6	0	0.00
	Toyota Sienna, 98-99	1	0	0.00
	Volkswagen Eurovan, 93-98	2	0	0.00
Comparison		181	0	0.00
Target	Chrysler Town & Country, 96-99	5	0	0.00
	Dodge Caravan, 98-99	5	0	0.00
	Dodge Grand Caravan, 96-99	8	0	0.00
	Plymouth Grand Voyager, 96-99	4	0	0.00
	Plymouth Voyager, 96-99	1	0	0.00
Target		24	0	0.00

Maryland 1991-1998

Vehicle Fire Rates for Chrysler Minivans and Other MY 92-99 Comparison Vehicles

All Impacts

Vehicle Group	Make Model	Collision Vehicles	Vehicles w Postcoll Fire	Vehicles w Postcoll Fire Per 1000 Vehicles
Comparison	Chevrolet Astro, 92-99	1,726	1	0.58
	Chevrolet Lumina Minivan, 92-96	441	0	0.00
	Ford Aerostar, 92-97	2,364	0	0.00
	Ford Windstar, 95-98	1,452	0	0.00
	GMC Safari, 92-99	415	0	0.00
	Honda Odyssey, 96-98	54	0	0.00
	Isuzu Oasis, 96-98	10	0	0.00
	Mazda MPV, 92-99	616	0	0.00
	Mercury Villager, 93-98	761	0	0.00
	Nissan Quest, 93-98	779	0	0.00
	Oldsmobile Silhouette, 92-96	114	0	0.00
	Oldsmobile Silhouette, 97-99	33	0	0.00
	Pontiac Trans Sport, 92-96	234	0	0.00
	Pontiac Trans Sport, 97-99	38	0	0.00
	Toyota Previa, 92-97	455	0	0.00
	Toyota Sienna, 98-99	22	0	0.00
	Volkswagen Eurovan, 93-98	39	0	0.00
Comparison		9,553	1	0.10
Target	Chrysler Town & Country SX, 97-99	5	0	0.00
	Chrysler Town & Country, 96-99	178	0	0.00
	Dodge Caravan, 96-99	503	0	0.00
	Dodge Grand Caravan, 96-99	756	0	0.00
	Plymouth Grand Voyager, 96-99	285	0	0.00
	Plymouth Voyager, 96-99	272	0	0.00
Target		1,999	0	0.00

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Maryland 1991-1998
Vehicle Fire Rates for Chrysler Minivans and Other MY 92-99 Comparison Vehicles

Side Impacts

Vehicle Group	Make Model	Collision Vehicles	Vehicles w Postcoll Fire	Vehicles w Postcoll Fire Per 1000 Vehicles
Comparison	Chevrolet Astro, 92-99	445	0	0.00
	Chevrolet Lumina Minivan, 92-96	136	0	0.00
	Ford Aerostar, 92-97	536	0	0.00
	Ford Windstar, 95-98	321	0	0.00
	GMC Safari, 92-99	115	0	0.00
	Honda Odyssey, 96-98	17	0	0.00
	Isuzu Oasis, 96-98	4	0	0.00
	Mazda MPV, 92-99	132	0	0.00
	Mercury Villager, 93-98	198	0	0.00
	Nissan Quest, 93-98	215	0	0.00
	Oldsmobile Silhouette, 92-96	30	0	0.00
	Oldsmobile Silhouette, 97-99	5	0	0.00
	Pontiac Trans Sport, 92-96	48	0	0.00
	Pontiac Trans Sport, 97-99	11	0	0.00
	Toyota Previa, 92-97	103	0	0.00
	Toyota Sienna, 98-99	5	0	0.00
	Volkswagen Eurovan, 93-98	7	0	0.00
Comparison		2,328	0	0.00
Target	Chrysler Town & Country SX, 97-99	1	0	0.00
	Chrysler Town & Country, 96-99	44	0	0.00
	Dodge Caravan, 96-99	136	0	0.00
	Dodge Grand Caravan, 96-99	204	0	0.00
	Plymouth Grand Voyager, 96-99	80	0	0.00
	Plymouth Voyager, 96-99	70	0	0.00
Target		535	0	0.00

Maryland 1991-1998

Vehicle Fire Rates for Chrysler Minivans and Other MY 92-99 Comparison Vehicles

Far Side Impacts

Vehicle Group	Make Model	Collision Vehicles	Vehicles w Postcoll Fire	Vehicles w Postcoll Fire Per 1000 Vehicles
Comparison	Chevrolet Astro, 92-99	212	0	0.00
	Chevrolet Lumina Minivan, 92-96	74	0	0.00
	Ford Aerostar, 92-97	252	0	0.00
	Ford Windstar, 95-98	163	0	0.00
	GMC Safari, 92-99	54	0	0.00
	Honda Odyssey, 96-98	5	0	0.00
	Isuzu Oasis, 96-98	2	0	0.00
	Mazda MPV, 92-99	64	0	0.00
	Mercury Villager, 93-98	85	0	0.00
	Nissan Quest, 93-98	92	0	0.00
	Oldsmobile Silhouette, 92-96	9	0	0.00
	Oldsmobile Silhouette, 97-99	2	0	0.00
	Pontiac Trans Sport, 92-96	22	0	0.00
	Pontiac Trans Sport, 97-99	7	0	0.00
	Toyota Previa, 92-97	48	0	0.00
	Toyota Sienna, 98-99	2	0	0.00
	Volkswagen Eurovan, 93-98	2	0	0.00
Comparison		1,095	0	0.00
Target	Chrysler Town & Country, 96-99	17	0	0.00
	Dodge Caravan, 96-99	62	0	0.00
	Dodge Grand Caravan, 98-99	88	0	0.00
	Plymouth Grand Voyager, 96-99	34	0	0.00
	Plymouth Voyager, 96-99	27	0	0.00
Target		228	0	0.00

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Maryland 1991-1998
Vehicle Fire Rates for Chrysler Minivans and Other MY 92-99 Comparison Vehicles

Near Side Impacts

Vehicle Group	Make Model	Collision Vehicles	Vehicles w Postcoll Fire	Vehicles w Postcoll Fire Per 1000 Vehicles
Comparison	Chevrolet Astro, 92-98	233	0	0.00
	Chevrolet Lumina Minivan, 92-96	62	0	0.00
	Ford Aerostar, 92-97	284	0	0.00
	Ford Windstar, 95-98	158	0	0.00
	GMC Safari, 92-99	61	0	0.00
	Honda Odyssey, 98-98	12	0	0.00
	Isuzu Oasis, 96-98	2	0	0.00
	Mazda MPV, 92-99	68	0	0.00
	Mercury Villager, 93-98	113	0	0.00
	Nissan Quest, 93-98	123	0	0.00
	Oldsmobile Silhouette, 92-96	21	0	0.00
	Oldsmobile Silhouette, 97-99	3	0	0.00
	Pontiac Trans Sport, 92-96	28	0	0.00
	Pontiac Trans Sport, 97-99	4	0	0.00
	Toyota Previa, 92-97	55	0	0.00
	Toyota Sienna, 98-99	3	0	0.00
	Volkswagen Eurovan, 93-98	5	0	0.00
Comparison		1,233	0	0.00
Target	Chrysler Town & Country SX, 97-99	1	0	0.00
	Chrysler Town & Country, 96-99	27	0	0.00
	Dodge Caravan, 96-99	74	0	0.00
	Dodge Grand Caravan, 96-99	116	0	0.00
	Plymouth Grand Voyager, 96-99	46	0	0.00
	Plymouth Voyager, 96-99	43	0	0.00
Target		307	0	0.00

AL, FL, ID, MD
Study of Vehicle with Fire Rates
MY 92-99 Chrysler Minivans and Comparison Vehicles
All Collisions

Vehicle Group	Make Model	Collision Vehicles	Vehicles w Postcoll Fire	Vehicles w Postcoll Fire Per 1000 Vehicles
Comparison	Chevrolet Astro, 92-99	12,130	17	1.40
	Chevrolet Lumina Minivan, 92	3,350	1	0.30
	Ford Aerostar, 92-97	16,140	6	0.37
	Ford Windstar, 95-98	7,376	1	0.14
	GMC Safari, 92-99	3,613	0	0.00
	Honda Odyssey, 96-98	361	1	2.77
	Isuzu Oasis, 96-98	62	0	0.00
	Mazda MPV, 92-99	3,944	0	0.00
	Mercury Villager, 93-98	3,930	4	1.02
	Nissan Quest, 93-98	4,500	2	0.44
	Oldsmobile Silhouette, 92-96	986	0	0.00
	Oldsmobile Silhouette, 97-99	178	0	0.00
	Pontiac Trans Sport, 92-96	2,312	4	1.73
	Pontiac Trans Sport, 97-99	299	0	0.00
	Toyota Previa, 92-97	2,682	2	0.75
	Toyota Sienna, 98-99	176	0	0.00
	Volkswagen Eurovan, 93-98	144	0	0.00
Comparison		62,183	38	0.61
Target	Chrysler Town & Country SX,	22	0	0.00
	Chrysler Town & Country, 96-	1,315	1	0.76
	Dodge Caravan, 96-99	2,553	3	1.18
	Dodge Grand Caravan, 96-99	3,561	2	0.56
	Plymouth Grand Voyager, 96-9	1,533	1	0.65
	Plymouth Voyager, 96-99	1,136	1	0.88
Target		10,120	8	0.79

AL, FL, ID, MD
Study of Vehicle with Fire Rates
MY 92-99 Chrysler Minivans and Comparison Vehicles
Side Impact Collisions

Vehicle Group	State	Collision Vehicles	Vehicles w Postcoll Fire	Vehicles w Postcoll Fire Per 1000 Vehicles
Comparison	Alabama 91-98	4,644	0	0.00
	Florida 91-98	8,317	2	0.24
	Idaho 91-98	353	0	0.00
	Maryland 91-98	2,328	0	0.00
Comparison		15,642	2	0.13
Target	Alabama 91-98	591	0	0.00
	Florida 91-98	1,517	1	0.66
	Idaho 91-98	48	0	0.00
	Maryland 91-98	535	0	0.00
Target		2,691	1	0.37

AL, FL, ID, MD
Study of Vehicle with Fire Rates
MY 92-99 Chrysler Minivans and Comparison Vehicles
Side Impact Collisions

Vehicle Group	Make Model	Collision Vehicles	Vehicles w Postcoll Fire	Vehicles w Postcoll Fire Per 1000 Vehicles
Comparison	Chevrolet Astro, 92-99	3,179	1	0.31
	Chevrolet Lumina Minivan, 92	916	0	0.00
	Ford Aerostar, 92-97	3,930	1	0.25
	Ford Windstar, 95-98	1,772	0	0.00
	GMC Safari, 92-99	1,004	0	0.00
	Honda Odyssey, 96-98	83	0	0.00
	Isuzu Oasis, 96-98	21	0	0.00
	Mazda MPV, 92-98	870	0	0.00
	Mercury Villager, 93-98	1,048	0	0.00
	Nissan Quest, 93-98	1,170	0	0.00
	Oldsmobile Silhouette, 92-96	299	0	0.00
	Oldsmobile Silhouette, 97-99	40	0	0.00
	Pontiac Trans Sport, 92-96	523	0	0.00
	Pontiac Trans Sport, 97-99	81	0	0.00
	Toyota Previa, 92-97	633	0	0.00
	Toyota Sienna, 98-99	43	0	0.00
	Volkswagen Eurovan, 93-98	30	0	0.00
Comparison		15,642	2	0.13
Target	Chrysler Town & Country SX,	6	0	0.00
	Chrysler Town & Country, 98-	336	0	0.00
	Dodge Caravan, 96-99	687	0	0.00
	Dodge Grand Caravan, 98-99	951	1	1.05
	Plymouth Grand Voyager, 96-9	422	0	0.00
	Plymouth Voyager, 96-99	289	0	0.00
Target		2,691	1	0.37

AL, FL, ID, MD
Study of Postcollision Fire Rates
Composite Results from Multi-States Using Mantel Haenszel
MY 92-99 Chrysler Minivans and Comparison Vehicles

All Impacts

Chrysler Minivan Vehs	Chrysler Minivan Fire Vehs	Chrysler Minivan Fire Vehs /100 Vehs	Comparison Vehicle	Comparison Vehs	Comp Fire Vehs	Comp Fire Vehs /100 Vehs	Odds Ratio (or)	Breslow-Day Test for Homogeneity	BD Chi-Sq Homogeneity P-Value	Pr(OR>or) 2-sided
10,120	8	0.079	Chevrolet Astro, 92-99	12,130	17	0.117	0.674	1.165	0.761	0.451
10,120	8	0.079	Chevrolet Lumina Minivan, 92-96	3,350	1	0.027	2.906	0.719	0.869	0.070
10,120	8	0.079	Ford Aerostar, 92-97	16,140	6	0.033	2.404	0.833	0.842	0.010
10,120	8	0.079	Ford Windstar, 95-98	7,376	1	0.013	6.290	1.204	0.752	0.000
10,120	8	0.079	GMC Safari, 92-99	3,613	0	0.000	.	0.000	1.000	.
10,120	8	0.079	Honda Odyssey, 96-98	381	1	0.262	0.326	1.079	0.782	0.529
10,120	8	0.079	Isuzu Oasis, 96-98	62	0	0.000	.	0.000	1.000	.
10,120	8	0.079	Mazda MPV, 92-99	3,944	0	0.000	.	0.000	1.000	.
10,120	8	0.079	Mercury Villager, 93-98	3,930	4	0.088	0.893	3.137	0.371	0.866
10,120	8	0.079	Nissan Quest, 93-98	4,500	2	0.041	1.942	0.030	0.999	0.235
10,120	8	0.079	Oldsmobile Silhouette, 92-96	986	0	0.000	.	0.000	1.000	.
10,120	8	0.079	Oldsmobile Silhouette, 97-99	178	0	0.000	.	0.000	1.000	.
10,120	8	0.079	Pontiac Trans Sport, 92-98	2,312	4	0.156	0.506	0.109	0.991	0.421
10,120	8	0.079	Pontiac Trans Sport, 97-99	299	0	0.000	.	0.000	1.000	.
10,120	8	0.079	Toyota Previa, 92-97	2,682	2	0.074	1.072	0.176	0.981	0.927
10,120	8	0.079	Toyota Sienna, 98-99	176	0	0.000	.	0.000	1.000	.
10,120	8	0.079	Volkswagen Eurovan, 93-98	144	0	0.000	.	0.000	1.000	.

