

Ford Motor Company

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OFFICE OF
DEFECTS INVESTIGATION

James P. Vondale, Director
Automotive Safety Office
Environmental & Safety Engineering

April 26, 2004

Ms. Kathleen C. DeMeter, Director
Office of Defects Investigation Safety Assurance
National Highway Traffic Safety Administration
400 Seventh Street, S.W.
Washington, DC 20590

Dear Ms. DeMeter:

Subject: PE04-020:NVS-212mbs

The Ford Motor Company (Ford) response to the agency's March 14, 2004 letter requesting certain information regarding the headlamp system in 1999 and 2000 model year Mercury Villager vehicles is attached.

The Mercury Villager was part of a joint program with Nissan Motor Company under which Nissan was responsible for designing the vehicles and Ford was responsible for manufacturing the vehicles. The corresponding Nissan vehicle was the Quest, and the two vehicles shared many common components and sub-assemblies. The Mercury Villager and Nissan Quest were produced at Ford's Ohio Assembly Plant (OHAP).

The headlamps for both vehicles were sub-assembled by Visteon. The headlamp sub-assemblies received at the OHAP included all of the components contained in the headlamp, ready to be assembled into a vehicle, including lenses, adjustment/aiming mechanisms, reflectors, and an industry standard -8007- combination high/low beam light bulb. The subject components were a combination headlamp, side marker/turn signal design.

During the fourth quarter of calendar year 1999 Ford identified a higher than expected number of claims for Villager headlamps. Further investigation by Ford and Nissan found certain failure modes on the 1999 and 2000 model year Villager and Quest vehicles that included a flickering or intermittently operating headlamp bulb, or a non-operational headlamp bulb that operated when the wire harness/connector was moved. It was also discovered that the failures typically accompanied a thermally deformed or damaged socket or electrical connector. A thorough investigation which included participants from Ford, Nissan, Visteon, Philips Lighting (bulb supplier), and Yazaki (wiring harness supplier) was conducted. Bench testing which, prior to this event, was not part of the industry standard development testing, showed that the stainless steel to tin coated brass interface does not initially exhibit any concerns. However, over time, a combination of certain factors (i.e., the oxide layer which develops on stainless steel; the effects of cycling the headlamps off and on; high beam to low beam cycling; operating temperatures, resulting from ambient temperature,



beam usage, vehicle speed; and micro-motion between the connector and terminals due to vehicle motion) may result in elevated contact resistance and higher than normal operating temperatures at the connection. Bench testing conducted as part of the investigation showed that the stainless steel bulb terminals could, over time, cause temperatures that exceed the design criteria of the plastic electrical connector housing material. If this condition does occur, the eventual result is typically permanent deformation of the connector terminals such that they lose electrical contact with the bulb's electrical contacts, culminating in an open or intermittent circuit. In a few cases the condition has reportedly resulted in a short circuit which opened the circuit's fuse. In all but one instance that Ford is aware of, any resulting damage is limited to the headlamp wiring connector. In one case (VIN 4MXZU11T0YD [REDACTED]) it is alleged that the thermal damage also included the headlamp assembly (lenses, reflectors) and some surrounding hood, grille and fender material. The damage in that single incident was melting, was contained locally to the immediate headlamp area, and did not result in a fire. It is noted that the owner of that vehicle had purchased it as a "used vehicle" and its history and the details surrounding the events leading up to that single event are unknown. As no other reports allege similar damage, and the history and condition of the vehicle are unknown, it cannot be concluded that a defect in the vehicle as sold by Ford caused this occurrence.

As a result of the conclusions reached during the aforementioned investigation, Philips Lighting specified tin coated brass for the bulb connectors for future production. Additionally, Ford contacted the USCAR alliance and the specification relating to the headlamp bulbs of the design under discussion (SAE/USCAR -14, item 7.6) now specifies that "all bulb terminals must be tin-plated, copper alloy....".

When the root cause of the issue was identified, Ford issued an Internal Service Message (ISM), and later a Special Service Message (SSM) to alert dealers and provide specific instruction on inspection and repair for an intermittent, flickering, or non-operational headlamp which exhibited the connector thermal deformation associated with these Philips Lighting bulbs. The ISM and SSM contained date code information for the bulbs to identify those with stainless steel terminals, and provided for a special service electrical connector to repair the wiring harness.

