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October 20, 2022

Mr. Stephen Ridella, Director  
Office of Defects Investigation  
National Highway Traffic Safety Administration  
1200 New Jersey Avenue SE, W45-302  
Washington, DC 20590

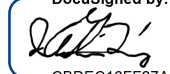
Dear Mr. Ridella:

Subject: RQ22-004: NEF-103my

The Ford Motor Company (Ford) response to the Agency's letter (received September 9, 2022) concerning reports of allegations of front brake jounce hose assembly failures in certain 2013-2018 model year Ford Fusion and Lincoln MKZ vehicles is attached.

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

Sincerely,

DocuSigned by:  
  
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For:  
Emily Frascaroli

Attachment

## FORD MOTOR COMPANY (FORD) RESPONSE TO RQ22-004

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 substantial effort to provide thorough and accurate information, and we would be pleased to meet with agency personnel to discuss any aspect of this Recall Query.

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

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

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

Answers to your specific questions are set forth below. As requested, after each numeric designation, we have set forth verbatim the request for information, followed by our response. Unless otherwise stated, Ford has undertaken to provide responsive documents dated up to and including September 9, 2022, the date of your inquiry. Ford has searched within the following offices for responsive documents: Sustainability, Environment and Safety Engineering, Ford Customer Service Division, Global Core Engineering, Office of the General Counsel and North American 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 (17-character VIN);
- b. Make;

- c. Model;
- d. Model Year;
- e. Date of manufacture (MM/DD/YYYY);
- f. Front brake hose part number, left;
- g. Front brake hose part number, right;
- h. Date warranty coverage commenced (MM/DD/YYYY); and
- i. The State in the United States where the vehicle was originally sold or leased, or delivered for sale or lease (postal abbreviation).

Provide the table in Microsoft Access 2010 and Microsoft Excel, or a compatible format, entitled "PRODUCTION DATA." A pre-formatted data collection file, which provides further details regarding this submission, will be provided to you.

### Answer

Ford records indicate that the approximate total number of 2013 through 2018 model year Ford Fusion and Lincoln MKZ vehicles sold in the United States (the 50 states and the District of Columbia), protectorates, and territories (American Samoa, Guam, Northern Mariana Islands, Puerto Rico, and Virgin Islands) is 1,726,734.

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

Model	2013 MY	2014 MY	2015 MY	2016 MY	2017 MY	2018 MY
Fusion	217,386	264,336	185,605	276,708	215,031	108,452
Fusion HEV	32,264	38,845	21,372	22,343	56,806	55,544
Fusion PHEV	6057	9632	8318	12,462	16,131	6252
MKZ	21,917	21,803	16,448	20,598	35,533	13,537
MKZ HEV	4896	10,496	7537	7281	8774	3833

The requested data is provided in Appendix A.

### 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;
  - d. Reports involving a fire;
  - e. Property damage claims; and
  - f. Third-party arbitration proceedings, both pending and closed, where Ford is or was a party to the arbitration; and
  - g. Lawsuits, both pending and closed, in which Ford is or was a defendant or codefendant.
- Please provide the counts as shown in Figure 1 on Page 5 (see the columns under "Request

2”).

For subparts “a” through “f, / g,” 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). For items “c” through “f, / g,” provide a summary description of the alleged problem and causal and contributing factors and Ford’s assessment of the problem, with a summary of the significant underlying facts and evidence. For items “e/f” and “f, / 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 purposes of identifying reports of incidents that may be related to the alleged defect and any related documents, Ford has gathered "owner reports" and "field reports" maintained by Ford Customer Service Division (FCSD) and claim and lawsuit information maintained by Ford's Office of the General Counsel (OGC).

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

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

Category	Definition
A1	Front brake jounce hose was leaking
A2	Front brake jounce hoses replaced under 22N02
A3	Front brake jounce hose had a bubble or bulge
B	Ambiguous brake system hose or line issue

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

Owner Reports: Records identified in a search of the GCCT database, as described in Appendix B, were reviewed for relevance and sorted in accordance with the categories described above. The number and copies of relevant owner reports identified in this search for the alleged defect are provided in the GCCT portion of the database contained in Appendix C. The categorization of each report is identified in the "Category" field.

