

Ford Motor Company

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

March 18, 2003

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

Dear Ms. DeMeter:

Subject: RQ03-002:NVS213dcl

Attached is the Ford Motor Company (Ford) response to the agency's February 5, 2003 letter concerning reports of alleged front lower control arm ball joint separations in 1995-1997 Ford Crown Victoria, Mercury Grand Marquis, and Lincoln Town Car vehicles.

As the agency is aware, Ford conducted Safety Recall 98S37 on certain 1990-1999 Crown Victoria, Grand Marquis, and Town Car vehicles equipped with police, fleet and limousine packages in December 1998. Ford conducted the recall based on the data available at the time, which indicated that the front lower control arm ball joint separations were occurring only in severe duty cycle vehicles very early in the service life of those vehicles. The average time in service for vehicles (or the components in the case of earlier model years serviced with the recalled components) was only slightly more than two years as compared to the subject vehicles, which have been in service for an average of approximately seven and one half years. It was believed that if left uncorrected, virtually all of the vehicles included in the recall would incur premature wear out of the ball joint and possible separation. Engineering analysis found that the ball joints with one-piece bearing assemblies incorporated in production in March 1996 had less capability in axial loading than the earlier ball joints with two-piece bearing assemblies and were not adequately performing at higher vehicle weights or in severe duty. Therefore, the recall included certain Crown Victoria, Grand Marquis and Town Car vehicles equipped with police, fleet and limousine packages (>6000 lbs GVW) manufactured or possibly serviced with ball joints with one-piece bearing assemblies. The recall remedy was replacement of ball joints with one-piece bearing assemblies with ball joints with two-piece bearing assemblies. The vehicles that are the subject of this RQ include base Crown Victoria, Grand Marquis and Town Car vehicles (5750 lbs GVW) that were not part of the recall.

Ford believes that separation of a ball joint as a result of a one-piece bearing assembly failure is preceded by substantial looseness. Drivers of subject vehicles with looseness in the ball joint due to this condition should hear unusual noise in the front end and feel



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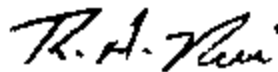
looseness in the steering. Ford also believes that these symptoms would persist for some length of time giving warning to the driver that front-end service is required.

Ford sold over 950,000 1995-1997 model year Crown Victoria, Grand Marquis, and Town Car vehicles. From this population, approximately 160,000 police and commercial fleet vehicles were recalled under recall 98S37. When Ford announced the recall in December 1998, most of those vehicles had only slightly more than two years of service. Ford had 45 confirmed reports of ball joint separation at that time. Based on these reports, the R/1000/year in service was about 0.11. During the course of this investigation, Ford has identified 489 owner, field and warranty reports and NHTSA has 33 VOQs that may relate to the alleged defect in the subject vehicles. The subject vehicles have now been in service for approximately seven and one half years. Assuming the very unlikely case that all of these 522 unconfirmed reports on the subject vehicles are related to the alleged defect, the R/1000/year in service is about 0.088. (Ford did not include UDB reports in this rate comparison as this database has only recently been established and provides some records that were not previously available. As such, a comparison of incident rates that were used as a basis for the recalled vehicles cannot appropriately include UDB data.)

Based on a reasonable and diligent search, Ford did not locate any owner or field reports, lawsuits or warranty claims alleging an accident or injury that may be related to the alleged defect. Note that Ford identified four owner reports (vehicles 2FALP74W6SX117933, 2FALP74W0SX127471, 2FALP71W3SX175647 and 2MELM75W4VX633650) that mention an "accident" but a review of comments suggests that they are referring to front-end vehicle damage likely sustained due to alleged ball joint failure and not due to a collision with another vehicle or resulting in other property damage. Ford believes that the extremely low report rate and lack of any reports alleging a collision or injury on vehicles that have been in service for over seven years, combined with the expected indication of the need for service resulting from front-end noise or looseness in the steering, indicate there is no pattern of defect related to ball joint separation in the subject vehicles that would 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 RQ03-002

Ford's response to this Recall Query 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 every effort to provide thorough and accurate information, and we would be pleased to meet with agency personnel to discuss any aspect of this information request.

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 February 5, 2003, 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, Marketing and Sales Operations, Purchasing, Quality, Research, Global Core Engineering, Office of the General Counsel, Vehicle Operations, North American Car Product Development and Lincoln Mercury 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 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 approximately 880,857 subject vehicles were sold in the United States (the 50 states and the District of Columbia) and its protectorates and territories (American Samoa, Guam, Marshall Islands, Micronesia, Northern Mariana Islands, Palau, Puerto Rico, US Minor Outlying Islands, and Virgin Islands). A table that contains the total number of subject vehicles in the requested format is provided in Appendix A (file: 2003-03-18_Appendix_A) on the enclosed CD.

Request 2

State the number of each of the following, received by Ford, or of which Ford is 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 as presented by both sides. 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 potentially involving the alleged defect and any related documents, Ford has gathered "owner reports" and "field reports" maintained by Ford Customer Service Division (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 (file: 2003-03-18_Appendix_B) on the enclosed CD.

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

Category Allegation

A1	SEPARATION with allegation of loss of control
A2	SEPARATION with no allegation of loss of control
A3	Ball joint broke/crack etc. No alleged separation
B1	Separation due to loose/missing nut or stripped threads. ¹
C1	Ambiguous Suspension/Steering concern with allegation of loss of control ²
C2	Ambiguous Suspension/Steering concern (e.g. noise/looseness) without allegation of loss of control ²

¹ Ford is providing these reports due to allegations of separations, however notes that they are not related to the subject recall issue.

² 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.

Owner Reports: The search and review of the Ford Master Owner Relations Systems (MORS) database records, as described in Appendix B, identified the following number of owner reports, excluding duplicates, in accordance with the categories described above:

Category	A1	A2	A3	B1
Reports	8	70	39	1

Copies of these owner reports are provided in the MORS II and MORS III portions of the electronic database contained in Appendix C (file: 2003-03-18_Appendix_C) on the enclosed CD. 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 is marked accordingly, and the group is counted as one report. In other cases, certain vehicles may have experienced more than one incident and have more than one report associated with their VINs. These reports have been counted separately.

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. No fleet reports were identified.

Field Reports: The search and review of the Ford Common Quality Indicator System (CQIS) and Unified Database (UDB) records, as described in Appendix B, identified the following number of field reports, excluding duplicates, in accordance with the categories described above:

CQIS

Category	A1	A2	A3	B1
Reports	1	11	3	5

Copies of these field reports are provided in the CQIS portion of the electronic 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 is marked accordingly, and the group is counted as one report. In other cases, certain vehicles may have experienced more than one incident and have more than one report associated with their VINs. These reports have been counted separately.

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, was conducted. Copies of potentially relevant reports and ambiguous reports are provided in the UDB portion of the electronic database contained in Appendix C on the enclosed CD.

UDB

Category	A1	A2	A3	B1
Reports	0	185	288	1

The categorization of each report is identified in the "Category" field. When we were able to identify that responsive (i.e., not ambiguous) duplicate UDB reports for an alleged incident were received, each of these duplicate reports is marked accordingly, and the group is counted as one report. In other cases, certain vehicles may have experienced more than one incident and have more than one report associated with their VINs. These reports have been counted separately.

Note that this database has only recently been established and provides some records that were not previously available. As such, a comparison of incident rates that were used as a basis for the recalled vehicles cannot appropriately include UDB data.

VOQ Data: This information request had an attachment that included 33 Vehicle Owner's Questionnaires (VOQs). Ford made inquiries of its MORS database for customer contacts, and its CQIS database for field reports regarding the vehicles reflected on 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. Any reports located on a vehicle identified in the VOQs related to the alleged defect are included in the MORS, CQIS and UDB portions of the electronic database provided in Appendix C and have been identified by a "Y" in the "VOQ Dup" field. Ford notes that none of the 33 VOQs alleged any type of injury.

Legal Contacts: Ford is providing in Appendix B a description of Legal Contacts and the activity that is responsible for this information, Litigation Prevention. 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, one file was located and is provided in Appendix D. Ford notes that the same incident was also reported in an owner report a copy of which is provided in the MORS III section of the reports database in Appendix C.

ICCD Information: A search of the ICCD database as described in Appendix B located no reports that may relate to the alleged defect.

Crash/Injury Incident Claims: 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, lawsuits and claims, and warranty claims. Based on a reasonable and diligent search, Ford did not locate any owner or field reports, lawsuits or warranty claims alleging an accident or injury that may be related to the alleged defect. Four owner reports (vehicles 2FALP74W66X117933, 2FALP74W0SX127471, 2FALP71W3SX175647 and 2MELM75W4VX633650) do mention an accident; however, a review of the comments suggests that the reports are likely referring to front-end damage sustained due to alleged ball joint failure and not to a collision with another vehicle or other property damage. These owner reports are included in the MORSIII portion of the electronic database provided in Appendix C.

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 no lawsuits, claims or consumer breach of warranty lawsuits, and no arbitrations that appear to relate to the alleged defect in the subject vehicles.

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 crash is alleged;
- j. Whether property damage is alleged;
- k. Number of alleged injuries, if any;
- l. Number of alleged fatalities, if any; and
- m. A summary of the complaint/report.

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

Ford is providing owner and field reports in the electronic database contained in Appendix C on the enclosed CD in response to Request 2. To the extent information requested in Request 3 is available, it's also provided in that database.

Request 4

Produce copies of all documents related to each item within the scope of Request No. 2 that involve allegations that the failure resulted in, or contributed in any way to, a crash, injury, fatality, or loss of vehicle control. Organize the documents separately by category (i.e., consumer complaints, field reports, etc.) and describe the method Ford used for organizing the documents.

Answer

Based on a reasonable and diligent search, Ford did not locate any owner or field reports, lawsuits or warranty claims alleging an accident or injury that may be related to the alleged defect. Four owner reports (vehicles 2FALP74W68X117833, 2FALP74W0SX127471, 2FALP71W3SX175647 and 2MELM75W4VX633650) do mention an accident; however, review of comments suggests that the reports likely are referring to front-end damage sustained due to alleged ball joint failure and not a collision with other vehicle or other property damage. Ford is providing electronic copies of responsive as well as ambiguous owner and field reports in the database contained in Appendix C on the enclosed CD in response to Request 2. The categorization of each report as to whether the report seems responsive or ambiguous, is identified in the "Category" field. These reports are provided under separate tabs for owner (MORSII & MORSIII) reports and field (CQIS) reports in the database.