AL, FL, ID, MD
Study of Vehicle with Fire Rates
MY 92-99 Chrysler Minivans and Comparison Vehicles
All Collisions

Vehicle Group	Make Model	Collision Vehicles	Vehicles w Postcoll Fire	Vehicles w Postcoll Fire Per 1000 Vehicles
Comparison	Chevrolet Astro, 92-98	12,130	17	1.40
	Chevrolet Lumina Minivan, 92-98	8,350	1	0.30
	Ford Aerostar, 92-97	16,140	6	0.37
	Ford Windstar, 95-98	7,376	1	0.14
	GMC Safari, 92-99	3,613	0	0.00
	Honda Odyssey, 98-98	361	1	2.77
	Isuzu Oasis, 96-98	62	0	0.00
	Mazda MPV, 92-99	3,944	0	0.00
	Mercury Villager, 93-98	3,930	4	1.02
	Nissan Quest, 93-98	4,500	2	0.44
	Oldsmobile Silhouette, 92-96	986	0	0.00
	Oldsmobile Silhouette, 97-98	178	0	0.00
	Pontiac Trans Sport, 92-96	2,312	4	1.73
	Pontiac Trans Sport, 97-99	298	0	0.00
	Toyota Previa, 92-97	2,682	2	0.75
	Toyota Sienna, 98-99	178	0	0.00
	Volkswagen Eurovan, 93-98	144	0	0.00
Comparison		62,183	38	0.61
Target	Chrysler Town & Country SX,	22	0	0.00
	Chrysler Town & Country, 96-99	1,315	1	0.76
	Dodge Caravan, 96-99	2,553	3	1.18
	Dodge Grand Caravan, 96-99	3,561	2	0.56
	Plymouth Grand Voyager, 96-99	1,533	1	0.65
	Plymouth Voyager, 96-99	1,136	1	0.88
Target		10,120	8	0.79

AL, FL, ID, MD
Study of Vehicle with Fire Rates
MY 92-99 Chrysler Minivans and Comparison Vehicles
Side Impact Collisions

Vehicle Group	State	Collision Vehicles	Vehicles w Postcoll Fire	Vehicles w Postcoll Fire Per 1000 Vehicles
Comparison	Alabama 91-98	4,644	0	0.00
	Florida 91-98	8,317	2	0.24
	Idaho 91-98	353	0	0.00
	Maryland 91-98	2,328	0	0.00
Comparison		15,642	2	0.13
Target	Alabama 91-98	591	0	0.00
	Florida 91-98	1,517	1	0.66
	Idaho 91-98	48	0	0.00
	Maryland 91-98	535	0	0.00
Target		2,691	1	0.37

AL, FL, ID, MD
Study of Vehicle with Fire Rates
MY 92-99 Chrysler Minivans and Comparison Vehicles
Side Impact Collisions

Vehicle Group	Make Model	Collision Vehicles	Vehicles w Postcoll Fire	Vehicles w Postcoll Fire Per 1000 Vehicles
Comparison	Chevrolet Astro, 92-99	3,179	1	0.31
	Chevrolet Lumina Minivan, 92-96	916	0	0.00
	Ford Aerostar, 92-97	3,930	1	0.25
	Ford Windstar, 95-98	1,772	0	0.00
	GMC Safari, 92-99	1,004	0	0.00
	Honda Odyssey, 96-98	83	0	0.00
	Isuzu Oasis, 96-98	21	0	0.00
	Mazda MPV, 92-99	670	0	0.00
	Mercury Villager, 93-98	1,048	0	0.00
	Nissan Quest, 93-98	1,170	0	0.00
	Oldsmobile Silhouette, 92-96	298	0	0.00
	Oldsmobile Silhouette, 97-99	40	0	0.00
	Pontiac Trans Sport, 92-96	523	0	0.00
	Pontiac Trans Sport, 97-99	81	0	0.00
	Toyota Previa, 92-97	633	0	0.00
	Toyota Sienna, 98-99	43	0	0.00
	Volkswagen Eurovan, 93-98	30	0	0.00
Comparison		15,642	2	0.13
Target	Chrysler Town & Country SX,	6	0	0.00
	Chrysler Town & Country, 96-99	336	0	0.00
	Dodge Caravan, 96-99	687	0	0.00
	Dodge Grand Caravan, 96-99	951	1	1.05
	Plymouth Grand Voyager, 96-99	422	0	0.00
	Plymouth Voyager, 96-99	289	0	0.00
Target		2,691	1	0.37

AL, FL, ID, MD
Study of Postcollision Fire Rates
Composite Results from Multi-States Using Mantel Haenszel
MY 92-98 Chrysler Minivans and Comparison Vehicles

All Impacts

Chrysler Minivan Vehs	Chrysler Minivan Fire Vehs	Chrysler Minivan Fire Vehs /100 Vehs	Comparison Vehicle	Comparison Vehs	Comp Fire Vehs	Comp Fire Vehs /100 Vehs	Odds Ratio (or)	Breslow-Day Test for Homogeneity	BD Chi-Sq Homogeneity P-Value	Pr(OR>or) 2-sided
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10,120	8	0.079	Ford Windstar, 95-98	7,376	1	0.013	6.290	1.204	0.752	0.000
10,120	8	0.079	GMC Safari, 92-99	3,613	0	0.000	.	0.000	1.000	.
10,120	8	0.079	Honda Odyssey, 96-98	381	1	0.242	0.326	1.079	0.782	0.529
10,120	8	0.079	Isuzu Oasis, 96-98	62	0	0.000	.	0.000	1.000	.
10,120	8	0.079	Mazda MPV, 92-99	3,944	0	0.000	.	0.000	1.000	.
10,120	8	0.079	Mercury Villager, 93-98	8,930	4	0.088	0.893	3.137	0.371	0.866
10,120	8	0.079	Nissan Quest, 93-98	4,500	2	0.041	1.942	0.030	0.999	0.235
10,120	8	0.079	Oldsmobile Silhouette, 92-96	986	0	0.000	.	0.000	1.000	.
10,120	8	0.079	Oldsmobile Silhouette, 97-99	178	0	0.000	.	0.000	1.000	.
10,120	8	0.079	Pontiac Trans Sport, 92-96	2,312	4	0.156	0.506	0.109	0.991	0.421
10,120	8	0.079	Pontiac Trans Sport, 97-99	299	0	0.000	.	0.000	1.000	.
10,120	8	0.079	Toyota Previa, 92-97	2,682	2	0.074	1.072	0.176	0.981	0.927
10,120	8	0.079	Toyota Sienna, 98-99	176	0	0.000	.	0.000	1.000	.
10,120	8	0.079	Volkswagen Eurovan, 93-98	144	0	0.000	.	0.000	1.000	.

Florida Accident Decode
September 4, 1996
ARN: 96539463680

Accident Information

Accident Date:	9/4/96
Location:	Broward County, City of Margate
Number of Vehicles Involved:	2
Accident Time:	21:45 (24hr clock)
Number of Persons Involved:	2
Site Location	At Intersection
First Harmful Event	Collision with Motor Vehicle in Transport (Left Turn)
Subsequent Harmful Event	Fire
Light Condition	Dark (Street Light)
Weather	Clear
Road Surface Type	Concrete
Type Shoulder	Paved
Road Surface Condition	Dry
Contributing Factor, Roadway	No Defects
Contributing Factor, Environment	Vision Not Obscured
Traffic Controls	Traffic Signal
Traffic Character	Straight, Level
Number of Lanes	Six
Accident Severity Damage	Disabling
Drugs or Alcohol Involved	Not Applicable
Rollover	Not Applicable
Speed Limit	45 MPH

Vehicle Information

Vehicle Number	1
Make/Model	Dodge
Body Type	Passenger Van
Model Year	1996
VIN (12 Digits)	2846P44ROTR833881
State Registered	Florida
Rollover	No
Estimated Speed	45 mph
Damage Type	Disabling
Special Use	No Special Use
Emergency Use	No
Direction Of Travel	South
Main Impact	Right Front Side Panel
Vehicle Movement	Making Left Turn
Driver Action	N/A

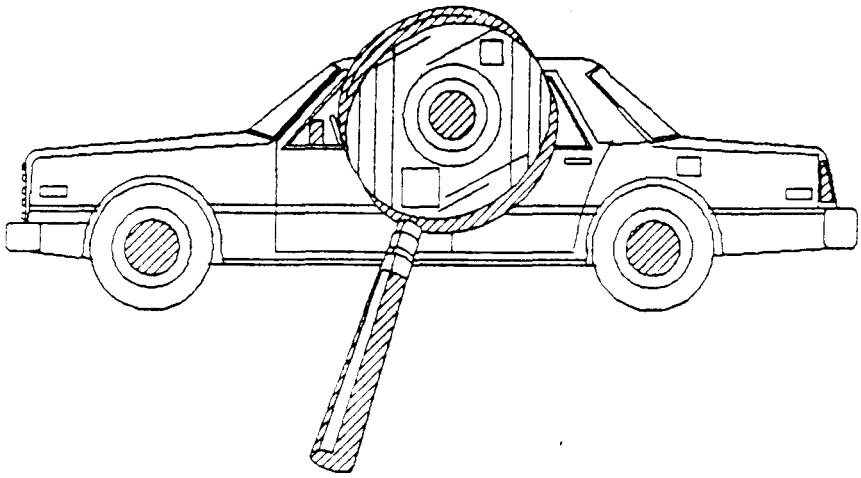
Vehicle Number	2
Make/Model	Toyota
Body Type	Automobile
Model Year	1989
VIN (12 Digits)	JT2SU21F2K4035024
State Registered	Florida
Rollover	No
Jackknife	Not Applicable
Estimated Speed	05 MPH
Damage Type	Disabling
Special Use	No Special Use
Emergency Use	No
Direction Of Travel	East
Main Impact	Head On
Vehicle Movement	Straight Ahead
Driver Action	N/A

FUEL SYSTEMS ON MINIVAN VEHICLES

Vehicle	Tank	Fuel port Orientation relative to wheel	Hard Tube	Soft Tube	Comments
Oldsmobile Silhouette	Plastic-Side Fill	12 o'clock	31" long, inside wheelhouse, protected by plastic shield.	9" long. Non Corrugated. Orientation- Lateral. Outboard end is 3" higher. Screw Clamps on ends.	Hard tube has a soft plastic cover to protect from stone throw.
Toyota Sienna	Metal-Rear Fill	1:30	26" long, 11.5" forward, 19" vertical.	12" long. Enters tank at rear. Orientation- Longitudinal. Corrugated. Screw clamps on ends.	
Mercury Villager	Metal-Side Fill	10	23" long, down from port, through rail.	17" long. Non Corrugated. Orientation- Primary Longitudinal. Tube enters side of tank. S-shaped. Clamps: Two wires with plates	Tank biased to rear of wagon.
Honda Odyssey	Plastic-Side Fill	10:30	23" long, down from port, and then lateral. 15" vertical, 8" lateral	13" long. Non Corrugated. Orientation- Lateral. Tube enters side of tank. Screw clamps on ends.	
Dodge Caravan (NS)	Plastic-Side Fill	10:30	32" long, protected by plastic shield.	5" long. Non Corrugated. Orientation- Lateral. Almost vertical. Tube enters side of tank. Screw clamps on ends.	

Notes:
- All Minivans have left side fuel fill.

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION



OFFICE OF DEFECTS INVESTIGATION

FACSIMILE TRANSMITTAL SHEET

FAX NO. (202) 366-1767

DATE: 12/13/99

FROM: JEFF QUANDT

TELEPHONE NO.: (202) 366- 5207

TO: CLINT SPEVAK

COMPANY: DAIMLER CHRYSLER

OFFICE:

PHONE NO.: (248) 512-5854 ; FAX NO.: (248) 576-7321

MESSAGE:

000095

PAGE COUNT: 3
(Including This Page)

Report Safety Defects
Call the Auto Safety Hotline
800-424-9393

U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**

400 Seventh Street, S.W.
Washington, D.C. 20590

DEC 13 1999

Susan M. Cischke, Vice President
Vehicle Certification, Compliance and Safety Affairs
DaimlerChrysler Corporation - CIMS 482-00-91
800 Chrysler Drive
Auburn Hills, MI 48326-2757

NSA-122jlq
EA99-013

Dear Ms Cischke:

This letter is to advise you that the Office of Defects Investigation (ODI) of the National Highway Traffic Safety Administration has received a report of a fatal crash involving a left-side impact and fire in a 1996 Chrysler Town and Country vehicle (VIN 1C4GP55L7TB504242). The incident occurred at the intersection of Garden Valley Road and Melrose Road near Roseburg, Oregon on August 19, 1999.

The incident vehicle is currently being stored at a Roseburg towing service at the expense of the family of the victims. Officials from Douglas County Fire District No. 2 are currently maintaining custody of the fuel tank and filler neck from the incident vehicle. Although ODI is neither requesting nor authorizing DaimlerChrysler to inspect the vehicle, DaimlerChrysler is requested to notify ODI before conducting, or arranging for, any inspections of the incident vehicle or fuel system components or to notify ODI that DaimlerChrysler does not plan such an inspection. In either case, ODI requests notification no later than December 20, 1999.

DaimlerChrysler is also requested to furnish ODI copies of all documents regarding the incident vehicle and crash that are in DaimlerChrysler's possession or control, or of which DaimlerChrysler is otherwise aware. This should include, but not be limited to, the vehicle production date, vehicle warranty start date, and all warranty and service history information. This information should be provided no later than January 10, 2000.

Should DaimlerChrysler decide to inspect the incident vehicle or to otherwise investigate, or gather information related to, the August 19, 1999 crash, DaimlerChrysler is requested to notify ODI when such actions have been completed and to then provide its assessment of the cause of the fire and copies of all relevant documents, using the definition of "document" provided in ODI's October 20, 1999 letter.

0000096

If you have any technical questions concerning this matter, please call Mr. Jeff Quandt of my staff at (202) 366-5207.

Sincerely,

Kathleen C. DeMeter, Director
Office of Defects Investigation
Safety Assurance

DAIMLERCHRYSLER

December 20, 1999

Kathleen C. DeMeter, Director
Office of Defects Investigation, Safety Assurance
National Highway Traffic Safety Administration
400 Seventh Street S.W. (NSA-12; Room 5326)
Washington, D.C. 20590

DaimlerChrysler Corporation
Susan M. Cischke
Sr. Vice President
Regulatory Affairs &
Passenger Car Operations

Re: NSA-122jlq; EA99-013

Dear Ms. DeMeter:

This supplements our November 26, 1999 response to your October 20, 1999 information request for Engineering Analysis (EA) 99-013 investigating fuel system integrity with 1996 through 2000 model year DaimlerChrysler minivan vehicles in FMVSS 214 side impact collision tests.

Design, development, and production of DaimlerChrysler vehicles have always considered fuel containment in a variety of crash situations as a very important requirement. Substantial engineering work and testing is invested to assure post collision fuel system integrity on all vehicle designs. These assurance efforts are confirmed by our vehicles' exemplary real world performance.

DaimlerChrysler has reviewed substantial information since receiving notification concerning leakage in NHTSA's January 1999 FMVSS 214 test. DaimlerChrysler continues to study the result in the NHTSA test and the concerns that it has raised. At this point, we continue to believe the test result to be an anomalous occurrence. With well over 5 million vehicle years of service, we have yet to experience a real world occurrence replicating the test result. Of course, we continue to monitor and study this issue closely as we share NHTSA's concern for real-world safety. Should we see evidence that our customers are at risk, we will take quick and responsive action.

Several questions ask for information that is confidential. Responses to those will be supplied separately to the NHTSA Chief Counsel's Office with a request for treatment as confidential business information.

We welcome discussion of questions you have during your review of this information.

Sincerely,

SM Cischke

Susan M. Cischke

Attachment
Enclosures

cc: Heidi Coleman

DaimlerChrysler Corporation
800 Chrysler Drive CIMS 484-12-14
Auburn Hills MI USA 48326-2757
Phone 248.576.7301
Fax 248.576.7321
e-mail: smc16@daimlerchrysler.com

DAIMLERCHRYSLER

December 20, 1999

Kathleen C. DeMeter, Director
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Sincerely,

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Susan M. Cischke

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Enclosures

cc: Heidi Coleman

DaimlerChrysler Corporation
800 Chrysler Drive CIMS 484-12-14
Auburn Hills MI USA 48326-2757
Phone 248.576.7301
Fax 248.576.7321
e-mail: smc16@daimlerchrysler.com

ATTACHMENT

Q2 State the number and provide copies of all of the following, from all sources, of which DaimlerChrysler is aware and which allege incidents of collision-induced fuel leakage or fire in the subject vehicles.

a.owner/fleet complaints;
b.field reports;
c.fire incident claims;
d.subrogation claims;
e.lawsuits; and
f.third-party arbitration proceedings (where DaimlerChrysler is a party to the arbitration).

A2 DaimlerChrysler was informed by the Office of Defects Investigation (ODI) on December 13, 1999 of an incident that might allege collision-induced fuel leakage or fire involving a vehicle with VIN 1C4GP55L7TB504242. The only document concerning the incident in DaimlerChrysler's possession or control is the December 13, 1999 letter from ODI. The VIN provided relates to a vehicle produced on 06/20/96 that was sold (warranty started) on 07/24/96. Available warranty history information will be provided after it is restored from database archives.

Q5 State the number of the following components or assemblies that have been sold annually to date by component name, part number (both service and engineering), and supplier (name and address). State all applications for each of the components by platform group (platform code and description), model year, application, and approximate total number of all vehicles for which they were intended.

a.filler neck assembly;
b.filler neck assembly hose; and
c.filler neck assembly hose clamp.