When we were able to identify that responsive (i.e., not ambiguous) duplicate owner reports for an alleged incident were received, each of these duplicate reports was marked accordingly, and the group counted as one report. In 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.

Field Reports: Records identified in a search of the Common Quality Indicator System (CQIS) database, as described in Appendix B, were reviewed for relevance and sorted in accordance with the categories described above. The number and copies of relevant field reports identified in this search that allege front brake jounce hose leaking in a subject vehicle are provided in the CQIS portion of the database contained in Appendix C. The categorization of each report is identified in the "Category" field.

When we were able to identify that responsive 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 have more than one report associated with their VINs. These reports have been counted separately.

VOQ Data: Of the fifty (50) VOQs provided by the agency in the Information Request, five of the subject vehicle records did not have the full VIN reported so Ford is unable to search its databases for corresponding reports. For the remaining, Ford made inquiries of its GCCT database for customer contacts, its CQIS database for field reports, and its GSAR system for warranty repairs regarding the vehicles identified on the VOQs with full VINs. Reports where identified are provided in the database contained in Appendix C.

Crash/Injury/Fatality Incident Claims: NHTSA identified one report of accident allegation in the VOQs provided by the agency. The customer referenced an incident that happened 3 years ago: "pedal went to the floor. I took my car to Planet Ford and was told that my right front brake hose had a weak spot in the line and busted.....caused me to have a wreck." Ford did not find any customer contacts for this vehicle.

Ford identified one report of a "minor accident" due to a "pin hole leak in the brake line" pertaining to the alleged defect in subject vehicles, with no mention of injury. This report is included in the Lawsuits and Claims files, provided in Appendix D.

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

Lawsuits and claims gathered in this manner were reviewed for relevance and categorized in accordance with the categories described above.

We are providing the requested detailed information, where available, on the responsive and ambiguous lawsuits and claims in our Log of Lawsuits and Claims, provided in Appendix D. The number of relevant lawsuits and claims identified is also provided in this log. To the extent available, copies of complaints, first notices relating to matters shown on the log are provided in Appendix D. To the extent available, GCCT reports relating to matters shown on the log are

provided in Appendix C. With regard to these lawsuits and claims, Ford has not undertaken to contact outside law firms to obtain additional documentation.

Reports are summarized in Figure 1 in Appendix C. Categories A1, A2, and A3 are included in the "Relate To" sections of Figure 1 for subject vehicles as they indicate a front brake jounce hose leak, which is what Ford understands as the focus of the agency's request. Reports for Categories B are summarized in the "May Relate To" sections for 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), email address and telephone number (please use distinct fields for each data type);
- d. Vehicle owner or fleet street address, city, state (postal abbreviation), and ZIP code (please use distinct fields for each data type);
- e. Vehicle's 17-character VIN;
- f. Vehicle's make, model and model year (please use distinct fields for each data type);
- g. Vehicle's mileage at time of incident;
- h. Incident date (MM/DD/YYYY);
- i. Report or claim date (MM/DD/YYYY);
- j. Whether a crash is alleged;
- k. Whether a fire is alleged;
- l. Whether property damage is alleged;
- m. Number of alleged injuries, if any; and
- n. Number of alleged fatalities, if any.

Provide this information in Microsoft Access 2010 and Microsoft Excel, or a compatible format, entitled "REQUEST NUMBER TWO DATA." A pre-formatted data collection file, which provides further details regarding this submission, will be provided to you.

### Answer

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

### 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. Describe in detail the search methods and search criteria used by Ford to identify the items in response to Request

No. 2.

Answer

Ford is providing owner and field reports in the database contained in Appendix C in response to Request 2. To the extent information sought in Request 4 is available, it is provided in Appendix D.

Detailed descriptions of the search methods and criteria, including all pertinent parameters, used to identify the items provided in response to Request 2 are described in Appendix B.

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. Please provide the counts as shown in Figure 1 on Page 5 (see the column "Request 5").