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 the following number of non-duplicative warranty claims in accordance with the categories described above:

Category	A1	A2	A3	B1
Reports	2	153	202	36

Electronic copies of these claims are provided in the AWS portion of the electronic database contained in Appendix C. The categorization of each report is identified in the "Category" field. When we were able to identify that duplicate claims for an alleged incident were received, each of these duplicate claims is marked accordingly and the group is counted as one report. In other cases, certain vehicles may have experienced more than one incident and have more than one claim associated with their VINs. These claims have been counted separately. Ford assumes that providing the warranty claims in the electronic database format meets the requirements of this request, because the agency can review or order the claims as desired.

Requests for "claims for good will services that were provided; field, zone, or similar adjustments and reimbursements" received by Ford to date that relate to the alleged defect in the subject vehicles that were honored would be provided in the warranty section of Appendix C. Such requests that were not honored, if any, would be included in the MORS reports identified above in response to Request 2.

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) related to the alleged defect 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 criteria used for searching Ford's Analytical Warranty System (AWS) are described in Appendix B. All claims coded under the selected part numbers were included in this search regardless of labor operations or problem codes. The resulting claims were then reviewed individually for allegations that may relate to the alleged defect.

The standard new vehicle warranty coverage for 1995-1997 Ford Crown Victoria and Mercury Grand Marquis vehicles is 3 years or 36,000 miles, whichever occurs first. For 1995-1997 Lincoln Town Car vehicles the standard new vehicle warranty coverage is 4 years or 50,000 miles, whichever occurs first. A list of Extended Services Plans (ESP) that covers the subject

components is provided in Appendix E with time/mile coverage. This appendix also includes the count of subject vehicles participating in those ESPs.

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 answer.

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

OASIS Messages: Ford has not identified any SSMs/TSBs that relate to the alleged defect. However, Ford has identified two SSMs and one TSB that relate to the subject component on the subject vehicles and is providing copies of those in Appendix F.

Internal Service Messages: Ford has identified no ISMs that may relate to the alleged defect in the subject vehicles.

Field Review Committee: Ford has identified no field service action communications that may relate to the alleged defect in the subject vehicles. Ford has not included communications related to field service action 98837, as the subject vehicles do not include vehicles covered by this field service action.

Request 8

Describe all assessments, analyses, tests, test results, studies, surveys, simulations, investigations, meetings, 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. Also, provide copies of all 14D Reports related to the subject recall. 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 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 G.

To the extent that the information requested in a-f is available, it is included in the documents provided. Should the agency have questions concerning any of the documents, please advise.

Ford will be submitting additional related documentation with a request for confidentiality under separate cover as Appendix H to the NHTSA's Office of the Chief Counsel pursuant to 49 CFR, Part 512. Ford notes that a copy of the 14D letter related to the 98S37 recall is provided in pages Bates numbered 6-14 of the confidential documents.

Request 9

Describe all modifications or changes made by, or on behalf of, Ford in the design or manufacture of the subject components, from their first use in the subject models to date, which relate to, or may relate to, the alleged defect. 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.

Answer

A table of the changes to the lower control arm ball joints that may relate to this investigation is provided electronically as Appendix I (file: 2003-03-18_Appendix_I) on the enclosed CD.

Request 10

State the number of each of the following that Ford has sold that may be used in the subject vehicles by component name, part number (both service and engineering/production), vehicle application (model and model year), and month/year of sale (including the cut-off date for sales, if applicable):

- a. Subject component; and

- b. Any kits that have been released, or developed, by Ford for use in service repairs to the subject component/assembly.

State the number of such sales that were used in the subject recall. For each component part number, provide the supplier's name, address, and appropriate point of contact (name, title, and telephone number). Also identify by make, model and model year, all 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

Ford is providing the requested part sales information in Appendix J (file: 2003-03-18_Appendix_J). The data is broken down by part names and service/engineering numbers along with the supplier information. Ford notes that the part sales database does not contain sales information broken down by month for historic data. Ford released a service kit for safety recall 98S37 repairs, and that kit sales information is also provided in this appendix. Ford records indicate that more than 200,000 of these service kits have been sold possibly for recall related repairs. 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 by which to determine how many of the parts were actually installed on vehicles, the vehicle model on which a particular part was installed, or the reason that the installation was made.

Request 11

Furnish a detailed comparison of the alleged defect in the subject vehicles and the condition addressed by Ford in the subject recall. Include in your comparison the following information:

- a. The differences between the causal or contributory factor(s) in the two populations (e.g., differences in suspension components, vehicle weight, and vehicle duty cycles);
- b. The differences in the failure mechanism(s) in the two populations (if any), based on returned part analysis or other data (state the basis for Ford's assessment);
- c. The failure mode(s);
- d. The differences in the risk to motor vehicle safety (if any) that are posed by the alleged defect and the condition addressed in the subject recall;
- e. The design lifetime in miles and time for the subject component;
- f. The predicted service lifetimes of the subject components in the two populations based on Ford's analysis of failure data measured against vehicle age and vehicle mileage (i.e., warranty and complaints);
- g. 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
- h. The reports included with this inquiry.

Answer

In December 1998, Ford issued recall 98S37 based upon then available data, which indicated that front lower control arm ball joint separations were occurring only in severe duty cycle vehicles very early in the service life of those vehicles. The average time in service for vehicles (or the components in the case of earlier model years serviced with the recalled components) was only slightly more than two years as compared to the subject vehicles that have been in service for an average of approximately seven and one-half years. It was believed that if left

uncorrected, virtually all of the vehicles included in the recall would incur premature wear-out of the ball joint and possible separation. Ford's engineering analysis found that the ball joints with one-piece bearing assemblies incorporated in production in March 1996 had less capability in axial loading than the previous ball joints with two-piece bearing assemblies and were not performing adequately at higher vehicle weight or in severe duty. As this condition was present only in higher vehicle weight or severe duty cycle vehicles, the recall included certain Crown Victoria, Grand Marquis and Town Car vehicles equipped with police, fleet and limousine packages (>6000 lbs GVW) manufactured or possibly serviced with ball joints with one-piece bearing assemblies. To remedy this condition, Ford replaced the ball joints with one-piece bearing assemblies with ball joints with two-piece bearing assemblies. The vehicles that are the subject of this RQ include base Crown Victoria, Grand Marquis and Town Car vehicles (5750 lbs GVW) that were not part of the recall. Ford is still in the process of analyzing data and at this time has not determined conclusively the failure mode for the alleged separated ball joints in the subject vehicles.

Preliminary analysis of the three parts received from the agency suggests that the single ball joint received from vehicle 1LNLM82W9VY812106 appears to have been pulled out of the socket; the remaining two ball joints received from vehicle 2FALP74W8VX203376 exhibit excessive wear but not separation. Wear in ball joints is a normal condition. The design lifetime of the subject components is 100,000 miles or approximately 10 years service life under normal usage conditions.

Ford believes that a separation of a ball joint resulting from a one-piece bearing assembly failure is preceded by substantial looseness in the joint. Drivers of the subject vehicles experiencing this looseness condition in the ball joint should notice an unusual noise coming from the front-end of the vehicle and will also feel looseness in the steering. Ford also believes that these symptoms will persist for some length of time giving warning to the driver that front-end service is required.

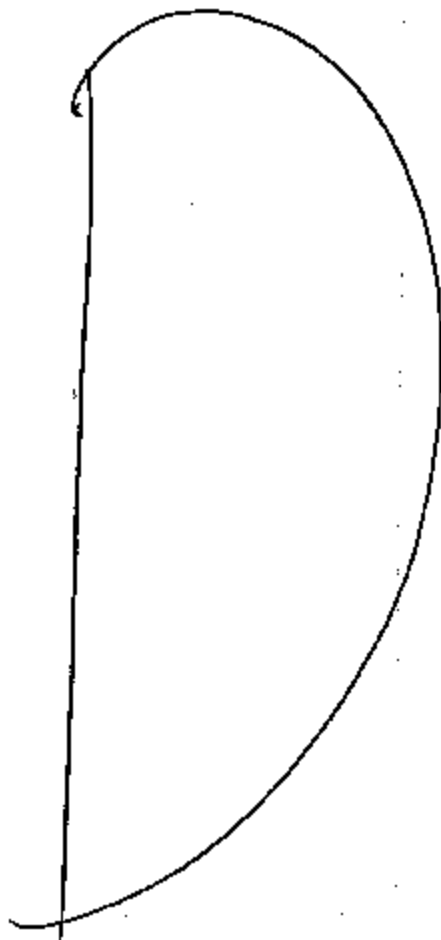
During the review of warranty claims and field reports, Ford identified reports that mention separation of ball joints due to missing nut or stripped threads on the stud. Although, this condition may potentially lead to a ball joint separation, this condition is different from the failure mode leading to recall 98S37. Because most owner reports contain only customer verbatims without the technical specificity that warranty or field reports normally contain, it is difficult to determine how many of those vehicles identified in owner reports actually exhibited the alleged defect and not a failure caused by missing nuts or stripped ball stud threads. Further, the reason for any missing nuts or stripped threads is unknown; such issues could be related to improper service.

Ford has sold over 950,000 1995-1997 model year Crown Victoria, Grand Marquis, and Town Car vehicles. From this population, approximately 180,000 police and commercial fleet vehicles were recalled under recall 98S37. When Ford announced the recall in December 1998, most of those vehicles had been in service for approximately two years of service. Ford confirmed 45 reports of ball joint separation at that time. Based on these reports, the R/1000/year in service was approximately 0.11. During the course of this investigation, Ford has identified 489 owner, field and warranty reports and NHTSA has 33 VOQs that may relate to the alleged defect in the subject vehicles. These vehicles have been in service for approximately seven and a half years. Assuming the very unlikely case that all of the 522 unconfirmed reports on the subject vehicles are related to the alleged defect, the R/1000/year in service is about 0.088. (Ford did not include UDB reports in this rate comparison as this database has only recently been established and provides some records that were not previously available. As such, a

comparison of incident rates that were used as a basis for the recalled vehicles cannot appropriately include UDB data.)

