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September 9, 2010

Mr. Richard P. Boyd, Acting Director
Office of Defects Investigation
National Highway Traffic Safety Administration
1200 New Jersey Avenue SE, Room W45-302
Washington, DC 20590

Dear Mr. Boyd:

Subject: PE10-026:NVS-213hkb

The Ford Motor Company (Ford) response to the agency's July 30, 2010, letter concerning reports of alleged corrosion-related failures of the front subframe assembly in 1999 through 2003 model year Ford Windstar vehicles is attached.

A thorough review of information and data collected in the preparation of the Ford response to this information request has found a low rate of reports alleging corrosion-related cracking or fracture of the front subframe on the subject vehicles. The rate is particularly low when considering the age of the vehicles (some have been in service for up to 12 years) and the tens of billions of miles they have accumulated. Analysis of the underlying reports shows that more than 98% of the reports concern vehicles that were originally sold or are currently registered in the "salt belt" states. When there is sufficient detail in the reports to determine the location on the front subframe where the alleged fracture occurred, a majority of the allegations relate to the lower control arm attachment with some related to the rear body mount attachment area. Review of the vehicle design and of available photographs related to complaint vehicles indicate that the lower control arm related reports likely pertain to the rear attachment bracket on the front subframe. Of the 50 reports identified as related to the lower control arm, 35 indicate the alleged separation occurred on the passenger side. None of the reports allege a fracture of the attachment on the driver side. The remaining 15 reports do not indicate on which side the alleged separation occurred.

Those reports that relate to a rear body mount attachment fracture of the front subframe often indicate that a driver noticed noise, such as a clunk, and brought the vehicle in for inspection and a broken front subframe near the rear body mount was determined to be the cause of the noise. The remaining reports include a variety of areas and attachment locations without an observable pattern.

This inquiry specifically requested Ford's analysis of vehicle controllability at various speeds and during certain vehicle maneuvers, such as turning. Ford conducted a series of straight line tests and tests in a turn, at a variety of speeds to assess the vehicle performance following a simulated separation of the rear attachment of the lower control arm bracket. Testing found that moderate brake application improves vehicle controllability. In tests without moderate brake application, the vehicle exhibits a toe out condition; in tests with moderate brake application the wheel initially toes out, but the toe returns to nearly its original location during moderate brake application, improving vehicle controllability.

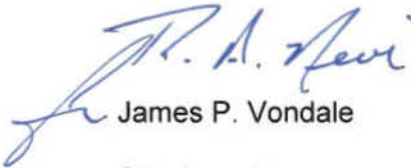


Ford has also completed static and low speed evaluations of the effect on vehicle control when the front subframe fractures in the area of the rear body mount. Ford's evaluation concludes that the vehicle remains completely controllable with a rear mount fracture.

Overall, for reports on vehicles originally sold or currently registered in "salt belt" states that meet the definition of the alleged defect, the rate is very low at 0.11 R/1000. When considering reports that specifically allege lower control arm separation from the front subframe the rate is even lower at 0.06 R/1000. Vehicle testing simulating a separation of the rear attachment of the lower control arm from the front subframe has shown that with moderate brake application the vehicle can be steered and safely stopped. Vehicle testing simulating a fracture of the front subframe in the area of the rear body mount has shown that the vehicle remains completely controllable. Years of real world data, including only two accident allegations pertaining to the lower control arm and only one accident allegation pertaining to the engine cradle, in combination with the very low rate of reports demonstrate that corrosion-related fracture of the front subframe does not pose an unreasonable risk to safety.

If you have any questions concerning this response, please feel free to contact me.

Sincerely,



James P. Vondale

Attachment

FORD MOTOR COMPANY (FORD) RESPONSE TO PE10-026

Ford's response to this Preliminary Evaluation information request was prepared pursuant to a diligent search for the information requested. While we have employed our best efforts to provide responsive information, the breadth of the agency's request and the requirement that information be provided on an expedited basis make this a difficult task. We nevertheless have made substantial effort to provide thorough and accurate information, and we would be pleased to meet with agency personnel to discuss any aspect of this Preliminary Evaluation.