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

- a. Ford's claim number;
- b. Vehicle owner or fleet name (and fleet contact person), email address and telephone number (please use distinct fields for each data type);
- c. Vehicle owner or fleet street address, city, state (postal abbreviation), and ZIP code (please use distinct fields for each data type);
- d. 17-character VIN;
- e. Repair date (MM/DD/YYYY);
- f. Vehicle mileage at time of repair;
- g. Repairing dealer's or facility's name, telephone number, city and state or ZIP code (please use distinct fields for each data type);
- h. Labor operation number(s);
- i. Problem code(s);
- j. Diagnostic trouble code(s);
- k. Replacement part number(s) and description(s);
- l. Concern stated by customer;
- m. Cause as stated on the repair order;
- n. Correction as stated on the repair order; and
- o. Additional comments, if any, by dealer/technician relating to claim and/or repair.

Provide this information in Microsoft Access 2010 and Microsoft Excel format when possible, or a compatible format, entitled "WARRANTY DATA." A pre-formatted data collection file, which provides further details regarding this submission, will be provided to you.

Answer

Records identified in a search of the GSAR and Concern Driven Reporting (CDR) databases, as described in Appendix B, were reviewed for relevance and sorted in accordance with the categories described in the response to Question 2. The number and copies of relevant warranty claims identified in this search that may relate to the alleged defect in a subject vehicle are provided in the GSAR portion of the database contained in Appendix C. The categorization of each report is identified in the "Category" field.

When Ford was 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 have more than one claim associated with their VINs. These claims have been counted separately.

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

Reports are summarized in Figure 1 in Appendix C. Categories A1, A2, and A3 are included in the "Relate To" sections of Figure 1 for subject vehicles as they indicate a front brake jounce hose leak, which is what Ford understands as the focus of the agency's request. Reports for Categories B are summarized in the "May Relate To" sections for subject vehicles.

Request 6

Describe in detail the search methods and search criteria used by Ford to identify the claims in response to Request No. 5, including the labor operations, problem codes, diagnostic trouble codes, part numbers and any other pertinent parameters used.

Answer

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

Request 7

Provide a list of all labor operations, labor operation descriptions, problem codes, and problem code descriptions, diagnostic trouble codes and diagnostic trouble code descriptions applicable to the alleged defect in the subject vehicles. State whether the diagnostic trouble codes are automatically reported to the warranty database electronically or manually entered into the warranty database by a claims administrator.

Answer

There are no specific DTC codes applicable to the alleged defect in the subject vehicles. Information applicable to specific claims as requested above can be found in Appendix C. Diagnostic trouble codes are manually entered into the warranty database by the claim administrator.

Request 8

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

For 2013-2018 model year Fusion, the New Vehicle Limited Warranty, Bumper-to-Bumper Coverage began at the warranty start date and lasted for three years or 36,000 miles, whichever occurred first. For 2013-2018 model year MKZ, the New Vehicle Limited Warranty, Bumper-to-Bumper Coverage began at the warranty start date and lasted for four years or 50,000 miles, whichever occurred first.

There are no Optional Extended Service Plans (ESPs) available to cover the brake jounce hoses.

Ford has launched Customer Satisfaction Program 22N02 for Certain 2013-2018 Model Year Fusion and Lincoln MKZ Vehicles built between February 3, 2012, and July 19, 2017, for front brake jounce hose replacement. This program provides a no-cost, one-time repair (if needed) to the front brake flexible hoses for 10 years of service or 150,000 miles from the warranty start date of the vehicle, whichever occurs first.

Request 9

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. State the maintenance recommendation (frequency of inspections and replacements) of the subject components.

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

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

OASIS Messages: Ford identified no TSBs that may relate to the agency's request.

Internal Service Messages: Ford identified no ISMs that may relate to the agency's request.

Field Review Committee: Ford has identified one field service action communication that may relate to the agency's request (reference Customer Satisfaction Program 22N02).

Ford currently has no plans to issue communications in the next 120 days related to the alleged defect that is the subject of NHTSA's investigation. Copies of Ford's Field Review Committee communication described above is provided in Appendix H.

#### Request 10

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 and the defect identified in the previously mentioned recall 20V-469, 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;
- f. A brief summary of the findings and/or conclusions resulting from the action; and
- g. For each failed front brake hose examined by Ford, provide a description, photos/videos of which hose failed. Provide a diagnosis or determination of the failed component and root cause.

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

#### Answer

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

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

Ford is submitting additional responsive documentation in Appendix F with a request for confidentiality under separate cover to the agency's Office of the Chief Counsel pursuant to 49

CFR Part 512. Redacted copies of the confidential documents will be provided in Appendix F and are labeled "Public."

