

DAIMLERCHRYSLER
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OFFICE
DEFECTS INVESTIGATION

May 16, 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
Matthew C. Reynolds
Director
Vehicle Compliance & Safety Affairs

Re: NSA-122Jlq;
EA99-013

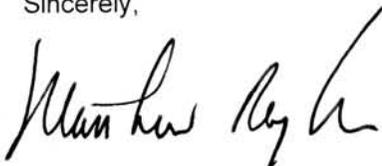
Dear Ms. DeMeter:

This responds to March 8 and March 31, 2000 requests for additional information regarding Engineering Analysis (EA) 99-013 investigating fuel system integrity in side impact collision tests with 1996 through 2000 model year DaimlerChrysler minivan vehicles.

DaimlerChrysler is continuing its review of NHTSA's laboratory crash tests and believes that the results obtained in those crashes do not predict a real world risk of loss of fuel system integrity. DaimlerChrysler has conducted an extensive review, paralleled by that of NHTSA, of the available real world crash data. That data confirms the excellent performance of the minivan fuel system in collisions. After well over 60 billion Vehicle Miles Traveled there are no known incidents of post collision fires under conditions similar to those assumed by NHTSA's laboratory tests. In fact, the few instances of post-collision fires in these vehicles were under conditions far more severe than those encompassed by NHTSA's laboratory procedures.

Particularly, in the absence of real world occurrences of post collision fire, there is no reason to question the adequacy of the FMVSS 301 side impact test for fuel system integrity for these vehicles. We look forward to resolving this issue with the Agency.

Sincerely,



Matthew C. Reynolds

Attachment
Enclosures

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

A1 Numbers of subject vehicles were previously provided in Enclosure 1 of the November 26, 1999 response to EA99-013. The requested update is provided in Enclosure 1 of this response, for vehicles built through March 28, 2000.

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 crash-induced fuel spillage or fire originating in the vicinity of the fuel tank assembly of the subject vehicles [Please note that this question concerns all such incidents, and is not limited to specific allegations of filler neck assembly failure]. For each such incident provided, state the crash mode, impact speed (if known), and alleged fuel system failure mode:

- 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.

A2 DaimlerChrysler provided available information for all incidents alleging side-collision-induced fuel leakage or fire with Enclosure 2 to the November 26, 1999 EA99-013 response. The current request limits incidents to those "which allege incidents of crash-induced fuel spillage or fire originating in the vicinity of the fuel tank assembly...." Question 3, below, requests any additional documents related to incidents reported in the November 26, 1999 response, so please see information provided at A3, below.

A2a DaimlerChrysler reported all known instances of owner/fleet complaints in the November 26, 1999 response to this investigation. Supplemental information available concerning one complaint is in Enclosure 2, as noted at A3, below.

A2b DaimlerChrysler has still received no other field reports of crash-induced fuel spillage or fire originating near the fuel tank.

A2c DaimlerChrysler has received no fire incident claims alleging crash-induced fuel spillage or fire originating near the fuel tank.

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- A2d DaimlerChrysler reported one subrogation claim in the November 26, 1999 response alleging fuel spillage or fire originating near the fuel tank. Investigation of this incident with VIN XR196325 found that the fire did not originate near the fuel tank, but at the left front of the vehicle, as noted in A3, below.
- A2e DaimlerChrysler is aware of one lawsuit alleging crash induced fuel spillage or fire. A summary is provided in Enclosure 3. This crash corresponds to the Fatality Analysis Reporting System (FARS) item cited in NHTSA's supplemental inquiry dated March 31, 2000. DaimlerChrysler was not able to inspect the vehicle, which has been crushed. Available information indicates this was an extremely severe, high-speed, single-vehicle crash involving multiple impacts with guardrails on both sides of an Interstate highway. The vehicle slid completely across the highway on its left side after crashing into a median guardrail. Conditions of this crash appear to bear no resemblance to FMVSS 214 laboratory test conditions.
- A2f DaimlerChrysler is still not a party to any arbitration related to allegations of crash-induced fuel spillage or fire originating near the fuel tank.

Q3 Describe, and provide copies of all documents related to, each and every investigation and other analyses conducted by, or for, DaimlerChrysler of left-side impact crash incidents involving subject vehicles. This should include:

- a.all incidents identified in DaimlerChrysler's November 26, 1999, letter concerning this investigation;**
- b.the Roseburg, Oregon crash identified in a December 13, 1999, letter from NHTSA to DaimlerChrysler; and**
- c.any other incident or allegation of filler tube assembly leakage or post-crash fire involving a subject vehicle of which DaimlerChrysler is aware.**

- A3a Descriptions by occupants in the crash of vehicle VIN XR196325, reported in DaimlerChrysler's November 26, 1999 response, indicate that a fire was initially noted near the front left corner of the vehicle, far from the fuel tank, with other indications that fuel spillage or fire "originating in the vicinity of the fuel tank" was unlikely. Nonetheless, additional documents concerning this incident and DaimlerChrysler investigation of the incident are provided in Enclosure 2. Additional photos of the vehicle and accident site taken during a later investigation than that reported earlier are provided as digital images on a CD in Enclosure 2.

The other incident reported in the November 26, 1999 EA99-013 response concerned VIN XR221644. All available documents concerning this incident were provided with the November 26, 1999 response. As reported in that response, this crash did not involve any fire, and severe localized crush into the minivan did not cause separation at the fuel filler hose joint to the tank spud, the subject of this investigation. The fuel filler hose was found separated from the steel filler tube.

- A3b January 7, 2000 and January 25, 2000 responses provided information available to DaimlerChrysler concerning a crash in Roseburg Oregon involving the vehicle with VIN TB504242. Our investigation of this crash is still continuing, but preliminary analysis confirms the full size contractor's work van was travelling more than 50 mph at the time it hit the left side of the minivan. Both the mass and the speed of this striking vehicle far exceeded the intentionally severe SINCAP test conditions.

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DaimlerChrysler will comply with NHTSA's December 13, 1999 request to notify ODI when our investigation is completed, and then provide our assessment and copies of all relevant documents.

Q4 Provide copies of all documents in DaimlerChrysler's possession or control which are related to NHTSA's January 6, 2000, side-impact test (MY0303) of a 2000 Dodge Caravan vehicle for the New Car Assessment Program (the SINCAP test).

A4 Copies of all DaimlerChrysler documents related to NHTSA's January 6, 2000 side-impact test are provided in Enclosure 4. These are notes and photos generated by DaimlerChrysler's observers at the January 6, 2000 test.

All other documents possessed by DaimlerChrysler related to NHTSA's test MY0303 have been provided to DaimlerChrysler by NHTSA. These are a letter from ODI dated March 31, 2000 describing damage observed when NHTSA disassembled the vehicle and a laboratory test report created by NHTSA's contractor.

DaimlerChrysler will value the opportunity to examine the tested vehicle and parts, but understands the vehicle is at VRTC while the parts have been removed to Washington. We expect to have related observations after examining the vehicle and parts together, but do not have such observations now.

The NHTSA laboratory report contains very little information useful for this investigation, since the subject fuel filler tube and hose were neither instrumented nor visible in any views of the test film.

Q5 Question 13.d of NHTSA's October 20, 1999, letter to DaimlerChrysler requested an assessment of the reasons for the differences in average pull-off forces between the subject hose joint and the metal filler tube end hose joint in test data that had been furnished by DaimlerChrysler, as follows:

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).

DaimlerChrysler did not answer this question in its December 20, 1999, response to NHTSA. Provide a complete response to this question. Also, rank and weigh (by the approximate percentage of contribution) the factors identified in descending order of importance.

A5 DaimlerChrysler regrets that oversight resulted in our December 20, 1999 response missing an answer for the part 13d request. The primary factors related to differences in pull-off forces between the subject hose joint (between the rubber hose and the plastic fuel filler spud) and the joint at the other end of the same hose (to the steel filler tube) are judged to be differences in material properties between plastic and steel tubes. The plastic spud is less rigid than the steel filler tube.

DaimlerChrysler does not have information to provide concerning a rank and weighting of this rigidity difference, compared to other differences which might relate to different pull-off loads for the hose from the two parts to which it is joined.

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- Q6 Enclosure 18 to DaimlerChrysler's January 7, 2000, letter responding to EA99-013 contains several meeting notices. The most recent notice, regarding a December 10, 1999 meeting, had the following subject and purpose:

Subject: Contingency [sic] Options for Actions

Purpose: Brainstorm alternatives to improve system performance in SINCAP test

Provide the following information regarding the meetings held by DaimlerChrysler regarding the alleged defect in the subject vehicles:

- a. List the date and subject matter of every meeting that DaimlerChrysler has conducted and state the agenda for each such meeting;
 - b. Describe all "contingency options," "actions," and "alternatives" that have been considered or discussed by DaimlerChrysler;
 - c. State the name, title, company, and division/group affiliation of each individual present at each of the meetings identified in Enclosure 18 of the January 7, 2000, letter or in response to Item 6.a of this letter; and
 - d. Provide copies of all documents related in any way to the December 10, 1999, meeting or otherwise related to the crash integrity or design of the subject hose joint from each of the individuals invited to the meeting. Furnish the information in separate enclosures for each individual.
- A6a DaimlerChrysler officials have held numerous meetings regarding the issues involved in this investigation. These meetings are informal in nature and intended, as the December 10, 1999 notice specifies, to invite participants to "brainstorm" very preliminary thoughts on issues under examination.

The same policy considerations relied on by NHTSA and other government agencies for withholding from public disclosure predecisional documents reflecting the agencies' deliberative processes underpins DaimlerChrysler's reluctance to furnish such detailed information to NHTSA. Any policy that requires a company's engineering community to share the fine details of its most preliminary and untested thought processes will certainly discourage the open and frank "brainstorming" that these reviews are intended to foster. Opening such meetings to government scrutiny, as this line of questioning requires, will necessarily turn all such inquiries into highly legalistic adversary proceedings, shrouded by all the protections available under the doctrines of attorney-client privilege and attorney work product. Such an outcome would be in neither NHTSA's nor the public interest.

Notwithstanding these concerns, DaimlerChrysler will update the information previously provided and identify the date, subject, and agenda (if such exists) for meetings held to discuss the alleged defect. It should be emphasized that none of these internal reviews has produced any data that would support even a preliminary finding of an unreasonable risk to safety. Nor have reviews identified any changes to the current fuel system that would be justified in light of the total absence of any real world failures of this system.

Other meetings concerning the review of hypothetical product changes that might affect the outcome of FMVSS 214 or SINCAP side impact tests have been conducted. Those meetings have

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not examined the question of whether NHTSA's side impact testing suggests the possibility of an unreasonable risk to safety, as we believe it does not.

- A6b The "contingency options" subject of the December 10, 1999 meeting was, as the Purpose of that meeting notice states, potential actions which DaimlerChrysler might consider requesting that NHTSA take with the 2000 model year minivan to be crashed for SINCAP during January 2000. Checking fastener torques, checking vehicle attitude to ground, and specifying vehicle-mounted instrumentation placement were all discussed and rejected. DaimlerChrysler staff decided it was not necessary to make any advanced requests relating to the upcoming test conditions, and instead to leave to the discretion of DaimlerChrysler's observer whether any particular change was necessary on the day of the test.
- A6c Please see response to 6a. Persons present at the meetings were from Vehicle Development, Body Structures, Fuel Systems Engineering, and the Vehicle Safety Offices of DaimlerChrysler Corporation.
- A6d Please see response to 6a. Notwithstanding our concern about the level of detail requested at this time by NHTSA, DaimlerChrysler will provide documents identifying factual information relating to analyses and testing which has been completed. DaimlerChrysler does not believe it reasonable to require the production of predecisional documents reflecting the company's deliberative process.