The scope of Ford's investigation conducted to locate responsive information focused on Ford employees most likely to be knowledgeable about the subject matter of this inquiry and on review of Ford files in which responsive information ordinarily would be expected to be found and to which Ford ordinarily would refer. Ford notes that although electronic information was included within the scope of its search, Ford has not attempted to retrieve from computer storage electronic files that were overwritten or deleted. As the agency is aware, such files generally are unavailable to the computer user even if they still exist and are retrievable through expert means. To the extent that the agency's definition of Ford includes suppliers, contractors, and affiliated enterprises for which Ford does not exercise day-to-day operational control, we note that information belonging to such entities ordinarily is not in Ford's possession, custody or control.

Ford has construed this request as pertaining to vehicles manufactured for sale in the United States, its protectorates, and territories.

Ford notes that some of the information being produced pursuant to this inquiry may contain personal information such as customer names, addresses, telephone numbers, and complete Vehicle Identification Numbers (VINs). Ford is producing such personal information in an unredacted form to facilitate the agency's investigation with the understanding that the agency will not make such personal information available to the public under FOIA Exemption 6, 5 U.S.C. 552(b)(6).

Answers to your specific questions are set forth below. As requested, after each numeric designation, we have set forth verbatim the request for information, followed by our response. Unless otherwise stated, Ford has undertaken to provide responsive documents dated up to and including July 30, 2010, the date of your inquiry. Ford has searched within the following offices for responsive documents: Sustainability, Environment and Safety Engineering, Ford Customer Service Division, Research, Global Core Engineering, Office of the General Counsel, and North American Product Development.

Request 1

State, by model year and region (Salt Belt and non-Salt Belt states), the number of subject vehicles Ford has manufactured for sale or lease in the United States. Separately, for each subject vehicle manufactured to date by Ford, state the following:

- a. Vehicle identification number (VIN);
- b. Make;
- c. Model;
- d. Model Year;
- e. Date of manufacture;
- f. Date warranty coverage commenced; and

- g. The State in the United States where the vehicle was originally sold or leased (or delivered for sale or lease).

Provide the table in Microsoft Access 2003, or a compatible format, entitled "PE10-026 PRODUCTION DATA." See Enclosure I, Data Collection Disc, for a pre-formatted table which provides further details regarding this submission.

Answer

Ford records indicate that the approximate total number of 1999 through 2003 model year Ford Windstar vehicles sold in the United States, (the 50 states and the District of Columbia) protectorates, and territories (American Samoa, Guam, Northern Mariana Islands, Puerto Rico, and Virgin Islands) is 914,789.

The "Salt Belt" Region includes the following states: Connecticut, Delaware, Iowa, Illinois, Indiana, Massachusetts, Maryland, Maine, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, Wisconsin, West Virginia and the District of Columbia. Vehicles sold in areas not listed above are considered non-Salt Belt states. Selling state information is unknown for a limited number of vehicles; these vehicles are included in the count of Unknown Region.

The number of subject vehicles sold in the United States by model year and region is shown below:

Region	1999 MY	2000 MY	2001 MY	2002 MY	2003 MY
Salt Belt	111,136	131,367	106,581	81,443	86,500
Non-Salt Belt	90,614	100,645	72,497	61,291	57,978
Unknown	3,811	1,957	2,121	3,415	3,433
Total	205,561	233,969	181,199	146,149	147,911

The requested data for each subject vehicle is provided in an Access database contained in Appendix A.

There are 16 additional vehicles that were not manufactured for sale or lease in the United States that have subsequently entered the United States and have resulted in a report in the United States to either Ford or NHTSA that relates to, or may relate to the alleged defect. The requested information for these vehicles is provided in an Excel spreadsheet contained in Appendix A.

Request 2

State the number of each of the following, received by Ford, or of which Ford are otherwise aware, which relate to, or may relate to, the alleged defect in the subject vehicles:

- a. Consumer complaints, including those from fleet operators;
- b. Field reports, including dealer field reports;
- c. Reports involving a crash, injury, or fatality, based on claims against the manufacturer involving a death or injury, notices received by the manufacturer alleging or proving that a death or injury was caused by a possible defect in a subject vehicle, property damage claims, consumer complaints, or field reports;

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

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

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

Answer

For purposes of identifying reports of incidents that may be related to the alleged defect and any related documents, Ford has gathered "owner reports" and "field reports" maintained by Ford Customer Service Division (FCSD), and claim and lawsuit information maintained by Ford's Office of the General Counsel (OGC).