In the interest of ensuring a timely and meaningful submission, Ford is not producing materials or items containing little or no substantive information. Examples of the types of materials not being produced are meeting notices, raw data lists (such as part numbers or VINs) without any analytical content, duplicate copies, non-responsive elements of responsive materials, and draft electronic files for which later versions of the materials are being submitted.

Ford is not producing documents responsive to this request that are protected from disclosure by attorney-client privilege, work-product doctrine, or other applicable immunity. Documents protected from disclosure on these bases are described in a privilege log contained in Appendix G.

Through this method, Ford is seeking to provide the agency with substantive responsive materials in our possession in the timing set forth for our response. We believe our response meets this goal. If the agency would like additional materials, please advise.

#### Request 11

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

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

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

#### Answer

Ford understands this request to relate to the subject components which relate to, or may relate to, the alleged defect in the subject vehicles. This information is provided in Appendix I.

#### Request 12

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), model and model year of the vehicle in which it is used 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.

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, any other vehicles of which Ford is aware that contain the identical component, whether installed in production or in service, and state the applicable dates of production or service usage.

#### Answer

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

Ford is providing the total number of Ford service replacement brake hose assemblies by part number (both service and engineering), year of sale, where available, and supplier point of contact information in Appendix J.

Ford notes that the subject component parts are not used on other Ford vehicle lines.

#### Request 13

Describe in detail how the subject components in the subject vehicles and the previously mentioned recalled vehicles (20V-469) are similar and/or different in their design. Provide the design specifications for the subject components in both the subject and recalled vehicles.

#### Answer

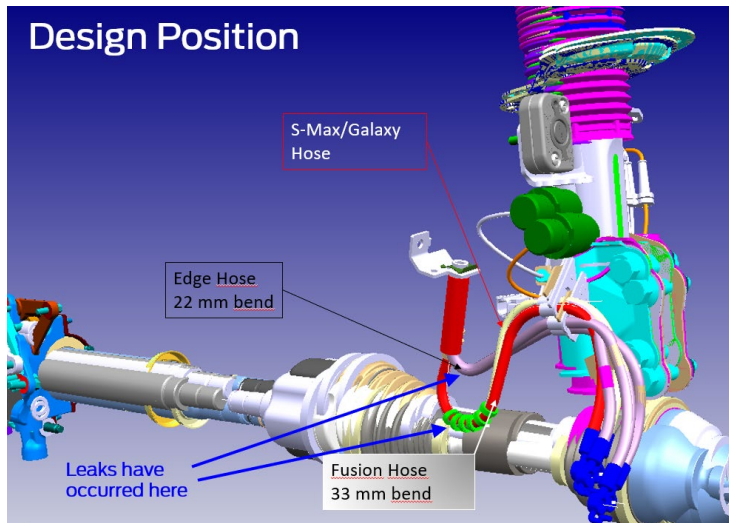
Some design differences between Fusion/MKZ and Edge/MKX are as follows:

1. Edge has a tighter bend radius (22 mm) in design position versus Fusion (33 mm)
2. Dynamic loop length: Fusion 285 mm Vs Edge 234 mm
3. Edge has a routing sleeve on the dynamic loop section, Fusion does not.
4. Fusion has over molded rings on the dynamic loop section, Edge does not.
5. Edge has the frame bracket included in the assembly of the brake tube side fitting, Fusion does not.

The requested Design Specifications for the subject components in both the subject vehicles and the recalled vehicles are included in the engineering drawings provided in Appendix K.

The Fusion and MKZ brake hose internal reinforcement braid material was changed from Poly Vinyl Alcohol (PVA) to Polyethylene Terephthalate (PET) in February 2016 for vehicles built at Ford's Flat Rock Assembly Plant (FRAP) and July 2017 for vehicles built at Ford's Hermosillo Assembly Plant (HSAP), to be common with other components coming from the same supplier.

PVA is identified in the drawings as supplier hose part number HCI-32184 and PET is identified as supplier hose part number HHPH-04270.



#### Request 14

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

- a. The causal or contributory factor(s); including the contributions of environmental conditions (e.g., ambient temperature) and the effects of the operating conditions on maximum operating temperatures for the inner and outer hose material at the caliper side crimp of the subject hose assemblies.
- b. The failure mechanism(s); including short and long term thermal limits for the inner and outer hose material;
- c. The failure mode(s);
- d. The risk to motor vehicle safety that it poses; and
- 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 VOQ reports included with this inquiry, including the counts as shown in Figure 1 on Page 5 (see the column "Request 13").