Copies of all available requested non-confidential documents related to the December 10, 1999, meeting and earlier meetings related to the alleged defect of crash-induced fuel filler neck separation from the fuel tank, as observed in NHTSA crash tests, are in Enclosures 5 and 6, separate enclosures for each individual with relevant documents. Additional confidential documents will be provided separately with a request for treatment as confidential business information.

- Q7 In its January 7, 2000, response to EA99-013, DaimlerChrysler stated that it has consulted with its suppliers concerning the subject hose joint and that the suppliers "agreed" that the subject hose joint design was "appropriate." However, DaimlerChrysler stated that no "relevant documents [were] available concerning clamped hose joint design beyond the design drawing and specification information supplied in portions of [the January 7, 2000] response:"**

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's suppliers agree that the ranges of interference fit and other aspects of the clamped hose joint 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.

Provide the following information regarding DaimlerChrysler's communications with its fuel tank, fuel filler tube assembly, hose, or hose clamp suppliers, or any other entity, regarding the alleged defect in the subject vehicles:

- a. Identify by company name, address, and contact person (name and telephone number) each supplier/entity with whom DaimlerChrysler has communicated regarding the alleged defect in the subject vehicles since January 5, 1999;

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- b. Identify each DaimlerChrysler employee who has engaged in any such communication, by name of company contacted and name, title, and group affiliation of employee;
- c. For each company contacted provide a chronology of communications, by date (state approximate month and year if actual date is not known), name(s) of DaimlerChrysler employee(s) involved, name(s) of supplier employee(s) involved, the nature the communication (i.e., written, electronic, telephone contact, meeting, etc.), and a summary of the issues discussed; and
- d. Provide copies of all documents relating in any way to such communications, including employee desk calendars and/or other contemporaneous notations.

A7 DaimlerChrysler and its suppliers have previously provided responsive documents relating to the fuel filler system and related components as currently configured in the subject vehicles.

Company officials have had numerous discussions with current and potential suppliers relating to the viability of various concepts aimed at addressing the results of NHTSA's laboratory tests, should any such efforts be deemed appropriate in the future. While DaimlerChrysler will produce documents responsive to this request, DaimlerChrysler continues to believe it is unreasonable and not in the public interest to require the production of incomplete ideas or analyses reflecting the internal deliberative process within the company. To do so will chill the open and frank communications within the company, and between the company and its suppliers, that is necessary to the prompt development of responses to the agency's concerns.

Q8 Provide the design specifications for the filler tube assembly hose fitting, including bead diameter, bead back angle, bead ramp angle, and fitting diameter.

A8 A letter sent voluntarily to ODI on February 8, 1999 in response to oral requests by Jeff Quandt before DaimlerChrysler received any PE99-010 information request provided the filler hose design specifications (inside diameter and wall thickness) and fuel tank inlet bead and tube fitting diameters (outside diameters). Additional details and specifications, including bead back and ramp angles, were supplied in Enclosure 6 of an April 9, 1999 response, and in confidential faxes of engineering drawing details to ODI on April 26, 1999.

Drawing number 04880929AA for the Fuel Filler Tube Assembly, also provided with Enclosure 6 to the April 26, 1999 response, includes the hose fitting diameter, bead diameter, and bead ramp angle. The bead back angle is not directly called out, but indirectly controlled by related dimensions to be a nominal value of approximately 105 degrees from the longitudinal axis of the tube.

Q9 Complete the survey form provided in Enclosure 10 of DaimlerChrysler's December 20, 1999, letter to NHTSA (copy enclosed), for the short wheelbase and long wheelbase subject vehicles.

A9 The proposed technical review of vehicles survey form is provided in Enclosure 7 with available information for DaimlerChrysler 1996-2000 MY short and long wheelbase minivans added to the form.

Q10 State whether there have ever been any pull-off standards or specifications for the fuel filler hose joints and/or filler neck assemblies of any model year 1996 or later motor vehicles sold

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by DaimlerChrysler. If the answer is affirmative, provide copies of all relevant standards, specifications, and related documents (e.g., design verification testing).

A10 There have not been pull-off standards or specifications relating specifically to pull-off load requirements for fuel filler hose joints or filler neck assemblies of any model year 1996 or later motor vehicles designed by DaimlerChrysler Corporation. Components of filler tube assemblies, e.g., fuel filler restrictor assemblies at the top of fill tubes and fittings crimped to the end of flexible hoses, have had push or pull-off requirements in component specifications. These load requirements serve as checks to ensure satisfactory durability in normal use or handling, or to validate proper manufacturing. Pull-off requirements have not been applied for fuel system integrity in crashes of DaimlerChrysler Corporation vehicles because integrity has been more directly, reasonably, and appropriately demonstrated by including the fuel systems in whole vehicle crash tests. Vehicle crash testing is the most comprehensive method available to evaluate such performance.

Q11 Provide copies of all other DaimlerChrysler documents relating to the design, pull-off resistance, or crash performance of the subject hose joint and/or subject filler neck assembly.

A11 DaimlerChrysler has conducted new investigations of pull-off resistance and crash performance of the subject hose joint to better understand questions arising from laboratory vehicle crash test results referred to in this investigation. These developmental investigations are not related to FMVSS compliance performance measurement or to NHTSA's SINCAP tests. Information is therefore being provided under separate cover with a request for treatment as confidential business information.

It should again be emphasized that none of these internal reviews and investigations has produced any data that would support even a preliminary finding of an unreasonable risk to safety. Nor have reviews and investigations identified any changes to the current fuel system that would be justified in light of the total absence of any real world failures of this system.

Q12 Provide DaimlerChrysler's assessment of all factors contributing to the filler hose separation incidents in the 1999 and 2000 Dodge Caravan vehicles crash-tested in NHTSA tests CX0305 and MY0303. Include in your response the following information:

- a.a description of all loads applied to the filler tube assembly, ranked in order of magnitude (i.e., state the approximate magnitude - based on tube deformation and direction of each load and identify the component applying each load); and**
- b.state the lateral, longitudinal, and vertical movement of the fuel filler tube assembly (lower end connected to the filler hose).**

A12 DaimlerChrysler does not possess any information concerning loads applied to the fuel filler tube assemblies in NHTSA tests CX0305 or MY0303. We do not possess any information concerning movement of the fuel filler tube lower end in those NHTSA tests. The only information available to DaimlerChrysler concerning these two tests is from NHTSA test reports and test films which provide no instrumentation or camera views of the fuel filler tube during the tests. Post-test observations of crashed vehicles by DaimlerChrysler representatives did not provide information relevant to loads and motion of the fuel filler tube during the NHTSA crash tests.

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From NHTSA's March 31, 2000 supplemental Information Request:

- Q1** Furnish the following dimensions, in millimeters, for both the short- and long-wheelbase subject vehicles:
- a. the longitudinal dimension from a vertical plane passing through the front axle centerline to the rear edge of the anchor plate for the left-middle seat belt (furnish these dimensions for each seating option available in the subject vehicles);
 - b. the longitudinal dimension from a vertical plane passing through the front axle centerline to the front and rear of the rail opening through which the fuel filler vent tube passes (vent tube pass-through);
 - c. the longitudinal dimension from a vertical plane passing through the front axle centerline to the interface between the sill inner wall and the left-rear wheelhouse extension;
 - d. the lateral dimension from a vertical plane passing through the vehicle centerline to the inner and outer edges of the fuel tank spud;
 - e. the minimum clearance between the fuel filler tube and: (1) the left rear wheelhouse; and (2) the sill inner wall;
 - f. the lateral dimension from a vertical plane passing through the vehicle centerline to the anchor bolt for the left-middle seat belt (furnish these dimensions for each seating option available in the subject vehicles); and
 - g. the vertical dimension from the bottom edge of the fuel tank nipple to the lower dimensions of the anchor plate for the left-middle seat belt (furnish these dimensions for each seating option available in the subject vehicles) and the vent tube pass-through.

A1 The requested dimensions for both short and long wheelbase minivans are provided in Enclosure 8.

- Q2** Furnish copies of all engineering standards, specifications, and guidelines regarding fuel tank and filler neck assembly packaging in the subject vehicles. "Packaging" should be interpreted in the context used in Section 4.12 of the enclosed copy of Society of Automotive Engineers Information Report SAE J1664, "Passenger Car and Light Truck Fuel Containment."

A2 SAE J1664 Section 4.12 notes that crash testing required by FMVSS 301 is a method to assess the crashworthiness of a vehicle's fuel system. DaimlerChrysler has demonstrated excellent performance of the minivan fuel containment system in all FMVSS 301 tests, and has gone well beyond FMVSS requirements to address all the other recommendations, regulatory and non-regulatory, contained in the remainder of SAE J1664. Descriptions of how these recommendations were addressed in design and development of the subject vehicles were provided in A19 of the EA99-013 response dated December 20, 1999.

SAE J1664 Section 4.12 also notes that packaging of the fuel-containment system is very design dependent, and may differ with tank or component design or location, and with vehicle intended use. These multiple complexities to consider in fuel-containment system packaging have precluded definition of some general standards, specifications, or guidelines for fuel tank and filler assembly packaging. Each design, including the packaging for the subject vehicles, must be evaluated for all requirements taken together. Therefore, DaimlerChrysler does not have any relevant standards, specifications, or guidelines to provide.

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Q3 State whether DaimlerChrysler has ever considered the safety implications of the packaging of the subject vehicle fuel filler neck assembly relative to the left-middle seat belt anchor plate and, if so, provide copies of all related documents.

A3 As noted in A2 immediately above, DaimlerChrysler agrees with statements in SAE J1664 noting that many factors must be considered for packaging of fuel-containment systems. The peculiar conditions of the high speed moving barrier impact, SINCAP, appear to be the only instance when the subject fuel filler tube assembly might be sufficiently loaded to breach the integrity of the fuel filler assembly. Since DaimlerChrysler had not observed such a test, which is not related to FMVSS compliance performance measurement, before NHTSA conducted one on January 6, 2000, packaging of the seat belt anchor was not an explicit design or development concern. As noted in A11, above, new design and development investigations have been initiated, and relevant documents will be provided under separate cover with a request for treatment as confidential business information.

Correction to April 9, 1999 Answer 8b description of changes to the fuel tank assembly:

Review of production details and of earlier responses to this investigation revealed an error in a description of changes to fuel tank assemblies used in the subject vehicles. The fuel inlet spud (or nipple) was initially designed, and development tooling was constructed to make prototype tanks, with the spud blow molded integrally with the tank, then machined to final shape. Contrary to a statement in the April 9, 1999 response, this design was not used in volume production. Production fuel tanks for subject vehicles have all included an inlet spud injection molded separately from the body of the blow molded tank, which has then been welded onto the tank body.

This pre-production development change to the spud design was made in anticipation of the October 1995 production change to the tank body described in the April 9, 1999 response, from monolayer to coextruded construction, with an integral evaporative emission vapor control barrier.