The issue was reviewed by Ford's Critical Concern Review Group and it was concluded that this issue did not affect safe vehicle operation, because it did not present a fire hazard, resulted in flickering or intermittent bulb operation prior to becoming non-operational, and affected the headlamps independently such that the possibility of both headlamps failing simultaneously and immediately was not likely.

Ford is aware of customers who have experienced repeat repairs on the same headlamp, and believes, based on some limited information, that those repeat repairs are due to incorrect or incomplete repairs by dealer technicians not fully following the service messages. Ford is also aware of customers who state that both headlamps were inoperative at the time of the repair, however, many cases indicate that one headlamp was already inoperative, but not yet repaired, when the second headlamp failed some time later. Of the responsive reports, Ford is aware of only four that specifically allege that both headlamps failed simultaneously. However, there is no technical analysis that would account for the four alleged simultaneous outages. There are no allegations of accidents or injury as a result of inoperative headlamps on these vehicles which have been in service for an average of 54 months.

As the agency is aware, headlamp bulbs are not designed or expected to last the life of a vehicle, and there are many factors that determine the actual service life of a headlamp bulb.

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Further, although Ford is not knowledgeable of all of the headlamp bulb replacement parts that are available to customers via aftermarket sources, Ford is aware that non-DOT or non-USCAR approved bulbs are available from some sources which are of higher wattage than approved bulbs, or may use materials other than those specified by the industry, and can result in a similar failure mode. When bulbs are purchased by vehicle owners, especially when replacing bulbs outside the normal warranty period, Ford cannot be aware of, nor held responsible for, product failures that may result. Ford has issued an SSM to its dealers to alert them to the existence of this potential condition.

The cause of the issue was identified and corrective actions were taken in vehicle production. Proper identification and repair processes were put into place. Adequate safeguards were put into design standards to prevent recurrence. While this issue may be a source of customer dissatisfaction, it does not present an unreasonable risk to safe vehicle operation, as evidenced by real world performance in which the subject of the investigation by the agency is not alleged to have caused any accidents.

If you have any questions, please call me.

Sincerely,



James P. Vondale

Attachment

FORD MOTOR COMPANY (FORD) RESPONSE TO PE04-020

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 Engineering Analysis.

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, as more fully described in this response. 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.

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 March 14, 2004, the date of your inquiry. Ford has searched business units and/or affiliates within the following offices for responsive documents: Environmental and Safety Engineering, Ford Customer Service Division (FCSD), Quality, Research, Global Core Engineering, Electrical and Electronics Systems Engineering, Office of the General Counsel, Vehicle Operations, and Ford Car Product Development.

Request 1

State, by model and model year, 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 2000, or a compatible format, entitled "PRODUCTION DATA." See Enclosure 1, Data Collection Disc, for a pre-formatted table that provides further details regarding this submission.

Answer

Ford records indicate that the approximate total number of 1999 and 2000 model year Mercury Villagers equipped with the subject headlamps sold in the United States (the 50 states and the District of Columbia) and its protectorates and territories (American Samoa, Guam, Northern Mariana Islands, Puerto Rico and Virgin Islands) is 82,733.

1999 MY	2000 MY
51,247	31,486

The requested data for each subject vehicle is provided electronically in Appendix A [file: 2004-04-26 Appendix A - Villager Production Data] on the enclosed CD.

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 fire, 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; and
- 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 "f" and "g," 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 the purpose of identifying reports of incidents potentially involving the alleged defect and any related documents, Ford has gathered "owner reports" and "field reports" maintained by FCSD, Intensified Customer Concern Definition (ICCD) data maintained by Ford's Quality Office, fleet reports maintained in a Fleet Test Database, and claim and lawsuit information maintained by Ford's Office of the General Counsel (OGC).

Descriptions of the FCSD owner and field report systems, the ICCD and the Fleet Test Database systems, and the criteria used to search each of these, are provided electronically in Appendix B (filename: 2004-04-26 Appendix B - Searches) on the enclosed CD.

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

- Category A: Appear to allege headlamps failing to operate correctly with the finding of an over heated, melted, or otherwise thermally damaged socket or electrical connector.
- Category B: Allegations that are ambiguous as to whether they pertain to the alleged defect. *

*We are providing electronic copies of these reports 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.