Based on a reasonable and diligent search, Ford did not locate any owner or field reports, lawsuits or warranty claims alleging an accident or injury that may be related to the alleged defect. Note that Ford identified four owner reports (vehicles 2FALP74W6SX117033, 2FALP74W0SX127471, 2FALP71W3SX175647 and 2MELM75W4VX633850) that mention "accident" but a review of the comments suggests that they are referring to front-end damage likely sustained due to alleged ball joint failure and not a collision with another vehicle or other property damage. Ford believes that the extremely low report rate and lack of any reports alleging a collision or injury on vehicles that have been in service for over seven years combined, with the expected indication of the need for service resulting from front-end noise or looseness in the steering, indicate there is no pattern of defect related to ball joint separation in the subject vehicles that would pose an unreasonable risk to safety.

###



628792389

FD-302 (Rev. 11-27-70)

==>

VIN: 2FALP74W0SK103896 Year: 1995 Model: CROWN VICTORIA
Owner Status: ORIGINAL WSD: 09/12/94

Name:

Frm:

Case: 1628792389

Day Ph:

Symptom Desc: AXLE CONCERNS INDICATOR

Reason Desc: LEGAL - ACCIDENT

Dealer: STAYTON MOTORS INC

Issue Type: 07 LEGAL

Issue Status: 0 OPEN

Comm Type: PH PHONE

Odometer Reading: 96000 MI

Analyst: MHENSLE1 MARC HENSLEY

Document Number:

Action Date: 08/26/99 Action Data:

Action Time: 17:23:27 EST

Origin Desc: GENERAL CAC

Action Desc: NO ACTION REQUIRED; INFORMATION ONLY

Comments: CUSTOMER SAYS: AN AXLE ON THE VEHICLE SNAPED COULD THERE BE A SILENT RECALL ON THE VEHICLE ?. WILL FORD COVER THE COST OF THE REPAIR AND THE TOWING ? THE CUST.WOULD LIKE TO KNOW IF THIS IS A PRODUCT DEFECT . THE CUST DOES NOT FEEL THAT THIS IS A NORMAL THING TO HAPPEN FEELS THAT THE VEH WAS DEFECTIVE AND WOULD LIKE FORD TO COVER THE COST OF THE REPAIR A

F1=Help F2=AddAction F4=PrevAction F5=NextAction F6=ActionData

F9=PrevComments F10=NextComments F11=Menu F12=Return F13=ESP

MORE COMMENTS AVAILABLE

LPREL25

==>

VIN: 2FALP74W0SX103896 Year: 1995 Model: CROWN VICTORIA
 Owner Status: ORIGINAL MSD: 09/12/94
 Name: ~~REDACTED~~
 Trmt: ~~REDACTED~~ Case: 1628792389 Day Ph:
 Symptom Desc: AXLE CONCERNS INDICATOR
 Reason Desc: LEGAL - ACCIDENT
 Dealer: STAYTON MOTORS INC
 Issue Type: 07 LEGAL Issue Status: 0 OPEN
 Comm Type: PH PHONE Odometer Reading: 96000 MI
 Analyst: MHENSLE1 MARC HENSLEY Document Number:
 Action Date: 08/26/99 Action Data: Action Time: 17:23:27 EST
 Origin Desc: GENERAL CAC
 Action Desc: NO ACTION REQUIRED; INFORMATION ONLY
 Comments: FROM CONSUMER AFFAIRS WILL FOLLOW UP ON YOUR CLAIM - NO TIM
 E FRAME AVAILABLE - PLEASE MAKE SURE YOU NOTIFY YOUR INSURA
 NCE CARRIER AND REPORT THE INCIDENT INFERENCE CASE ID: 24

F1=Help F2=AddAction F4=PrevAction F5=NextAction F6=ActionData
 F9=PrevComments F10=NextComments F11=Menu F12=Return F13=ESP
 MORE COMMENTS AVAILABLE

LPREL25

==>

VIN: 2FALP74W0SX103896 Year: 1995 Model: CROWN VICTORIA
Owner Status: ORIGINAL WSD: 09/12/94
Name:
Trmt:
Symptom Desc: AXLE CONCERNS INDICATOR
Reason Desc: LEGAL - ACCIDENT
Dealer: STAYTON MOTORS INC
Issue Type: 07 LEGAL Issue Status: 0 OPEN
Comm Type: PH PHONE Odometer Reading: 96000 MI
Analyst: MHENSLE1 MARC HENSLEY Document Number:
Action Date: 08/26/99 Action Data: Action Time: 17:23:27 EST
Origin Desc: GENERAL CAC
Action Desc: NO ACTION REQUIRED; INFORMATION ONLY
Comments:

F1=Help F2=AddAction F4=PrevAction F5=NextAction F6=ActionData
F9=PrevComments F10=NextComments F11=Menu F12=Return F13=ESP
MORE COMMENTS AVAILABLE

LPREL25

==>

DEALER: 174424 STAYTON MOTORS INC
 Address: P&A Code: 08507
 City: STAYTON Sales Region: 74 SEATTLE
 State/Prov: OR ZIP/Postal: 97383 Sales Zone: F
 Country: USA Trained: Y FCSD Region: 74 SEATTLE
 Dlr Phone: 503 769 6666 Market: D1
 Svc Phone: 503 769 6666 Market Area:
 Svc Hours: 7:30 AM - 5:00 PM FAX: 503-769-3598
 Directions:

A

C POSITION	Employee Name
SALES MANAGER	JOHNSON, MIKE E
SERVICE MANAGER	BIRKEY, TIM J

F1=Help F2=IssueList F7=Prev F8=Next F11=Menu F12=Return
 NO MORE RECORDS AVAILABLE LPREL25

Vehicle: 1995 CROWN Body: 4 DR SEDAN LX Engine: 4.8L SOHC Callb: 518FR10A
VICTORIA
Trans: 4R70W 4 SPD AUTO Axle: AXLE CD: C8
(ROMEO)

There are no recalls associated with this vehicle

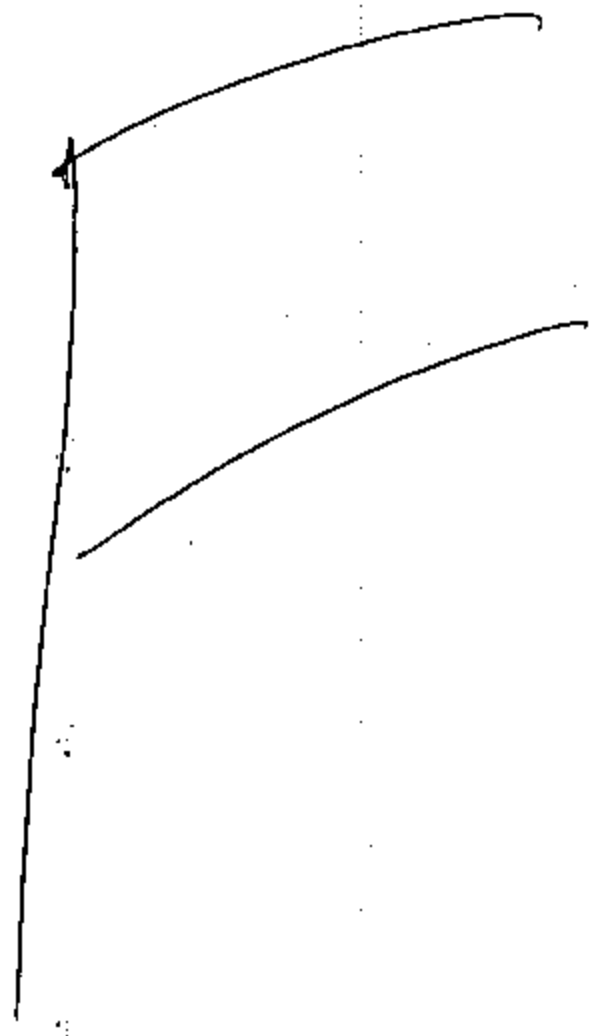
WARRANTY START DATE 08/12/1994 BUILD DATE 08/09/1994
START ODOM 00312 Special Message: LESS THAN TWO DEALER APPROVED
AWA REPAIR VISITS PAID TO DATE
MORSII: *THIS VEHICLE HAS AN OPEN MORSII
LEGAL CONTACT

There is no Extended Service Plan information associated with this vehicle

System Message: NO REPAIR HISTORY ON VEHICLE

There are no ESP Parts associated with this request

End of OASIS report for 2FALP74W08X103896



→

Next/Previous Article (N/P): _ Article #: SSM 12406 Date: 02/02/1999

Symptom:

Year Vt Fm VI Mdl Trans Engine Calib Axle

Criteria:

BALL JOINT MAY NEED TO BE REPLACED, CHECK COLOR OF CAP ON SOME 1996-1999 CROWN VICTORIA FLEET / TOWN CAR LIMO VEHICLES, THE LOWER CONTROL ARM MAY REQUIRE REPLACEMENT DUE TO BUSHING WEAR AS NOTED WHEN PERFORMING RECALL 98S37 (LOWER CONTROL ARM BALL JOINT REPLACEMENT). IF THE CONTROL ARM IS REPLACED WITH A F8VZ-3078-BA OR F8VZ-3079-BA PART NUMBER, THE BALL JOINT MAY NEED TO BE REPLACED ON THE SERVICE PART. IF THE METAL CAP ON THE BOTTOM OF THE BALL JOINT IS A GOLD COLOR, THE BALL JOINT DOES NOT NEED TO BE REPLACED. IF THE CAP COLOR IS SILVER (ALL METAL ON BALL JOINT SAME COLOR), THE BALL JOINT NEEDS TO BE REPLACED. NOTE: THE RECALL CAMPAIGN COVERS REPLACEMENT OF THE BALL JOINT ONLY. OTHER PROCEDURES ARE COVERED UNDER THE 3 YEAR/36,000 MILE BUMPER TO BUMPER WARRANTY.