A5 The numbers of components and assemblies sold were provided with our November 26, 1999 response to Q5, but one part number was overlooked. Sales for that assembly are provided in Enclosure 7 of this supplement. Supplier name and address, along with the list of applications and approximate numbers of vehicles are also provided in Enclosure 7 of this supplement.

Q7 Identify and provide copies of all documents related to any study, survey, or investigation pertaining to the alleged defect that are known to DaimlerChrysler. Include in your response all notes, measurements, calculations, reports, photographs (color copies), or other documents related to DaimlerChrysler's analysis of issues pertaining to the alleged defect. State clearly the source of each document. Include all pertinent documents, regardless of whether they are in interim, draft, or final form.

A7 The methodology for and analysis from the search DaimlerChrysler conducted of accident-reporting databases for post-collision fuel leak reports or post-collision fires in side impacts are provided in Enclosure 9 to this supplement. This provides confirmation of the earlier observation that DaimlerChrysler minivans evidence no more real world occurrence of post collision fires after side impact crashes than any other minivans. Again, such occurrences are extremely rare for all minivans, including the 1996 through 1999 DaimlerChrysler minivans, which are not statistically distinguishable from the other minivans for collision-related fires in either side-impact or all directions of impacts.

Enclosure 10 to this supplement provides an additional document related to a proposed survey of competitive vehicles, extending the review reported in Enclosure 10 of our November 26, 1999 response. This document compiles the factors several DaimlerChrysler fuel system engineers considered worth recording if a technical review of vehicles would be undertaken. No such detailed survey has been conducted, other than that reported in our November 26, 1999 EA99-013 response to Q7.

ATTACHMENT

Q11 *DaimlerChrysler has indicated that at least some of the subject hose joints are assembled with the aid of power steering fluid or transmission oil. After first suggesting that the practice was inappropriate and discontinued, DaimlerChrysler has subsequently informed NHTSA that the use of lubricants was and is authorized by established procedures and is still part of the assembly process for the subject hose joints. NHTSA's review of information submitted by DaimlerChrysler in response to PE99-010 reveals no such authorization. However, an engineering process standard (PS-8952, "Leak Check and Assembly of Fuel Tanks," September 20, 1990), submitted by DaimlerChrysler with its April 9, 1999 letter, does not permit the use of such lubricants to aid in the assembly of fuel line hoses to the tank assembly, stating in Section 2.2.4.4, "Fuel Line Installation:"*

"To aid in the assembly of fuel hoses, only wetting agent (MS 3881) or water may be used."

Section 2.2.4.3, "Filler Tube Installation," indicates that hydraulic steering fluid is permissable, but only for grommet type seals:

"If the fuel tank filler tube interfaces the tank using a grommet type seal, the use of a light film of either hydraulic steering fluid (MS 1872) or wetting agent (MS 3881) is permissable."

Furnish the following information regarding DaimlerChrysler's use of lubricants in the assembly of the subject hose joints:

a *Provide copies of all documents which relate to the use of lubricants in the assembly of fuel tank hose joints in all DaimlerChrysler vehicles. Identify the specific controlling documents applicable to the assembly of the subject hose joints, and cite all sections authorizing each of the lubricating agents used by DaimlerChrysler in the assembly of the subject hose joints;*

b *Explain any conflicts between DaimlerChrysler Engineering Process Standard PS-8952, "Leak Check and Assembly of Fuel Tanks," and documents furnished in response to item "a" relative to the use of lubricants as assembly aids for fuel tank assembly hose joints;*

c *Describe the development of DaimlerChrysler Engineering Process Standard PS-8952, "Leak Check and Assembly of Fuel Tanks," including the reasons and bases for Sections 2.2.4.3 and 2.2.4.4, and identify who is responsible for the standard;*

d *Describe in detail the processes used to assemble the subject tank, filler neck, and hose joints at each of the assembly plants which produce subject vehicles, from Job#1 to date, including all types of lubricants that have been used by each plant, all methods used for applying each lubricant to the hose and/or spud at each plant, and all methods used to control the amount of lubricant applied to the hose and/or spud at each plant for each method of application;*

e *Describe in detail the processes used to assemble the subject hose joints in each of the crash test vehicles identified in Enclosure 4 of DaimlerChrysler's April 9, 1999, letter responding to PE99-010. Include in your description an identification of who assembled the fuel tank and filler neck assembly components (e.g., assembly plant, engineering, etc.), the location where the components were assembled, and how the components were assembled, including an identification of any lubricant used to aid in the assembly of the subject hose joint;*

f *Provide DaimlerChrysler's assessment of the influence of each lubricant used in the assembly of the subject hose joint on the pull-off forces for the joint as assembled;*

g *Provide DaimlerChrysler's assessment of the reasons for the variance in pull-off forces recorded in testing of lubricated joints that were subjected to temperature aging cycles, as shown in Enclosure 7 of DaimlerChrysler's response to PE99-010 (i.e., the difference between the lowest and highest pull-off forces recorded in Report No. 201-99);*

h *State whether DaimlerChrysler is aware of more appropriate fluids to aid in assembly of the subject hose joints (e.g., water or water-based wetting agents) and describe the advantages of each such*

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fluid over those used in the assembly of the subject joints; Include in your response a description of the composition of wetting agent MS-3881;

l State whether DaimlerChrysler has ever considered the safety implications of the use of lubricants in the assembly of the subject hose joint and provide copies of all related documents; and

j Provide copies of any other documents related to the use and effects of lubricants in the assembly of the subject hose joint that were not provided in response to items "a" through "i."

A11 Several specifications cited in this question were provided in DaimlerChrysler's April 9, 1999 response to PE99-010 Question 3 which requested standards related to crash performance of the fuel system. The assembly aids used are not significantly related to crash performance of the fuel system, so those specifications were not included.

PS-8952 is not the appropriate Process Standard applicable to the subject fuel filler hose to fuel tank joint. The applicable standard is PS-4114, as detailed below. The note in PS-8952 concerning use of hydraulic steering fluid "only for grommet type seals" does not prohibit use of such an assembly aid for the fuel system present in the minivan.

A11a The governing Process Standard most appropriate to the subject hose joint is PS-4114, "Assembly Aids - Rubber and Plastic Parts", provided in Confidential Enclosure 11 (under separate cover).

A11b No conflicts are evident. As noted in A11a, above, the relevant Process Standard for installation of the fill hose on minivans is PS-4114, not PS-8952. An update to note is that the MS-1872 specification for power steering fluid cited in PS-8952 has been superceded by MS-5931, which is provided in Confidential Enclosure 12. Also, "fuel hoses" as used in PS-8952 refers to small diameter (1/4 to 3/8 inch) hoses for fuel supply, return, or vapor transport on the vehicle, and which are not the same as the fuel filler hose. PS-4114 names the hose composing the subject joint the "filler hose".

All DaimlerChrysler Corporation vehicles used a tube through a grommet to connect the filler tube to the fuel tank when PS-8952 was initially issued.

A11c As noted above, the more appropriate standard related to fuel filler assembly is PS-4114. When PS-8952 was written in 1989 a standard was required for both outside and DaimlerChrysler internal fuel tank manufacturing operations, primarily for tanks made of stamped steel which were assembled, welded, then leak-checked.

Section 2.2.4.4 was provided to help vehicle assembly plants assemble small diameter fuel hoses to the appropriate fuel tank nipples, and Section 2.2.4.3 to aid assembly of the filler tube to the tank.

When PS-8952 was written a core fuel tank engineering group was responsible for its content. Since Chrysler Corporation Engineering was reorganized into platforms, a fuel tank committee with a representative from each vehicle platform reviews any standards as required. Formal responsibility for maintaining the standards belongs to the Engineering Product Specifications, Business Systems & Operations Department within Vehicle Engineering Operations.

A11d Process descriptions for assembly of subject fuel filler hoses to fuel tanks are provided in Confidential Enclosure 13.

A11e The only available details of processes used to assemble fuel systems of vehicles identified in the April 9, 1999 PE99-010 Confidential Enclosure 4 are related to the locations where vehicle assembly was completed, and to the type of fuel system. Information for this point is provided in Confidential Enclosure 14. Those shown as Built by SLAP with Gas fuel systems were assembled with the production method detailed in process documents provided for A11d, above. Those built at Pilot would have been assembled with the same

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processes but with additional engineering oversight, no further details are available. CNG systems were retrofitted completely by a prototype process with different components, and no further details are available.

A11f Any lubricant used to aid assembly of the hose onto the fuel tank spud is likely to also reduce the force required to pull that same joint apart immediately after assembly. The effect of the lubricants to reduce pull-off force has, however, been shown to greatly decrease with time and temperature cycles, as demonstrated in test results provided as Confidential Enclosure 7 of the April 9, 1999 response to PE99-010. Those tests did not include the effect of repeated and long-term exposure to gasoline as a solvent, which is expected to further reduce any lubrication effect to zero.

The pull-off testing done and reported in that April 9, 1999 Confidential Enclosure 7 was conducted primarily with Automatic Transmission Fluid (ATF) as a possible assembly aid showing the largest test effect on pull-off. Only verbally reported recollections that ATF might have been used at some time at an assembly plant for this operation are available to suggest that ATF effects should be evaluated.

A11g Test results provided in Confidential Enclosure 7, Report 201-99 show that different possible assembly aid lubricants have pull-off load effects. Transmission fluid without time (aging) for absorption or migration was related to lower pull-off loads than the power steering fluid used in minivan production. Another effect demonstrated is that relatively short test aging (5 days) permitted the lubricant effect to be nearly eliminated, although measured fastener torque relaxed considerably during the same aging. Torque relaxation does not, however, indicate any change in the effective diameter of the clamp. The diameter of the clamp may be the most significant factor effecting resistance against pull-off.

A11h MS-5931, cited in PS-4114, is an appropriate fluid for use in assembly of the fuel filler hose to the plastic fuel tank inlet tube. Specifications for MS-3881 and a related material are provided in Confidential Enclosure 15.

A11i DaimlerChrysler continuously considers the safety implications of design and processing choices as questions arise. Laboratory testing of fuel filler hose joints provided with our April 9, 1999 response to PE99-010 demonstrated that the worst cases of assembly lubricant without time to dissipate and with the lowest initial clamp torque values still provided substantial pull-off resistance.

A11j No other related documents are available or known to exist.

Q12 NHTSA calculates the back angle of the tank spud bead in the subject hose joints to be less than 15 degrees, based on measurements of two sample spuds provided by DaimlerChrysler. Furnish the following information regarding the design of the tank spud bead in the subject vehicles:

a Explain the design basis for DaimlerChrysler's bead back angle design on the subject tank spud and provide copies of all documents referenced in the design process which authorize, recommend, or depict appropriate bead back angles;

b State whether the subject hose joint bead design geometry is unique to the subject fuel tank spud. If not, provide copies of any and all documents depicting or describing tank spud bead designs of similar geometry in any other tank designs by DaimlerChrysler or any other manufacturer;

c Provide DaimlerChrysler's assessment of the influence of the spud bead back angle on the subject hose joint pull-off forces;

d State whether DaimlerChrysler has ever considered the safety implications of the design of the tank spud bead back angle, either during the design of the spud or at any time since; and

e Provide copies of any and all additional documents that are related in any manner to items "a" through "d," or to any other aspect of the bead design of the subject tank spud.

A12a The bead design back angle was not a separately specified part, but rather was included within the more general specifications for the fuel tank. As a result, there are no documents specifying the bead design back

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angle as an independent item at DaimlerChrysler or at any of our suppliers. DaimlerChrysler's fuel integrity specifications and requirements are considerable, however, and include design and development work outlined in the answer to Question 19, manufacturing, and component specifications. These specifications are confirmed through supplier validation tests and through a series of full vehicle crash tests. DaimlerChrysler has previously submitted its full vehicle crash product development and compliance testing to the agency.

A12b Confidential Enclosure 16 provides the engineering detail documents depicting a DaimlerChrysler tank spud bead design of similar geometry to that on the minivan. DaimlerChrysler is unable to comment on designs of other manufacturers.

A12c The bead back angle is one feature of a fuel integrity system. DaimlerChrysler's design and specifications are intended to provide occupant protection in real world conditions throughout the life of the vehicle. Supplier validation testing, durability testing, and full vehicle crash testing all confirm the strength and safety of the system.

A12d DaimlerChrysler went to considerable efforts to ensure the fuel integrity of the minivan. DaimlerChrysler's specifications are substantial and full vehicle crash testing confirmed the adequacy of those specifications. Many of these specifications are referred to in the answer to Q19, below. Real world performance has also confirmed the strength and safety of the fuel integrity system. Regular validation testing from the fuel tank supplier confirms that the fuel tank is manufactured in conformity with the specifications. Documents related to this validation testing have not yet been provided to DaimlerChrysler, but will be forwarded as soon as available.

A12e DaimlerChrysler has conducted a reasonable search and has found no documents that relate specifically to the bead design of the subject tank spud.

Q13 Furnish the following information regarding the construction and structural properties of the tank spud in the subject vehicles:

a State whether DaimlerChrysler has ever considered reinforcing the tank spud with metal, or by any other means. Describe all reinforcement options considered by, or for, DaimlerChrysler and state the reasons each option was considered and the reasons for rejection, as applicable;

b Describe all structural properties that were considered by DaimlerChrysler in the design of the tank spud. Identify all structural property specifications for the subject hose joint (e.g., spud wall thickness, spud flexural modulus, etc.) and state the reasons for each;

c Provide DaimlerChrysler's assessment of the influence of the spud structural properties (e.g., reinforcement, or lack thereof, and wall thickness) on the subject hose joint pull-off forces;

d Provide DaimlerChrysler's assessment of the factors responsible for the disparity in pull-off performance between the subject hose joint and the metal filler tube end hose joint in the test data furnished in Enclosure 7 of DaimlerChrysler's April 9, 1999 response to PE99-010 (Test Report No. 200-99);

e Describe the location where the metal filler tube end hose joint is assembled (i.e., state whether the filler tube end joint is assembled at the vehicle assembly plant or by the filler neck assembly supplier) and describe any and all lubricants used in the assembly of the metal filler tube end joint;

f State whether DaimlerChrysler has ever considered the safety implications of the spud structural properties, either during the design of the spud or at any time since; and

g Provide copies of all documents that are related in any manner to items "a" through "f," or to any other aspect of the tank spud structural properties.

A13a DaimlerChrysler had no reason before the NHTSA 214 test to consider whether it might be beneficial to reinforce the fuel tank spud. DaimlerChrysler conducted numerous preproduction tests, including 214 crash

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tests, which were the same as the conducted by NHTSA, without any fuel leaks. The minivan's field performance has been exceptional and consistent with competitive vehicles. DaimlerChrysler continues to study the NHTSA test results and to consider the significance of this test result.

A13b DaimlerChrysler provides functional specifications, all of which were met by the fuel tank supplier. The supplier is responsible for the detailed design of the tank spud. These details meet specifications for function of the joint at both the component level and as a vehicle system in full vehicle crash testing. Tests have revealed no deficiencies in the spud structural properties. In addition to conducting full vehicle crash tests, DaimlerChrysler has required validation testing on a regular basis to validate the fuel tank performance to specifications.

A13c,dEach vehicle crash is a unique event, with unique energy and force characteristics. Crash forces often range in tens of thousands of pounds, and forces in the infinite variety of real-world crashes cannot reasonably be evaluated. Field performance shows that the system in this vehicle has strength attributes similar to other, competitive products.

A13e The filler tube assembly suppliers assemble the rubber fuel filler hose to the steel filler tube. Two different suppliers manufacture this assembly of filler hose on filler tube. One suppler uses a mixture of 10% Merpol in water to aid assembly, the other uses a rosewater solution.

A13f The post-collision fuel system performance of all of the specific design parameters used in the manufacture of the subject vehicles is well documented in the tests provided in response to PE99-010. The subject vehicles met, and still meet, all applicable Federal Motor Vehicle Safety Standards. Full vehicle crash testing is the only reasonably comprehensive means to check for post-collision fuel system integrity, including any potential effect of spud structural properties.

A13g DaimlerChrysler has no documents that are specifically related to tank spud structural properties.