We note that in a preliminary review of owner and field reports, some reports were initially determined to be ambiguous (Category B), because it could not be determined from the text of the report if the allegation related to a thermally damaged socket or electrical connector. A subsequent review of warranty repair records, where available, for the corresponding vehicle, was conducted to determine which parts had been affected and the categorization was revised as appropriate. We have not re-categorized as ambiguous or non-responsive those reports that on their face allege loss of headlamp operation due to thermally damaged electrical connectors, even if other documents indicate they are not.

Owner Reports: The search and review of the Ford Master Owner Relations Systems (MORS) database records, as described in Appendix B, identified 31 non-duplicative reports that appear to relate to the alleged defect. Copies of these owner reports are provided in the MORS III portion of the electronic database contained in Appendix C (filename: 2004-04-26 Appendix C - Vilager Request Number Two Data) on the enclosed CD. These reports are identified by an "A" in the "Category" field. Where 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 other cases, certain vehicles may have experienced more than one incident and may have more than one report associated with their VINs, any such reports have been counted separately.

Ford is also providing non-duplicative owner reports that are ambiguous as to whether they meet the alleged defect criteria in Appendix C 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. These reports are identified by a "B" in the Category field.

Legal Contacts: Ford is providing in Appendix B a description of Ford's Litigation Prevention activity and contacts that may be categorized by that activity as "Legal Contacts." To the extent that responsive (i.e., not ambiguous) owner reports reflect that they are Legal Contacts, Ford has gathered the related files from the Litigation Prevention section. Based on this search, no files corresponding to category "A" owner reports were located

ICCD Information: A search of the ICCD database as described in Appendix B located no responsive reports. Five reports that are ambiguous as to whether they relate to the alleged defect are provided in Appendix J.

Fleet Reports: In addition to fleet reports that may be contained in the owner reports or field reports identified in this response, Ford conducted a search of its Fleet Test Database as described in Appendix B for reports that may relate to the alleged defect in the subject vehicles. This search did not identify any such fleet reports.

Field Reports: The search and review of the Ford Common Quality Indicator System (CQIS) database records, as described in Appendix B, identified 107 non-duplicative reports that appear to relate to the alleged defect. Copies of these field reports are provided in the CQIS portion of the electronic database contained in Appendix C on the enclosed CD. These reports are identified by an "A" in the "Category" field. Where we were able to identify that responsive (i.e., not ambiguous) duplicate field reports for an alleged incident were received, each of these duplicate reports was marked accordingly, and the group counted as one report. In other cases, certain vehicles may have experienced more than one incident and may have more than one report associated with their VIN; any such reports have been counted separately. In addition, two field reports that appear to be duplicative of Owner's Reports are provided in Appendix C, and the count of these reports is not reflected in the count above.

Ford is also providing ambiguous field reports electronically in Appendix C as "non-specific allegations" for your review because of the broad scope of the request. These reports are identified by a "B" in the Category field.

Unified Database: The Unified Database (UDB) was created to facilitate parts availability by tracking part sales and is not intended as a problem reporting system. However, because a small percentage of the records may contain verbatim comments that could potentially relate to the agency's inquiry, we are including these in response to Request 2.

A search of UDB, as described in Appendix B, identified two non-duplicative records that appear to relate to the alleged defect. Copies of these reports are provided in the UDB portion of Appendix C on the enclosed CD. These reports are identified by an "A" in the "Category" field.

VOQ Data: This information request had an attachment that included six Vehicle Owner's Questionnaires (VOQs) related to the Mercury Villager. Ford made inquiries of its MORS database for customer contacts, its CQIS database for field reports, and its Analytical Warranty System (AWS) database for warranty claims regarding the vehicles identified on these VOQs. Reports on four of the vehicles identified in VOQs were located. They are included in Appendix C and have been identified with a "Y" in the "VOQ Dup" field. One VOQ identified by the agency, reference number 10044974, contains insufficient information to reliably identify the alleged event in Ford's databases (i.e., there is no VIN, date of alleged event, name, location, etc.). The final VOQ provided (VIN 4M2XV11T8XD [REDACTED]) while expressing several issues with the vehicle, including an issue with the headlamp sockets, has no record in the aforementioned databases related to headlamps. While there are warranty records for some of the other issues mentioned in the VOQ, there are none related to any headlamp issue.