Descriptions of the FCSD owner and field report systems and the criteria used to search each of these are provided in Appendix B.

The following categorizations were used in the review of reports located in each of these searches:

Category	Allegation
A1	Fracture of front subframe with lower control arm separation due to corrosion
A2	Fracture of front subframe at other or unknown location due to corrosion
A3	Cracked front subframe at lower control arm bracket due to corrosion
A4	Cracked front subframe at other or unknown location due to corrosion
B1	Lower control arm separated from front subframe – unknown cause
B2	Fracture of front subframe – unknown cause
B3	Cracked front subframe – unknown cause
B4	Front subframe rusted/corroded – no indication of fracture or crack

We are providing copies of reports categorized as "B" as "non-specific allegations" for your review because of the broad scope of the request. Based on our engineering judgment, the information in these reports is insufficient to support a determination that they pertain to the alleged defect.

Owner Reports: Records identified in a search of the Master Owner Relations Systems (MORS) database, as described in Appendix B, were reviewed for relevance and sorted in accordance with the categories described above. The number and copies of relevant owner reports identified in this search that may relate to the agency's investigation are provided in

the MORS III portion of the database contained in Appendix C. The categorization of each report is identified in the "Category" field.

When we were able to identify that responsive (i.e., not ambiguous) duplicate owner reports for an alleged incident were received, each of these duplicate reports was marked accordingly, and the group counted as one report. In one case, the vehicle may have experienced more than one incident and has more than one report associated with its VIN. These reports have been counted separately.

Legal Contacts: Ford is providing, in Appendix B, a description of Legal Contacts and the activity that is responsible for this information. To the extent that responsive (i.e., not ambiguous) owner reports indicate that they are Legal Contacts, Ford has gathered the related files from the OGC. Non-privileged documents for files that were located that are related to the responsive owner reports are provided in Appendix D. Ford notes that it was unable to locate two files.

Field Reports: Records identified in a search of the Common Quality Indicator System (CQIS) database, as described in Appendix B, were reviewed for relevance and sorted in accordance with the categories described above. The number and copies of relevant field reports identified in this search that may relate to the agency's investigation are provided in the CQIS portion of the database contained in Appendix C. The categorization of each report is identified in the "Category" field.

When we were able to identify that a responsive field report was duplicative of an owner report, the field report was marked accordingly, and the group counted as one report. The field report that is duplicative of the owner report is provided in Appendix C but is not included in the field report count.

VOQ Data: This information request had an attachment that included 87 Vehicle Owner Questionnaires (VOQs). Ford made inquiries of its MORS database for customer contacts, and its CQIS database for field reports regarding the vehicles identified in the VOQs. Ford notes that in some instances where the VOQ does not contain the VIN or the owner's last name and zip code, it is not possible to query the databases for owner and field reports specifically corresponding to the VOQs. There are 51 VOQs related to the alleged defect that are duplicative of MORS or CQIS reports that are provided in Appendix C.

Crash/Injury Incident Claims: For purposes of identifying allegations of accidents or injuries that may have resulted from the alleged defect, Ford has reviewed responsive owner and field reports, and lawsuits and claims. Ford identified two allegations of accidents and copies of the reports corresponding to these alleged incidents are provided in the MORS portion of the database provided in Appendix C.

Claims, Lawsuits, and Arbitrations: For purposes of identifying incidents that may relate to the alleged defect, Ford has gathered claim and lawsuit information maintained by Ford's OGC. Ford's OGC is responsible for handling product liability lawsuits, claims, and consumer breach of warranty lawsuits and arbitrations against the Company.

Lawsuits and claims gathered in this manner were reviewed for relevance and sorted in accordance with the categories described above. Ford has also located one other claim which is ambiguous as to whether it pertains to the alleged defect. We have included this claim as a "non-specific allegation" for your review because of the broad scope of the request.

Based on our engineering judgment, the information in this claim is insufficient to support a determination that it pertains to the alleged defect.