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PRODUCTION FOR U.S.A. NOVEMBER 7, 1999 THROUGH MARCH 28, 2000

Model Year	Model Code	4 Doors	3 Doors
2000	NS H C 53	677	0
2000	NS H D 53	2798	0
2000	NS H H 52	4127	0
2000	NS H H 53	15882	0
2000	NS H K 52	12922	0
2000	NS H K 53	59650	0
2000	NS H Y 53	13399	0
2000	NS L H 52	9231	7884
2000	NS L H 53	4579	0
2000	NS L K 52	19886	16053
2000	NS L K 53	9937	0
2000	NS P C 53	1604	0
2000	NS P D 53	447	0
2000	NS P K 53	3030	0
2000	NS P Y 53	14822	0
2000	NS S C 53	2610	0
2000	NS S Y 53	11841	0
2000	NS X D 53	452	0
2000	NS X K 53	3080	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)

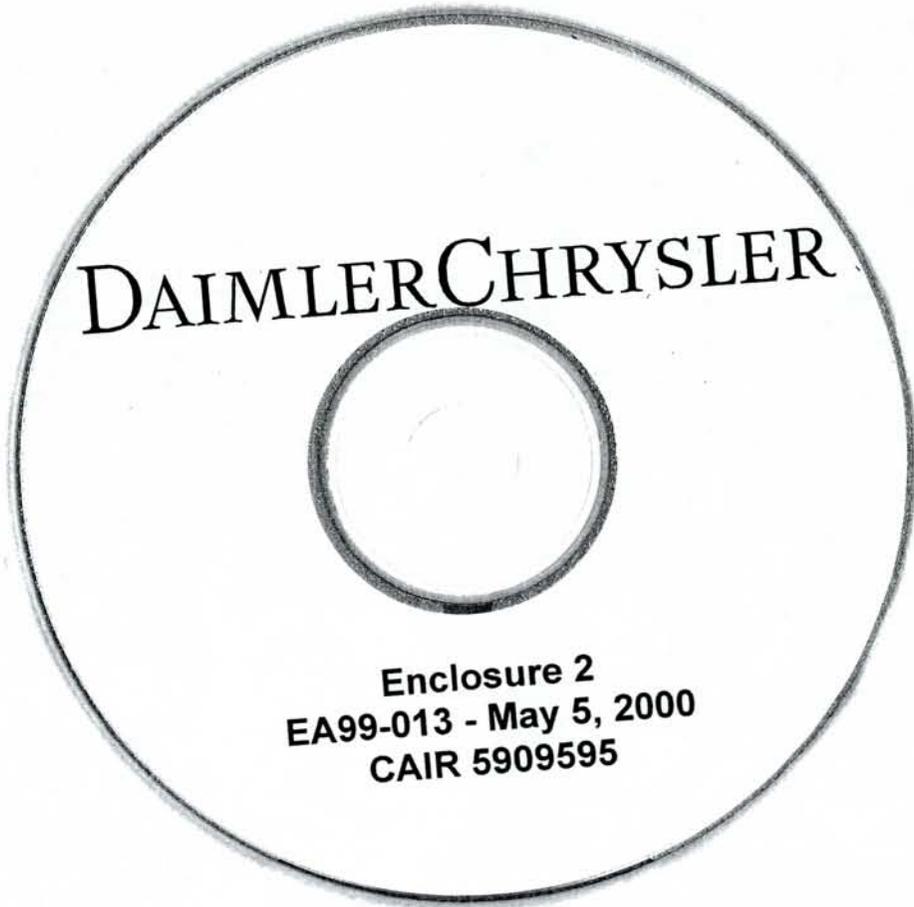
4th Code = H Voyager & Grand Voyager
 P Voyager AWD
 K Caravan & Grand Caravan
 D Caravan AWD
 Y Town & Country
 C Town & Country AWD

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C-LINE #61958 CD HOLDER
PATENT NUMBER 5,556,683

Disc Available upon Request.

516000



Robert D Banta
12/09/99 05:24 PM

To: Clinton E Spevak/CTC/Chrysler@Chrysler
cc:

Subject: Re: Call to driver of crashed minivan

Clint:

I talked to Mr. and Mrs. [redacted] Jday. They live in St. Petersburg, FL and are semi-retired. He is a part time Blue Cross / Blue Shield sales representative. Mr. and Mrs [redacted] are 66 and 61 years old respectively. They are pleasant, bright and alert people and, although they communicate quite well, neither possesses a very high mechanical aptitude.

INJURIES:

The injuries to Mr. was a broken left rib - now healed. Mrs. received a fairly severe blow to the head producing swelling and a cut in her forehead between the left eye and nose that required 17 stitches to close. The stitches are tight and although the swelling is down there remains some tightness and a "spiderweb" appearance to that area. She also had a bone chip in her right knee. Last week she had orthoscopic surgery to clean the knee joint area and has some pain from the surgery. Overall, he is fine and she has a favorable prognosis.

ACCIDENT:

On the day of the crash they were visiting an elderly relative at a nearby nursing home. Both were wearing seat belts. The fuel tank had been filled just a few miles prior to the crash. Mr. appears to understand that he was responsible for this crash but believes that the impacting vehicle was traveling greatly in excess of 55 mph. He believes that the impact was perpendicular to the left side from the trailing edge of the drivers door back to about the filler cap area. He said that they were rotated 360 degrees CW by the impact to the point of rest. (I think it was actually CCW) There was a loud noise at impact from the hit and rotation, they were somewhat stunned, but claim to remember the events well.

FIRE:

About 10 to 15 seconds after rest he saw flames at the area of the left front windshield and A pillar. These flames were initially constant in size, neither increasing or decreasing. He did not smell the odor of gasoline. They both exited out the right front door and, fearing an explosion, immediately walked 25 to 35 yards down the roadway and away from the van.

They sat on a lowered tailgate of a passing pickup truck at the scene. The right side of the van was visible and the fire continued for about 20 minutes before the FD arrived. They did not devote a lot of attention to the progress of the fire, rather they were busy trying to stop the bleeding of Mrs. and insure that the others were being cared for. Neither ever saw any gasoline liquid, spillage, flow or any other such description. They did not leave the pickup tailgate area until the FD and PD arrived.

FOLLOW UP:

They have been contacted only by me and the EAA representative. After the crash they bought another 1999 Voyager identical to the accident example.

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MY ANALYSIS:

The physical evidence observed at the scene along with the observations during the vehicle exam do not indicate that this fire had its origin at the fuel tank. Rather, the fire appears to have started at the left front in the area of the wheel opening and transmission. An impact of this magnitude could have damaged the transmission housing releasing its fluid along with anti-freeze from the coolant system. These combined fluids may have sprayed onto the exhaust system surfaces and ignited, causing the initial production of flames. The final involvement of the fuel storage system is not well known but is believed to be a late event based on the limited damage to the polymer tank.

Facts that support those conclusions are:

1. The tank was largely intact after the fire.
2. The roadway surfaces at the scene does not reveal a concentrated fuel spillage burn area.
3. Mr. V did not observe the initial fire at the tank area.
4. No fuel spillage was observed
5. There was no fuel odor recognized at rest.

Bob Banta

responding to:

Clinton E Spevak 12/08/99 07:11 PM

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FILE TYPE: Lawsuit
FILE NAME: _____, et al. v. DaimlerChrysler Corporation,
et al.
COURT: 16th Judicial District Court, St. Mary Parish, Louisiana
DOCKET NO: 104,532 (Div "E")
DATE OF SERVICE: November 16, 1999
DATE OF INCIDENT: August 22, 1998
VEHICLE: 1998 Dodge Grand Caravan
VIN: 2B4GP4439WR659485
MILEAGE: Unknown
OWNER:

ALLEGATION: Negligent in producing a vehicle with the propensity to roll over in an accident and with a gas tank in a location that would cause a fire if it hit another vehicle or object during a crash

DESCRIPTION: Ellen _____ rented a 1998 Dodge Grand Caravan from _____ in Kenner, Louisiana, to drive her infant grandson to his mother in California. Also present in the vehicle were four teenage relatives. At approximately 5:45 a.m. on August 22, 1998, Ms. _____ was traveling on I-10 West near Crockett County, Texas, when she drove the minivan off the road to the left, over-corrected to the right, skidded broadside and struck an extruder guardrail. The minivan then rolled ¼ turn to the left side, spun across the roadway to the north, and struck another guardrail. The vehicle returned to an upright position and continued westbound backwards, coming to rest on the north side of the roadway facing southwest. At some point during the accident, it is alleged the minivan caught on fire, and two of the occupants were unable to be rescued from the vehicle.

000979

DaimlerChrysler Corporation has not yet inspected the subject vehicle, and at this point in time, has absolutely no information as to the alleged mode of failure of the fuel tank in this accident.

000930

4

18600
00081

TEST#: A267-0110

TITLE: SNCAP Test# 6 - 2000 Dodge Caravan

Version 1.00

=====

Incoming Test Weight = 3656.3 lbs

Actual Test Weight = 4098.3 lbs

Test Velocity = 38.2 mph

LEFT SIDE IMPACT

P1 TTI: 50 g *50*

Input channels: P1 Lower Rib Y (7) FIR_100
 P1 Upper Rib y (5) FIR_100
 P1 Lower Spine y (9) FIR_100

P1 PEV: 71 g

Input channel: P1 Pelvic Y (11) FIR_100

CHN NAME	UNIT	MAX	MSEC	MIN	MSEC	FILT
P1 Upper Rib y	g	36.68	54.4	-11.72	95.7	FIR_100
P1 Upper Rib Ry	g	35.33	40.0	-12.49	95.7	FIR_100
P1 Lower Rib Y	g	36.86	38.1	-9.03	159.3	FIR_100
P1 Lower Rib YR	g	37.95	38.1	-10.02	159.4	FIR_100
P1 Lower Spine y	g	63.60	40.7	-8.00	113.8	FIR_100
P1 Lower Spine Ry	g	64.43	40.7	-8.21	65.0	FIR_100
P1 Pelvic Y	g	70.82	38.1	-10.72	65.7	FIR_100
P1 Pelvic Ry	g	70.84	38.1	-10.99	66.3	FIR_100

LEFT SIDE IMPACT

P4 TTI: 54 g *LR*

Input channels: P4 Lower Rib y (18) FIR_100
 P4 Upper Rib y (16) FIR_100
 P4 Lower Spine y (20) FIR_100

P4 PEV: 116 g

Input channel: P4 Pelvic y (22) FIR_100

CHN NAME	UNIT	MAX	MSEC	MIN	MSEC	FILT
P4 Upper Rib y	g	44.88	62.5	-8.64	33.8	FIR_100
P4 Upper Rib Ry	g	47.69	53.1	-12.71	31.9	FIR_100
P4 Lower Rib y	g	45.19	53.2	-9.75	31.9	FIR_100
P4 Lower Rib Ry	g	42.58	61.9	-9.74	33.8	FIR_100
P4 Lower Spine y	g	62.61	50.0	-8.84	75.6	FIR_100
P4 Lower Spine Ry	g	62.03	50.0	-9.21	75.0	FIR_100
P4 Pelvic y	g	115.56	44.4	-14.15	66.3	FIR_100
P4 Pelvic Ry	g	128.66	44.4	-15.43	66.3	FIR_100

000982

COMPARISON OF CTC vs MGA MVSS214 IMPACT VEHICLES - SWB

ITEM	SWB-CTC	SWB-MGA	VERULIAN	
			PRE	POST
Fuel tank nipple weld pad to bottom of filler hose	69 mm	105 mm	2.2"	4.0
Bottom of hose clamp to bottom of hose	7 mm	12 mm	.53"	0.4
Sill pinch flange to filler tube (at fuel tank nipple)	70 mm	76 mm	4.8" +1.5"	4.5
Hose clamp teeth (peaks) from screw to end of clamp	15	15	15	—
Hose clamp teeth (peaks) in tension zone of hose clamp	27	26	27	—
Fuel tank to spring hanger bracket	80 mm	114.3 mm	3.8"	4.0
Pinch flange to pinch flange across vehicle	52 3/16"	54 1/4"	56 1/4"	54"
Sill thickness at spring bolt	1.25"	1"	7.0"	1.3
Tank nipple base to top of clamp	86.5 mm	126 mm	2.95"	4.0
Estimated displacement of hose up nipple	22 mm	64 mm		
Rail to pinch flange (straight line, diagonal)	6.0 "	7.75"	9.25"	5.0
Spring bolt to tank nipple (centerline) X	4.0"	4.75"	4.8"	5.0
Vertical wall of sill to outboard rail	160 mm	246 mm	4.5" 3.8"	4.0
Tank nipple base to start of bead	82 mm		4.3"	5.0
Tank nipple base to center of bead	88 mm		3.55"	3.4
CLAMP TOP TO BEAD CENTER			0.7"	
CLAMP TOP TO NIPPLE WELD PAD			2.55"	

4/6/00

VERULIAN
PRE POST

2.2" 4.0
.53" 0.4
4.8"
+1.5" 4.5
15 —
27 —
3.8" 4.0
56 1/4" 54"
7.0" 1.3
2.95" 4.0
9.25" 5.0
4.8" 5.0
4.5"
3.8" 4.0
4.3" 5.0
3.55" 3.4
0.7"
2.55"

JAW
1/21/99

WIDTH OF CLAMP = 34

000983

NHTSA SINCAP TEST
1/6/00
Dodge Caravan YR530409

Occupant Position

Seat Back Angle
Seat Position
ATL Position
Column Mid position

Driver	Passenger
240	240
240	OK
OK	OK
Gen. T.H.	