Reports of Crash/Injury/Fatality: For purposes of identifying alleged accidents or injuries potentially related to the alleged defect, Ford has reviewed responsive (i.e., not ambiguous) owner and field reports, UDB reports, lawsuits and claims, and warranty claims. Based on a

reasonable and diligent search, Ford located no reports that contain allegations of accidents or injuries related to the alleged defect. Ford is aware of one Owner Report related to VIN 4M2XV14T6YD [REDACTED] where the owner states "his wife almost got into an accident when she hit a sign because the headlamp went out." Ford does not consider this event to represent a "crash" or an accident. Further we believe the likelihood of an operator striking an object due to a single headlamp failure is unlikely.

Claims, Lawsuits, and Arbitrations: For purposes of identifying incidents potentially related 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.

Based on a reasonable and diligent search, Ford located one claim that appears to relate to the alleged defect in the subject vehicles. Ford also located two lawsuits that appear to be duplicative of owner or field reports included in Appendix C.

In addition to a log of these three items, Ford is providing copies of all non-privileged documents associated with these lawsuits and claims in hardcopy form in Appendix G. With regard to these lawsuits and 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), address, and telephone number;
- d. Vehicle's VIN;
- e. Vehicle's make, model and model year;
- f. Vehicle's mileage at time of incident;
- g. Incident date;
- h. Report or claim date;
- i. Whether a fire is alleged;
- j. Whether property damage is alleged;
- k. Number of alleged injuries, if any; and
- l. Number of alleged fatalities, if any.

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

Answer

The requested information, to the extent that it is available, is provided in Appendices C, I, I2 [filename 2004-26-04_Appendix_I2], J and J2 [filename 2004-26-04_Appendix_J2] as discussed in response to Request 2.

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

The requested information, to the extent that it is available, is provided in Appendices C, I, J2, J and J2 as discussed in response to Request 2.

Request 5

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

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

Answer

In responding to this information request, Ford electronically searched its Analytical Warranty System (AWS) for all claims meeting the criteria described in Appendix B. The resulting claims were then reviewed individually for allegations that may relate to the alleged defect. This search and review of the Ford AWS database records identified 1,806 non-duplicative warranty reports that appear to relate to the alleged defect in the subject vehicles. Electronic copies of these claims are provided in the AWS portion of the electronic database contained in Appendix C and are identified by an "A" in the "Category" field. When we were able to identify that duplicate claims for an alleged incident were received, each of these duplicate claims was marked accordingly and the group counted as one report. In other cases, certain vehicles may have experienced more than one incident and may have more than one claim associated with their VIN. These claims have been counted separately. In addition, 21 warranty claims that appear

to be duplicative of 20 Field Reports and one Owner Report were identified and are provided in Appendix C; the count of these reports is not reflected in the count above.

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

Ford is also providing ambiguous claims electronically in Appendix C as "non-specific allegations" for your review because of the broad scope of the request. These reports are identified by a "B" in the Category field.

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

The search criteria used by Ford to identify responsive claims is described in the AWS section of Appendix B. The requested customer concern codes and the warranty condition codes are also provided in Appendix B.

No special warranty extensions have been issued on the subject components. Headlamp bulbs and mating electrical connectors for the subject vehicles are covered under the standard, new vehicle, three year or thirty-six thousand mile "bumper to bumper" warranty. The wiring harness and electrical connector to the headlamp bulb could be covered by optional extended warranty plans that would not cover the bulbs. Descriptions of the optional coverage plans and numbers of vehicles involved is provided in Appendix F.

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 the alleged defect in the subject vehicles, 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 the 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 response.

A description of Ford's OASIS messages, Internal Service Messages, and the Field Review Committee files and the search criteria used is provided in Appendix B. One ISM and one SSM were identified that may relate to the alleged defect. The ISM is provided electronically in Appendix J2, and the SSM is provided in hardcopy in Appendix J. Additionally, one TSB was located. While not directly related to the alleged defect, the TSB does relate to repair of electrical components and wiring harnesses and is referenced in the ISM and SSM. Ford is providing a copy of the TSB in Appendix J for reference.