We are providing the requested detailed information, where available, for the responsive and ambiguous claims in our Log of Lawsuits and Claims, in the Legal Claims/Lawsuits portion of the database provided in Appendix C. The number of relevant claims identified is also provided in this log. To the extent available, copies of complaints, first notices, or MORS reports relating to matters shown on the log are provided. With regard to these claims, Ford has not undertaken to contact outside law firms to obtain additional documentation.

Request 3

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

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

Provide this information in Microsoft Access 2003, or a compatible format, entitled "PE10-026 REQUEST NUMBER TWO DATA," See Enclosure, Data Collection Disc, for a preformatted table which provides further details regarding this submission.

Answer

Ford is providing owner and field reports in the database contained in Appendix C in response to Request 2. To the extent information sought in Request 3 is available for owner and field reports, it is provided in the database. To the extent information sought in Request 3 is available for lawsuits and claims, it is provided in the database.

Request 4

Produce copies of all documents related to each item within the scope of Request No. 2. Organize the documents separately by category (i.e., consumer complaints, field reports, etc.) and describe the method Ford used for organizing the documents.

Answer

Ford is providing owner and field reports in the database contained in Appendix C in response to Request 2. Copies of complaints or MORS reports relating to matters shown on the Log of Lawsuits and Claims are provided in Appendix E. To the extent information sought in Request 4 is available, it is provided in the referenced appendices.

Request 5

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

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

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

Provide this information in Microsoft Access 2003, or a compatible format, entitled "PE10-026 WARRANTY DATA." See Enclosure 1, Data Collection Disc, for a pre-formatted table which provides further details regarding this submission.

Answer

Records identified in a search of the AWS database, as described in Appendix B, were reviewed for relevance and sorted in accordance with the categories described in the response to Request 2. The number and copies of relevant warranty claims identified in this search that may relate to the agency's investigation are provided in the AWS portion of the database contained in Appendix C. The categorization of each report is identified in the "Category" field.

Warranty claims that are duplicative of field reports are provided in Appendix C but are not included in the report count.

Requests for "goodwill, field, or zone adjustments" received by Ford to date that relate to the alleged defect that were not honored, if any, would be included in the MORS reports identified above in response to Request 2. Such claims that were honored are included in the warranty data provided.

Request 6

Describe in detail the search criteria used by Ford to identify the claims identified in response to Request No. 5, including the labor operations, problem codes, part numbers and any other pertinent parameters used. Provide a list of all labor operations, labor operation descriptions, problem codes, and problem code descriptions applicable to the alleged defect in the subject vehicles. State, by make and model year, the terms of the new vehicle warranty coverage offered by Ford on the subject vehicles (i.e., the number of months and mileage for which coverage is provided and the vehicle systems that are covered). Describe any extended warranty coverage option(s) that Ford offered for the subject vehicles and state by option, model, and model year, the number of vehicles that are covered under each such extended warranty.

Answer

Detailed descriptions of the search criteria, including all pertinent parameters, used to identify the claims provided in response to Request 5 are described in Appendix B.

For 1999 through 2003 model year Ford Windstar vehicles, the New Vehicle Limited Warranty, Bumper-to-Bumper Coverage begins at the warranty start date and lasts for three years or 36,000 miles, whichever occurs first. Optional Extended Service Plans are not available to cover the subject component.

Request 7

Produce copies of all service, warranty, and other documents that relate to, or may relate to, the alleged defect in the subject vehicles, that Ford has issued to any dealers, regional or zone offices, field offices, fleet purchasers, or other entities. This includes, but is not limited to, bulletins, advisories, informational documents, training documents, or other documents or communications, with the exception of standard shop manuals. Also include the latest draft copy of any communication that Ford is planning to issue within the next 120 days.

Answer

For purposes of identifying communications to dealers, zone offices, or field offices pertaining, at least in part, to corrosion-related failures of the front subframe assembly, Ford has reviewed the following FCSD databases and files: The On-Line Automotive Service Information System (OASIS) containing Technical Service Bulletins (TSBs) and Special Service Messages (SSMs); Internal Service Messages (ISMs) contained in CQIS; and Field Review Committee (FRC) files. We assume this request does not seek information related to electronic communications between Ford and its dealers regarding the order, delivery, or payment for replacement parts, so we have not included these kinds of information in our answer.