Q14 Provide the following information regarding the design tolerances of the hose and tank spud used in the subject hose joint:

a State the engineering bases for the design tolerances established by DaimlerChrysler for the hose inner diameter and tank spud;
b State whether the design tolerances for the hose and spud allow for a clearance fit condition to exist between the hose and spud (i.e., can the hose inner-diameter dimension be greater than the outer-diameter of the spud land/shank);
c Provide DaimlerChrysler's assessment of the influence of a clearance fit condition on the sealing performance and pull-off forces for the subject hose joint;
d State whether DaimlerChrysler has ever considered the safety implications of a tolerance stack-up condition which results in a clearance fit condition for the subject hose joints, either during the design of the joint or at any time since;

A14a Design tolerances are determined such that there is always an interference fit between the fuel filler hose inner diameter and the tank spud bead. Excessive interference between the hose inner diameter and the spud shank outer diameter would make installation of the hose onto the spud difficult to impossible, depending on the degree of interference.

14b Design tolerances allow the possibility that clearance could sometimes exist between the hose inner diameter and the shank of the spud tube. A major reason a bead is included in the spud design is to ensure that the hose inner diameter seals effectively to the spud, preserving fuel system integrity. An important consideration requiring that the degree of interference between the hose and the spud not be excessive is the health and safety of workers installing the hose onto the spud.

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14c Possible clearance fit between the shank of the spud and the hose inner diameter does not significantly influence the sealing performance or pull-off forces of the subject hose joint. Sealing and pull-off resistance are contributed by the bead portion of the spud tube, which is always a significant interference fit.

14d The potential clearance fit between the fuel filler hose and the tank spud shank is not relevant to proper and safe function of the joint after it is assembled in a vehicle. The bead included in the spud design exists to provide interference required for sealing and pull-off resistance. Reasonable tolerances for hose manufacturing together with ergonomic safety for assembly workers combine to indicate that clearance fit is an accepted possibility. Possible clearance between the inner diameter of the hose and the outer diameter of the spud shank was considered and accepted as appropriate for the design, both at the time the design was released and now.

Q15 Furnish the following information regarding the packaging/routing of the fuel filler neck assembly in the subject vehicles:

a Provide DaimlerChrysler's assessment of the propensity for sill buckling to occur in the subject vehicles in FMVSS 214 type side impact collisions;
b Provide DaimlerChrysler's assessment of the influence of sill buckling on the deformation of the left-rear wheelhouse structure in FMVSS 214 type side impact collisions;
c Identify and describe all modifications or changes made by DaimlerChrysler in the pre-production vehicle design process that were specifically intended to improve the performance of the subject vehicles in FMVSS 214 dynamic side impact testing. For each such change, state the date of the change, the reasons for the change, the effect on the test results, whether the effect on fuel system integrity was considered during the change process, and provide copies of all relevant documents;
d Provide DaimlerChrysler's assessment of the potential for the inner sill wall, wheelhouse structure, or other body components to contact the fuel filler neck assembly in FMVSS 214 type left-side impact collisions. Provide the same assessment for FMVSS 301 type side impacts;
e State whether DaimlerChrysler has ever reviewed, or considered the safety implications of, the packaging of the fuel filler neck assembly in the subject vehicles; and
f Provide copies of all documents that are related in any manner to items "a" through "e," or to any other aspect of the packaging of the subject filler neck assembly.

A15a DaimlerChrysler engineers have inspected post-crash vehicles and made the following observations and conclusions. DaimlerChrysler believes that it is possible and acceptable for sill buckling to occur on the minivans in FMVSS 214 type side impact collisions. The relatively concentrated loading and high stiffness of the Moving Deformable Barrier (MDB) bumper form is applied above the primary sill structure.

The minivan sill is located at and below the MDB bumper form (FMVSS 214 specifies 13" to 21" above ground). The MDB primarily engages vehicle structure above the sill. This generates lateral deformation and upward rolling of the sill, predominantly near the B-post. The B-post is subject to direct loading from the center of the MDB nose-cone, and indirect lateral loading from both the front hinged and rear sliding doors.

The bumper form initiates vehicle deformation in the FMVSS-214 test, since it is 4" proud to the primary block of the MDB. The sill therefore realizes significant MDB loading in an FMVSS-214 type test, and sill buckling is expected.

A15b DaimlerChrysler has not conducted a detailed analysis of the influence of sill buckling on the deformation of the left rear wheelhouse structure.

In our judgment, the primary load paths from the outer body side to the underbody during an FMVSS-214 test are indicated below in descending order of contribution:

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- B-post to sill
- Sliding door to the lower track support structure (body-mounted)
- C-post to sill
- A-post to sill
- Sill to underbody
- Spring hanger box assembly "Bracket and plate assembly, floorpan / rear suspension hanger front"
- Front seat front and front seat rear outriggers (two total, in line with seat crossmembers) "Reinforcement, floorpan side rail to sill inner"
- Front torque box "Reinforcement, side front rail to sill inner"
- Rear wheelhouse

The rear wheelhouse structure is one of the least significant load paths for structural performance in an FMVSS 214 test, since loads to the wheelhouse are reacted by the floorpan (not the stronger longitudinal rail).

A15c The design of the 1996 minivan was an evolutionary change from DaimlerChrysler's immediate predecessor vehicle (1995 minivan). The 1996 minivan design included similar attributes that, in our opinion, provide inherent occupant crash protection performance benefits for FMVSS-214 type tests. These include high "H-point to ground" seating position, side door impact beams, and heavier total vehicle mass and greater "occupant to vehicle interior" lateral offsets than a typical passenger car.

Because of these favorable attributes, baseline test performance of pre-production 1996 vehicles satisfied FMVSS-214 requirements. Subsequent testing of production level vehicles provided similar performance at acceptable levels.

A15d DaimlerChrysler believes that any high-energy crash event (such as an FMVSS-214 test) with intrusion near the fuel filler neck assembly could result in some degree of body structure-to-fuel filler contact. The system was designed with this in mind to preserve fuel system integrity. Multiple FMVSS-214 and FMVSS-301 tests were conducted to verify that the environment surrounding the fuel filler minimizes damage to the fuel fill assembly.

Examples of design features include:
- Break-away housing at upper end of fuel filler system (to de-couple body side deformation from fuel filler and tank motion).
- Metal upper fill tube for resistance to cuts and punctures.
- Spring shield to protect the tube assembly from potential punctures (in the event the rear leaf spring separates during dynamic use)
- Plastic wheelhouse liner to protect the fill tube assembly from road debris during normal vehicle use, and to reduce the possibility of fill tube assembly damage during impacts.
- Rear-facing flange on rear edge of sill / wheelhouse extension to present a flat, friendly surface toward the fuel filler assembly.
- Flex hose to accommodate relative motion between upper fill tube and tank spud.

A15e The post-collision fuel system performance of all of the specific design parameters, including packaging of the fuel filler tube assembly used in the subject vehicles, is well documented in the tests provided in response to PE99-033. All tested vehicles were subjected to post-crash analysis which included assessment of any safety implications.

A15f The only available document which might relate in some manner to alternative packaging of the fuel filler tube assembly is the preliminary list of factors proposed to survey in other minivans, provided in Enclosure 10, cited above in Answer 7.

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Q18 Provide the following information regarding DaimlerChrysler's lack of a pull-off force standard for the subject hose joint:

a Explain why DaimlerChrysler does not have a pull-off force standard for the subject hose joint; and
b State whether DaimlerChrysler has specified pull-off force requirements for any other passenger vehicles produced from January 1, 1990, to present and, if so, state the specifications by platform, model years, fuel tank size, and pull-off requirement.

A18a A pull-off force standard does not exist for the subject hose joint because such a standard does not have demonstrated technical value for product performance. Forces associated with vehicle motion and deformation in vehicle crash environments often range in tens of thousands of pounds, far beyond reasonable hose joint pull-off specifications.

The reason to apply a pull-off specification to a joint would be to verify that the process of assembling the joint was in control and being conducted consistently. This specification does not apply to the minivan filler since connecting the hose to the tank creates the subject joint, then the clamp is added after the tank and hose are already installed in the vehicle. No practical means exists to do a pull-off test in this environment, so a pull-off standard is not appropriate for this purpose, either.

Q19 Furnish the following information regarding DaimlerChrysler's participation on the SAE Fuel Containment Standards Committee which published the SAE Information Report "Passenger Car and Light Truck Fuel Containment," SAE J1664 (copy enclosed), in January 1994:

a Identify by name and title each of DaimlerChrysler's representatives on the SAE Fuel Containment Standards Committee;
b State how each of DaimlerChrysler's representatives voted in the balloting for the final SAE J1664 Information Report; and
c Explain the reasons for any votes by DaimlerChrysler representatives opposing the final SAE J1664 Information Report and identify who made the decision for any such votes.

A19 DaimlerChrysler's minivans were designed and developed in full accordance with SAE J1664. It is important to note, however, that neither SAE nor DaimlerChrysler Corporation designate corporate "representatives" to the SAE Fuel Containment Standards Committee, nor to other similar SAE committees. SAE members serve on such committees as interested and informed professionals, not as representatives of their employers. SAE minutes and records of committee membership for 1993 are no longer archived, and DaimlerChrysler is currently unaware which, if any, of its employees might have served on that committee. Rules of the SAE specifically prohibit maintenance of individual Technical Report approval ballots.

The referenced SAE paper is an Information Report. The SAE creates, approves, and publishes three types of surface vehicle Technical Reports, as described in Section 7.3 of SAE Technical Standards Board Rules and Regulations - SAE TSB 001 JAN96. These are SAE Standards, SAE Recommended Practices, and SAE Information Reports. Information Reports, like SAE J1664, "are compilations of engineering reference data or educational material useful to the technical community." (SAE TSB 001 JAN96). This is the least demanding and possibly less generally accepted of the three approved Technical Report types. As noted in Section 7.7 of SAE TSB 001, all approved Technical Reports include the statement: "The use of this report is entirely voluntary...."

Although DaimlerChrysler did not explicitly reference SAE J1664 during minivan fuel system development, the concepts included in the Information Report agree with the design practices DaimlerChrysler employs for design and development of the fuel system. The following reviews the DaimlerChrysler practices used for minivan development as related to Section 4 of SAE J1664. Since some of these evaluations were done

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during early development of the vehicle the related documentation may be more than five years old, and no longer available. Other documents are still being collected and will be provided as soon as possible.

4.1- Durability tests, including gravel road and off-road, are routinely run. Miles accumulated are correlated to actual customer miles. Vehicles are reviewed at the completion of testing.

4.2- A 170 cycle full vehicle corrosion test is run at the Proving Ground. Materials, including protective coatings, are chosen for compatibility as well as corrosion and fuel resistance protection. Vehicles are reviewed at the completion of testing.

4.3- Fuel soaks, as well as other accelerated aging bench tests contained in DaimlerChrysler performance standards, are run on components. Functional tests on the components are run after completion of accelerated aging testing.

4.4- Various components, including fuel tank and pump module, are vibration tested and pressure/vacuum tested. Parts are leak checked at the conclusion of testing.

4.5- The recommendations of this Permeation Guideline for evaporative losses are met. All vehicles are certified and documentation is submitted to the appropriate emissions control agency.

4.6- Fuel compatibility testing is performed on tank mounted components per their performance standards. SAE "worstcase condition" fuels as well as flexible fuels are utilized.

4.7- Service guidelines to the customer are outlined in each vehicle's owner's manual. Appropriate instructions are also provided in service manuals.

4.8- Supplier manufacturing processes are reviewed by DaimlerChrysler Engineering and Supplier Quality before production. Particular attention is paid to possible sources of fuel system contamination. Fuel system parts are shipped to DaimlerChrysler vehicle assembly plants as complete assemblies whenever practicable to further minimize the possibility of contamination. All openings are capped during shipment. Leak test audits are conducted at assembly plants for entire vehicle system.

4.9- Current fuel component leak testing consists of air pressure (no evidence of bubbles) or helium gas leak detection (for the newer ORVR systems).

4.10- The abnormalities of misassembly, vent system failure, engine or fuel system malfunction, exhaust system leakage or failure, overfilled fuel tanks, and possible combinations of these abnormalities are all addressed during the normal course of system development.

4.11- Extensive heat testing under extreme vehicle use conditions is done in Arizona, on Baker grade in California and in the temperature-controlled wind tunnel. Fuel system component temperatures are monitored during these tests.

4.12- Packaging of fuel system components to provide adequate protection during crash tests is a development priority. Prototype components representing the production intent configuration for the fuel system are installed on early development crash vehicles to check for any fuel leaks. Subsequent crash testing becomes more meaningful as the body structure design and fuel system component designs become more refined. Each post-crash vehicle is reviewed to assess fuel component performance. Pre and post-test leak checks are also conducted to insure system integrity. Points particular to the vehicle design:

The tank was located forward of the rear axle and on the left side of the vehicle, providing maximum protection for front and rear crashes. Fuel pump, level sender, valves, and vent attachments are on the top of the tank, protected against the vehicle floorpan. A plastic shield to protect the filler tube from rocks and other road debris was located in the wheelhouse. A steel shield to protect the tube in the event of spring breakage was included. This shield also helps protect the tube from road debris. The plastic housing attaching the top end of the filler tube to the body breaks away in crashes, letting the tube pivot about the fill nipple.

4.13- Normal venting of the fuel tank occurs through top mounted rollover/vent valves. If this system fails to function properly, the system will vent through the filler cap. Pressure/vacuum cycle testing of the tank as well as burst testing is performed.

4.14- Fuel system component placement and crash performance are reviewed throughout the development process, in conjunction with all full vehicle crash tests. Fuel system containment performance during vehicle crash compliance testing is the final assurance of fuel containment system integrity.

4.15- Fire testing by exposure to open flames is run for vehicles required to meet ECE 34, Annex 5.