Occupant Dimensions

	DRIVER Reference	Actual	Passenger Reference	Actual
HZ	4.5	4 1/4	6	5 3/8
HR	7.8	6.5	8.9	7.0
HS	11.2	10.5	14.5	13.0
AD	5.7	6.0"	8.2	7.5
AR	2.5	2.5	N/A	6.0
HD	4.9	5.5	11.3	N/A
H	29.4	29 1/2	N/A	N/A
	14.6		N/A	

3 accelerometers in car
1 Midreind
1 Belt Center
1 Mid Forward

Vehicle / Barrier Position

	Reference	Actual
Front Wheel Lip	35	AT
Rear Aperture	35.8	29 1/16
Bottom or Rear Rails	21.9	29 1/8
Barrier forward point	19	Center Barrier to Rear Axle
Barrier height Flange	11	11" Flange
Barrier height surface	13	13" Barrier
Barrier Serial Number		A207-11-185-1

000984

Calspan NS Summary 1/4/00 2:00 PM

- Air Review of VC 5486

- Archi Rock letter to NHTSA

- Data Review & contents for Pre test Measures

1/6/00

Tank filler separated from tank @ Clam

Filler separated from Quarter Panel Outer

Door Outer separated from Inner on front Door

Wheels turned to right

Trim Panel, Arm Rest separated from Quarter Trim

Gap closed between front seats.

Sill Rolled over Spring hanger Bracket.