F1 Help F3 Exit F7 Backward F8 Forward
I0018-BOTTOM OF DATA

F12 Return
OGDB019

**BALL JOINT—REPLACEMENT PROCEDURE—
SERVICE TIP****Article No.
95-14-4****FORD: 1980-1995 CROWN VICTORIA, MUSTANG****LINCOLN: 1980-1985 TOWN CAR****MERCURY: 1980-1995 GRAND MARQUIS****ISSUE**

Serviceability cost can be lowered for the customer if a worn lower ball joint is replaced separately, rather than as a lower arm and ball joint assembly.

ACTION

Replace the lower ball joint with the individual service replacement ball joint. Refer to the 1995 Mustang Service Manual, Page 04-01-9 for service details.

NOTE

IT IS NOT NECESSARY TO REPLACE THE LOWER CONTROL ARM WHEN REPLACING THE BALL JOINT.

PART NUMBER	PART NAME
F4ZZ-3050-A	Ball Joint (1994-95 Mustang, 1995 Town Car, Grand Marquis And Crown Victoria)
F2ZZ-3050-A	Ball Joint (All Others)

OTHER APPLICABLE ARTICLES: NONE
WARRANTY STATUS: INFORMATION ONLY
OASIS CODES: 303000, 304000

TSB/SSM File Search — OASIS Archives

Sympton (Article Ty; Message | Title

Text

304000 S

ENGINEERING
REQUEST FOR
HIGH MILEAGE
SUSPENSION
13047 PART RETURN

ENGINEERING IS INVESTIGATING HIGH MILEAGE FIELD DURABILITY ON SHOCKS, BALL JOINTS, CONTROL ARMS, SPRINGS, STA-BAR LINKS, AND STRUTS ON 1998 TO 1999 VEHICLES WITH MORE THAN 36K MILES OR 3 YEARS IN SERVICE. IF YOU REPLACE ONE OF THESE COMPONENTS ON A CONCERN VEHICLE, ENGINEERING WOULD LIKE TO HAVE THE PART RETURNED FOR ENGINEERING REVIEW. PLEASE SUBMIT A WARRANTY CLAIM FOR REIMBURSEMENT OF THE SHIPPING COST ONLY. A YELLOW PARTS RETURN TAG WILL BE ISSUED WITH SHIPPING INSTRUCTIONS. TAG THE PART WITH: VEHICLE IDENTIFICATION NUMBER, MILEAGE, DESCRIPTION OF THE CONCERN AND REPAIR ORDER. BE SURE TO COMPLY WITH ANY STATE REGULATIONS THAT MAY APPLY AND OBTAIN ANY NECESSARY CUSTOMER WAIVER/RELEASE PRIOR TO RETURNING PARTS. FOR FURTHER INFORMATION REGARDING THIS REQUEST, PLEASE CONTACT FORD MOTOR COMPANY AT (313)937-2989.

6

Appendix G: Study, Surveys and Investigations (Non-Confidential)

All team members agreed that a break in the boot seal integrity will allow contaminants to enter the housing and result in the observed failure mode. The focus of the brainstorming theories was on process or design changes that would have lead to observed failure modes as of 4/1996.

Theories:

Top clamp ring seized on stud which led to wind-up condition tearing boot.

Excessive torque of ball joint nut during assembly will over compress boot.

Excessively large spindle taper will allow ball joint stud to move past gauge line, over-compressing the boot.

Rough surface on spindle boss will trap water and grit on seal lip.

Since stud is not polished, oxidation of stud lead to lip/stud seize.

Bearing degradation will cause excessive free play in balljoint.

Lanforder process checks: material properties to design intent ; bearing cracks to during press

Excessive loading from sub-system or assembly design changes or quality issues (Bushing walk-out)

Excessive grease degradation will lead to premature failure of component.

Lanforder process checks: Is all grease added in first place ?

Does boot seal migrate into bearing/stud interface ?

Is water entering balljoint at design ?

Degraded or torn boot

Assembly plant stacking of arms with no protective caps may lead to torn boots

Non-plumb orientation of balljoint will lead to tears during press fit operation

Excessive heat from brakes may degrade rubber boot

Boot may be torn during service from tools or degrade from grease.

High loads on oscillation angles exceeding original spec may tear boot, or cause boot to act like pump. ✓

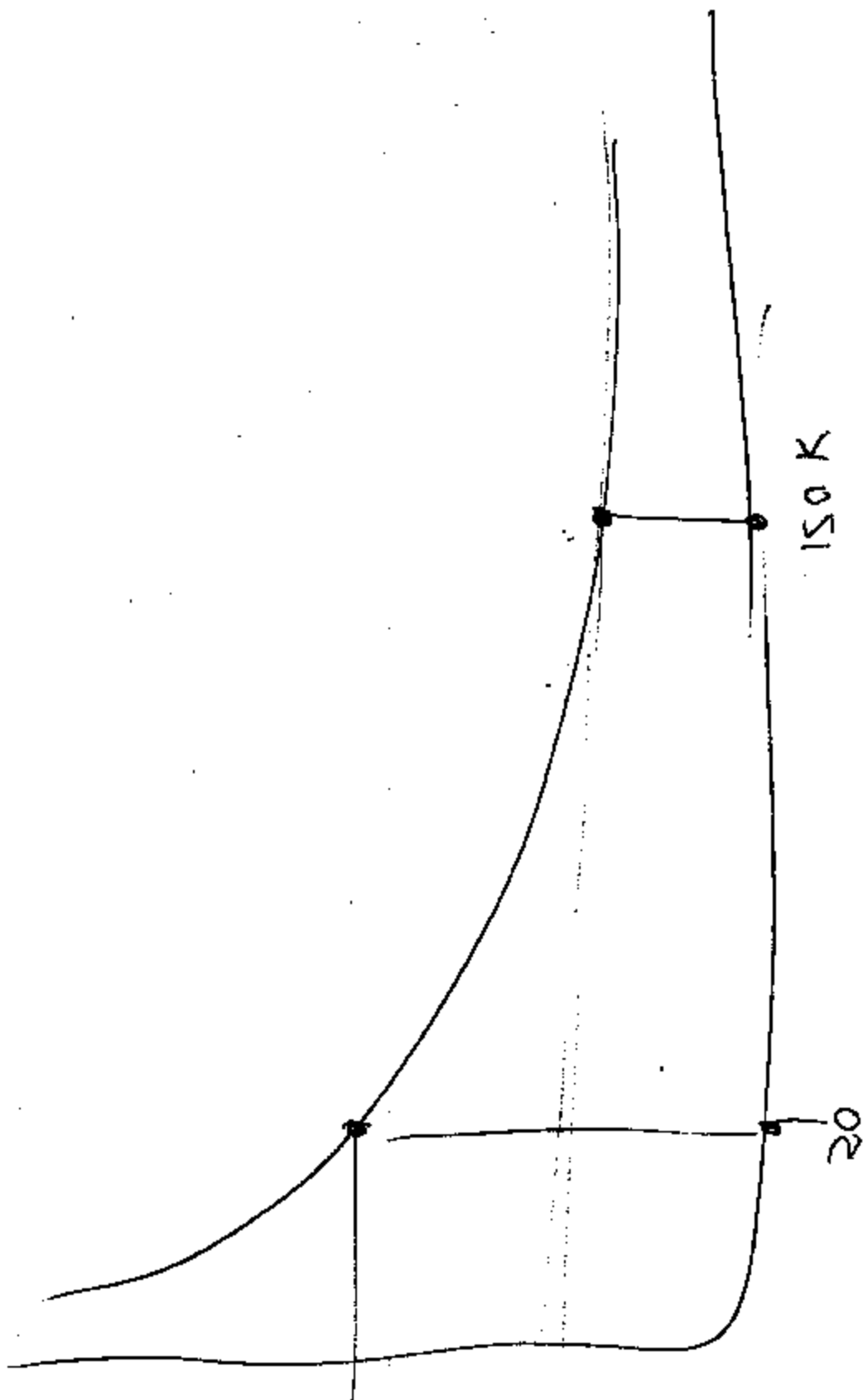
Insufficient clamp load at top of boot will allow contaminants to enter balljoint

Lanforder process checks: missing clamp; clamp spring load; clamp length

Stud metallurgy

Inconsistent or insufficient heat treat may leave stud unable to withstand loads

ID	110	Section	Title	Responsible Party	Date Due	Has Started	Status	Notes
2A		What caused the problem? (Ex. Tightened/designed/machined incorrectly)	8D	Team	05/08/1998			Brainstorm - establish test plan to validate results theories - 05/08
2A		How does this cause the problem?	8D	Team	TBD			
2B		FORD system Intended to prevent?	TBD	Team	TBD			
2C		Why did this happen - why not prevented?	TBD	Team	TBD			
2A		Lab tests						
2A1			conduct ball joint organic, metalurgy, and dimensional analysis to determine: degradation to boot, status of grease, performance of heat treat, route of contaminant entry.	ATRAMAL				
2B		Vehicle tests						
2B1			Review heat load of police vehicles due to proximity of balljoint to brakes.	PPEDRAH				
2B2			Review road loads on balljoint with failed bushings	PPEDRAH				
2C		Plant/Supplier Reports						
2C1			review changes in control arm and spindle assembly as of Job 1 1996 for any variations that may affect boot seal integrity, placement of spindle on taper, torque on ball joint.	MWILLIAG				
2C2			review changes in balljoint design as of Job 1 1996 that may affect process integrity or load capability.	AKRUSE, PPEDRAH	06/04/1998	06/08/1998		bearing release 1 week prior to first incident vehicle built



* Note printed by JDAVIS1 on 14 Dec 1998 at 07:55:46 *

From: PPIEDRAH--DRBN005 Date and time 12/09/98 11:20:05
To: PASHBURN--DREN005
cc: JDAVIS1 --DREN005 MRAURA --DRBN005
LKEEFER --DRBN005 CTESKE --DREN005
RPLAWECK--DRBN005 ADIONNE --DREN005

From: Tricia Piedrahita USAET(UTC -05:00)

Subject: New Number "98837" Assigned on 12/8/98

Paul,
The 90 day clock for Panther and corporate-wide follow-up items on the ball joint 14D has been set.

As we have discussed before, AVT's support is key to making this happen. I will set up a meeting this week to ensure we are on track to present the corporate wide/AVT items (item 13 of 14D) by the second week of March. The police load/usage correlation is well under way, however that's not the only item.

Thanks for your support.