A description of Ford's OASIS messages, ISMs, and the Field Review Committee files and the search criteria used are provided in Appendix B.

OASIS Messages: Ford has not identified any SSMs or TSBs that may relate to this request.

Internal Service Messages: Ford has not identified any ISMs that may relate to this request.

Field Review Committee: Ford has not identified any field service action communications that may relate to this request.

Ford is not aware of any forthcoming communications that may relate to this request.

Request 8

Describe all assessments, analyses, tests, test results, studies, surveys, simulations, investigations, inquiries and/or evaluations (collectively, "actions") that relate to, or may relate to, the alleged defect in the subject vehicles that have been conducted, are being conducted, are planned, or are being planned by, or for, Ford. For each such action, provide the following information:

- a. Action title or identifier;
- b. The actual or planned start date;
- c. The actual or expected end date;
- d. Brief summary of the subject and objective of the action;
- e. Engineering group(s)/supplier(s) responsible for designing and for conducting the action; and
- f. A brief summary of the findings and/or conclusions resulting from the action.

For each action identified, provide copies of all documents related to the action, regardless of whether the documents are in interim, draft, or final form. Organize the documents chronologically by action.

Answer

Ford is construing this request broadly and is providing not only studies, surveys, and investigations related to the alleged defect, but also notes, correspondence, and other communications that were located pursuant to a diligent search for the requested information. Ford is providing the responsive non-confidential Ford documentation in Appendix F.

To the extent that the information requested is available, it is included in the documents provided. If the agency should have questions concerning any of the documents, please advise.

In the interest of ensuring a timely and meaningful submission, Ford is not producing non-responsive materials or items containing little substantive information. Examples of the types of materials not being produced are meeting notices, raw data lists (such as part numbers or VINs) without any analytical content, duplicate copies, non-responsive elements of responsive materials, and draft electronic files for which later versions of the materials are being submitted. Through this method, Ford is seeking to provide the agency with substantive responsive materials in our possession in the timing set forth for our response. We believe our response meets this goal. Should the agency request additional materials, Ford will cooperate with the request.

Request 9

Describe all modifications or changes made by, or on behalf of, Ford in the design, material composition, manufacture, quality control, supply, or installation of the subject component, from the start of production to date, which relate to, or may relate to, the alleged defect in the subject vehicles. For each such modification or change, provide the following information:

- a. The date or approximate date on which the modification or change was incorporated into vehicle production;
- b. A detailed description of the modification or change;
- c. The reason(s) for the modification or change;
- d. The part number(s) (service and engineering) of the original component;
- e. The part number(s) (service and engineering) of the modified component;
- f. Whether the original unmodified component was withdrawn from production and/or sale, and if so, when;
- g. When the modified component was made available as a service component; and
- h. Whether the modified component can be interchanged with earlier production components.

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

For each component/assembly part number, provide the supplier's name, address, and appropriate point of contact (name, title, and telephone number).

Answer

A table of the requested changes is provided in Appendix G. The production front subframe was produced by Dana Holding Corporation. Dana Holding Corporation has sold this portion of their business to Metalsa Structural Products, Inc. Contact information for Metalsa Structural Products, Inc. is provided in response to Request 11.

Request 10

Provide the following information regarding the subject components:

- a. Provide top, side and front view diagrams of the subject components and the suspension including the wheels and tires;
- b. Describe all potential paths for water, road slurry and other foreign material entering the subject component and state where the water would collect (e.g., the low point of the assembly);
- c. Describe the corrosion protection system for the subject component (internal and external), including all minimum thickness specifications of anti-corrosion protection systems and drainage features designed in the subject component;
- d. Using a diagram or photograph of the subject component, identify the areas Ford believes are: (1) experiencing the most severe corrosion in vehicles where front sub-frame corrosion damage has been observed; and (2) most likely to fail in service from corrosion damage;
- e. State Ford's assessment of the effect on vehicle steering and controllability of (1) partial; and (2) complete detachment of a lower control arm from the subject mounting bracket and state the basis for Ford's assessment:

- f. Give Ford's assessment of the geographic distribution of failure risk based on failure rates and trend, field surveys or other data used by Ford to measure corrosion patterns in the United States in suspension components;
- g. Describe all requirements for salt-spray and other durability tests related to corrosion resistance; and
- h. Provide copies of all documents related to 10.a – 10.g.