#### Answer

##### Root Cause

Although the root cause is not fully understood, analysis determined that the leak in the brake jounce hoses occurs from a consistent localized failure of the internal reinforcement braid caused by cyclic fatigue via tensile/bending and torsional inputs during suspension and steering articulations. This causes increased work inside the hose braid leading to fatigue failure of the braids, causing a pin hole leak in the inner rubber layer, and ultimately a fluid leak. The rate of failure is proportional to the amount of steering and suspension inputs "work done" to the hose

by the suspension and steering motion. Some customers have experienced a leaking hose on both left and right sides at different times suggesting this is a usage issue.

Regarding the agency's question about the maximum operating temperature of the hose, the hose material on the subject components is designed to withstand 120 degrees Celsius (248 F) which is within the operating temperatures on these vehicles.

#### Data

Ford's assessment of the alleged defect in the subject vehicles is guided by data we have received related to the concern. Ongoing analysis of vehicles sharing a similar jounce hose design as the previously recalled populations described below has identified significantly lower 10-year projections than those covered under the prior Safety Recalls (70 R/1000 for vehicles previously recalled compared to 14 R/1000 for vehicles not recalled). Among this population of vehicles not covered by prior safety recalls, our investigation has identified that vehicles with certain engines have a relatively higher projected rates than other engines. (Analysis of the influence of engine type on the performance of the brake jounce hose is ongoing):

- a) U.S. Fusion vehicles with 2.0L GTDI, 1.5L GTDI, and 2.7L DOHC = 34 R/1000 for 10yr/150k projection
- b) U.S. Fusion vehicles with 2.5L DOHC, 2.0L DOHC Hybrid, 1.6L PI Ethanol = 3 R/1000 for 10yr/150k projection
- c) U.S. MKZ vehicles with 2.0L GTDI, 3.7L DOHC, 3.0L GTDI = 35 R/1000 for 10yr/150k projection

Based on this data and discussions with NHTSA on the progress of this investigation, an extended warranty program was approved for the Fusion and MKZ vehicles with certain engines ("a" and "c" above). Ford launched Customer Satisfaction Program 22N02 for certain 2013-2018 model year Fusion and MKZ vehicles built between February 3, 2012, and July 19, 2017, for front brake jounce hose replacement. This extended warranty program provides a no-cost, one-time repair (if needed) to the front brake jounce hoses for 10 years of service or 150,000 miles from the warranty start date of the vehicle, whichever occurs first. Since the customer can continue to safely stop the vehicle, and the rate of failure is significantly lower than in vehicle populations covered by previous safety recalls, Ford believes an extended warranty is an appropriate way to remedy the subject vehicles should they experience a concern.

#### Other Actions

In January 2018, Ford approved Field Service Action (FSA) 18S03 for front brake jounce hose leaks on Fusion, Mondeo & Edge vehicles in the China and South America markets based on certain unique road/parking conditions and driving habits contributing to elevated warranty rates of front brake jounce hose leaking at a lower time in service and a projected 500-700 R/1000 at 10 years in service. Ford continued to monitor and investigate reports globally for vehicles not included in the prior service actions.

In August 2020, after continued monitoring of rates over time related to front brake jounce hose leaks, Ford approved FSA 20S42 on Edge and MKX vehicles in the North America due to a projected repair rate of 70 R/1000 at 10 years in service.

Although a progressive leak in a front brake jounce hose may increase brake pedal travel, these vehicles are equipped with two isolated brake circuits allowing the vehicle to be stopped safely if one circuit is leaking. While the vehicles can be stopped safely, due to a high projected rate of repairs, Ford issued a safety recall on these vehicle populations.

As a containment action, the brake hose material was changed in production globally between December 2016 and October 2018 depending on the vehicle and assembly plant, leading to an improved jounce hose fatigue life on the test rig by a factor of 4-5 times over the original hose. The brake hose construction consists of 5 layers: 2 layers of yarn braiding sandwiched between 3 layers of EPDM rubber. The Fusion and MKZ brake hose internal reinforcement braid material was changed from Poly vinyl alcohol (PVA) to Polyethylene terephthalate (PET) in February 2016 for vehicles built at FRAP and July 2017 for vehicles built at HSAP, to be common with other components coming from the same supplier.