EA99-013
SERVICE PARTS DEMAND

Part		CALENDAR YEAR				MONTH-YEAR									
No.	NAME	1995	1996	1997	1998	JAN-99	FEB-99	MAR-99	APR-99	MAY-99	JUN-99	JUL-99	AUG-99	SEP-99	OCT-99
04682733	HOSE	24	62	79	32	4	8	11	11	14	13	9	11	7	17
04725925AA	TUBE	0	0	14	57	32	32	17	21	10	18	22	18	19	29
04809331AA	TUBE	0	0	0	0	0	0	3	11	13	9	32	14	15	16
04809434	TUBE	135	166	0	4	4	1	1	1	0	1	6	3	2	1
04809547	TUBE	22	37	35	1	1	1	2	0	4	0	1	0	1	1
04809890	TUBE	0	305	807	105	45	50	28	63	51	54	86	109	120	85
04809891	TUBE	0	188	316	72	26	25	40	35	15	22	21	45	25	45
04809926AA	TUBE	0	0	10	22	11	13	16	12	8	3	11	13	7	13
04880422AA	TUBE	0	0	0	0	1	0	1	4	1	5	2	5	2	8
04880422AB	TUBE	0	0	0	0	0	0	0	0	2	1	2	4	12	8
06502091	CLAMP	98	175	234	62	11	20	10	163	21	7	43	20	21	41
04809331AB	TUBE	0	0	0	0	0	0	0	0	0	6	16	40	90	88

EA99-013
SERVICE PARTS SUPPLIERS & APPLICATIONS

Fuel Filler Tube Assembly

Part No.	Models	Model Years	# of Vehicles	Supplier	Supplier Address
04809547	NS__52	1996	278,000	Mark IV Auto Fuel Systems	3775 E. Outer Dr., Detroit, MI 48234
04809891	NS__52	1996-1998	760,000	Mark IV Auto Fuel Systems	3775 E. Outer Dr., Detroit, MI 48234
04809926AA	NS__52	1998-2000	594,000	Mark IV Auto Fuel Systems	3775 E. Outer Dr., Detroit, MI 48234
04880422AA	NS__52	1998-2000	594,000	Mark IV Auto Fuel Systems	3775 E. Outer Dr., Detroit, MI 48234
04880422AB	NS__52	1998-2000	594,000	Mark IV Auto Fuel Systems	3775 E. Outer Dr., Detroit, MI 48234
04809434	NS__53	1996	465,000	Randall Textron	750 Stephenson Highway, Troy, MI 48083
04809890	NS__53	1996-1998	1,224,000	Randall Textron	750 Stephenson Highway, Troy, MI 48083
04725925AA	NS__53	1998-1999	757,000	Randall Textron	750 Stephenson Highway, Troy, MI 48083
04809331AA	NS__53	1999	387,000	Randall Textron	750 Stephenson Highway, Troy, MI 48083
04809331AB	NS__53	1999-2000	556,000	Randall Textron	750 Stephenson Highway, Troy, MI 48083

Fuel Filler Hose

Part No.	Models	Model Years	# of Vehicles	Supplier	Supplier Address
04682733	NS	1996-2000	2,455,000	Randall Textron	750 Stephenson Highway, Troy, MI 48083

Hose Clamp

Part No.	Models	Model Years	# of Vehicles	Supplier	Supplier Address
06502091	NS	1996-2000	2,455,000	Norma Products of USA	31132 Century Drive, Wixom, MI 48393
	LH	1993-1997	1,242,000	Norma Products of USA	31132 Century Drive, Wixom, MI 48393
	AA	1994-1995	214,000	Norma Products of USA	31132 Century Drive, Wixom, MI 48393
	AN	1994-1996	319,000	Norma Products of USA	31132 Century Drive, Wixom, MI 48393
	BR	1994-1998	1,319,000	Norma Products of USA	31132 Century Drive, Wixom, MI 48393
	PL	1995-1999	1,128,000	Norma Products of USA	31132 Century Drive, Wixom, MI 48393
	JA	1995-1997	497,000	Norma Products of USA	31132 Century Drive, Wixom, MI 48393
	XJ	1995-1997	397,000	Norma Products of USA	31132 Century Drive, Wixom, MI 48393
	SR	1996	1,800	Norma Products of USA	31132 Century Drive, Wixom, MI 48393
	JX	1997-1998	155,000	Norma Products of USA	31132 Century Drive, Wixom, MI 48393
	BE	1998	284,000	Norma Products of USA	31132 Century Drive, Wixom, MI 48393

Exponent™
Failure Analysis Associates®

Exponent
149 Commonwealth Drive
Menlo Park, CA 94025

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facsimile 650-326-9072
www.exponent.com

December 14, 1999

Mr. Antonius Brenders
DaimlerChrysler Corporation
CIMS 482-00-91
800 Chrysler Drive
Auburn Hills, MI 48326-2757

RE: Minivan Collision Fire Study

Dear Tony:

The following report describes the methodology and results of our recent study of collision fire rates for Chrysler minivans as compared to minivans of other manufacturers.

METHODOLOGY

The objective of the study was to compare the post-collision fire rates for model year 1996-99 Chrysler minivans to the post-collision fire rates for minivans of other manufacturers. The primary focus of the study was risk of post-collision fire in side impact accidents, particularly for impacts on the same side as the gasoline filler neck. Two analyses were performed: 1.) analysis based upon databases of state police reported traffic accidents and 2.) analysis based upon the National Highway Traffic Safety Administration's National Automobile Sampling System (NASS/GES).

Selection of Comparison Minivans

Non-Chrysler minivans in the1992-99 model year range were used as comparison vehicles. Tables provided by DaimlerChrysler were used to identify the location of the fuel filler neck. The comparison minivans and the location of the filler neck are as follows:

Non-Chrysler Vehicles Used in the Study		
Comparison Minivan	**Model Year Range**	**Location of Filler Neck**
Ford Aerostar	1992-7	Left
GM Astro/Safari	1992-9	Left
GM APV Van	1992-6	Left
Toyota Previa	1992-7	Left
Mercury Villager/Quest	1993-8	Left
Mazda MPV	1992-9	Right
VW EuroVan	1993-8	Left
Ford Windstar	1995-8	Left
GM U-Van	1997-9	Left
Toyota Sienna	1998-9	Left
Honda Odyssey/Oasis (Import)	1996-8	Left
Honda Odyssey (Transplant)	1999	Left

State Analyses

Data from publicly available computerized databases of state police reported traffic accidents were used for this analysis. Only databases with good codes for collision fire, VIN for vehicle identification, and variables with which to identify vehicles with side impact collisions were used in the analysis. Due to the fact that the focus of this study was later model year vehicles, only databases for which accident information including calendar year1998 were used. These states are Alabama, Florida, Idaho and Maryland.

For each state, the percentage of accident involved vehicles for which there was a collision fire was calculated. The percentage of vehicles with a collision fire was calculated for all accidents, for side impact accidents, for near side (impact on the same side as the filler neck) and opposite side impacts.

Summary collision fire percentages were obtained by combining data from all four states using the Mantel-Haenszel procedure. This method controls for the potentially biasing effects of factors, such as state regulations for accident reporting, which may result in differences between states in the percentage of collision fires among reported traffic accidents.

114 EX

GES Analyses

The National Automobile Sampling System/General Estimates System (GES) is a nationally representative sample of police-reported motor vehicle crashes of all types, from minor to fatal. A cluster sample of traffic accident reports is obtained by NHTSA analysts, recorded in a uniform format and stored in a publicly available database. Information such as vehicle make, vehicle model, vehicle VIN, direction of impact, and presence of post-collision fire is available in this database. Each record contains a weighting factor which allows the analyst to produce national estimates. The percentage of accident-involved vehicles with collision fire was calculated for the Chrysler minivans and for the comparison minivans. Collision fire percentages were calculated in all accidents, side impact accidents, near side (impact on the same side as the filler neck) and opposite side impacts.

RESULTS

Results from the state analyses are consistent with the nationally representative sample from the NASS/GES. The risk of collision fire is low for all minivans. The risk of collision fire in Chrysler minivans is comparable to the collision fire risk for non-Chrysler minivans as a group. This is true in all impacts and in side impacts.

State Analyses

	All Impacts			*Side Impacts*		
	Vehicles with Collision Fire	***Vehicles in Collision***	***Percent of Collision Vehicles with Fire***	***Vehicles with Collision Fire***	***Vehicles in Collision***	***Percent of Collision Vehicles with Fire***
Chrysler Minivans	*8*	*10,120*	*0.079%*	*1*	*2,691*	*0.037%*
Other Minivans	*38*	*62,183*	*0.053%*[1]	*2*	*15,642*	*0.014%*[1]

Note that the only Chrysler minivan with side impact collision fire was a Florida state accident with an opposite side impact.

[1] Percent calculation based upon the Mantel-Haenszel odds ratio.

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National Estimates based upon NASS/GES

	All Impacts			Side Impacts		
	Vehicles with Collision Fire	Vehicles in Collision	Percent of Collision Vehicles with Fire	Vehicles with Collision Fire	Vehicles in Collision	Percent of Collision Vehicles with Fire
Chrysler Minivans	82	98,218	0.08%	0	32,041	0%
Other Minivans	511	666,202	0.08%	0	211,071	0%

DISCUSSION

The data from the four-state analysis indicates that collision fires occur in less than 1% of traffic accidents; furthermore, the risk of fire in side impact collisions is even lower than the risk of fire in all collisions. There is no indication that the risk of collision fire is higher for impacts on the same side as the filler neck as compared to impacts on the opposite side. The results of the NASS/GES analysis are consistent with the four-state analysis. The observed differences in collision fire rates between the four-state analysis and the NASS/GES analysis may be in part due to state-to-state differences in accident reporting. The differences are of a magnitude to be attributable to sampling variability.

It was a pleasure working with you on this project. Please don't hesitate to call me at 650-688-7264 or Ninah Asuncion at 650-688-7248 if we can be of further assistance.

Yours truly,

Rose M. Ray, Ph.D.
Principal Scientist

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Vehicle Identification - Make, Model, Model Year, options. Date of Inspection.

Wheel base of vehicle		
Rated fuel capacity		
Location of fuel fill tube (right or left side)		
Location of fill opening CntrLine on sheet metal		
Fore-Aft position of opening to rear axle CntrLine (in 'Y')		
Up_Down position of opening to top of rear wheel opening (above axle CntrLine, in 'Z')		
Description of fuel tank location in vehicle		
Position of rear edge of tank to rear axle CntrLine		
Position of front edge of tank to rear axle CntrLine		
Position of left outboard edge to outboard side of left sill		
Position of right outboard edge to outboard side of right sill		
Position of left outboard edge to inboard side of left rail		
Position of right outboard edge to inboard side of right rail		
Any additional comments ?		
Fill venting and valving		
ORVR, internal/external		
Location on tank and fill tube		
Material, attachment, size, valving		
Fuel tank material type (metal or plastic)		
Unique suspension or other chassis interface ?		
Fuel tank		
Location of fuel filler tube entry (Rear, side, top?)		
Submerged fill (yes or no?)		
Any tank shields ? Note if thermal or impact (skid plate), attached to tank, body or exhaust.		
Any additional comments ?		
Fuel tank straps		
How many straps ?		
Fore/aft or lateral ?		
Any additional comments ?		
Are they fastened to fixed dimension or to torque?		
Fill Pipe		
Housing at body side: Fixed or breakaway ?		
Approximate overall length		
Number of bends		
Pipe Material		
Pipe OD		
Routed above rail, below rail, through rail?		
Connection type to tank		
Pipe attachment to BIW structure (yes or no)		
Comments pertaining to venting hoses		
Unique rollover valves or plumbing ?		
Any shielding? For impact? (yes or no)		
Any additional comments ?		
Fill Pipe Hose		
Hose OD		
Length		
Number of bends		
Corrugated or not		

Hose reinforced (yes or no)		
Any additional comments ?		
Fill pipe attachment to tank		
Type: Spud ? Note material, how attached to tank, length, diameter, diameter of bead.		
Clamp ? Style of clamp ?		
Bead type on spud		
Any additional comments ?		
Fuel cap		
Type (screw-on, quick-on, etc.)		
Valving		
Cap attachment - metal/plastic?		
Vehicle Attitude - Vertical from top of wheel opening above axle CntrLine (As received, no additional loading)		
Left Front		
Left Rear		
Right Front		
Right Rear		

DAIMLERCHRYSLER

January 7, 2000

Kathleen C. DeMeter, Director
Office of Defects Investigation, Safety Assurance
National Highway Traffic Safety Administration
400 Seventh Street S.W. (NSA-12; Room 5326)
Washington, D.C. 20590

DaimlerChrysler Corporation
Susan M. Cischke
Sr. Vice President
Regulatory Affairs &
Passenger Car Operations

Re: NSA-122jlq; EA99-013

Dear Ms. DeMeter:

This supplements our November 26, 1999 and December 20, 1999 responses to the October 20, 1999 information request for Engineering Analysis (EA) 99-013 investigating fuel system integrity with 1996 through 2000 model year DaimlerChrysler minivan vehicles in FMVSS 214 side impact collision tests.

The exemplary real world performance of DaimlerChrysler minivans in providing post-collision fuel system integrity and protections against all other causes of post-collision fires was demonstrated by the accident statistical studies provided with our November 26 and December 20, 1999 responses. NASS/GES data contains no incidence of post-side-collision fires in minivans. Our further search into available state accident databases found only one incident, which on further inquiry involved a DaimlerChrysler minivan hit on the right front side, opposite the fuel filler location.

Nonetheless, DaimlerChrysler continues to be concerned about leakage observed in NHTSA's FMVSS 214 test, and to consider whether changes to reduce the possibility of any similar event occurring in customer use might be called for. Examination of accident statistics clearly shows that no significant safety risk is evident, but we also certainly share NHTSA's concern to reasonably minimize whatever risk might exist.

Several requests are for information that is confidential. Responses to those will be supplied separately to the NHTSA Chief Counsel's Office with a request for treatment as confidential business information.

We welcome discussion of questions you have during your review of this information.

Sincerely,

Sm Cischke

Susan M. Cischke

Attachment
Enclosures

cc: Heidi Coleman

DaimlerChrysler Corporation
800 Chrysler Drive CIMS 484-12-14
Auburn Hills MI USA 48326-2757
Phone 248.576.7301
Fax 248.576.2202
e-mail: smc16@daimlerchrysler.com

ATTACHMENT

Q6 Identify and describe all modifications or changes in the design, manufacture, or packaging of the fuel tank or filler neck assembly used in the subject vehicles, from pre-production development to date that may relate in any way to the alleged defect.

A6 Mr. Jeff Quandt of the ODI staff asked about differences between fuel filler tube assemblies observed in the field. Enclosure 7 of the December 20, 1999 response to EA99-013 provided information concerning the various service part fuel filler tube assemblies. Differences among those assemblies were not described in earlier responses to this question since the associated changes were not in the area of the subject joint. Enclosure 7 of this response provides summary descriptions of the service parts listed in prior responses.

Q8 Furnish copies of all documents relating to communications between DaimlerChrysler and each supplier of components used in the subject filler neck assembly pertaining to the design, manufacture, performance, durability, quality, testing, or modification of the subject filler neck assembly and/or any of its component parts. If any communications on this subject were oral, provide a written transcript or summary of each such communication, and include a statement that identifies the participants and the date of the communication. Include in your response all documents from each such supplier that are in DaimlerChrysler's files. Furnish this information in a separate enclosure for each supplier.

A8 Confidential Enclosure 17, provided separately with a request for confidential treatment, provides relevant DaimlerChrysler file documents from Solvay, the supplier for the fuel tank assembly.

Regular business practice indicates that records of ongoing performance and quality assurance testing are maintained by component suppliers, and provided to DaimlerChrysler on request. No other relevant records are available in DaimlerChrysler files because no design or manufacturing process change is currently underway, and no quality issues are under investigation.

"All documents from each supplier that are in DaimlerChrysler's files" might be interpreted to include normal component procurement and shipping documents, since production of subject vehicles is continuing. DaimlerChrysler is not providing those documents because they contain no information relevant to the subject investigation.

Q9 Furnish copies of all DaimlerChrysler documents relating to internal communications which pertain to the design, manufacture, packaging, performance, durability, quality, testing, or modification of the subject filler neck assembly, including all electronic mail messages, memoranda, presentations, test data, photographs (color copies), videotapes, reports, meeting minutes, or notes.

A9 DaimlerChrysler's earlier responses to ODI after the January 1999 OVSC FMVSS 214 test, to PE99-010 requests, and to EA99-013 have provided available documents relevant to the subject filler neck assembly. The only additional documents available are meeting notices for discussions related to DaimlerChrysler's responses. Meeting notices related to generating responses to ODI requests are provided in Enclosure 18. Meeting minutes were neither required nor generated from these meetings, so cannot be provided.

Q10 Furnish copies of all documents relating to communications between DaimlerChrysler and any and all other entities not covered by Items 8 and 9 and pertaining to the design,

ATTACHMENT

manufacture, packaging, performance, durability, quality, testing, or modification of the subject filler neck assembly. If any communications on this subject were oral, provide a written transcript or summary of each such communication, and include a statement that identifies the participants and the date of the communication. Include in your response all documents from each such contact that are in DaimlerChrysler's files. Furnish this information in a separate enclosure for each contact.

A10 No additional documents are available.

Q14 Provide the following information regarding the design tolerances of the hose and tank spud used in the subject hose joint:

e State whether DaimlerChrysler ever consulted with any hose or hose clamp suppliers concerning appropriate ranges of interference fit or any other aspect of clamped hose joint design and provide copies of all relevant materials and descriptions of all oral discussions regarding such subjects by date and names of participants; and

f Provide copies of all documents that are related in any manner to items "a" through "e," or to any other aspect of the subject hose joint dimensional tolerances.

A14ef DaimlerChrysler did consult with suppliers of the hose clamp, the hose (which is supplied to DaimlerChrysler in assembly with the fuel filler tube), and the fuel tank as part of the normal design and development process for the minivan. Discussions have also occurred with these suppliers through the course of responding to ODI's investigation. DaimlerChrysler suppliers agree that the ranges of interference fit and other aspects of the clamped hose design are appropriate. No relevant documents are available concerning clamped hose joint design beyond the design drawing and specification information supplied in portions of this response. No descriptions of oral discussions are available.