Comm Forward, 1 vertical

Speed 38.2

Head Call on the Driver left Shoulder

Rear Quarter Glass

1/7/00

1:00 PM Safety Office Review

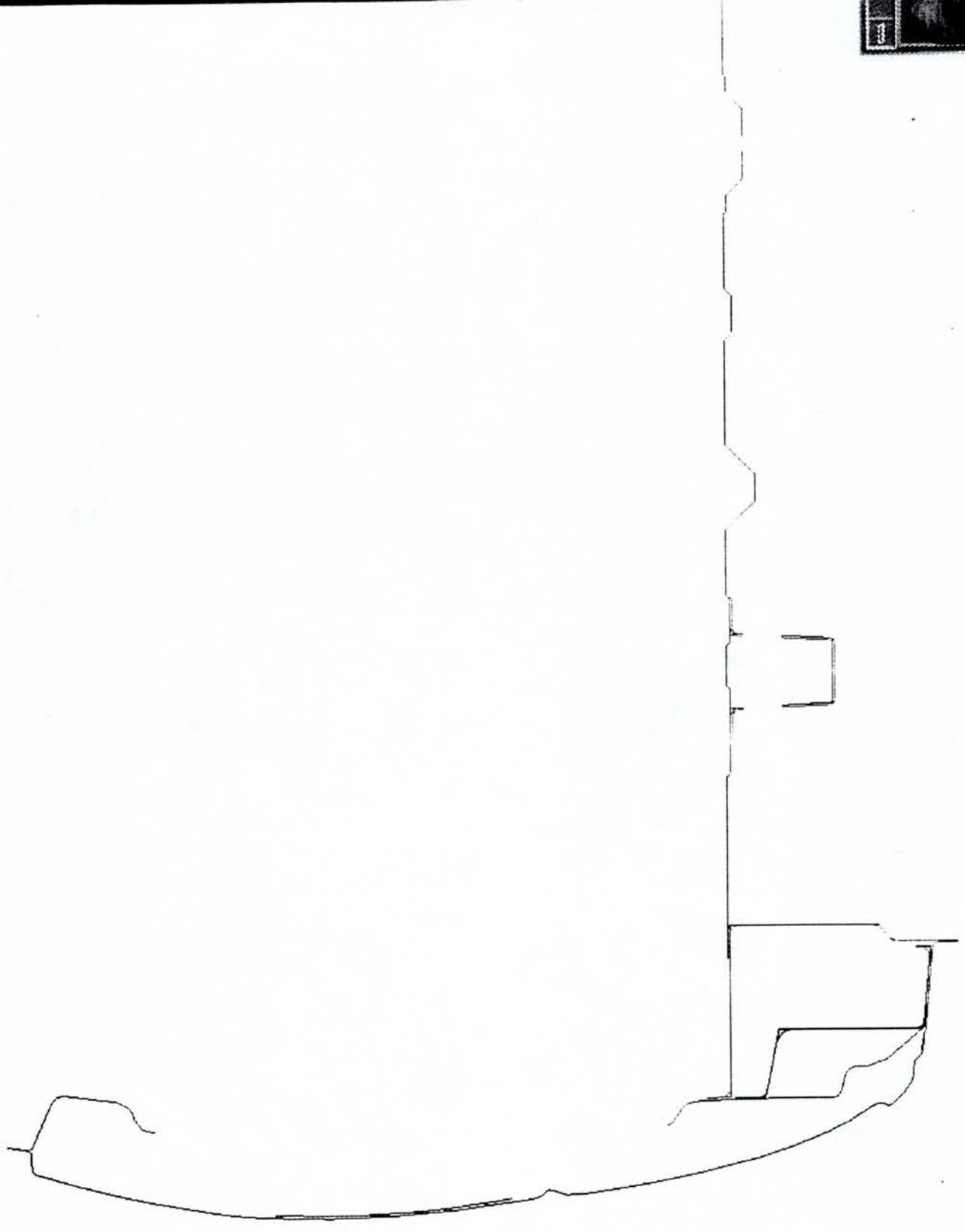
1) Test Tear-down of VC 5486

2) Test Baseline condition with Photographic coverage

3) Static Crush test

3

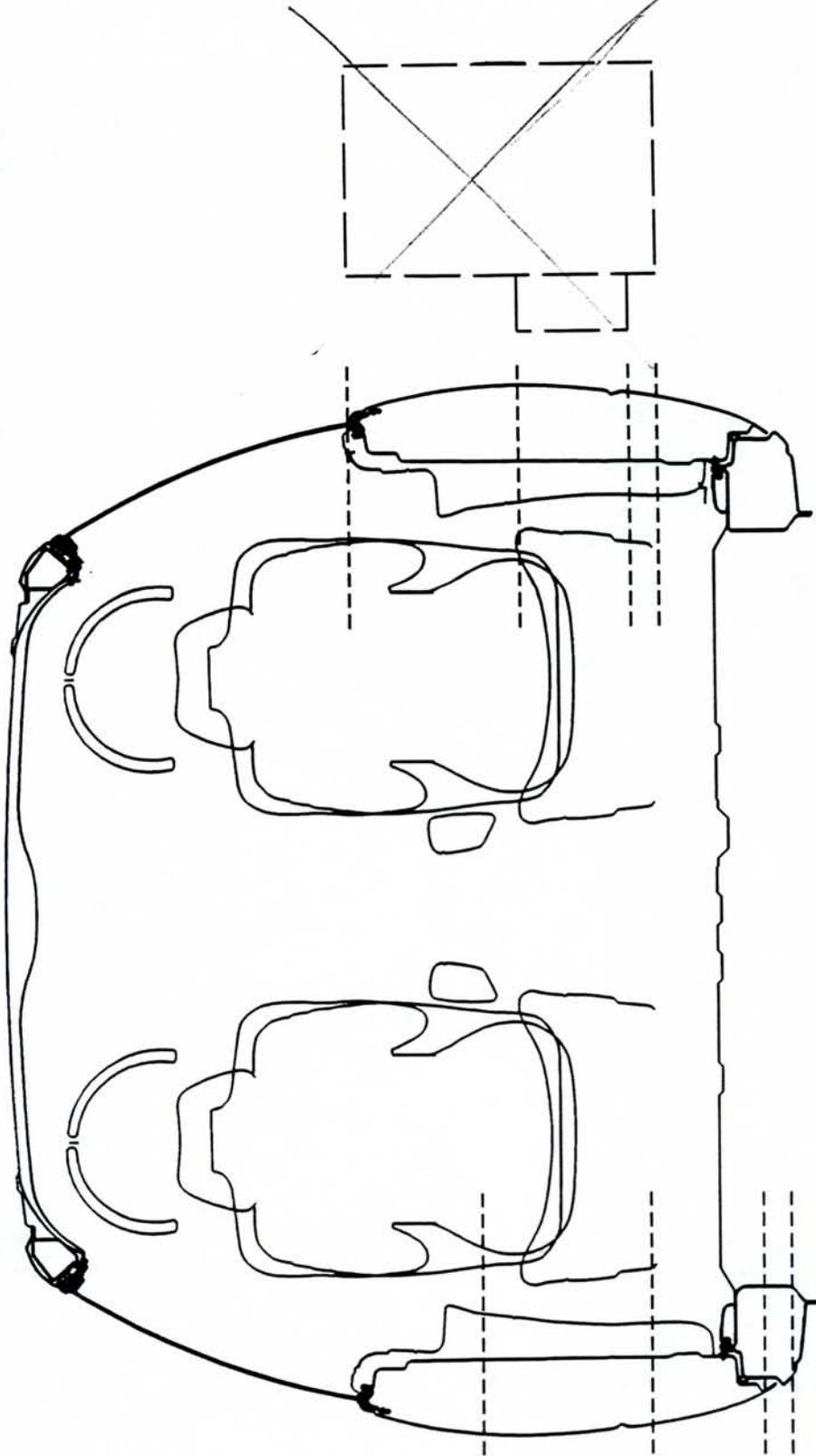
000985



000986

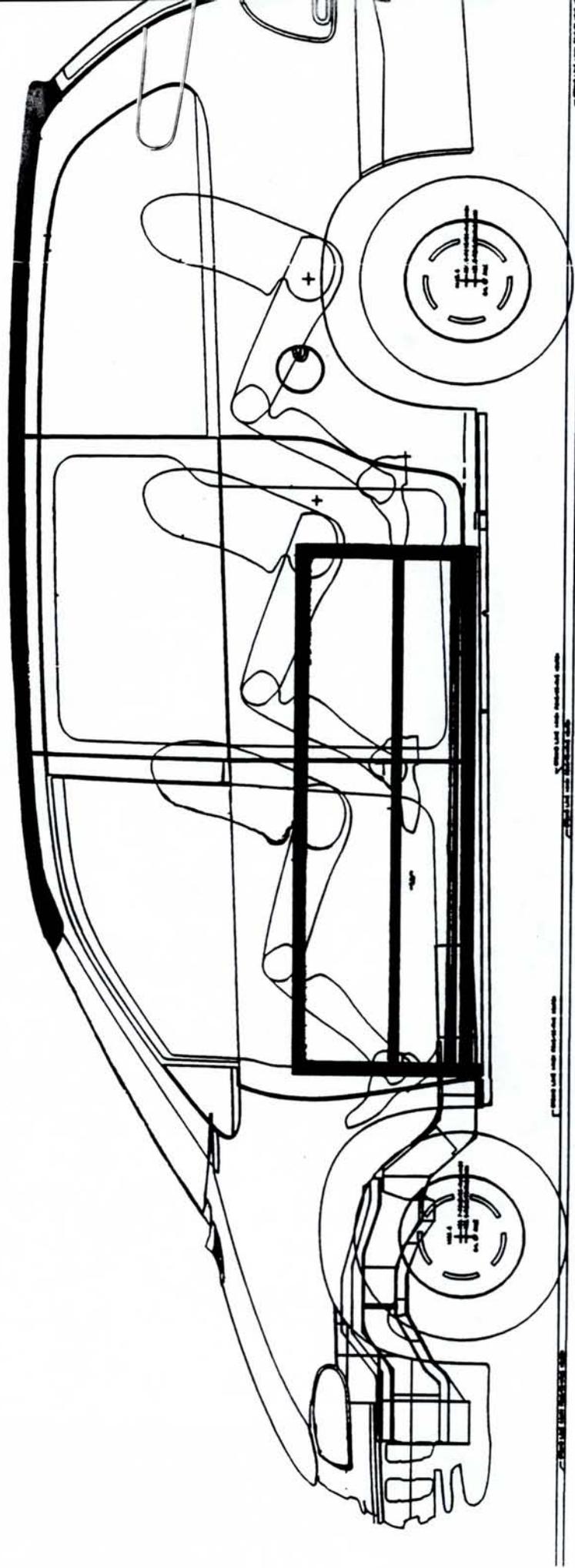


186000