In addition, robustness actions to revise the routing of the hose while maintaining the improved material have resulted in an improved jounce hose fatigue life on test rig by a factor of more than 12 times over the original hose.

#### Effect on Vehicle Operation and Warnings

If the brake hose is leaking, the driver may experience an increase in pedal travel. If the customer continues to drive the vehicle, and the level of brake fluid in the master cylinder reservoir becomes low, the red brake warning indicator light will illuminate. Over time, if the brake fluid in one circuit of the master cylinder becomes empty, the driver will experience a reduction in the rate of deceleration. The brake system is split diagonally, and one circuit in the master cylinder is isolated (protected) and will always have fluid, so two of the vehicle's four brakes will always work if a hose is leaking.

#### Ford Test Drive

Ford installed a field return hose that exhibited the alleged defect (leaking) on one of the subject Fusion vehicles. The brakes initially behaved normally for two separate drivers during 10 medium to heavy brake applications. One driver succeeded in causing the ABS to activate during a simulated emergency stop. The driver then noticed that the brake pedal travel was longer after the vehicle was stopped. Following the ten brake applications the red brake warning light came on, and the brakes continued to function, with a longer pedal, giving the driver time to stop safely before losing all the brake fluid in the one leaking circuit. This Ford test drive confirmed that a customer who experiences a leaking front brake jounce hose will receive overt warnings (a longer brake pedal and a red brake warning light) before experiencing reduced brake performance.

#### VOQs

Most of the VOQs provided by the agency in this Information Request allege a longer brake pedal travel and reduced braking. In order to better understand the customer's experience Ford obtained permission to contact two customers who wrote VOQs alleging reduced braking due to leaking front brake hoses. NHTSA provided the customer contact information. The details of these two interviews are as follows:

#### Customer #1 - 2015 Fusion

First Incident: the customer noticed a change in the brake pedal feel when he slowed down for a speed bump. He drove home carefully and found the driver's side front hose was split and leaking. He installed a new hose.

Second Incident: at a later date, the customer was driving on the highway and pressed the brake pedal to disengage cruise control and noticed the brake pedal did not feel normal, the pedal travel was longer. He drove home carefully and noticed fluid leaking on the ground and the brake fluid reservoir was empty. He does not remember if the brake light was on. He replaced the leaking hose himself. He indicated in the interview that the brakes were working but did not want to brake hard because he did not have confidence in them. He was aware of the Edge recall and was wondering if this hose was similar and created the VOQ so that NHTSA would be aware of this incident.

#### Customer #2 - 2017 Fusion

The customer noticed the brake pedal was spongy for a day or two before the incident. He never saw fluid leaking. One day he noticed the brake light was on in the morning and the brake pedal travel was longer than normal so he drove the car carefully to a mechanic. He indicated in the interview that the brakes were working but he did not want to brake hard because he did not have confidence in them.

The two customers interviewed both indicated a loss of confidence in the brake system; however, customers chose to continue to drive the vehicle cautiously and indicated that they did not lose the ability to stop. This feedback from VOQ customers is consistent with the findings of our vehicle test drive at Ford and supports Ford's assessment that this is a progressive issue and customers can safely stop and park the vehicle after they realize the brake pedal travel has become longer and the red brake light has come on.

#### Conclusion

Ford has identified only one VOQ alleging an accident related to a front brake jounce hose leak with no injuries resulting from the accident. Our investigation identified only one Ford report alleging "there was a minor accident" pertaining to the alleged defect in subject vehicles, with no mention of injury, on a population of over 1.7 million vehicles that are up to ten years old. Although a progressive leak in a front brake jounce hose may increase brake pedal travel, these vehicles are equipped with two isolated brake circuits allowing the vehicle to be stopped safely if one circuit is leaking. Given the field performance, low projected rates (10yr/150K miles), and severity of the failure, Ford has concluded that this does not present an unreasonable risk to motor vehicle safety in these vehicles.

Ford believes the actions already taken (robustness related design changes, and extended warranties), are sufficient to address the customer complaints relating to this issue.