Q17 Provide tables listing the same information requested in Items 16.b through 16.d for all DaimlerChrysler plastic fuel tanks used since September 1993 other than the subject vehicles.

b. Furnish a table listing all plastic fuel tanks used by ~~Mercedes Benz~~ (DaimlerChrysler Corporation) ***since September 1993, by tank capacity, tank supplier, tank material, tank part number, and vehicle model and model year in which used;***

c. For each fuel tank identified in Item "b" which has a plastic tank spud, furnish a drawing or sketch of the bead design and state the bead back angle dimension and tolerance range;

d. For each fuel tank identified in Item "c," furnish a table showing the following information: (1) whether the spud incorporates any type of metal reinforcement, such as a sleeve or ferrule; (2) the dimensional tolerances of the spud wall thickness; (3) the dimensional tolerances of the spud land diameter; (4) the dimension tolerances of the hose clamped to the tank spud; (5) the dimensional tolerances of the spud bead; and (6) all lubricants used in the assembly of the spud hose joint ...

A17 Enclosure 19 provides tables listing DaimlerChrysler vehicles produced for sale in the United States since September 1993 which used plastic fuel tanks. The available design details, assembly process details, and drawings requested are provided in Confidential Enclosure 20.

ATTACHMENT

Q18 Provide the following information regarding DaimlerChrysler's lack of a pull-off force standard for the subject hose joint:

b. State whether DaimlerChrysler has specified pull-off force requirements for any other passenger vehicles produced from January 1, 1990, to present and, if so, state the specifications by platform, model years, fuel tank size, and pull-off requirement.

No DaimlerChrysler passenger motor vehicles produced from January 1, 1990 to date have had a pull-off force requirement for a fuel filler hose to fuel tank spud. DaimlerChrysler steel fuel tanks, and some plastic fuel tanks, did not have a clamped joint. The steel filler tube was a slip fit through a grommet into the fuel tank.

4203211 (s/o 4203001) 1/4" hose, 50' roll

4443175 1/4" hose, 25 ft roll

4682733 Filler hose, tank/filler tube, unchanged for NS/GS

4725925AA Filler tube assy, single vent, LWB (s/b 4809331AA)

4809331AA Filler tube assy, single vent, 1/4 turn cap, LWB

4809434 (s/b 4809890) Original NS LWB filler tube, 2 vents

4809547 (s/b 4809891) Original NS SWB filler tube, 2 vents

- 4809890 Filler tube assy, added grnd strap (LWB), 2 vents

- 4809891 Filler tube assy, added grnd strap (SWB), 2 vents

4809926AA Filler tube assy, single vent, SWB (s/b 4880422AA)

- 4880422AA Filler tube assy, single vent, 1/4 turn cap, SWB

- 4880422AB Same as above exc. revised grnd strap

4883140 Fuel tank (OEX) Ribs added to bottom

4897570AB Fuel tank Pads added for 'thud'

5011939AA Fuel tank Single vent

65022091 Clamp, hose/tank, hose/filler tube, unchanged for NS/GS

- 4809331AB Same as 4809331AA, exc revised grnd strap

om: T0081CS --CLIC Date and time 03/04/99 17:38:30
: T7964JW --CLIC James A. Walendzik T3166MC --CLIC Mark W. Crossman
  T5011FF --CLIC Francis M. Fodale T2034GC --CLIC Guy L. Cowing
  T0285DC --CLIC Diana A. Cernis T8692AB --CLIC Antonius H. Brende
  T0081CS --CLIC Clinton E. Spevak

om:

quester:
te to be scheduled: 03/08/99
arting time: 10:00AM EASTERN
ding time: 11:00AM EASTERN

ıcation: CWHQ-4B Headquarters Tower

ıbject: Response to NHTSA PE99-010 Kickoff

ırpose: Agree on responsibilities to provide information required by Feb 19, 1999 NHTSA PE99-010 request concerning filler tube separation in crash. Response due in Washington on April 9, 1999

Attendee List:

T7964JW	CLIC	James A. Walendzik
T3166MC	CLIC	Mark W. Crossman
T5011FF	CLIC	Francis M. Fodale
T2034GC	CLIC	Guy L. Cowing
T0285DC	CLIC	Diana A. Cernis
T8692AB	CLIC	Antonius H. Brenders
T0081CS	CLIC	Clinton E. Spevak

* *

om: T0081CS --CLIC Date and time 03/10/99 12:43:53
: T7964JW --CLIC James A. Walendzik T3166MC --CLIC Mark W. Crossman
  T5011FF --CLIC Francis M. Fodale T2034GC --CLIC Guy L. Cowing
  T0285DC --CLIC Diana A. Cernis T8692AB --CLIC Antonius H. Brende
  T0081CS --CLIC Clinton E. Spevak

om:

quester:
te to be scheduled: 03/26/99
arting time: 10:00AM EASTERN
ding time: 11:00AM EASTERN

cation: Tech Plaza 2C

bject: Final Response to PE99-010 Review

rpose: Ensure that information required for response to NHTSA by their April 9 deadline has been provided to Safety Office.

Attendee List:

T7964JW	CLIC	James A. Walendzik
T3166MC	CLIC	Mark W. Crossman
T5011FF	CLIC	Francis M. Fodale
T2034GC	CLIC	Guy L. Cowing
T0285DC	CLIC	Diana A. Cernis
T8692AB	CLIC	Antonius H. Brenders
T0081CS	CLIC	Clinton E. Spevak

* *

om: T0081CS --CLIC Date and time 08/16/99 18:35:30
: T3166MC --CLIC Mark W. Crossman T7964JW --CLIC James A. Walendzik
  T4117GB --CLIC Gregory A. Beecher T0285DC --CLIC Diana A. Cernis
  T2034GC --CLIC Guy L. Cowing T8692AB --CLIC Antonius H. Brende
  T5941WE --CLIC William R. Edwards T0081CS --CLIC Clinton E. Spevak

om:

quester:
te to be scheduled: 08/18/99
arting time: 3:00PM EASTERN
ding time: 4:00PM EASTERN

cation: W2003 Cischke CR @ N2W22

bject: NS Fuel Filler in 214D type crashes

rpose: Review status of NHTSA inquiry and brainstorm options,
assign activities

Attendee List:

T3166MC	CLIC	Mark W. Crossman
T7964JW	CLIC	James A. Walendzik
T4117GB	CLIC	Gregory A. Beecher
T0285DC	CLIC	Diana A. Cernis
T2034GC	CLIC	Guy L. Cowing
T8692AB	CLIC	Antonius H. Brenders
T5941WE	CLIC	William R. Edwards
T0081CS	CLIC	Clinton E. Spevak

* *

om: T0081CS --CLIC Date and time 09/09/99 15:36:27

:	T3166MC --CLIC	Mark W. Crossman	T7964JW --CLIC	James A. Walendzik
	T4117GB --CLIC	Gregory A. Beecher	T5457NT --CLIC	Nicolaos Tapazoglo
	T2034GC --CLIC	Guy L. Cowing	T8692AB --CLIC	Antonius H. Brende
	T5941WE --CLIC	William R. Edwards	T0081CS --CLIC	Clinton E. Spevak
	T6965MB --CLIC	Marion Bugin	T8067GD --CLIC	Gary D. Dawson
	T9452MO --CLIC	Mark J. Olex	T6626MT --NOVM	T6626MT at NOVM

om:

equester: Clinton E. Spevak
te to be scheduled: 09/14/99
arting time: 9:00AM EASTERN
ding time: 10:00AM EASTERN

cation: TECH-2G

bject: NS Fuel Filler Investigation

rpose: Collect available information, assign responsibilities for needed information concerning NHTSA inquiry into NS fuel system integrity in side impacts.
NHTSA will send us a second list of detailed questions (their Engineering Analysis level) in a few days.
All NS vehicles produced to date are subject to this inquiry. NHTSA will side crash test another NS at higher speed in the near future.

Attendee List:

T3166MC	CLIC	Mark W. Crossman
T7964JW	CLIC	James A. Walendzik
T4117GB	CLIC	Gregory A. Beecher
T5457NT	CLIC	Nicolaos Tapazoglou
T2034GC	CLIC	Guy L. Cowing
T8692AB	CLIC	Antonius H. Brenders
T5941WE	CLIC	William R. Edwards
T0081CS	CLIC	Clinton E. Spevak
T6965MB	CLIC	Marion Bugin
T8067GD	CLIC	Gary D. Dawson
T9452MO	CLIC	Mark J. Olex
T6626MT	NOVM	T6626MT at NOVM

* *

om: T0081CS --CLIC Date and time 09/15/99 19:40:07
: T3166MC --CLIC Mark W. Crossman T7964JW --CLIC James A. Walendzik
T4117GB --CLIC Gregory A. Beecher T5457NT --CLIC Nicolaos Tapazoglo
T8506NK --CLIC Namir A. Konja T8692AB --CLIC Antonius H. Brende
T5941WE --CLIC William R. Edwards T0081CS --CLIC Clinton E. Spevak
T6965MB --CLIC Marion Bugin T8067GD --CLIC Gary D. Dawson
T9452MO --CLIC Mark J. Olex

om:

quester: Clinton E. Spevak
te to be scheduled: 09/20/99
arting time: 3:00PM EASTERN
ding time: 4:00PM EASTERN

cation: Competitive Teardown Office Conference Table

bject: Review of Minivan Competitive Fuel Filler and Tank

rpose: Evaluate various designs for potential performance in impact testing like FMVSS 214D or NHTSA SINCAP

Attendee List:

T3166MC	CLIC	Mark W. Crossman
T7964JW	CLIC	James A. Walendzik
T4117GB	CLIC	Gregory A. Beecher
T5457NT	CLIC	Nicolaos Tapazoglou
T8506NK	CLIC	Namir A. Konja
T8692AB	CLIC	Antonius H. Brenders
T5941WE	CLIC	William R. Edwards
T0081CS	CLIC	Clinton E. Spevak
T6965MB	CLIC	Marion Bugin
T8067GD	CLIC	Gary D. Dawson
T9452MO	CLIC	Mark J. Olex

* *

om: T0081CS --CLIC Date and time 10/19/99 16:44:57

: T3166MC --CLIC	Mark W. Crossman	T7964JW --CLIC	James A. Walendzik
T4117GB --CLIC	Gregory A. Beecher	T5457NT --CLIC	Nicolaos Tapazoglo
T8506NK --CLIC	Namir A. Konja	T8692AB --CLIC	Antonius H. Brende
T5941WE --CLIC	William R. Edwards	T0081CS --CLIC	Clinton E. Spevak
T6965MB --CLIC	Marion Bugin	T8067GD --CLIC	Gary D. Dawson
T9452MO --CLIC	Mark J. Olex		

om:

quester: Clinton E. Spevak
te to be scheduled: 10/27/99
arting time: 1:00PM EASTERN
ding time: 2:00PM EASTERN

cation: TECH-2A

bject: NS Fuel Filler in 214D Type Crashes

rpose: Review status of NHTSA inquiry and brainstorm options, assign activities to resolve.

Attendee List:
T3166MC CLIC Mark W. Crossman
[redacted] James A Walendzik

om: T0081CS --CLIC Date and time 10/26/99 09:45:48
: T5457NT --CLIC Nicolaos Tapazoglo T3166MC --CLIC Mark W. Crossman
T7964JW --CLIC James A. Walendzik T4117GB --CLIC Gregory A. Beecher
T8506NK --CLIC Namir A. Konja T6965MB --CLIC Marion Bugin
T8067GD --CLIC Gary D. Dawson T9452MO --CLIC Mark J. Olex
T8692AB --CLIC Antonius H. Brende T5941WE --CLIC William R. Edwards
T0081CS --CLIC Clinton E. Spevak

om:

quester: Clinton E. Spevak
te to be scheduled: 11/01/99
arting time: 10:00AM EASTERN
ding time: 11:30AM EASTERN

cation: DESIGN-2B

bject: NS Fuel Filler in 214D Type Crashes

rpose: Review status of NHTSA inquiry, which is now available
Brainstorm options to address in timely way.

Attendee List:

T5457NT	CLIC	Nicolaos Tapazoglou
T3166MC	CLIC	Mark W. Crossman
T7964JW	CLIC	James A. Walendzik
T4117GB	CLIC	Gregory A. Beecher
T8506NK	CLIC	Namir A. Konja
T6965MB	CLIC	Marion Bugin
T8067GD	CLIC	Gary D. Dawson
T9452MO	CLIC	Mark J. Olex
T8692AB	CLIC	Antonius H. Brenders
T5941WE	CLIC	William R. Edwards
T0081CS	CLIC	Clinton E. Spevak

* *

From: T0081CS --CLIC Date and time 10/19/99 16:44:57

To:				
T3166MC --CLIC	Mark W. Crossman	T7964JW --CLIC	James A. Walendzik
T4117GB --CLIC	Gregory A. Beecher	T5457NT --CLIC	Nicolaos Tapazoglo
T8506NK --CLIC	Namir A. Konja	T8692AB --CLIC	Antonius H. Brende
T5941WE --CLIC	William R. Edwards	T0081CS --CLIC	Clinton E. Spevak
T6965MB --CLIC	Marion Bugin	T8067GD --CLIC	Gary D. Dawson
T9452MO --CLIC	Mark J. Olex		

From:

Requester: Clinton E. Spevak
Date to be scheduled: 10/27/99
Starting time: 1:00PM EASTERN
Ending time: 2:00PM EASTERN

Location: TECH-2A

Subject: NS Fuel Filler in 214D Type Crashes

Purpose: Review status of NHTSA inquiry and brainstorm options, assign activities to resolve.

Attendee List:

T3166MC	CLIC	Mark W. Crossman
T7964JW	CLIC	James A. Walendzik
T4117GB	CLIC	Gregory A. Beecher
T5457NT	CLIC	Nicolaos Tapazoglou
T8506NK	CLIC	Namir A. Konja
T8692AB	CLIC	Antonius H. Brenders
T5941WE	CLIC	William R. Edwards
T0081CS	CLIC	Clinton E. Spevak
T6965MB	CLIC	Marion Bugin
T8067GD	CLIC	Gary D. Dawson
T9452MO	CLIC	Mark J. Olex

* *

From: T0081CS --CLIC Date and time 10/26/99 09:45:48

To:
T5457NT --CLIC	Nicolaos Tapazoglo	T3166MC --CLIC	Mark W. Crossman
T7964JW --CLIC	James A. Walendzik	T4117GB --CLIC	Gregory A. Beecher
T8506NK --CLIC	Namir A. Konja	T6965MB --CLIC	Marion Bugin
T8067GD --CLIC	Gary D. Dawson	T9452MO --CLIC	Mark J. Olex
T8692AB --CLIC	Antonius H. Brende	T5941WE --CLIC	William R. Edwards
T0081CS --CLIC	Clinton E. Spevak		

From:

Requester: Clinton E. Spevak
Date to be scheduled: 11/01/99
Starting time: 10:00AM EASTERN
Ending time: 11:30AM EASTERN

Location: DESIGN-2B

Subject: NS Fuel Filler in 214D Type Crashes

Purpose: Review status of NHTSA inquiry, which is now available
Brainstorm options to address in timely way.

Attendee List:

T5457NT	CLIC	Nicolaos Tapazoglou
T3166MC	CLIC	Mark W. Crossman
T7964JW	CLIC	James A. Walendzik
T4117GB	CLIC	Gregory A. Beecher
T8506NK	CLIC	Namir A. Konja
T6965MB	CLIC	Marion Bugin
T8067GD	CLIC	Gary D. Dawson
T9452MO	CLIC	Mark J. Olex
T8692AB	CLIC	Antonius H. Brenders
T5941WE	CLIC	William R. Edwards
T0081CS	CLIC	Clinton E. Spevak

* *

From: T0081CS --CLIC Date and time 11/05/99 15:49:35

To: T1666JC --CLIC	J. Coval	T4117GB --CLIC	Gregory A. Beecher
T3166MC --CLIC	Mark W. Crossman	T7964JW --CLIC	James A. Walendzik
T8692AB --CLIC	Antonius H. Brende	T0081CS --CLIC	Clinton E. Spevak

rom:

Requester: Clinton E. Spevak
Date to be scheduled: 11/09/99
Starting time: 2:00PM EASTERN
Ending time: 3:30PM EASTERN

Location: S. Cischke Conf Rm - W2003 @ N2-W22

Subject: Information responsibilities for EA99-013, due 11/24

Purpose: Ensure that information required for response to NHTSA , due on 11/24/99, is available and will be passed to Safety Office in time for assembly of response before deadline. Call requestor @ 722-5854 if other information providers are required in this meeting.