SEE LINE AT CURB

000988

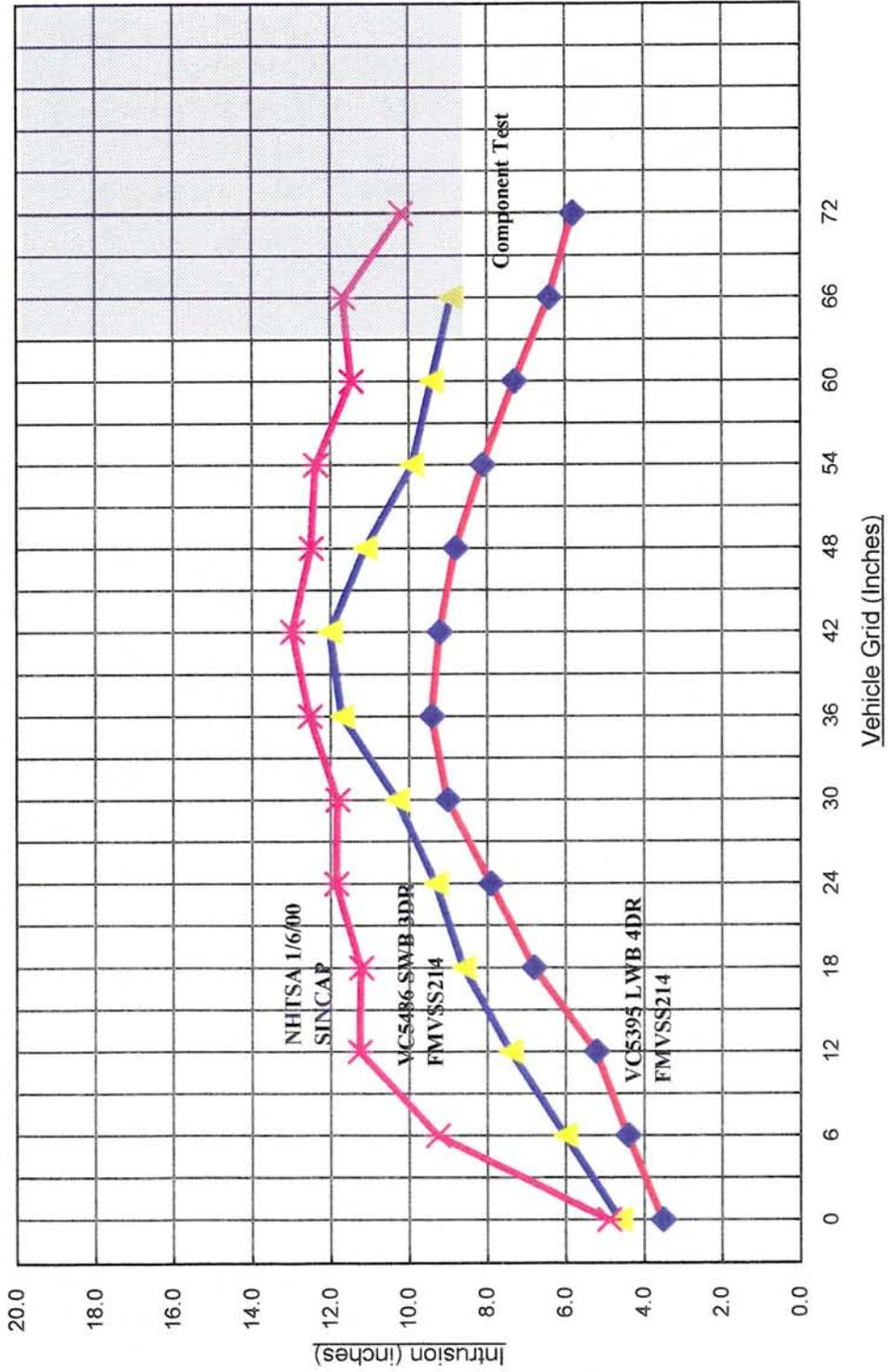


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986000

NS Post-Test Crush Measurements

Door Sill Plane



VC05395 VC05486 Series5

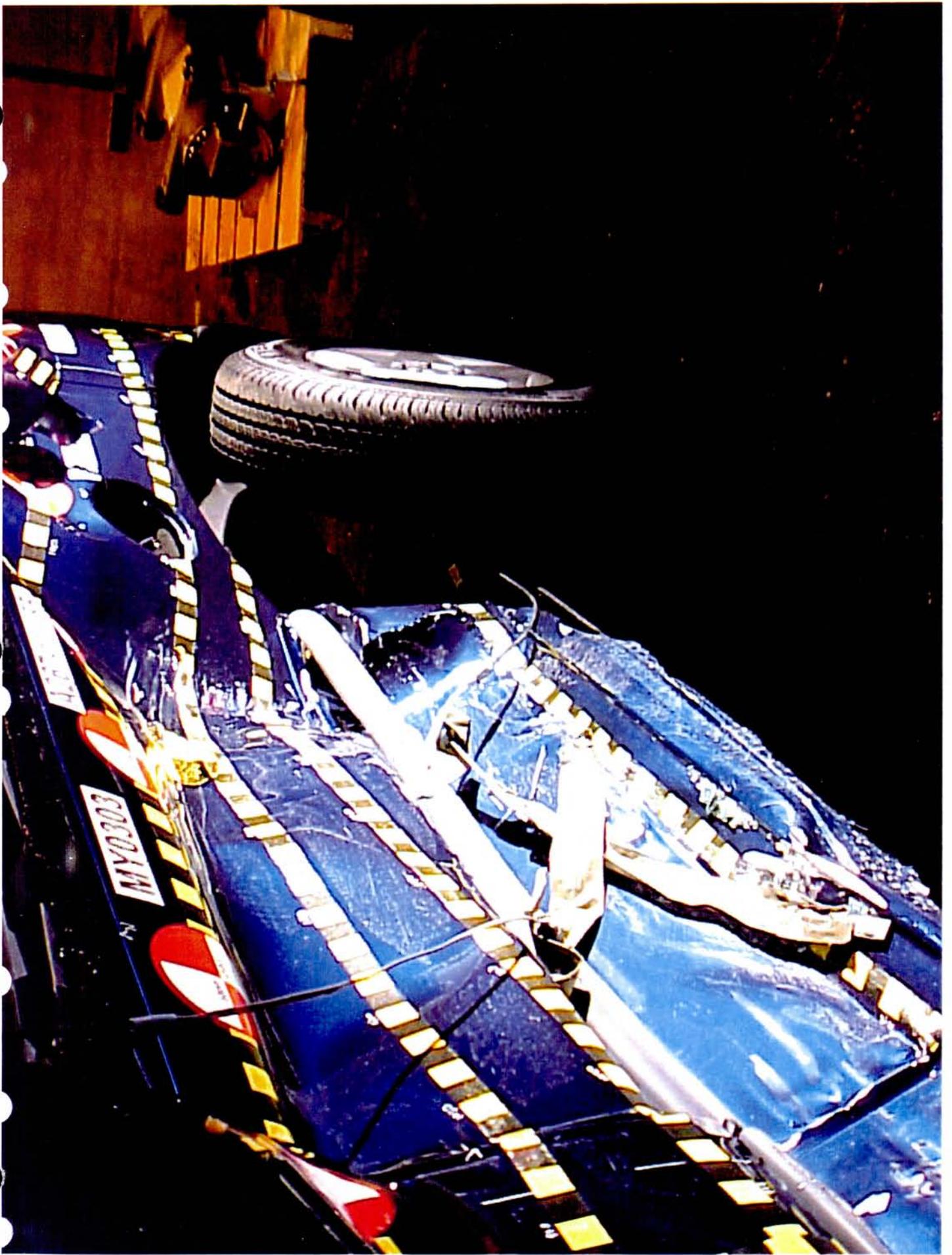
060000



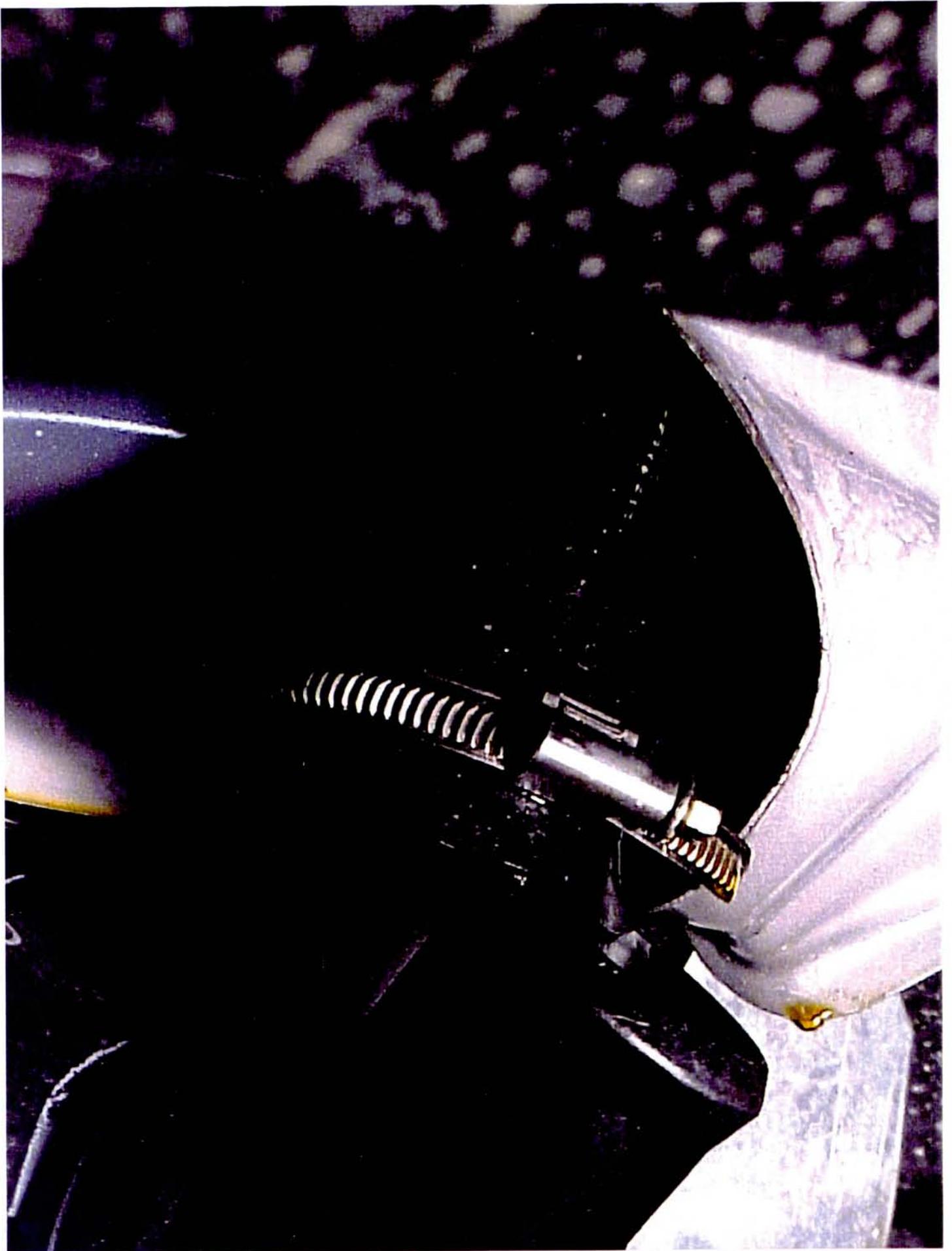
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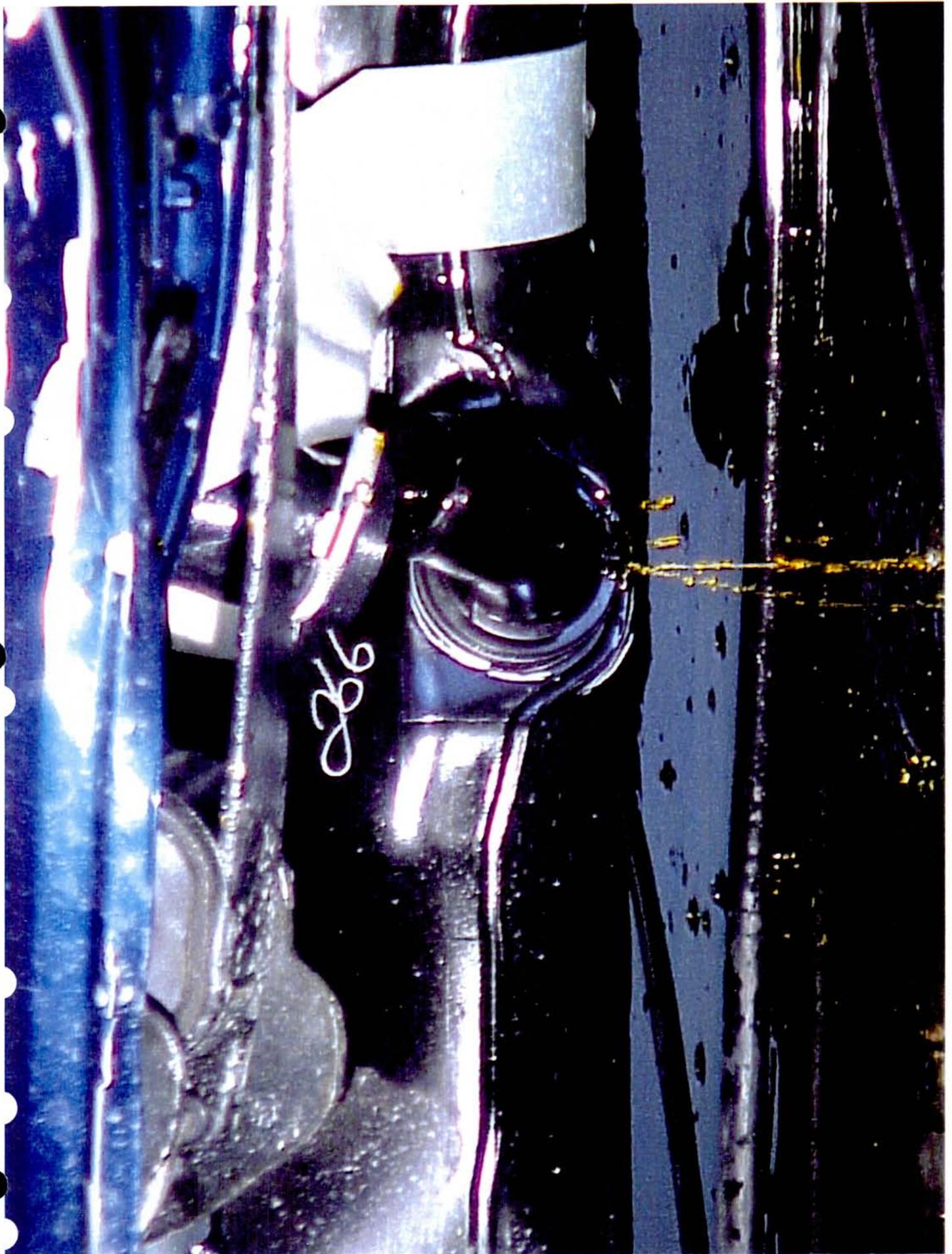
000992