Answer

- a. Drawings of the front subframe and the front suspension are contained in Confidential Appendix H. The drawings are being submitted under separate cover with a request for confidential treatment to the Office of Chief Counsel pursuant to 49 CFR Part 512.
- b. Water and road slurry can only enter the front subframe from the drain holes located on the bottom side (ground-facing) of the front subframe. The drain holes are located at the lowest part of the front subframe. Ford notes that the corrosion observed during vehicle inspections on the front subframe is on the outside of the member and does not appear to be originating from inside the front subframe.
- c. The front subframe is protected using an electrodepositing corrosion protection (e-coat) system. The minimum coating thickness for the interior of the front subframe is 0.0005" and for the exterior of the front subframe is 0.0008".

Eight drainage holes are provided on the bottom side of the front subframe. Two drainage holes on each side rail located approximately 100 mm and 350 mm forward of the center of the rear body mount, one drainage hole at the bottom of each front body mount bracket located approximately 225 mm rearward of the center of the front body mount, and two drainage holes in the rear crossmember. Photographs illustrating the locations of the drainage holes are provided in Appendix I.

- d. Based on vehicle inspections conducted during the course of this investigation where front subframe corrosion was observed, the two areas that were more likely to experience corrosion were the lower control arm bracket on the passenger side of the front subframe and the rear body mount on the passenger side of the front subframe. Photographs depicting corrosion of these two areas are provided in Appendix J. Ford refers the agency to the reports provided in Appendix C for any indication as to which areas are "most likely to fail in service from corrosion damage."
- e. Please see response to Request 12.
- f. Ford's review of the reports provided in response to this inquiry, indicate that the condition predominately occurs on vehicles located in the 20 "salt belt" states. Additional information is provided in response to Request 12.
- g. Ford has a laboratory based salt spray resistance requirement (FLTM BI 103-01) and a full vehicle durability requirement (CETP 00.00-R-311) for assessing corrosion resistance. Note: The full vehicle durability requirements in place during development of the 1999 through 2003 model year Windstar vehicles required completion of 60 cycles of testing without perforation of the parts and with the parts remaining functional. Consistent with Ford's continuous improvement objective, the requirements, as stated in CETP 00.00-R-311, specify completion of 100 cycles of testing. The types of tests contained in each cycle has not changed, only the number of cycles. The engineering

specification and test procedure contained in Confidential Appendix H and are being submitted under separate cover with a request for confidential treatment to the Office of Chief Counsel pursuant to 49 CFR Part 512.

h. All documents are provided in the appendices referenced above.

Request 11

State the number of subject components that Ford has sold that may be used in the subject vehicles by component name, part number (both service and engineering/production), model and model year of the vehicle in which it is used and month/year of the sale (including the cut-off date for sales, if applicable). Also, identify by make, model and model year, any other vehicles of which Ford is aware that contain the identical component, whether installed in production or in service, and state the applicable dates of production or service usage.

Answer

As the agency is aware, Ford service parts are sold in the U.S. to authorized Ford and Lincoln-Mercury dealers. Ford has no means to determine how many of the parts were actually installed on vehicles, the vehicle model or model year on which a particular part was installed, the reason for any given installation, or the purchaser's intended use of the components sold.

Ford is providing the total number of Ford service replacement front subframes by part number (both service and engineering) and month/year of sale, where available, production and service usage for each part number, and supplier point of contact information in Appendix K.

Request 12

Furnish Ford's assessment of the alleged defect in the subject vehicle, including:

- a. The causal or contributory factor(s);
- b. The failure mechanism(s);
- c. The failure mode(s);
- d. The risk to motor vehicle safety that it poses;
- e. The effect on vehicle control while driving at highway speeds (e.g. speeds \geq 55 mph) and while turning at speeds above and below 55 mph;
- f. What warnings, if any, the operator and the other persons both inside and outside the vehicle would have that the alleged defect was occurring or subject component was malfunctioning; and
- g. The reports included with this inquiry.