Attendee List:

T1666JC	CLIC	J. Coval
T4117GB	CLIC	Gregory A. Beecher
T3166MC	CLIC	Mark W. Crossman
T7964JW	CLIC	James A. Walendzik
T8692AB	CLIC	Antonius H. Brenders
T0081CS	CLIC	Clinton E. Spevak

* *

From:	T0081CS --CLIC			Date and time	12/03/99 11:39:01
To:	T3166MC --CLIC	Mark W. Crossman		T7964JW --CLIC	James A. Walendzik
	T4117GB --CLIC	Gregory A. Beecher		T5457NT --CLIC	Nicolaos Tapazoglo
	T8506NK --CLIC	Namir A. Konja		T8692AB --CLIC	Antonius H. Brende
	T9452MO --CLIC	Mark J. Olex		T0081CS --CLIC	Clinton E. Spevak

From:

Requester: Clinton E. Spevak
Date to be scheduled: 12/07/99
Starting time: 3:00PM EASTERN
Ending time: 4:30PM EASTERN

Location: TECH-2H

Subject: NHTSA EA99-013 Response Needs

Purpose: More complete explanation of design features and development done to ensure NS fuel system integrity is needed for response. Technical information required

Attendee List:

T3166MC	CLIC	Mark W. Crossman
T7964JW	CLIC	James A. Walendzik
T4117GB	CLIC	Gregory A. Beecher
T5457NT	CLIC	Nicolaos Tapazoglou
T8506NK	CLIC	Namir A. Konja
T8692AB	CLIC	Antonius H. Brenders
T9452MO	CLIC	Mark J. Olex
T0081CS	CLIC	Clinton E. Spevak

* *

rom: T0081CS --CLIC Date and time 12/09/99 08:47:50

o: T3166MC --CLIC	Mark W. Crossman	T7964JW --CLIC	James A. Walendzik
T4117GB --CLIC	Gregory A. Beecher	T8506NK --CLIC	Namir A. Konja
T8692AB --CLIC	Antonius H. Brende	T9452MO --CLIC	Mark J. Olex
T0081CS --CLIC	Clinton E. Spevak	T1666JC --CLIC	J. Coval

rom:

equester: Clinton E. Spevak
ate to be scheduled: 12/10/99
tarting time: 9:00AM EASTERN
nding time: 10:00AM EASTERN

ocation: S. Cischke Old Conf Rm (W2003, N2-W22)

ubject: Contigency Options for Actions

urpose: Brainstorm alternatives to improve system performance in SINCAP test

Attendee List:

T3166MC	CLIC	Mark W. Crossman
T7964JW	CLIC	James A. Walendzik
T4117GB	CLIC	Gregory A. Beecher
T8506NK	CLIC	Namir A. Konja
T8692AB	CLIC	Antonius H. Brenders
T9452MO	CLIC	Mark J. Olex
T0081CS	CLIC	Clinton E. Spevak
T1666JC	CLIC	J. Coval

* *

DAIMLERCHRYSLER CORPORATION
PASSENGER CARS WITH PLASTIC FUEL TANKS
1993-2000

SERIES/MODEL/NAME	BODY TYPE	MODEL YEARS	TANK LOCATION
SR-BODY VIPER RT/10 GTS COUPE	CONV 2DR	1992-00	ABOVE RR AXLE
LH-BODY NEW YORKER CONCORDE INTREPID VISION LHS	4DR	1993-97	FWD AND ABOVE RR SUSPENSION
PL-BODY NEON	2DR 4DR	1996-00	AHEAD OF RR AXLE
JA-BODY CIRRUS STRATUS BREEZE	4DR	1995-00	AHEAD OF RR AXLE
JX-BODY SEBRING	CONV	1996-00	AHEAD OF RR AXLE
PR-BODY PROWLER	CONV	1997-00	ABOVE TRANSAXLE
LH-BODY CONCORDE INTREPID 300M	4DR	1993-00	AHEAD OF RR AXLE

JEEP TRUCKS WITH PLASTIC FUEL TANKS
1994-2000

SERIES/MODEL/NAME	BODY TYPE	MODEL YEARS	TANK LOCATION
CJ SERIES:			
YJ WRANGLER	2 DR OPEN	1991-97	AFT OF RR AXLE
TJ SERIES:			
TJ WRANGLER	2 DR OPEN	1998-00	AFT OF RR AXLE
XJ SERIES:			
XJ CHEROKEE	4 DR SPORT UTIL	1997-00	AFT OF RR AXLE
ZJ SERIES:			
GRAND CHEROKEE	4 DR SPORT UTIL	1993-98	AFT OF RR AXLE
WJ SERIES:			
GRAND CHEROKEE	4 DR SPORT UTIL	1999-00	AFT OF RR AXLE

0/21

DODGE TRUCKS WITH PLASTIC FUEL TANKS
1994-2000

MODEL/BODY/NAME	BODY TYPE	MODEL YEARS	TANK LOCATION
AB100-200-300 VAN	VAN & WAGON	1988-97	AFT OF RR AXLE
AB100-200-300 VAN	VAN & WAGON	1988-00	MID, LEFT SIDE
BR1-2-3-5-6-7 RAM P/U	CONV CAB	1993-97	MID LEFT
BR1-2-3-5-6-7 RAM P/U	CLUB CAB	1993-97	MID LEFT
BR1-2-3-5-6-7 RAM P/U	QUAD CAB	1998-00	MID LEFT
AN1-5 DAKOTA PICKUP	CONV CAB	1989-00	MID, RIGHT
AN1-5 DAKOTA PICKUP	CLUB CAB	1990-00	MID, RIGHT
AN1-5 DAKOTA PICKUP	CREW CAB	2000	MID, RIGHT
DN1 DURANGO	SPORT UTILITY	1998-00	MID, RIGHT
DN5 DURANGO	SPORT UTILITY	1999-00	MID, RIGHT

DAIMLERCHRYSLER MINIVANS WITH PLASTIC FUEL TANKS
1994-2000

SERIES/MODEL/NAME	BODY TYPE	MODEL YEARS	TANK LOCATION
AS-BODY CARAVAN VOYAGER TOWN&COUNTRY	WAGON AWD	1991-95	MID, LEFT SIDE
NS-BODY CARAVAN VOYAGER TOWN&COUNTRY	WAGON FWD	1996-00	MID, LEFT SIDE
NS-BODY CARAVAN VOYAGER TOWN&COUNTRY	WAGON AWD	1996-00	MID, LEFT SIDE

DAIMLERCHRYSLER

January 25, 2000

Kathleen C. DeMeter, Director
Office of Defects Investigation, Safety Assurance
National Highway Traffic Safety Administration
400 Seventh Street S.W. (NSA-12; Room 5326)
Washington, D.C. 20590

DaimlerChrysler Corporation
Susan M. Cischke
Sr. Vice President
Regulatory Affairs &
Passenger Car Operations

Re: NSA-122jlq; EA99-013

Dear Ms. DeMeter:

This supplements our November 26, 1999, December 20, 1999, and January 7, 2000 responses to the October 20, 1999 information request for Engineering Analysis (EA) 99-013 investigating fuel system integrity with 1996 through 2000 model year DaimlerChrysler minivan vehicles in FMVSS 214 side impact collision tests. DaimlerChrysler received an additional request dated December 13, 1999 for information concerning a vehicle, VIN 1C4GP55L7TB504242, which was in a crash on August 19, 1999.

DaimlerChrysler notified Mr. Jeff Quandt of your staff on December 20, 1999 that we would inspect the crashed vehicle on January 20, 2000. Our January 7, 2000 response provided the vehicle production date and warranty start date, but warranty history details were not available at that time. Available warranty history details are provided in Enclosure 1 to this letter.

Initial observations concerning the August 19, 1999 crash indicate that the impact was extremely severe. A contractor's heavily loaded full size work van, estimated to have been travelling at least 50 miles per hour, struck the minivan on the left side. We continue to investigate and gather information related to the crash. As requested, DaimlerChrysler will notify ODI when our investigation is completed, and will then provide any assessments and copies of all relevant documents.

We welcome discussion of questions you have during your review of this information.

Sincerely,

SM Cischke

Susan M. Cischke

Enclosure

DaimlerChrysler Corporation
800 Chrysler Drive CIMS 484-12-14
Auburn Hills MI USA 48326-2757
Phone 248.576.7301
Fax 248.576.2202
e-mail: smc16@daimlerchrysler.com

F500710I F500710T WARRANTY VEHICLE INQUIRY A01T2024 DATE: 01/26/00
(V E H I C L E I N F O) TIME: 09:03:43

VIN: 1C4GP55L7TB504242 BODY MODEL: NSYP52 SORT CODE: C96B REC TYPE: 3
DESCRIPTION: 96 CHRYSLER TOWN & COU TIME STAMP: 01/26/98 23445928

WAR CODE : F WARRANTY DT: 07/23/96 VEHICLE REST : NO RESTRICTION
PREP PAID: A I.S.D. : CHOICE ELIG :
SPCL CVRG: EFF. DATE : CURRENT WCC : 336 EFF. DATE: 06/20/96
EXTD MLG : NVDR MILES : 00007 1ST PRIOR WCC: 000 EFF. DATE:
SERV CONT: NARRATIVE : 2ND PRIOR WCC: 000 EFF. DATE:

CLAIM INFO: LAST REPAIR MLG : 027338 LAST REPAIR DATE: 01/21/98
LAST LIST DATE : 98021 TOTAL EXPENSE : +00658.38
MLG AT ODOM REPL: 0-MLG ODO CHG DT: KILO:

SOLD TO: ZN/DLR: 72 24161 DATE: 07/24/96 CODE : Z YR PERIOD: 9621
SHIP TO: ZN/DLR: 72 24161 DATE: 06/20/96 FLEET: YR PERIOD: 9618
ENGINE BUILT : 101636 TRANS BUILT : 27404 J-STATUS : 06/20/96
WAR BUILT DATE : 06/20/96 LAST UPDATE : 07/05/96 INV. AMT : 25917.50
STATION : KZ MASTERSHIELD REMAINING AMT :

PF: 2=NAR,4=SLS CODES,5=CNA,6=CLM INQ,7=AUTH NQ,8=ROOT CAU,11=MENU,12=HELP

F500710I F500710T WARRANTY VEHICLE INQUIRY A01T2024 DATE: 01/26/00
(S U B S E Q U E N T A N D O R I G I N A L O W N E R I N F O)
VIN: 1C4GP55L7TB504242 TIME: 09:04:34

SUB OWN NAME :

SUB OWN NAME :

ORIG OWN NAME:
ORIG OWN ADDR:

TYPE SALE....: 1 DIRECT RETAIL

CREATION DATE..: 08/16/99
EFFECTIVE DATE: 06/20/98
ANALYST ID....: SZA0040
RELATIONSHIP..:

CREATION DATE..:
EFFECTIVE DATE:
ANALYST ID....:
RELATIONSHIP..:

MICRO NUMBER..: WHX0629
AUTH NUMBER...:
RD RDY RPR DTE:
RD RDY RO NO..: N
RD RDY IND....:
SOLD BY DEALER: 24161

PF3=VEHICLE PF4=SLS CODES PF5=CNA PF11=WARR MENU PF12=HELP

SZA9600T WARRANTY CLAIM INFORMATION SUMMARY A01T2024
01/26/00
VIN: 1C4GP55L7TB504242 --- 96 CHRYSLER TOWN 09:09:29

T	C	----REPAIR---- DATE	ZN	DLR	CLAIM/SC	MILEAGE	MICRO/AUTH	LIST-DT	TOT-EXP	
W		01/21/98	72	24161	033339	27,300	BC53355	98021	$487.76	R
	1	LOP=23704105 PANEL ROOF				FC=P6	PART=00000NPN	EXP=	$487.76	
W		01/07/98	72	24161	328930	27,300	AY07517	98021	$60.37	R
	1	LOP=08400101 HORN RPL				FC=48	PART=04685562AC	EXP=	$60.37	
W		05/13/97	72	24161	250620	15,200	FT40239	97052	$15.02	R
	1	LOP=08801301 SWT UNDERHOOD ALARM				FC=48	PART=04687558	EXP=	$15.02	
K		07/05/96	72	24161	PREPNV	0	1999381	96072	$95.23	R
	1	LOP=95900040 REIMBURSE TRNSFR FEE				FC=	PART=NO PART	EXP=	$76.48	
	2	LOP=95900045 REIMBURSE TRNSFR FEE				FC=	PART=NO PART	EXP=	$18.75	