000993



000994



000995



DV

DO NOT TOUCH
FOR CONSTRUCTION

171

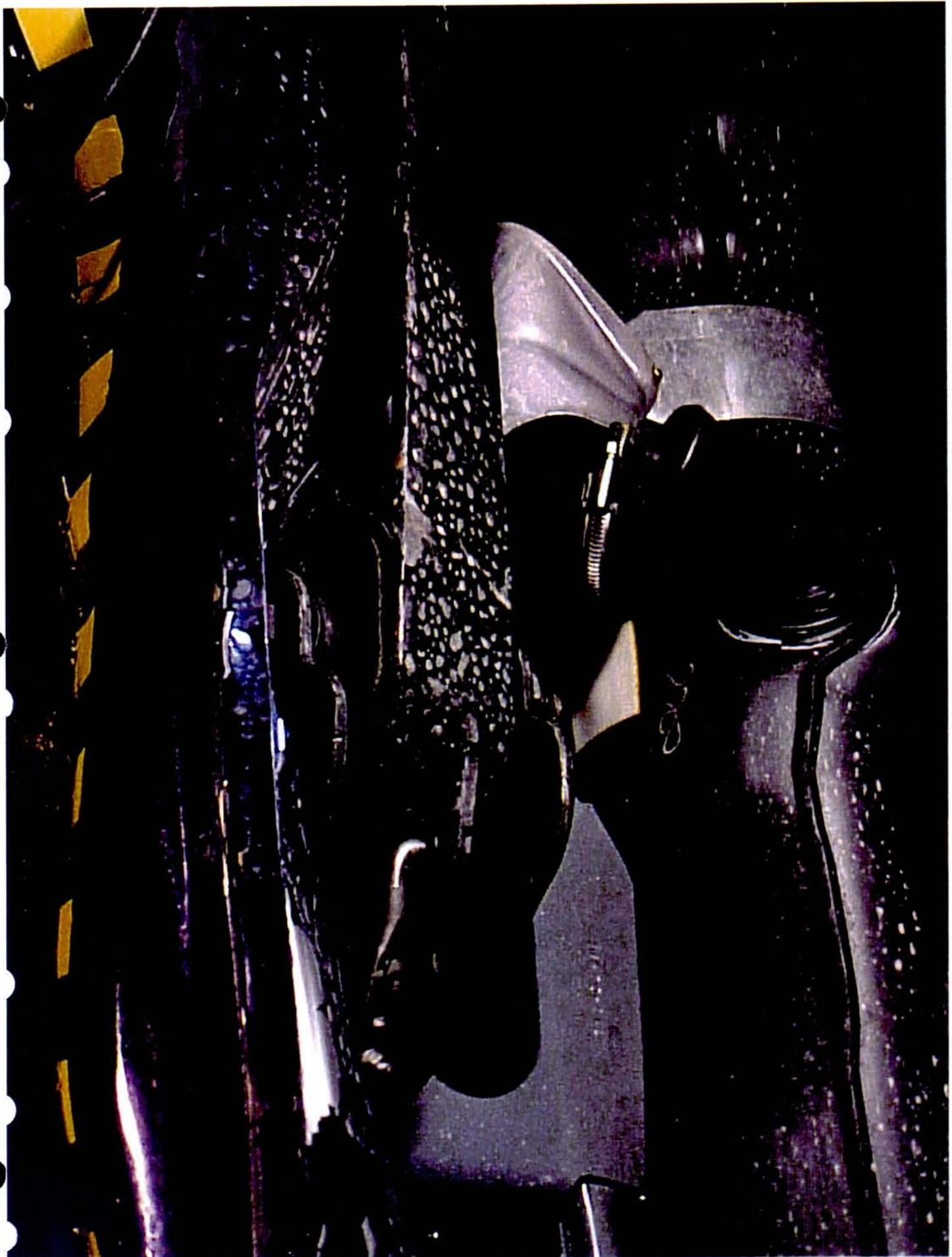
000996



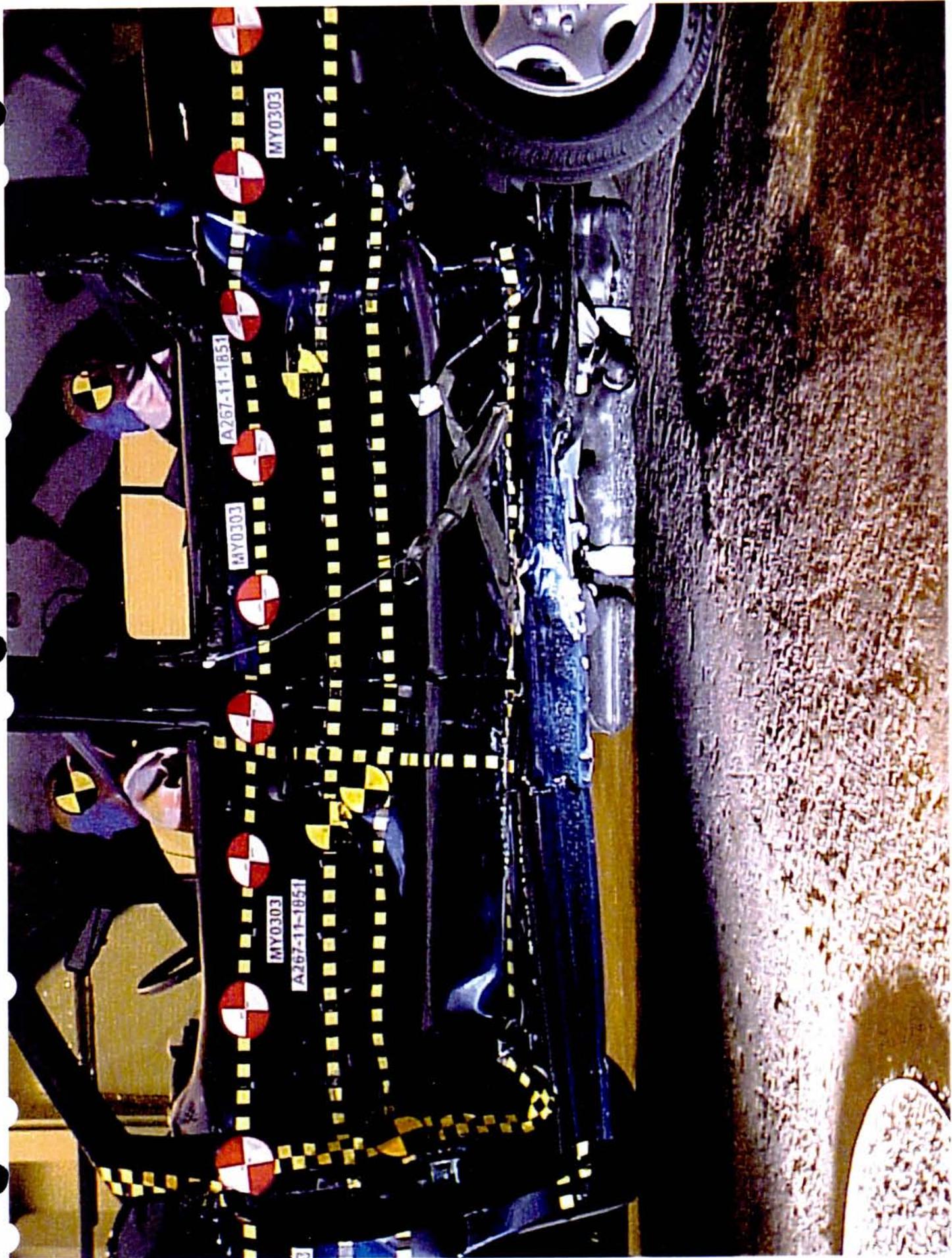
000997



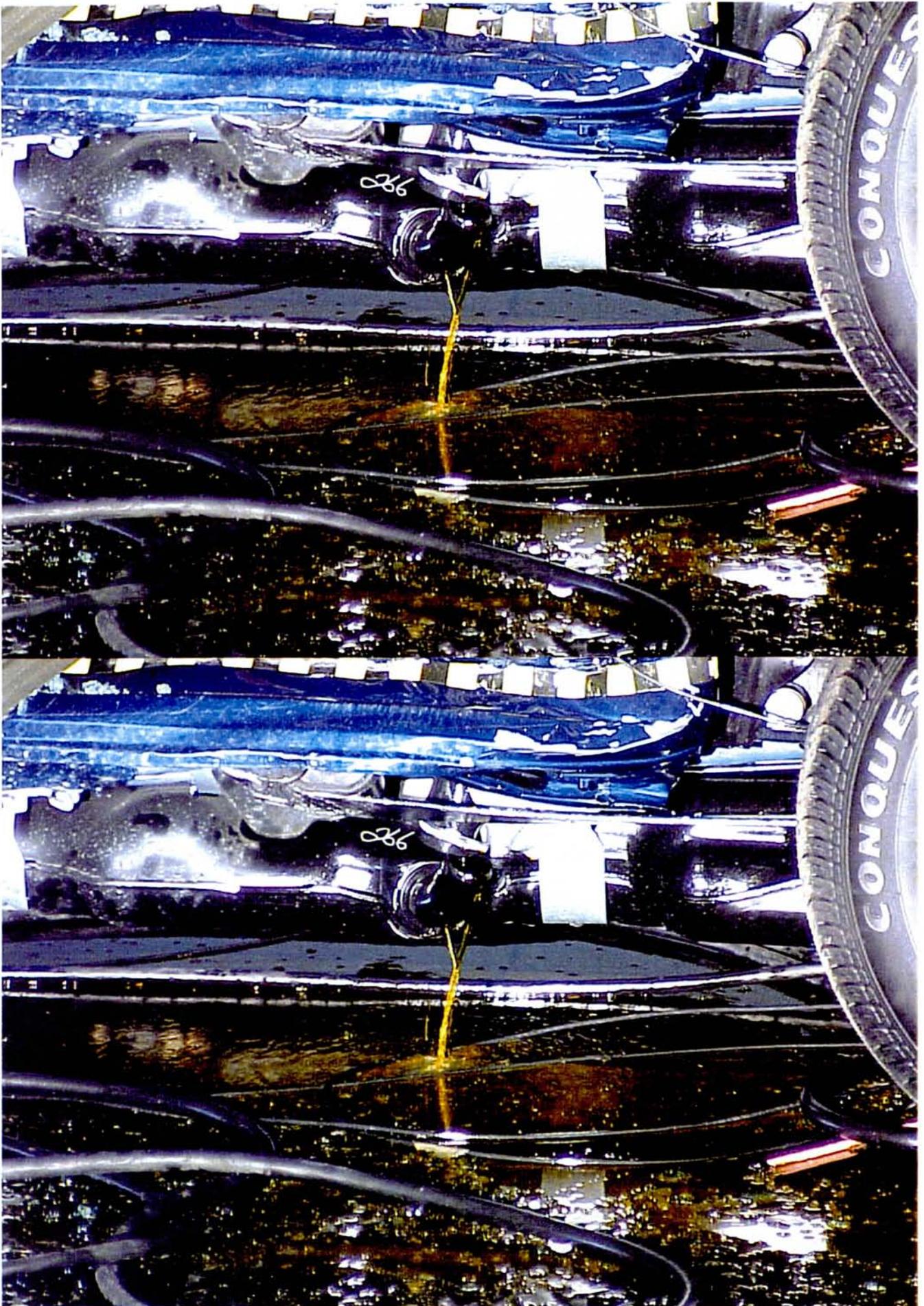
000998



000999



001000



001001

5

001002



Mark W Crossman

01/06/99 06:48 PM

To: Gordon L Rinschler/MVP/Chrysler@Chrysler, Douglas E Shepherd/MVP/Chrysler@Chrysler, Guy L Cowing/SCI/Chrysler@Chrysler, Frank M Fodale/LCP/Chrysler@Chrysler, James A Walendzik/MVP/Chrysler@Chrysler, Robert A Gasparovich/MVP/Chrysler@Chrysler, Diana A Cernis/MVP/Chrysler@Chrysler
cc: Antonius H Brenders/CTC/Chrysler@Chrysler, William R Edwards/CTC/Chrysler@Chrysler, Clinton E Spevak/CTC/Chrysler@Chrysler

Subject: Pictures of Caravan - FMVSS 214D test

NHTSA conducted an FMVSS-214 Dynamic Side Impact (left side struck) on a 1999 Caravan on 1/5/99.

Dummy numbers were satisfactory, meeting the 214 Dynamic requirements.

The fuel filler tube separated from the fuel tank nipple, creating a stoddard solvent leak.

We have not observed this event in the apx (5-6) NS-Body FMVSS-214 DSI tests we have conducted at CPG. We have impacted NS vehicles on the left side and the right side using the 214 barrier.

Technically, this stoddard leakage is not a violation of the 214 standard, since 214 does not specify fuel system performance requirements (these reside in FMVSS-301). However, we want to understand what happened and why it happened.

The test site was MGA. Incidentally, MGA just completed two NHTSA-sponsored SINCAP side impacts (11/30/98 and 12/18/98) on Grand Caravans at the +5 mph SINCAP barrier speed, with no fuel system issues.

A small group of DaimlerChrysler engineers met today to review available information, including a post-test hoist review of a Chelsea-tested LWB 214 side impact. We will meet again after gathering all pertinent data from our internal 214 tests, to further review this data and finish constructing a plan. On Tuesday, January 12, three DC engineers (Clint Spevak, Frank Fodale, and me) will visit MGA to review the vehicle. A NHTSA engineer will also be at MGA that day.

Post-test photos from the NHTSA test are attached.

To save time go to the third photo - #30504 - for the best view of fill tube and tank nipple.

----- Forwarded by Mark W Crossman/MVP/Chrysler on 01/06/99 06:08 PM -----



Archie J Rock
01/06/99 03:11 PM

001003

To: Mark W Crossman/MVP/Chrysler@Chrysler, Clinton E Spevak/CTC/Chrysler@Chrysler, Guy L Cowing/SCI/Chrysler@Chrysler, Frank M Fodale/LCP/Chrysler@Chrysler

cc:

Subject: Pictures of Caravan - FMVSS 214D test

Forwarded by Archie J Rock/CTC/Chrysler on 01/06/99 03:06 PM



"Giuseppe, Jeff <NHTSA>" <Jeff.Giuseppe@nhtsa.dot.gov> on 01/06/99
07:56:28 PM

To: ajr6@daimlerchrysler.com

cc:

Subject: Pictures of Caravan - FMVSS 214D test

See attachments - If you are wondering there is no CX030503 or CX030505.

Hope everything goes well with your dad....

 - Cx030507.jpg

 - cx030502.jpg

 - cx030504.jpg

 - cx030506.jpg

 - CX030501.jpg

001004



Mark W Crossman

01/29/99 01:38 PM

To: Clinton E Spevak/CTC/Chrysler@Chrysler
cc: Troy M Cornell/MVP/Chrysler@Chrysler, Diana A Cernis/MVP/Chrysler@Chrysler, James A Walendzik/MVP/Chrysler@Chrysler

Subject: Side Impact Data matrix

Clint -

Here's the matrix describing the LEFT SIDE impact vehicles in more detail, minus the two tests for which we lack any support documentation: VC-5143 and VC-5178. Those files should be coming to DCTC early next week. They are currently in storage at Iron Mountain.

Troy Cornell constructed the matrix to help us understand body configurations and results.

Based on the test files reviewed thus far, we see no indication of fill tube separation from the tank on any of the tests.

Note that two of the impact test units - XT-528 and VC-5600 - were CNG vehicles, which possess an entirely different fuel system than the gasoline vehicles. Because they showed in the VCRecords search, we include detail in this matrix.

We'll update the matrix next week when VC-5143 and VC-5178 files arrive.

Mark

----- Forwarded by Mark W Crossman/MVP/Chrysler on 01/29/99 01:19 PM -----

From: Troy M Cornell on 01/29/99 01:16 PM

Sent by: Troy M Cornell

To: Mark W Crossman/MVP/Chrysler@Chrysler
cc:

Subject: Side Impact Data matrix


SIDE IMPACT TESTS.doc

001005

D/E → MWC

FAX TRANSMISSION

DaimlerChrysler Corporation
VEHICLE SAFETY OFFICE
800 CHRYSLER DRIVE
AUBURN HILLS, MICHIGAN 48326-2757
FAX: 248-576-7321

To: G. L. Rinschler
D. E. Shepherd
G. L. Cowing
R. A. Gasparovich
~~_____~~

Date: February 3, 1999

Fax #: 6-2257
6-2256
6-2250

Pages: 2, including this cover sheet.