Tricia Piedrahita
LVC OPD Suspension Design
Ph: 313.24.84850
Fax:313.621.6675

*** Forwarding note from KEUBIETA--DREN006 12/09/98 10:39 ***
To: Recall Number Assignment Distribution
cc: PPIEDRAH--DREN005 CTESKE --DREN005
LKEEFER --DREN005

FROM: Kelly Zubieta USAET(UTC -05:00)
Subject: New Number "98837" Assigned on 12/8/98

Safety Recall "98837" has been assigned to 1993-98 Crown Victoria Police/Taxi/Fleet/NGV vehicles and Town Car Limo vehicles (98X72).

14-D Author: Tricia Piedrahita

The 14-D team/author will be contacted to demonstrate to Engineering Directors that prevent actions stated in the 14-D have been implemented. Presentation/Demonstration to take place 90 days from 12/8/98. Questions: Contact Len Adamek (LADAMEK) or Bruce Maeroff (BMAEROFF).

Regards,

Kelly Zubieta

FCSD, Recall/Service Programs, Recall/ONP Coordinator
313-337-9787 Fax: 313-845-1024 Internet: KEUBIETA@Ford.com

AGENDA

Police Car LCA Ball Joint Customer Correlation Team

18 November 1998

ASSIGNMENTS:

- Dionne - Was P3-22DX ever used to add cycles to P3-22D?
- Tricia - Timing/Feasibility to obtain the test/data acquisition vehicle
- Piedrahita - Component differences between police and base vehicles
- Stewart - Investigate any Mazda tests that may relate to our problem
- Monrad - Investigate test scheduling of radial chuckhole pad / curb island

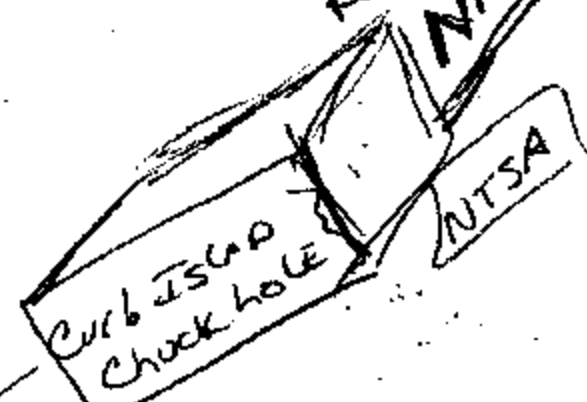
2 weeks after
Recvt of vehicle

RESPONSE TO RESSLER:

OPEN DISCUSSION:

NEXT STEPS:

- Police / Base loads P3-22DX
- RADIAL Chuck hole Speed
20mph.
- MAZDA Systems test RUNS 136's
Vertical



130
18
1300

1080
45
4500X

* Note printed by JDAVIS1 on 10 Nov 1998 at 06:55:33 *

From: PPIEDRAH--DRBN005 Date and time 11/09/98 08:57:43
To: JDAVIS1 --DRBN005

From: T.E.Piedrahita USAET(UTC -05:00)
LVC OPD Suspension Design & Dynamics 313.24.84850
Subject: (U)Radial Chuck Hole Pad DPG
FYI

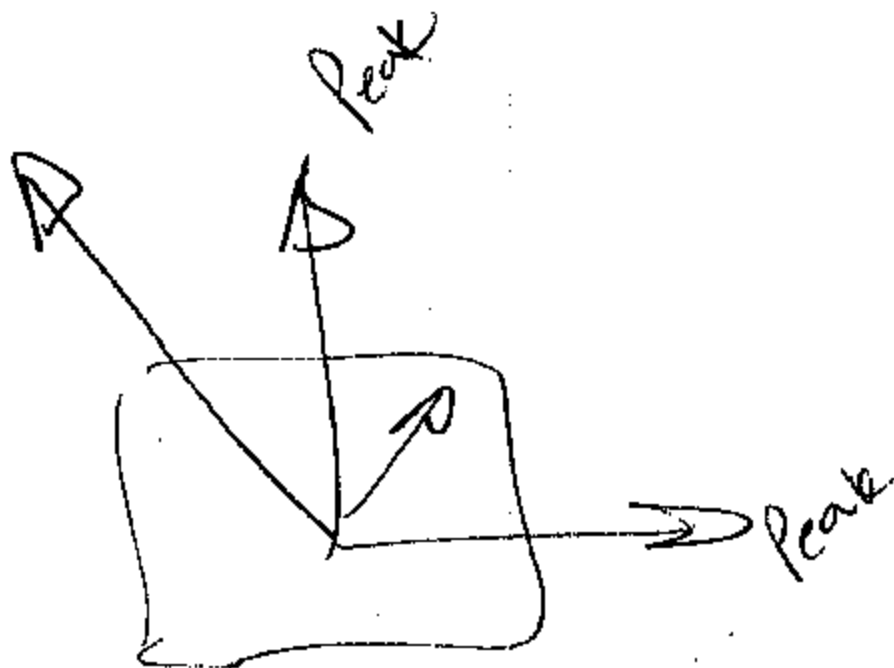
Tricia Piedrahita
*** Forwarding note from RMONRAD --DRBN005 11/07/98 11:49 ***
To: ADIONNE --DRBN005
cc: PPIEDRAH--DRBN005 DALLENS --DRBN005

FROM: Dick Monrad USAET(UTC -05:00)
Subject: (U)Radial Chuck Hole Pad DPG

I scrapped some grass and weeds out of some of the joints on this test pad and found little frost heaving of adjacent surfaces. I was able to run procedure speed even with the grass in the cracks. I'm sure we can use this surface with a few hours of cleanup. If you request another road load test to record on this surface we will get the area cleaned up. Additional Curb Island events would still have to be run at MPG. We didn't plan well when we were up at MPG last time. We should have run at least 3 passes of Curb Island.

A Police car is being built up to obtain wheel force data. At this time there is no plan to run Radial Chuck Holes. That will give another measure of combined forces. That vehicle will be running in about 6 weeks.

Regards, R.J. (Dick) Monrad 84-55832 - Loads Analysis Engineer
USA - Prod. Dev. - Adv Veh Tech - Global Test Operations
Road Load Engineering Dept T671, LVC Engineering section
Bldg. CTL, room 201, cube 2C-124 FAX (313)84-50522



* Note printed by JDAVIS1 on 12 Nov 1998 at 17:13:33 *

From: JDAVIS1 --DRBN005 Date and time 11/12/98 12:31:45
To: JCROCKER--DRBN005 Crocker, Jonathan
cc: JDAVIS1 --DRBN005

FROM: Jeffrey S. Davis USAET(UTC -05:00)
Subject: Ball Joints

We have come to the conclusion that R310 does not validate ball joints. Example being the panther police vehicle completed 830 cycles without a failure or even a concern and now they are pulling apart in the field at very low mileage - 20K.. The max load measured on the Panther on R310 is about 25KN. The joint is from Lemforder and the ball diameter is 35mm (one piece bearing).

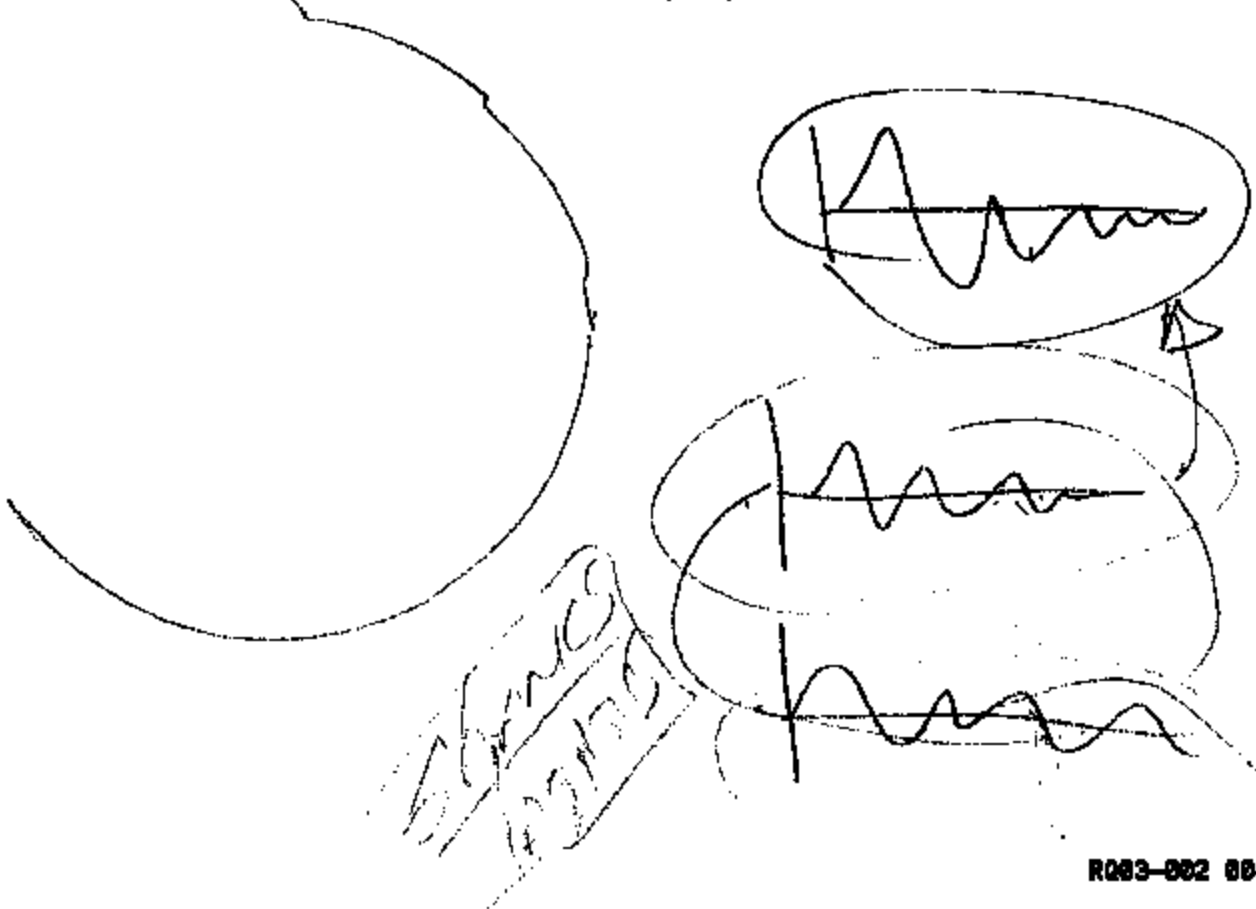
Have you sectioned any of the joints that have completed durability? If so look very carefully at the bearing for signs of plastic flowing and very small stress cracks. What was your measured max 1 occ. load off of R310 and your max special event load? Did you measure any loads on P3-22DX?