Answer

A thorough review of information and data collected in the preparation of this response reveals that over 98% of the reports of corrosion-related fracture or cracking of the front subframe pertain to vehicles either originally sold or currently registered in "salt belt" states, that the rate of reports even when adjusted for "salt belt" states is low, and that the majority of reports alleging separation of the lower control arm pertain to the passenger side of the front subframe.

A comprehensive search of Ford's databases identified 85 reports that allege corrosion-related fracture or cracking of the front subframe (reports categorized as "A" – see response to Request 2); all but one of these reports involved a vehicle either originally sold or currently registered in a "salt belt" state. Ford also located 52 reports that allege fracture or cracking of the front subframe without specific mention of corrosion (reports categorized as B1 + B2 + B3 – see response to Request 2), 50 of these involved a vehicle either originally sold in or currently registered in a "salt belt" state.

Further analysis of reports reinforces the relationship with "salt belt" states:

- Of the 43 reports that allege lower control arm separation from the front subframe (reports categorized as A1 + B1 – see response to Request 2), only one pertained to a vehicle that was sold and, seemingly, registered and operated in a "non-salt belt" state (Florida).
- When reviewing those reports where an alleged corrosion-related fracture of the front subframe has occurred at an unknown or other location (A2), all reports pertain to vehicles originally sold or currently registered in "salt belt" states.

When adjusted for the population of vehicles in "salt belt" states, the rate of reports alleging corrosion-related front subframe fracture (alleged defect, A1 + A2) is a low 0.11 R/1000, especially considering the time in service (up to 12 years) and the tens of billions of vehicle miles traveled in that time. Furthermore, the rate of reports specifically alleging corrosion-related separation of the lower control arm from the front subframe is even lower at 0.06 R/1000. Ford notes that the reports do not provide sufficient detail to determine if the lower control arm separated from the forward or rearward mounting locations; however, based on available photographs from reported separations and the design of the two mounting locations on the front subframe, Ford believes that the rearward mounting bracket is more likely to separate due to corrosion than the front mounting location.

Despite the age and mileage of these vehicles, the data indicate that front subframe corrosion has not presented an unreasonable safety risk on these vehicles. Only two allegations of accidents caused by front subframe fracture were located by Ford. One complainant reports separation of the passenger (right) side lower control arm from the front subframe that caused the vehicle to move left, striking a vehicle in the adjacent lane of a multi-lane highway and following the contact exited the roadway onto the right shoulder. The other incident has less detail, only indicating that the "engine cradle broke" and ultimately caused a crash. However, the report indicates that a police report was not filed because there were no injuries or other vehicles involved.

Ford has also reviewed the three VOQs where the "crash" box was checked and the remaining non-duplicative VOQs for any allegations of an accident or injury. Of the three VOQs with "crash flags" checked, none of these appear to actually involve accidents. One alleges "the vehicle c[a]me to a screeching halt", the second alleges "driving at a slow speed in a parking lot... could not steer the vehicle... was able to stop the van" and the third alleges loss of control without mention of contact with any vehicle or object. It appears that these complaints are considering the component separation to be a "crash." Ford did identify one VOQ where the "crash flag" was not checked, though the submitter stated the right lower control arm separated, sending the vehicle off the road and contacting a highway sign. No contact was received by Ford regarding this allegation; however, it appears that the vehicle was totaled by an insurance company near to the time of the alleged accident.

As previously noted, analysis of the reports provided in this response has found that reports alleging separation of the lower control arm pertain predominantly to the passenger side of the front subframe. Both Ford reports and VOQs were reviewed to aid with the assessment, as frequently a VOQ may contain different information than the report received by Ford. Of the 50 reports identified, 35 indicate the alleged separation occurred on the passenger side of the front subframe. The remaining 15 reports do not indicate on which side the separation allegedly occurred. None of the reports allege that separation of the lower control arm occurred on the driver side of the front subframe. Ford believes this may be related to the location of air conditioning lines and possibly the air conditioning drain tube. The air conditioning lines run above the front subframe on the passenger side of the vehicle and condensation has been observed dripping onto the front subframe in the area of the lower control arm bracket. The air conditioning drain tube is also located on the passenger side near the rear of the front subframe. This increases the exposure of the passenger side front subframe to moisture, which could exacerbate any existing corrosion in the area.