TOTAL WARRANTY COST: $658.38

PF 1=DLR/SUS 2=PG1 3=DLR 4=AUTH 6=VEH 7=CLM DTL 8=HELP 9=DESC 11=WARR 12=OWNR
**** INQUIRY COMPLETE ****

0000142

```
 F500720I F500720T     WARRANTY  CLAIM  BASE          A01T2024     DATE: 01/26/00
                              PAGE 1            (RESTORED CLAIM)     TIME: 09:04:45
VIN: 1C4GP55L7TB504242 CHRYSLER TOWN  WCC: 336  ISD: 07/23/96 TS 01269823445928
  CLAIM NO: 033339      ZN/D/DLR: 72 S 24161   CYCLE     :     98021
  MICRO NO: BC53355     EPUR    : 3   DSA:     TOT LAB  $:    291.50
  TRAN CD : W           AUTH CD : SA    0000   TOT PART $:    196.26
  RPR DATE: 012198      PAINT RT: 050.3        ORIG AMT  :       .00
  MILEAGE : 027300      MECH RT : 050.3        DEDUC     :       .00
  BATCH   : @#          RTN MAT :              CLM TOTAL :    487.76   PAID
  CLM WCC : 336                           MSG CODES:  SA

 CONDITION 1  PRO-RATED AMT:   487.76
 CAUSAL LOP FC  CC  FAILED PART# / NAME  LABOR   $  PARTS   $  SUBLET  $  TECH#
  23704105  P6  M   00000NPN    NO DESC    291.50     196.26        .00   3045

 CONDITION 2  PRO-RATED AMT:


 CONDITION 3  PRO-RATED AMT:


PF: 1=CLMSUM   2=CLM NARRATIVE    3=PG2   4=LOPS   5=PARTS   6=EQUIP
    7=QUAL&OLS   8=NEXT CLM       9=VEH  10=PREV  11=MENU   12=HELP
 ***  PRESS PF8 TO CONTINUE CLAIM SEARCH  ***
```

```
 F500720I F500720T     WARRANTY  CLAIM  LABOR        A01T2024    DATE: 01/26/00
                                                                 TIME: 09:04:59
VIN: 1C4GP55L7TB504242 CHRYSLER TOWN  WCC: 336  ISD: 07/23/96 TS 01269823445928
  CLAIM NO: 033339      ZN/D/DLR: 72 S 24161   CYCLE     :     98021
  MICRO NO: BC53355     EPUR    : 3   DSA:     TOT LAB  $:    291.50
  TRAN CD : W           AUTH CD : SA    0000   TOT PART $:    196.26
  RPR DATE: 012198      PAINT RT: 050.3        ORIG AMT  :       .00
  MILEAGE : 027300      MECH RT : 050.3        DEDUC     :       .00
  BATCH   : @#          RTN MAT :              CLM TOTAL :    487.76   PAID
  CLM WCC : 336                          MSG CODES:  SA

C LABOR OP FC  HRS   LOP$   PRT$ D P M A H AC SC INVC # -MESSAGE CODES-  M/H
1 23704105 P6 03.9  196.17 0192   1
1 23704161    00.5   25.15 0001 3 1
1 23700101    00.6   30.18 0005 3 1
1 23600512    00.0     .00 0042   1
1 23600513    00.0     .00 0042   1
1 97756555    00.0   40.00 0002 1 1     $



 PF:1=CLSUM 2=PG1 3=PG2 5=PART 6=EQUIP 7=QO 8=NXT 9=VEH 10=PREV 11=MENU 12=HELP
 ***  PRESS PF8 TO CONTINUE CLAIM SEARCH  ***
```

```
F500720I F500720T     WARRANTY  CLAIM  PARTS        A01T2024    DATE: 01/26/00
                                                                TIME: 09:05:03
VIN: 1C4GP55L7TB504242 CHRYSLER TOWN  WCC: 336  ISD: 07/23/96 TS 01269823445928
  CLAIM NO: 033339      ZN/D/DLR: 72 S 24161   CYCLE     :     98021
  MICRO NO: BC53355     EPUR    : 3   DSA:     TOT LAB  $:    291.50
  TRAN CD : W           AUTH CD : SA    0000   TOT PART $:    196.26
  RPR DATE: 012198      PAINT RT: 050.3        ORIG AMT  :       .00
  MILEAGE : 027300      MECH RT : 050.3        DEDUC     :       .00
  BATCH   : @#          RTN MAT :              CLM TOTAL :    487.76   PAID
  CLM WCC : 336                          MSG CODES:  SA

 C PART NO.    PART NAME DLR PRC   RTL PRC QTY PRC ID FP   MESSAGE CODES
 1 00000NPN              136.63    191.28  1          X
 1 00000NPN                3.56      4.98  1

PF:1=CSUM 2=PG1 3=PG2 4=LOP 5=PLX 6=EQP 7=QO 8=NXT 9=VEH 10=PRV 11=MNU 12=HLP
***  PRESS PF8 TO CONTINUE CLAIM SEARCH  ***
```

```
 F500720I F500720T     WARRANTY  CLAIM  BASE          A01T2024     DATE: 01/26/00
                             PAGE 1            (RESTORED CLAIM)     TIME: 09:05:12
VIN: 1C4GP55L7TB504242 CHRYSLER TOWN  WCC: 336  ISD: 07/23/96 TS 01239816342205
  CLAIM NO: 328930      ZN/D/DLR: 72 S 24161   CYCLE      :      98021
  MICRO NO: AY07517     EPUR    : 3   DSA:     TOT LAB  $:      20.12
  TRAN CD : W           AUTH CD :              TOT PART $:      40.25
  RPR DATE: 010798      PAINT RT: 050.3        ORIG AMT   :        .00
  MILEAGE : 027300      MECH RT : 050.3        DEDUC      :        .00
  BATCH   : @#          RTN MAT :              CLM TOTAL  :      60.37   PAID
  CLM WCC : 336                          MSG CODES:

 CONDITION 1  PRO-RATED AMT:    60.37
 CAUSAL LOP FC  CC  FAILED PART# / NAME  LABOR   $  PARTS   $  SUBLET  $  TECH#
  08400101  48  M   04685562AC  NO DESC     20.12      40.25        .00   0359

 CONDITION 2  PRO-RATED AMT:


 CONDITION 3  PRO-RATED AMT:


PF: 1=CLMSUM   2=CLM NARRATIVE    3=PG2   4=LOPS   5=PARTS   6=EQUIP
    7=QUAL&OLS   8=NEXT CLM       9=VEH  10=PREV  11=MENU   12=HELP
 ***  PRESS PF8 TO CONTINUE CLAIM SEARCH  ***
```

```
 F500720I F500720T     WARRANTY  CLAIM  LABOR          A01T2024    DATE: 01/26/00
                                                                   TIME: 09:05:19
VIN: 1C4GP55L7TB504242 CHRYSLER TOWN  WCC: 336  ISD: 07/23/96 TS 01239816342205
  CLAIM NO: 328930      ZN/D/DLR: 72 S 24161   CYCLE      :     98021
  MICRO NO: AY07517     EPUR    : 3   DSA:     TOT LAB  $:     20.12
  TRAN CD : W           AUTH CD :              TOT PART $:     40.25
  RPR DATE: 010798      PAINT RT: 050.3        ORIG AMT   :       .00
  MILEAGE : 027300      MECH RT : 050.3        DEDUC      :       .00
  BATCH   : @#          RTN MAT :              CLM TOTAL  :     60.37   PAID
  CLM WCC : 336                          MSG CODES:

C LABOR OP FC  HRS   LOP$   PRT$ D P M A H AC SC INVC # -MESSAGE CODES-  M/H
1 08400101 48 00.4    20.12 0153 2 1

 PF:1=CLSUM 2=PG1 3=PG2 5=PART 6=EQUIP 7=QO 8=NXT 9=VEH 10=PREV 11=MENU 12=HELP
 ***  PRESS PF8 TO CONTINUE CLAIM SEARCH  ***
```

```
F500720I F500720T     WARRANTY  CLAIM  PARTS          A01T2024     DATE: 01/26/00
                                                                   TIME: 09:05:23
VIN: 1C4GP55L7TB504242 CHRYSLER TOWN  WCC: 336  ISD: 07/23/96 TS 01239816342205
  CLAIM NO: 328930      ZN/D/DLR: 72 S 24161   CYCLE      :     98021
  MICRO NO: AY07517     EPUR    : 3   DSA:     TOT LAB  $:     20.12
  TRAN CD : W           AUTH CD :              TOT PART $:     40.25
  RPR DATE: 010798      PAINT RT: 050.3        ORIG AMT   :       .00
  MILEAGE : 027300      MECH RT : 050.3        DEDUC      :       .00
  BATCH   : @#          RTN MAT :              CLM TOTAL  :     60.37   PAID
  CLM WCC : 336                          MSG CODES:

 C PART NO.    PART NAME DLR PRC   RTL PRC QTY PRC ID FP   MESSAGE CODES
 1 04685562AC HORN        28.75     40.25  1    C    X

PF:1=CSUM 2=PG1 3=PG2 4=LOP 5=PLX 6=EQP 7=QO 8=NXT 9=VEH 10=PRV 11=MNU 12=HLP
***  PRESS PF8 TO CONTINUE CLAIM SEARCH  ***
```

```
 F500720I F500720T     WARRANTY  CLAIM  BASE          A01T2024    DATE: 01/26/00
                              PAGE 1            (RESTORED CLAIM)    TIME: 09:05:27
VIN: 1C4GP55L7TB504242 CHRYSLER TOWN  WCC: 336  ISD: 07/23/96 TS 05139723553917
  CLAIM NO: 250620      ZN/D/DLR: 72 S 24161   CYCLE     :     97052
  MICRO NO: FT40239     EPUR    : 3   DSA:     TOT LAB  $:      9.84
  TRAN CD : W           AUTH CD :              TOT PART $:      5.18
  RPR DATE: 051397      PAINT RT: 049.2        ORIG AMT  :       .00
  MILEAGE : 015200      MECH RT : 049.2        DEDUC     :       .00
  BATCH   : @#          RTN MAT :              CLM TOTAL :     15.02   PAID
  CLM WCC : 336                          MSG CODES:

 CONDITION 1  PRO-RATED AMT:    15.02
 CAUSAL LOP FC  CC  FAILED PART# / NAME  LABOR   $  PARTS   $  SUBLET  $  TECH#
  08801301  48  M   04687558    SWITCH       9.84       5.18        .00   2686

 CONDITION 2  PRO-RATED AMT:


 CONDITION 3  PRO-RATED AMT:


PF: 1=CLMSUM   2=CLM NARRATIVE    3=PG2   4=LOPS   5=PARTS   6=EQUIP
    7=QUAL&OLS   8=NEXT CLM       9=VEH  10=PREV  11=MENU   12=HELP
 ***  PRESS PF8 TO CONTINUE CLAIM SEARCH  ***
```

```
 F500720I F500720T     WARRANTY  CLAIM  LABOR          A01T2024     DATE: 01/26/00
                                                                    TIME: 09:05:36
VIN: 1C4GP55L7TB504242 CHRYSLER TOWN  WCC: 336  ISD: 07/23/96 TS 05139723553917
  CLAIM NO: 250620      ZN/D/DLR: 72 S 24161   CYCLE     :      97052
  MICRO NO: FT40239     EPUR    : 3   DSA:     TOT LAB  $:       9.84
  TRAN CD : W           AUTH CD :              TOT PART $:       5.18
  RPR DATE: 051397      PAINT RT: 049.2        ORIG AMT  :        .00
  MILEAGE : 015200      MECH RT : 049.2        DEDUC     :        .00
  BATCH   : @#          RTN MAT :              CLM TOTAL :      15.02   PAID
  CLM WCC : 336                          MSG CODES:

C LABOR OP FC  HRS   LOP$   PRT$ D P M A H AC SC INVC # -MESSAGE CODES-  M/H
1 08801301 48 00.2     9.84 0069   1

 PF:1=CLSUM 2=PG1 3=PG2 5=PART 6=EQUIP 7=QO 8=NXT 9=VEH 10=PREV 11=MENU 12=HELP
 ***  PRESS PF8 TO CONTINUE CLAIM SEARCH  ***
```

```
 F500720I F500720T     WARRANTY  CLAIM  PARTS          A01T2024     DATE: 01/26/00
                                                                    TIME: 09:05:39
VIN: 1C4GP55L7TB504242 CHRYSLER TOWN  WCC: 336  ISD: 07/23/96 TS 05139723553917
  CLAIM NO: 250620      ZN/D/DLR: 72 S 24161   CYCLE      :      97052
  MICRO NO: FT40239     EPUR    : 3   DSA:     TOT LAB  $:       9.84
  TRAN CD : W           AUTH CD :              TOT PART $:       5.18
  RPR DATE: 051397      PAINT RT: 049.2        ORIG AMT   :        .00
  MILEAGE : 015200      MECH RT : 049.2        DEDUC      :        .00
  BATCH   : @#          RTN MAT :              CLM TOTAL  :      15.02   PAID
  CLM WCC : 336                          MSG CODES:

 C PART NO.    PART NAME DLR PRC   RTL PRC QTY PRC ID FP   MESSAGE CODES
 1 04687558    SWITCH       3.70      5.18  1    C    X

 PF:1=CSUM 2=PG1 3=PG2 4=LOP 5=PLX 6=EQP 7=QO 8=NXT 9=VEH 10=PRV 11=MNU 12=HLP
 ***  PRESS PF8 TO CONTINUE CLAIM SEARCH  ***
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```
 F500720I F500720T      WARRANTY  CLAIM  BASE          A01T2024     DATE: 01/26/00
                              PAGE 1              (RESTORED CLAIM)     TIME: 09:05:45
VIN: 1C4GP55L7TB504242 CHRYSLER TOWN  WCC: 336  ISD: 07/23/96 TS 07089615445791
  CLAIM NO: PREPNV       ZN/D/DLR: 72 L 24161   CYCLE      :      96072
  MICRO NO: 1999381      EPUR    : 3   DSA:     TOT LAB  $:      95.23
  TRAN CD : K            AUTH CD :              TOT PART $:        .00
  RPR DATE: 070596       PAINT RT: 047.8        ORIG AMT   :        .00
  MILEAGE : 000000       MECH RT : 047.8        DEDUC      :        .00
  BATCH   : M3           RTN MAT :              CLM TOTAL  :      95.23   PAID
  CLM WCC : 336                              MSG CODES:

 CONDITION 1  PRO-RATED AMT:     76.48
 CAUSAL LOP FC  CC  FAILED PART# / NAME  LABOR   $  PARTS   $  SUBLET  $  TECH#
  95900040      P   NO PART     NO DESC     76.48        .00        .00

 CONDITION 2  PRO-RATED AMT:     18.75
  95900045      V   NO PART     NO DESC     18.75        .00        .00

 CONDITION 3  PRO-RATED AMT:


PF: 1=CLMSUM   2=CLM NARRATIVE    3=PG2   4=LOPS   5=PARTS   6=EQUIP
    7=QUAL&OLS   8=NEXT CLM       9=VEH  10=PREV  11=MENU   12=HELP
 ***  PRESS PF8 TO CONTINUE CLAIM SEARCH  ***
```

```
 F500720I F500720T     WARRANTY  CLAIM  LABOR          A01T2024     DATE: 01/26/00
                                                                    TIME: 09:05:52
VIN: 1C4GP55L7TB504242 CHRYSLER TOWN  WCC: 336  ISD: 07/23/96 TS 07089615445791
  CLAIM NO: PREPNV      ZN/D/DLR: 72 L 24161   CYCLE     :      96072
  MICRO NO: 1999381     EPUR    : 3   DSA:     TOT LAB  $:      95.23
  TRAN CD : K           AUTH CD :              TOT PART $:        .00
  RPR DATE: 070596      PAINT RT: 047.8        ORIG AMT  :        .00
  MILEAGE : 000000      MECH RT : 047.8        DEDUC     :        .00
  BATCH   : M3          RTN MAT :              CLM TOTAL :      95.23   PAID
  CLM WCC : 336                          MSG CODES:

C LABOR OP FC  HRS   LOP$   PRT$ D P M A H AC SC INVC # -MESSAGE CODES-  M/H
1 95900040    01.5   71.70 0002   1     H
1 95900050    00.1    4.78 0002   1     H

 PF:1=CLSUM 2=PG1 3=PG2 5=PART 6=EQUIP 7=QO 8=NXT 9=VEH 10=PREV 11=MENU 12=HELP
 ***  PRESS PF8 TO CONTINUE CLAIM SEARCH  ***
```

F500720I F500720T WARRANTY CLAIM PARTS A01T2024 DATE: 01/26/00
TIME: 09:05:57

VIN: 1C4GP55L7TB504242 CHRYSLER TOWN WCC: 336 ISD: 07/23/96 TS 07089615445791

CLAIM NO: PREPNV	ZN/D/DLR: 72 L 24161	CYCLE :	96072
MICRO NO: 1999381	EPUR : 3 DSA:	TOT LAB $:	95.23
TRAN CD : K	AUTH CD :	TOT PART $:	.00
RPR DATE: 070596	PAINT RT: 047.8	ORIG AMT :	.00
MILEAGE : 000000	MECH RT : 047.8	DEDUC :	.00
BATCH : M3	RTN MAT :	CLM TOTAL :	95.23 PAID
CLM WCC : 336	MSG CODES:		

C PART NO. PART NAME DLR PRC RTL PRC QTY PRC ID FP MESSAGE CODES

PF:1=CSUM 2=PG1 3=PG2 4=LOP 5=PLX 6=EQP 7=QO 8=NXT 9=VEH 10=PRV 11=MNU 12=HLP
*** NO PART DATA FOR THIS CLAIM ***

0000159

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 F500720I F500720T     WARRANTY  CLAIM  BASE          A01T2024    DATE: 01/26/00
                             PAGE 1                                TIME: 09:06:04
VIN: 1C4GP55L7TB504242 CHRYSLER TOWN  WCC: 336  ISD: 07/23/96 TS 07089615445791
  CLAIM NO: PREPNV      ZN/D/DLR: 72 L 24161   CYCLE     :     96072
  MICRO NO: 1999381     EPUR    : 3   DSA:     TOT LAB  $:     95.23
  TRAN CD : K           AUTH CD :              TOT PART $:       .00
  RPR DATE: 070596      PAINT RT: 047.8        ORIG AMT  :       .00
  MILEAGE : 000000      MECH RT : 047.8        DEDUC     :       .00
  BATCH   : M3          RTN MAT :              CLM TOTAL :     95.23   PAID
  CLM WCC : 336                          MSG CODES:

 CONDITION 1  PRO-RATED AMT:
 CAUSAL LOP FC  CC  FAILED PART# / NAME  LABOR   $  PARTS   $  SUBLET  $  TECH#


 CONDITION 2  PRO-RATED AMT:


 CONDITION 3  PRO-RATED AMT:


PF: 1=CLMSUM   2=CLM NARRATIVE    3=PG2   4=LOPS   5=PARTS   6=EQUIP
    7=QUAL&OLS   8=NEXT CLM       9=VEH  10=PREV  11=MENU   12=HELP
 *** VEH HAS NO MORE CLAIMS / NO CLAIMS FOUND ***
```