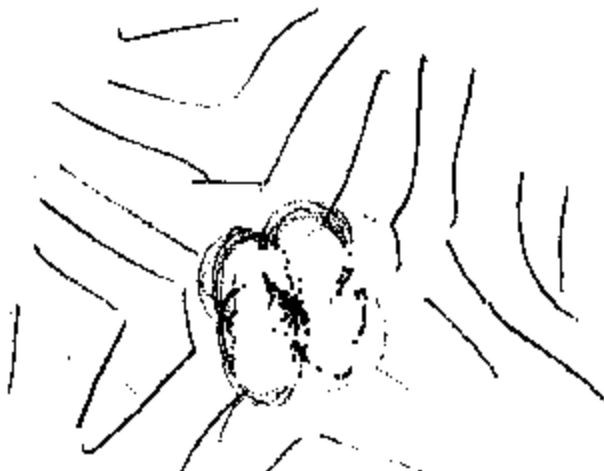
The thing that seems to cause the trouble is the combination of static weight (5300N), time, high peak loads and temp.

We are trying to develop a new ball joint lab test to simulate the separation. The static pull out load is above 100KN.

Info..

Jeffrey S. Davis (jdavis1@ford.com)
Senior Research Engineer, AVT Chassis Engineering
Rm. 3C063 Building 5
Office: (313) 845-5224 Fax: (313) 845-4781





AGENDA

Police Car LCA Ball Joint Customer Correlation Team

11 November 1998

ASSIGNMENTS:

Tricia Piedrahita - Has Police car usage changed (become more severe) ?

Aaron Dionne - Locate the P3 - 22DX Procedure

POSSIBLE TESTING:

We can possibly use the radial chuckhole pad at DPG if it's cleaned up.

- GTO would need a road load test request
- Curb island events would still have to be run at MPG - at least 3 passes
- Vehicle is currently being "built up." Could it run curb island events?

Bearing Key Life Testing - Can we develop a KLT?

- Increased temperature
- Increased load
- Aged ball joints

Should we test some of the inferior ball joints at true loads and see if they fail at similar mileage as in the police vehicles?

RESPONSE TO RESSLER:

How did P3-22D evolve into R-310?

Need to fill out Test Load Matrix

How will future police car testing change?

OPEN DISCUSSION:

NEXT STEPS:

Paul's Response to Neil Kessler

P3-22DX

- Not currently run (not called out in WCR)
 - Radial chuckholes are not included in current testing
- Test procedure will be used to estimate impact loads.
- How did we lose DX?

Test Load Matrix - Which load?

Type of Load	4 + Corner Weights	Original R3 to Durability	Supplemental Vehicle Instrumentation	Curb Impact I (MPG)	Curb Impact I (MPG)	Radial Chuckholes (DPG)	Original Design Load	New ADAM's Model Input Load
rod Tension								
vertical Impact								
lateral Acceleration								

Testing for Future Police Cars

Additions to R-320 and Accelerated Durability Routs

Investigations into KLT lab test for the bearing

Updates to Design Guide, PVS, SDS, CAE models, WCR

Attachments:

P3-22DX Procedure

F8AC-3385-AA Lower Belljoint New Part Pull-Out values																	
1997																	
	Jan-97	Feb-97	Mar-97	Apr-97	May-97	Jun-97	Jul-97	Aug-97	Sep-97	Oct-97	Nov-97	Dec-97	Jan-98	Feb-98	Mar-98	Apr-98	May-98
Average	83.08	81.37	81.86	79.88	80.63	82.01	81.25	85.60	80.01	80.01	80.91	79.42	80.24	80.11	79.83	78.65	78.89

Crown Victoria Fleet LCA Balljoint

Contact	COIS Report No.	Parts Available	VIN	MY	Make	Build Date	Mileage	Fleet Y/N	Fleet Name	State/County	Service Location	Service Date	Ann Stamp Date	Ball Joint
jmcinern		Y	TX166844	1996	CmVic Police	04/03/1996	34159	Y	City of Worcester Police Dept	MA	Natick Auto Sales	03/17/1998	03/20/1996	W1
jmcinern	WCLAA240	N	TX176067	1996	CmVic Police	05/09/1996	32699	Y				03/12/1998		
jmcinern		Y	VX108415	1997	CmVic Police	08/27/1996	24687	Y	Boston Municipal Police	MA	Natick Auto Sales	03/31/1998	08/14/1996	W3
rsayler		N	TX198420	1996	CmVic Police	06/17/1996	45037	Y	B7230-0G012	CAN	Fort Motors - Armand Trembley	05/01/1998		
rsayler		Y - stud missing	VX156401	1997	CmVic Police	04/08/1997	32399	Y	B7230-0G013	CAN	Fort Motors - Armand Trembley	05/02/1998		
pvisger (NA Fleet)	WDFEK002	Y	VX118663	1997	CmVic Police		39798	Y	City of Stow	OH	T.E. Clarke Ford	04/20/1998	12/10/1996	W50
rsayler		incoming to STAP		1996	CmVic Police	04/24/1996		Y	Dole Fruits	AZ				
rsayler		incoming to STAP		1996	CmVic Police	04/24/1996		Y	Dole Fruits	AZ				
rsayler		incoming to STAP		1996	CmVic Police	04/24/1996		Y	Dole Fruits	CA				
rsayler		incoming to STAP		1996	CmVic Police	04/24/1996		Y	Dole Fruits	CA				
lawmet		Y - ball joint only	TX152797	1996	CmVic Police		45000	Y		AZ				
lawmet		Y - ball joint only	TX?16280	1996	CmVic Police		51000	Y		AZ				
jmcinern		Y	VX189947	1997	CmVic Police	08/13/1997	18600	Y	Worcester	MA	Natick Auto Sales			

3/27/97

FORM 002 06/92

* Note printed by JDAVIS1 on 4 Jun 1998 at 07:18:16 *

From: JDAVIS1 --DRBN005 Date and time 06/03/98 09:28:16
To: SMARULIS--DRBN005
cc: WSTEWARI--DRBN005 RPLAWECK--DRBN005
JDAVIS1 --DRBN005 MKAUDRA --DRBN005

FROM: Jeffrey S. Davis USART(DTC -04:00)
Subject: Ball Joint
Steve, This is what I have gathered on the Ball Joint Issue.

The joint was released in 1996 on the CV/GM/TC and Mustang. To date there are 12 confirmed separations. These separations date back to April 1996 and occur between 30k and 50K miles. 9 of the separations are from police cars, 3 are Dole Pineapple fleet vehicle. All joints appear to have torn boot seals. The cause of boot failure has not yet been determined. Some look to be torsional failures of the material - this could happen when the boot freezes to the stud due to rusting/contamination of the stud (all unconfirmed). Lemforder has reviewed all inprocess test data back to 1996 and has not found any issues..

The Police/Fleet vehicles have the same ball joint as the base vehicle however the control arm is unique. The base control arm is manufactured and assembled by VanDyke. The Police/Fleet control arm is manufactured by an outside supplier (Howell??) and shipped to Van Dyke for assembly of joint. Painting of all arms is done in Plymouth.

I do not know if there is any difference in the shipping and handling of the assembled control arms. I have recommended to the program team that this be looked in to.

I do not know of any other vehicle changes in the time frame of the separations. There were no engine, trans, brake, suspension changes that I can identify. I am looking into tire/wheels and shock valving.

I will keep you informed as I learn more.

Jeffrey S. Davis
Senior Research Engineer, AVT Chassis Engineering
jdavis1@ford.com, usfmc2dd@ibmmail.com
84-55224 Rm. 3C053 Building 5



CMI-TECH CENTER, INC.
 1600 West Eight Mile Road
 Ferndale, Michigan 48220
 (248) 399-9800
 Fax: (248) 399-3512

Page _____ of _____
 Date _____
 Subject _____

Kevin EN/FN Police (12 pieces)
 3 RETORTS (4?)

Failures include puncture in boot with
 ingress of contamination &

734-496-2333

9 Police (30-50K miles)

3 Dole Fleet Vehicles

12

April 1996 → Tires/Wheels

- Boots all appear to be torn
- Some look like torsional failures from boot seizure.

• Lemforder next week (ES)

- Bldg 2 BASEMENT Bld.

(1996)

CW/GM/TC/MUSTANG

FLAC-3395-AA

→ B201

From: Cline, Susan (S.L.)
Sent: Tuesday, May 28, 2002 5:32 PM
To: Skynar, Joe (J.M.)
Subject: RE: Your father's LCA

Joe,

Here's your requested information....thanks a lot!

1. 1896
2. 1LNLM83WXTY717958
3. 65,637
4. Michigan!

Good day,

Susan Cline

Supervisor, Road Loads - Car
Durability Methods and Road Loads Department
CTL Bldg., 2nd floor, 2C132 (scline1@ford.com)

phone: 313-317-9322
pager: 313-796-5663

—Original Message—

From: Skynar, Joe (J.M.)
Sent: Tuesday, May 28, 2002 4:04 PM
To: Cline, Susan (S.L.)
Subject: Your father's LCA

I received the front LCA with the pulled out ball stud from your father's Towncar from Todd Brown. The ball joint supplier has the arm now for their inspection. I was wondering whether you could provide some information which could help their diagnosis such as:

1. Model year of the vehicle.
2. VIN (if you know it)
3. Mileage
4. What state he drives in.

This information is not critical but may help. The supplier can get the manufacture date from the ball joint.