The definition of the alleged defect does not confine the analysis to the lower control arm rear bracket area of the front subframe; it includes any corrosion-related failures of the front subframe. Ford has analyzed the reports that allege fracture of the front subframe at other or unknown locations with or without corrosion to understand if any other location on the front subframe is experiencing report rates similar to the lower control arm bracket area of the front subframe. Ford has identified some reports alleging fracture of the front subframe in the area of the rear body mount. Some of these reports indicate that a driver noticed noise, such as a clunk, and brought the vehicle in for inspection and a broken front subframe near the rear body mount was determined to be the cause of the noise. The remaining reports include a wide variety of areas and attachment locations without an observable pattern.

This inquiry specifically requested Ford's analysis of vehicle controllability at various speeds and during certain vehicle maneuvers, such as turning. Based upon our review of the reports, the passenger side of a vehicle was equipped with a removable pin that replaced the bolt that normally connects the lower control arm to the rear lower control arm bracket to simulate the reports of lower control arm separation from the front subframe when the pin was pulled. Ford believes that this condition, separation of the lower control arm from the front subframe, represents the most likely scenario where a driver might characterize the vehicle as not being controllable. Tests were initially conducted in a straight line at speeds up to 60 mph without significant brake application. These tests showed an initial movement to the right of approximately four feet from the original lane of travel. Next, additional tests were conducted while navigating a turn: 35 mph with a 300' radius left turn, 45 mph with a 340' radius left turn, 55 mph in a left curve, and 55 mph in a right curve. Ford conducted evaluations in a left turn because this places the passenger side wheel on the outside of the turn. In each of these tests, the vehicle moved to the right or outside of the turn. A right turn test at 55 mph showed that the vehicle maintained its line of travel.

Additional straight line tests were conducted at 35 mph and 60 mph with moderate brake application. This set of tests found that brake application improved vehicle controllability by reducing the amount of toe out. Normally, the lower control arm transfers lateral load from the wheel and tire assembly to the vehicle structure and also helps control toe. When the lower control arm separates from the front subframe lateral load is not transferred and the toe is changed. In tests without moderate brake application, the vehicle exhibits a toe out condition; in tests with moderate brake application the wheel initially toes out, but the toe returns to nearly its original location during moderate brake application, improving vehicle controllability. Ford believes that such brake application and consequent effect on vehicle controllability may

account for reports of alleged lower control arm separation from the front subframe without a corresponding complaint of a loss of vehicle control.

Ford has completed evaluations of the effect on vehicle control when the front subframe fractures in the area of the rear body mount. Static evaluations show that when the passenger side rear body mount is removed, the front subframe drops an inch or two, without any affect on steering effort. Removal of the driver side rear body mount does not result in the front subframe dropping or in any effect on steering effort. Low speed driving and parking lot maneuvers have demonstrated that the vehicle remains completely controllable. The only observable difference in vehicle performance is that a slight left pull occurs under moderate to hard acceleration with the passenger side mount removed. A minor steering input easily corrects for the left pull. Ford's evaluation of vehicle control following a fracture of the front subframe in the area of the rear body mount concludes that the vehicle remains completely controllable.

Overall, for reports on vehicles originally sold or currently registered in "salt belt" states that meet the definition of the alleged defect, the rate is very low at 0.11 R/1000. When considering reports that specifically allege lower control arm separation from the front subframe the rate is even lower at 0.06 R/1000. Vehicle testing simulating a separation of the rear attachment of the lower control arm from the front subframe has shown that with moderate brake application the vehicle can be steered and safely stopped. Vehicle testing simulating a fracture of the front subframe in the area of the rear body mount has shown that the vehicle remains completely controllable. Years of real world data, including only two accident allegations pertaining to the lower control arm and only one accident allegation pertaining to the engine cradle, in combination with the very low rate of reports demonstrate that corrosion-related fracture of the front subframe does not pose an unreasonable risk to safety.

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