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 has developed processes for identifying, investigating, and assessing potential safety or quality concerns in our products. In responding to this request, Ford has conducted a reasonably diligent search of those organizations that normally would be involved in our safety or quality investigation processes related to the alleged defect. Reports of Villager headlamp outages were investigated through Ford's Critical Concern Review Group [CCRG] process. Ford is producing documents related to the CCRG investigation and assessment of this condition in response to this request. Documents reflecting the CCRG activities for which Ford is requesting confidential treatment on the grounds that such items contain commercially sensitive business information and/or trade secrets are being submitted under separate cover to the agency's Office of Chief Counsel as hard copy in Appendix I and additional documents are provided electronically in Appendix I2. No other such actions are being conducted or planned to be conducted at this time.

Further, Ford is voluntarily submitting additional documents that while not directly related to Ford's CCRG investigation process may assist in the agency's analysis of this matter. Documents reflecting such activities that are not customarily disclosed outside of Ford are being submitted under separate cover with a request for confidentiality to the agency's Office of Chief Counsel as hard copies in Appendix J and additional documents electronically in Appendix J2

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 components, 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 numbers (service and engineering) of the original component;
- e. The part number (service and engineering) of the modified component;
- f. Whether the original unmodified component was withdrawn from production and/or sale, and if so, when;
- g. When the modified component was made available as a service component; and
- h. Whether the modified component can be interchanged with earlier production components.

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

Answer

Due to the nature of the responsibility between Ford and Nissan for design and production of the subject vehicles, please refer to Nissan's response to this information request. There were no changes in the vehicle assembly process that relate to the subject of the agency's investigation. Other than the May 24, 1999 bulb terminal material change, described more fully in our response to Request 12, Ford is not aware of any other modifications or changes that may relate to the alleged defect.

Request 10

List all Ford models that have the same or similar headlamp designs as the subject vehicle.

Answer

Ford is construing this request to mean other Ford models that use the same capsule type, dual element (high and low beams) headlamp bulb, commonly referred to as an industry standard [9007] bulb and mating electrical connector. The requested information is provided in Appendix K. It should be noted that while vehicles share the common bulb design, there are several manufacturers of the bulb, and hence a given vehicle line may have bulbs from different suppliers installed throughout the time of vehicle production. Also, please note that no other Ford vehicles share the complete Villager headlamp assembly.

Request 11

Produce each of the following:

- a. Parts schematics of the headlamp assembly for each design version of the subject component;
- b. A diagram of the headlamp assembly showing how the system works.

Answer

Due to the nature of the separation of responsibility between Ford and Nissan for the subject vehicles, please refer to Nissan's response to this information request.

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. 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
- f. The reports included with this inquiry.

Answer

Ford and Nissan shared common design and component sources for the subject vehicles. The headlamps for the subject vehicles were sub-assembled by a tier one supplier (Visteon) who provided the complete headlamp assembly, including the headlamp bulb, to Ford's Ohio Assembly Plant (OHAP). During the 1999 model year a shortage of the automotive industry standard [9007] (dual filament, capsule type) headlamp bulbs developed, and additional sources were located and approved by Ford from which the tier one supplier could procure bulbs. Philips Lighting, one of the new sources made available, used stainless steel material for the bulb's electrical terminals. Previous suppliers to Ford typically used tin-coated brass for the bulb's electrical terminals, as is used in the mating connector terminal in the wiring harness.

The Philips bulbs were tested, prior to approval as a source, in accordance with the DOT, USCAR and SAE standards in existence at that time. The bulbs passed the appropriate standards; however, the standards did not evaluate the long-term effects of the stainless steel to tin-coated brass interface.

During the fourth quarter of calendar year 1999 Ford identified a higher than expected number of claims for Villager headlamps. Further investigation by Ford and Nissan found certain failure modes on the 1999 and 2000 model year Villager and Quest vehicles that included a flickering or intermittently operating headlamp bulb, or a non-operational headlamp bulb that operated when the wire harness/connector was moved. It was also discovered that the failures typically accompanied a thermally deformed or