From: W. R. Edwards *WR*

Subject: NHTSA Defect Investigation PE99-010; '96-'99 NS Fuel System Integrity

COMMENTS:

Attached for your information is the NHTSA ODI Resume for PE99-010, regarding post collision fuel system integrity on '96-'99 MY NS vehicles. During an FMVSS 214 dynamic side impact compliance test of a '99 MY NS run January 5, 1999 at MGA in Burlington WI, the fuel filler tube hose separated from the nipple on the fuel tank, spilling approximately 11.0 gallons. While this in not a non compliance event, it has caused NHTSA to open a defect investigation. The formal inquiry will arrive shortly and we will require your assistance in preparing DaimlerChrysler's response. Thank you in advance for your help.!

001006

cc: AHB
SME
WRE
L eoldfarb
S. McLean



U.S. Department
of Transportation
National Highway
Traffic Safety
Administration

ODI RESUME

DATE OPENED: 3 -Feb-99

INVESTIGATION: PE99-010
SUBJECT: Post-Collision Fuel System Integrity
PROMPTED BY: IE99-001
PRINCIPAL ENGINEER: J. L. Quandt

MANUFACTURER: DaimlerChrysler Corporation
MODEL(S): NS-minivans (Dodge Caravan and Grand Caravan, Plymouth Voyager and Grand Voyager,
and Chrysler Town and Country)
MODEL YEAR(S): 1996-99
VEHICLE POPULATION: 2,000,000 estimated

PROBLEM DESCRIPTION: The filler tube hose may separate from the fuel tank in certain crash modes.

FAILURE REPORT SUMMARY

	ODI	MANUFACTURER	TOTAL
COMPLAINTS:	0	Unknown	0
FIRES:	0	"	0
INJ INCID:	0	"	0
# INJURIES:	0	"	0
FAT INCID:	0	"	0
# FATALS:	0	"	0
OTHER:	1	-	1

DESCRIPTION OF OTHER: Fuel filler tube hose separation in a left-side impact test conducted for a NHTSA FMVSS No. 214, Side Impact Protection, compliance test.

ACTION: A Preliminary Evaluation has been opened.

ENGINEER: [Signature] DIV CHF: [Signature] OFC DIR: [Signature]
 DATE: 2/2/99 DATE: 2/2/99 DATE: 2/3/99

SUMMARY: On January 5, 1999, a 1999 Dodge Caravan minivan was crash tested at the MGA Proving Ground in Burlington, Wisconsin to assess compliance with the Federal Motor Vehicle Safety Standard regarding side impact occupant protection (FMVSS No. 214). During the crash test the fuel filler tube hose separated from the fuel tank fill nipple causing approximately 11 gallons of test fuel to leak from the tank assembly. The tank, which has a nominal capacity of 20 gallons, had been filled with 18.43 gallons of Stoddard solvent for the test.

#

[Signature]
2/3/99

To: Clinton E Spevak/CTC/Chrysler@Chrysler
cc: Troy M Cornell/MVP/Chrysler@Chrysler, Diana A Cernis/MVP/Chrysler@Chrysler, James A Walendzik/MVP/Chrysler@Chrysler

Subject: Side Impact Data matrix

Clint -

Here's the matrix describing the LEFT SIDE impact vehicles in more detail, minus the two tests for which we lack any support documentation: VC-5143 and VC-5178. Those files should be coming to DCTC early next week. They are currently in storage at Iron Mountain.

Troy Cornell constructed the matrix to help us understand body configurations and results.

Based on the test files reviewed thus far, we see no indication of fill tube separation from the tank on any of the tests.

Note that two of the impact test units - XT-528 and VC-5600 - were CNG vehicles, which possess an entirely different fuel system than the gasoline vehicles. Because they showed in the VCRecords search, we include detail in this matrix.

We'll update the matrix next week when VC-5143 and VC-5178 files arrive.

Mark

----- Forwarded by Mark W Crossman/MVP/Chrysler on 01/29/99 01:19 PM -----

From: Troy M Cornell on 01/29/99 01:16 PM

Sent by: Troy M Cornell

To: Mark W Crossman/MVP/Chrysler@Chrysler

cc:

Subject: Side Impact Data matrix


SIDE IMPACT TESTS.doc

001008

6

600100

MVSS 214 SIDE IMPACT TEST

- During an FMVSS 214 dynamic side impact compliance test of a 1999 MY 'three door' SWB NS, run at MGA, the fuel filler tube hose separated from the fuel tank nipple, spilling approximately 11 gallons of Stoddard (SINCAP tests at the same facility on two 1999 MY LWB 'four door' vehicles were run without incident).
- Although not a 214 compliance issue, NHTSA has opened up a defect investigation on 1996-1999 MY NS vehicles.
- No field failures of this type are known. The Safety Office is conducting a record search to confirm.
- The vehicle was reviewed by Fuel Systems Engrg, Safety Office and Safety Development personnel at MGA on 1/19/99. It appeared that the clamp was properly tightened and all correct components were on the vehicle.
- No fuel system leakage has been observed in any of the ten 214/Euro barrier/301 lateral impact tests run by DaimlerChrysler (two of the ten tests were run on CNG vehicles). See attached matrix.
- This joint is not presently safety shielded for NS. However, CN 90203-M04 is in process to add the shield to this joint. SLAP and WAP are now processing as though this joint is already shielded. WAP started doing this on 1/7/99. SLAP started on 2/1/99.
- Filler hose pull-off testing is now in process. Results are due Friday, 2/12/99.
- Information NHTSA has asked for so far seems to be concentrating on the joint components and the robustness of the joint.

JAW
2/9/99

001010

DAIMLERCHRYSLER

Jerry L Coval

12/01/99 12:33 PM

To: Clinton E Spevak/CTC/Chrysler@Chrysler
cc: Namir A Konja/MVP/Chrysler@Chrysler

Subject: clamp ID measurements

Clint ---

Below is the info you requested from Norma at our last meeting. If you need anything else, please call me at 6-4851.

----- Forwarded by Jerry L Coval/MVP/Chrysler on 12/01/99 12:15 PM -----



Bob Ristovski <bristovs@normatech.com> on 12/01/99 11:02:01 AM

To: jc79@daimlerchrysler.com
cc: bward@normatech.com, lcallon@normatech.com

Subject: clamp ID measurements

:

Hello Jerry,

The following is the measurements of the clamp ID's as requested:

Old hose, old spud, clamp torqued to 35"-lbs = 51.3mm
New hose, new spud, clamp torqued to 25"-lbs = 52.70mm

I will forward your request to Lee regarding the addition of the latest pull test to the bar graphs.

Best Regards,
Bob

001011

7

2101012

Fuel System Survey - SWB/LWB

Dodge Plymouth
 Caravan, Grand
 2000 MY, Voyager,
 April 2000 1996 MY,
 April 2000

Vehicle Identification - Make, Model, Model Year, options. Date of Inspection.	
Wheel base of vehicle	2878mm
Rated fuel capacity	76 liters
Location of fuel filler tube (right or left side)	Left
Location of fill opening CntrLine on sheet metal	
Fore-Aft position of opening to rear axle CntrLine (in 'X')	214mm
Up_Down position of opening to top of rear wheel opening (above axle CntrLine, in 'Z')	-9mm
Description of fuel tank location in vehicle	
Position of rear edge of tank to rear axle CntrLine	187mm
Position of front edge of tank to rear axle CntrLine	1451mm
Position of left outboard edge to outboard side of left sill	0mm
Position of right outboard edge to outboard side of right sill	480mm
Position of left outboard edge to inboard side of left rail	-55mm
Position of right outboard edge to inboard side of right rail	425mm
Any additional comments ?	
Fill venting and valving	
ORVR, internal/external	None
Location on tank and fill tube	Top to top
Material, attachment, size, valving; Nylon 12 convolute weld to tank, quick connect to tube; 9/16" and 3/8" dia; no valve	
Fuel tank material type (metal or plastic)	Plastic
Unique suspension or other chassis interface ?	No
Fuel tank	
Location of fuel filler tube entry (Rear, side, top?)	Side
Submerged fill (yes or no?)	Yes
Any tank shields ? Note if thermal or impact (skid plate), attached to tank, body or exhaust.	None
Any additional comments ?	
Fuel tank straps	
How many straps ?	2
Fore/aft or lateral ?	Lateral
Any additional comments ?	
Are they fastened to fixed dimension or to torque?	Torque

001013

Fuel System Survey - SWB/LWB

Fill Pipe									
Housing at body side: Fixed or breakaway ?									
Approximate overall length	474mm	Breakaway	483mm						
Number of bends	3		3						
Pipe Material	Steel	Steel	Steel						
Pipe OD	44.5mm	44.5mm	44.5mm						
Routed above rail, below rail, through rail?	Below	Below	Below						
Connection type to tank	Hose, clamp	Hose, clamp	Hose, clamp						
Pipe attachment to BIW structure (yes or no)	No	No	No						
Comments pertaining to venting hoses									
Unique rollover valves or plumbing ?	No	No	No						
Any shielding? For impact? (yes or no): Shield toward leaf spring; not for side impact									
Any additional comments ?									
Fill Pipe Hose									
Hose OD	50mm	50mm	50mm						
Length	127mm	127mm	127mm						
Number of bends	0	0	0						
Corrugated or not	No	No	No						
Hose reinforced (yes or no)	Yes	Yes	Yes						
Any additional comments ?									
Fill pipe attachment to tank									
Type: Spud ? Note material, how attached to tank, length, diameter, diameter of bead.		Spud, HDPE, welded							
Clamp ? Style of clamp ?		Screw clamp	Screw clamp						
Bead type on spud		ramped	ramped						
Any additional comments ?									
Fuel cap									
Type (screw-on, quick-on, etc.)		Quick	Screw						
Valving		Press/Vac	Press/Vac						
Cap attachment - metal/plastic?		Plastic	Plastic						
Vehicle Attitude - Vertical from top of wheel opening above axle CntrLine (As received, no additional loading)									
Left Front	765mm	765mm	755mm						
Left Rear	765mm	765mm	775mm						
Right Front	765mm	765mm	755mm						
Right Rear	765mm	765mm	760mm						

001014

8

001015

Dimensions requested in March 31, 2000 Question 1 (mm):

		Short	Long
a	the longitudinal dimension from a vertical plane passing through the front axle centerline to the rear edge of the anchor plate for the left-middle seat belt (furnish these dimensions for each seating option available in the subject vehicles)	2413.6	2508.2
b	the longitudinal dimension from a vertical plane passing through the front axle centerline to the front and rear of the rail opening through which the fuel filler vent tube passes (vent tube pass-through)	2199.2, 2269.1	2677.3, 2447.2
c	the longitudinal dimension from a vertical plane passing through the front axle centerline to the interface between the sill inner wall and the left-rear wheelhouse extension	2410.3	2562.5
d	the lateral dimension from a vertical plane passing through the vehicle centerline to the inner and outer edges of the fuel tank spud	471.8, 549.7	471.8, 549.7
e	the minimum clearance between the fuel filler tube and: (1) the left rear wheelhouse; and (2) the sill inner wall	6.31, 8.28	7.78, 10.09
f	the lateral dimension from a vertical plane passing through the vehicle centerline to the anchor bolt for the left-middle seat belt (furnish these dimensions for each seating option available in the subject vehicles)	688.2, all options	688.2, all options
g	the vertical dimension from the bottom edge of the fuel tank nipple to the lower dimensions of the anchor plate for the left-middle seat belt (furnish these dimensions for each seating option available in the subject vehicles) and the vent tube pass-through	174.8, 181.4	172.0, 182.7

001016

001047