Thanks,

Joe Skynar

2003 Panther Suspension

Schaefer Court II, Cube 1CE24

Phone: (313) 24-85581

Fax: (313) 84-52819

Text pager: (313) 796-4481 (3137964481@skrtouchpegging.com or <http://myaimall.com/>)

jskynar@ford.com

From: Kramer Doug - NAO Northville Technical Center [Doug.Kramer@zf.com]
Sent: Wednesday, May 28, 2002 4:44 PM
To: Ferrill Gary - NAO F-Brewer PD MGR
Cc: Skynar, Joe (J.M.)
Subject: FW: SN report on returned Ball joints

Gary,

Before you release your final report on the returned parts you need to change your description from the "SN" to "FN" parts.

Sincerely,

Douglas J. Kramer
ZF Lemforder
Account Manager Ford Group
phone : 734 - 354 - 1485
fax : 734 - 416 - 8331
e-mail : "doug.kramer@zf.com"

-----Original Message-----

From: Skynar, Joe (J.M.) [mailto:jaskynar@ford.com]
Sent: Wednesday, May 29, 2002 4:41 PM
To: 'Kramer Doug - NAO Northville Technical Center'
Subject: RE: SN report on returned Ball joints

Thanks. The report states the arms are SN95. They are FN arms.

Joe Skynar
2003 Panther Suspension
Schaefer Court II, Cube 1CE24
Phone: (313) 24-85581
Fax: (313) 84-52619
Text pager: (313) 796-4481 (3137964481@airtouchpaging.com or
<http://myairmail.com/>)
jaskynar@ford.com

-----Original Message-----

From: Kramer Doug - NAO Northville Technical Center
[mailto:Doug.Kramer@zf.com]
Sent: Wednesday, May 29, 2002 4:25 PM
To: jaskynar@ford.com
Cc: mfrey@ford.com
Subject: FW: SN report on returned Ball joints
Importance: High

Joe,

Attached is a draft of the report on the 2 control arms with ball studs that had failed. My plant is waiting on the Chemistry analysis before

finalizing the report. Material properties checked out "OK" per specification.

If you have any questions please let me know.

Sincerely,

Douglas J. Kramer
ZF Lemforder
Account Manager Ford Group
phone : 734 - 354 - 1485
fax : 734 - 416 - 8331
e-mail : "doug.kramer@zf.com"

> -----Original Message-----

> From: Ferrill Gary - NAO F-Brewer PD MGR

> Sent: Wednesday, May 29, 2002 4:14 PM

> To: Kramer Doug - NAO Northville Technical Center

> Subject: SN report

>

> Here's the draft. Shouldn't take much longer to get the chemical analysis
> back.

>

> <<SNBJCR-0502.doc>>

>

> <<...OLE_Obj...>>

> Gary R. Ferrill

> Product Development Manager

> F-Brewer

>

> 207 989 9125

> gary.ferrill@zf.com

>

From: Skynar, Joe (J.M.)
Sent: Wednesday, May 29, 2002 7:42 AM
To: 'Doug Kramer (E-mail)'
Subject: LCA with ball stud pulled out

Doug,

The arm with the ball stud pulled out is from a 1996 model year Towncar with 65637 miles and he drives on Michigan roads.

Joe Skynar

2003 Panther Suspension

Schaefer Court II, Cube 1CE24

Phone: (313) 24-85581

Fax: (313) 84-52819

Text pager: (313) 796-4481 (3137964481@airtouchpaging.com or <http://myaimail.com/>)

jskynar@ford.com

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Sent: Tuesday, May 28, 2002 5:32 PM
To: Skynar, Joe (J.M.)
Subject: RE: Your father's LCA

Joe,

Here's your requested information....thanks a lot!

1. 1996
2. 1LNLM83WXTY717958
3. 65,637
4. Michigan

Good day,

Susan Cline

Supervisor, Road Loads - Car
Durability Methods and Road Loads Department
CTL Bldg., 2nd floor, 2C132 (scline1@ford.com)

phone: 313-317-9322
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Sent: Tuesday, May 28, 2002 4:04 PM
To: Cline, Susan (S.L.)
Subject: Your father's LCA

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2. VIN (if you know it)
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This information is not critical but may help. The supplier can get the manufacture date from the ball joint.

Thanks,

Joe Skynar

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Text pager: (313) 796-4481 (3137964481@airtouchpaging.com or <http://myairmail.com/>)

jskynar@ford.com

ROE3-802 1508

* Note printed by AKRUSE on 3 Nov 1998 at 13:02:21 *

From: LKEEFER --DRBN005 Date and time 09/17/98 15:25:27
To: AKRUSE --DRBN006 LMASTROF--DRBN005
JCRIST --FORDSMTP AREAUME --DRBN007
ATRAMAL--DRBN005 PPIEDRAH--DRBN005
JMCINERN--DRBN005
cc: LKEEFER --DRBN005

FROM: Laura A. Keefer USAET(UTC -04:00)
Subject: En114/Sn95 Frt LCA ball joint investigation

Meeting Minutes 10/17/98, 2GC23B, 10 am

The following items were discussed:

1. Root Cause Analysis

Jeff Crist reviewed non-failed ball joints which showed material cold flow at the top and bottom of the race. The team agreed it appears the bearing was loaded in compression causing flow at the bottom. We suspect that this bottom flow created enough lash for the stud to cause subsequent flow at the top of the race. discussed: 2. Lemforder Testing:

Kevin Kolb reported 2 ball joints completed 100,000 cycles of the revised ball joint fatigue test. The test was revised to include 10 occurrence impact loads. Two more parts will be run to failure asap.

3. Campaign parts status:

Lemforder confirmed 1st samples of the old 2 pc design will be available next week. Lemforder committed to supporting 200,000 pcs of the old design by 10/15. This should be enough pcs to allow release of the Campaign.

4. Kit release: Laura Keefer confirmed the service kit is released.

5. Production Support with old 2 pc design:

Lemforder confirmed by 10/15 they could support current production with the 2 pc ball joint for either the civic police/limo only or all Panther vehicles.

Assignments:

Jeff Crist - to test 1 gate vs 2 gate races to confirm no matl. differences

Jim Stacey - confirm what and when the race changed from 1 to 2 gates. Take back message that lab facilities and staff need expanded/upgraded, also Ford feels Dearborn Applications Engineer/Kevin Kolb is overloaded - need more Applications Engineers.

Laura Keefer - Verify road loads data available next 2 weeks. Supply R310 parts to Alan Reaume, supply base car parts to Alan Reaume, issue CR to revert to 2 pc design for current production (hold to 10/15).

Anne Tran-Malone - Provide Mustang parts to Alan Reaume for inspection.

Kevin Kolb - Update L. Keefer on life cycle test, send 100,000 cycle fatigue life test parts to Alan Reaume.

Alan Kruse - Work with Lemforder to make sure Lab upgrades and additional applications engineer happens.

Tricia Piedrahita- Please schedule next meeting week of 9/28.

Laura Keefer
Suspension, OPD LVC
Fax 16675, phone 32626
MD1229, Bldg 2, cube 24H34

* Note printed by AKRUSE on 6 Oct 1998 at 08:09:05 *

From: PPIEDRAH--DRBN005 Date and time 09/25/98 13:33:38
To: AKRUSE --DRBN006 LALLMACH--DRBN006
LKEEFER --DRBN005 KKOLB --DRBN007

From: T.E.Piedrahita USAET(UTC -04:00)
LVC OPD Suspension Design & Dynamics 313.24.84850
Subject: Lemforder Communication 9/24/1998

The following letter was faxed to Keith Kinney, Lemforder - Brewer, Maine.

Ford Motor Company
20000 Rotunda Drive
P.O. Box 2053
Dearborn, MI 48121

September 24, 1998

To: Keith Kinney, Lemforder
cc: Kevin Kolb, Lemforder (via e-mail)
Alan Kruse, Ford STA (via e-mail)
Laura Allmacher, Ford Van Dyke (via e-mail)
Laura Keefer, Ford Suspension (via e-mail)

From: T. E. Piedrahita

Subject: Panther LCA Ball Joint Problem Resolution

Keith,
Per your discussion this morning with Laura Keefer, the following list documents our expectations for lab analysis:

- * You will receive the nose portion of the arms.
- * Once parts are received in plant 24hr is allotted to measure and return parts.
- * You may remove and discard the boot.
- * Measure parts for axial and radial free-play.
- * Label parts with vehicle number (or sample ID if vehicle number was not provided), and test results.
- * Include test description on label, for parts coming off Lemforder bench test.
- * Secure parts in individual plastic bags to prevent further contamination.
- * Return parts to Ford Central Lab, attention Steve Larouche.

Please confirm that the parts to be returned include the following:

- * 23 ball joints - arrived at your facility, from Central Lab on 9/15/1998
- * 2 ball joints - which underwent 100,000 cycles of a modified ES test with impact loads
- * 3 ball joints - which underwent 1,000,000 cycles of a modified ES test with impact loads

In addition, please run 3 of the 2-piece bearing parts to 100,000 cycles (same test as the 5 previous parts). Measure axial and radial free-play, return one part to Central Lab and continue the other 2 to failure or 1,000,000 cycles. Please return those parts as well to Central Lab, with axial and radial free-play measurements (if feasible).

Also, please provide the following information:

- * Design load limits in all directions for the 1-piece bearing ball joint and the 2-piece bearing ball joint.
- * Status of raw material for 2-piece bearing to support full production.
- * Status of production of 2-piece bearing ball joint for 10/15/1998 deadline.

Finally, per your and Kevin's requests, Van Dyke has checked their on-hand stock and will drop their release to 80,000 additional parts to meet their production requirements until 10/31/1998. With the 36,000 you have at your facility (per Keith Kinney 9/23/1998), you will still need to manufacture an additional 46,000.

Your cooperation in this matter is greatly appreciated. Questions may be directed to me on 313-248-4850.