damaged socket or electrical connector. A thorough investigation which included participants from Ford, Nissan, Visteon, Philips Lighting (bulb supplier), and Yazaki (wiring harness supplier) was conducted. Bench testing which, prior to this event, was not part of the industry standard development testing, showed that the stainless steel to tin coated brass interface does not initially exhibit any concerns. However, over time, a combination of certain factors (i.e., the oxide layer which develops on stainless steel; the effects of cycling the headlamps off and on; high beam to low beam cycling; operating temperatures, resulting from ambient temperature, beam usage, vehicle speed; and micro-motion between the connector and terminals due to vehicle motion) may result in elevated contact resistance and higher than normal operating temperatures at the connection. Bench testing conducted as part of the investigation showed that the stainless steel bulb terminals could, over time, cause temperatures that exceed the design criteria of the plastic electrical connector housing material. If this condition does occur, the eventual result is typically permanent deformation of the connector terminals such that they lose electrical contact with the bulb's electrical contacts, culminating in an open or intermittent circuit. In a few cases the condition has reportedly resulted in a short circuit which opened the circuit's fuse. In all but one instance that Ford is aware of, any resulting damage is limited to the headlamp wiring connector. In one case (VIN 4MXZU11T0YD [REDACTED]) it is alleged that the thermal damage also included the headlamp assembly (lenses, reflectors) and some surrounding hood, grille and fender material. The damage in that single incident was melting, was contained locally to the immediate headlamp area, and did not result in a fire. It is noted that the owner of that vehicle had purchased it as a "used vehicle" and its history and the details surrounding the events leading up to that single event are unknown. As no other reports allege similar damage, and the history and condition of the vehicle are unknown, it cannot be concluded that a defect in the vehicle as sold by Ford caused this occurrence.

As a result of the conclusions reached during the aforementioned investigation, Philips Lighting specified tin coated brass for the bulb connectors for future production. Additionally, Ford contacted the USCAR alliance and the specification relating to this type of headlamp bulb (SAE/USCAR -14, item 7.6) now specifies that "all bulb terminals must be tin-plated, copper alloy....".

When the root cause of the issue was identified, Ford issued an Internal Service Message (ISM), and later a Special Service Message (SSM) to alert dealers and provide specific instruction on inspection and repair for an intermittent, flickering, or non-operational headlamp which exhibited the connector thermal deformation conditions associated with the Philips Lighting bulbs. The ISM contained date code information for the bulbs to identify those with stainless steel terminals, and provided an electrical connector to repair the wiring harness.

The issue was reviewed by Ford's Critical Concern Review Group and it was concluded that this issue did not affect safe vehicle operation since it did not present a fire hazard, resulted in flickering or intermittent bulb operation prior to becoming non-operational, and affected the headlamps independently such that the possibility of both headlamps failing simultaneously and immediately was not likely, even in the rare event that a headlamp fuse opened.

Ford is aware of customers who have had repeat repairs on the same headlamp, and believes, based on some limited information, that those repeat repairs are due to incorrect or incomplete repairs by dealer technicians not following the service messages completely. Ford is also aware of customers who state that both headlamps were inoperative at the time of the repair, however, many cases indicate that one headlamp was already inoperative, but not yet repaired, when the second headlamp failed some time later. Of the responsive reports, Ford is aware of only four that specifically allege that both headlamps failed simultaneously. However, there is no technical analysis that would account for the four alleged simultaneous outages. There are no allegations of accidents or injury as a result of inoperative headlamps on these vehicles which have been in service for an average of 54 months.

As the agency is aware, headlamp bulbs are not designed or expected to last the life of a vehicle, and there are many factors that determine the actual service life of a headlamp bulb. Further, although Ford is not knowledgeable of all of the headlamp bulb replacement parts that are available to customers via aftermarket sources, Ford is aware that non-DOT or non-USCAR approved bulbs available from some sources, which are of higher wattage than approved bulbs, or may use materials other than those specified by the industry, and can result in a similar failure mode. When bulbs are purchased by vehicle owners, especially when replacing bulbs outside the normal warranty period, Ford cannot be aware of, nor held responsible for, product failures that may result. Ford has issued an SSM to its dealers to alert them to the existence of this potential condition.

The cause of the issue was identified and corrected in vehicle production. Proper identification and repair processes were put into place. Adequate safeguards were put into design standards to prevent recurrence. While this issue may be a source of customer dissatisfaction, it does not present an unreasonable risk to safe vehicle operation, as evidenced by real world performance in which the subject of the investigation by the agency is not alleged to have caused any accidents.

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