Regards,

Tricia Piedrahita
LVC OPD Suspension

Tricia Piedrahita

Panther Lower Control Arm

INTRO

- ISSUE
- PART HISTORY

BRAINSTORM THEORIES

- QUALITY
- ASSEMBLY
- DESIGN

WORK PLAN

- PROPOSE WORK PLAN TASKS
- IS EACH THEORY INVESTIGATED ?
- ASSIGN KEY PLAYERS
- SET MEETING FREQUENCY

LCA PART HISTORY

ASSEMBLY PART NO.	RELEASE DATE	BALL JT. COMPONENT	DESCRIPTION
F6AC - 3042 - AC	Feb-95	F4ZC-3395-AA	CLIMAX PRE-GREASE
F5AC - 3042 - AD	Nov-95	F5AC-3395-AA	1-PIECE DELRIN HOUSING
F8AC - 3042 - AA	Oct-96		INNER SLEEVE CHANGE REAR BUSHING
F7AC - 3042 - AB	Apr-97	F6AC-3395-AA	POST-BONDED FRONT BUSHING

ROB-882 1755

**F6AC-3395-AA Panther Front Lower Ball Joint
Date Summary (9/16/98)**

4/2/98:

First (2) balljoints reported with separated ballstuds.
Lemforder requested to provide pull-out values over the last (3) months for this balljoint in production.

Action:

Fax sent 4/2/98 containing the last 40 pull-out values from the assembly line.

4/5/98:

Ford requested date stamp details from the returned parts.

Action:

Fax sent 4/6/98 containing the date stamp information from both returned parts.

4/7/98:

Most recent IP test results for balljoint fatigues requested by Ford.

Action:

Phone call prior, and test results faxed to Ford 4/7/98.

5/15/98:

Balljoint cut-away requested from Ford for review.
(6) additional balljoint returns provided to Lemforder for evaluation.

Action:

Return evaluation test request written and sent to the plant.
First part return reports were submitted 6/3/98.
Second part return reports were submitted 6/3/98.
Final (2) returns evaluated 6/4/98.

6/8/98:

14D opened at Ford.

Page 2:

6/21/98:

Pull-out loads requested from 4/1/96 two-piece race design.
Capability study of Simpson Knuckle mating bore requested.
Component parts and drawings requested at Ford Central Laboratories.
Current copies of CP, DFMEA, and PFMEA requested.

Action:

NO AVAILABLE PULL-OUT DATA PRIOR TO 1997.
requested knuckles from Simpson to conduct study.
Component parts and drawings submitted to Central Lab.
Copies of CP, DFMEA, and PFMEA available.

7/13/98:

Two-piece race parts requested from Lemforder.

Action:

Searched the plant and found no available assemblies with two-piece races.
Contacted the race material supplier.
Requested material to make samples ASAP.

7/23/98

Lemforder notified by BASF that the two-piece race material is not available in the US.

Action:

Ordered material to make samples from Germany.

9/14/98:

Two-piece race material arrived in Brewer.

Action:

final prep of old race tools conducted.

9/17/98:

two-piece race production scheduled.



LEMFORDEE CORPORATION

55 BAKER BOULEVARD
BREWER, MAINE 04412

Telephone : 207 989 1310
Telex : 207 989 8700 / 941 0230

FAX# 1029may
Page 1 of 1

Date : 29MAY96
To : Alan Kruss : 313 390 5400
From : Gary R. Ferrill
cc: Jim Stacey, Bruce Veresplit, Sandy Krumens
Subject: July machine movement

Greetings Alan:

As discussed during your visit here on 02-03MAY96, Lemforder Brewer will redesign its equipment layout of the ball joint machining area during the 04JUL96 shutdown. The purpose is to refinish the floor and optimize material flow within the area.

This move will affect the following Ford part numbers:

F6AC 3395 AA	SN95 Ball joint	Van Dyke
F5XA 3395 AA	VX54 Ball Joint	Avon Lake
F2UA 3B102 AA	32mm Econoline (tier 2)	LeRoy Industries
F2UA 3B102 CA	35mm Econoline (tier 2)	Kelsey-Hayes
F2ZC 3395 AA	EN Ball Joint (service)	Van Dyke and / or service

All pins are a single "family" in nature.

This letter confirms, as per your direction, for PPAP purposes, we will perform full capability evaluation of each machine involved against one pin, make the move, restudy the same pin, and submit this before / after comparison for PPAP to you. All part numbers will be submitted to you on a single warrant. Copies of the warrant will be supplied to the appropriate tier one suppliers.

I really appreciate your help concerning this matter.

Regards,

Gary R. Ferrill
Quality Assurance Manager
Lemforder Corporation Brewer

Crown Victoria Fleet LCA Balljoint

Contact	CGE Report No.	Parts Available	VIN	BY	Make	Ball Date	Mileage	Rest Y/N	Rest Name	Rest Count	Service Location	Service Date	Anti Sump Date	Ball Joint Markup Date	L/R	Admin Comments
Incident		Y	TX168844	1998	Cm/Vic Police	04/03/1998	34180	Y	City of Worcester Police Dept	MA	Natick Auto Sales	08/17/1998	03/23/1998	W1196	L	LCA bracket on frame needed to be replaced at time of service - entire boot came off.
Incident	WCLAA240	N	TX176067	1998	Cm/Vic Police	06/08/1998	32809	Y				03/12/1998			R	Replaced upper ball joints at 22378, left was worn as well
Incident		Y	VX108415	1997	Cm/Vic Police	08/27/1998	24667	Y	Boston Municipal Police	MA	Natick Auto Sales	09/01/1998	09/14/1998	W3396	L	Boot tore off above ring - split in half
reaylor		N	TX198420	1998	Cm/Vic Police	06/17/1998	46087	Y	B7230-03D12	CAN	Fort Motors - Armand Tremblay	05/01/1998			L	
reaylor		Y - stud missing	VX168481	1997	Cm/Vic Police	04/08/1997	32399	Y	B7230-03D13	CAN	Fort Motors - Armand Tremblay	05/02/1998			R	Boot stayed on arm, tear on side, no sign of wind up
privater (NA Fleet)	WDFEK002	Y	VX118889	1997	Cm/Vic Police		39788	Y	City of Bow	OH	T.E. Clarke Ford	04/20/1998	12/10/1998	W5036	R	Boot stayed intact on arm, upper snap ring intact on ball stud.
reaylor		incoming to STAP		1998	Cm/Vic Police	04/24/1998		Y	Dole Fruit	AZ						
reaylor		incoming to STAP		1998	Cm/Vic Police	04/24/1998		Y	Dole Fruit	AZ						
reaylor		incoming to STAP		1998	Cm/Vic Police	04/24/1998		Y	Dole Fruit	CA						
reaylor		incoming to STAP		1998	Cm/Vic Police	04/24/1998		Y	Dole Fruit	CA						
lawnet		Y - ball joint only	TX162787	1998	Cm/Vic Police		48000	Y		AZ						
lawnet		Y - ball joint only	TX162850	1998	Cm/Vic Police		51000	Y		AZ						
Incident		Y	VX188847	1997	Cm/Vic Police	08/12/1997	18000	Y	Worcester	MA	Natick Auto Sales				R	Top ring rusted/damaged on

15,000 to 51,000

9 of 13 were police cars
 4 are police packages but on Dole Fruit cars, ^{design} in the fields

RC03-002 1763

113 **11D** **Special** **11E** **Review the Job, Overall Evidence, and/or Alternative Vehicle**
11A **11C** **11D** **11E** **11F** **11G** **11H** **11I** **11J** **11K** **11L** **11M** **11N** **11O** **11P** **11Q** **11R** **11S** **11T** **11U** **11V** **11W** **11X** **11Y** **11Z**

2A	What caused the problem? (Ex. brake/misaligned/machined incorrectly)		Team	08/08/1985		
2A	How does this cause the problem?		Team	TED		
2B	FORD system intended to prevent?		Team	TED		
2C	Why did this happen - why not prevented?		Team	TED		
3A	Lab tests					
		conduct ball joint organic, metallurgy, and dimensional analysis to determine whether released lubricants and bearing materials were present	ATRAMM			
3B	Vehicle tests					
		Review load of police vehicles due to proximity of traffic to brake.	PPEDRAH			
3C	Plant/Supplier Reports					
		review changes in control arm and spindle assembly as of Job 1 1886 for any variations that may affect boot seal integrity, placement of spindle on taper, torque on ball joint.	MWLLIAS			
3D	Other: 11D-11E-11F-11G-11H-11I-11J-11K-11L-11M-11N-11O-11P-11Q-11R-11S-11T-11U-11V-11W-11X-11Y-11Z	Review ADMS to verify whether linked to Crown Victoria Police Application	PPEDRAH GIDEANE			

RO03-002 1784

BE
3F

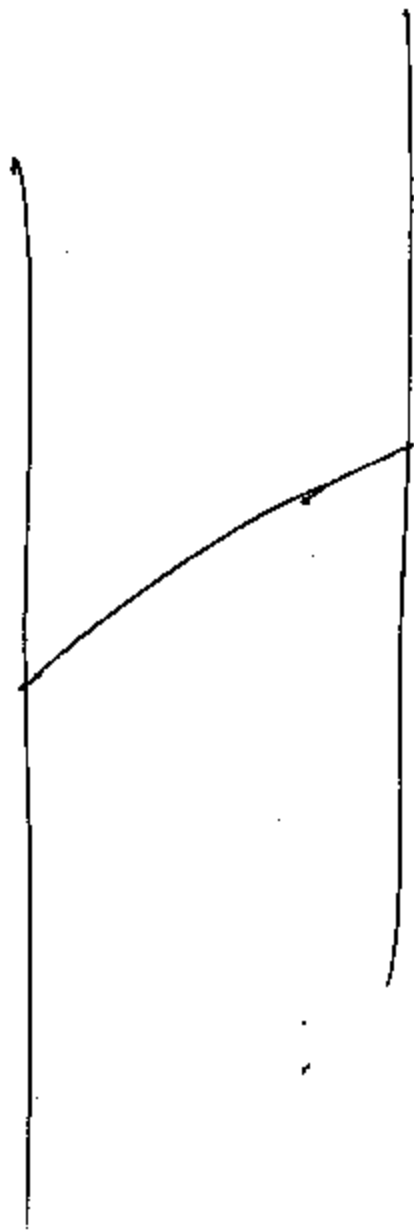
Field Reports	140 ACTION PLAN	LAUNCHER			
Parts Sales		PV800R			

Originator: P/Field No. / PROGRAM
[?]
[?]

Page 2 of 2
Date Printed: 09/08/1998

Date Created: 08/08/1998
Date Printed: 09/08/1998

ROB-902 1785



Appendix H: Study, Surveys and Investigations (Confidential)

Provided separately with a request for confidentiality.