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August 24, 2016

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

Dear Mr. Ridella:

Subject: PE16-008:NEF-120bes

The Ford Motor Company (Ford) response to the Agency's July 13, 2016 letter concerning reports of alleged exhaust odor in the vehicle cabin in 2011 through 2015 model year Ford Explorer vehicles is attached.

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

Sincerely,

A handwritten signature in blue ink, appearing to read "Wayne Bahr".

Handwritten initials "WB" in blue ink.

Wayne Bahr

Attachment

FORD MOTOR COMPANY (FORD) RESPONSE TO PE16-008

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

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

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

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

Answers to your specific questions are set forth below. As requested, after each numeric designation, we have set forth verbatim the request for information, followed by our response. Unless otherwise stated, Ford has undertaken to provide responsive documents dated up to and including July 13, 2016, the date of your inquiry. Ford has searched within the following offices for responsive documents: Sustainability, Environment and Safety Engineering, Ford Customer Service Division, Quality, 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 (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 2010, 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 2011 through 2015 Ford Explorer 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 839,635.

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

Model	2011 MY	2012 MY	2013 MY	2014 MY	2015 MY
Ford Explorer	82,480	86,489	238,711	208,378	223,577

The requested data for each subject vehicle 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. Property damage claims;
- e. Third-party arbitration proceedings where Ford is or was a party to the arbitration;
- f. Vehicle repurchases in accordance with state "lemon law" or similar programs; and
- g. Lawsuits, both pending and closed, in which Ford is or was a defendant or codefendant.

For subparts "a" through "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).

In addition, for items "c" through "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 "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	Allegation
A	Allegations of CO/Exhaust Odor in Vehicle
B1	Allegations of Propane/Natural Gas/Sulfur Odor in Vehicle
B2	Unknown/Ambiguous Odor Allegations in Vehicle Cabin

Ford notes that unrelated conditions associated with the Power Transfer Unit (PTU) or the vehicle cooling system may exhibit an odor that some customers describe as like propane or natural gas in the passenger compartment, similar to what customers may also describe as an exhaust odor. We are providing electronic copies of these reports along with other ambiguous odor claims 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 FMC360 Owner Relations System, as described in Appendix B, were reviewed for relevance and sorted in accordance with the categories described above. The number and copies of relevant owner reports identified in this search that allege exhaust odors inside the vehicle cabin in a subject vehicle are provided in the FMC360 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.

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

Field Reports: Records identified in a search of the Common Quality Indicator System (CQIS) database, as described in Appendix B, were reviewed for relevance and sorted in accordance

with the categories described above. The number and copies of relevant field reports identified in this search that allege exhaust odors inside the vehicle cabin 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. In addition, field reports that are duplicative of owner reports are provided in Appendix C but are not included in the field report count.

VOQ Data: This information request had an attachment that included 154 Vehicle Owner Questionnaires (VOQs), 97 of which were duplicative. Ford made inquiries of its FMC360 database for customer contacts, and its CQIS database for field reports regarding the vehicles identified 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.

Crash/Injury/Fatality Incident Claims: For purposes of identifying allegations of accidents or injuries that may have resulted from the alleged defect, Ford has reviewed responsive owner and field reports, and lawsuits and claims. While there were no reports of physical injury related to this investigation, Ford did identify one claim with a Vehicle Identification Number (VIN) of 1FM5K7D85EC [REDACTED] that contained an allegation of a fatality. However, Ford does not believe this is related to the alleged defect. Records available from the dealership related to this allegation indicate that a death certificate produced by the customer stated that the alleged fatality was the result of a stroke that occurred at or near the time the vehicle was first purchased. This timing offered very little or possibly no opportunity for the deceased to even experience an exhaust odor in the vehicle. This is further evidenced by the approximately 16 months that passed before this exhaust allegation was made to the dealership. Ford requested additional information from the complainant related to this claim but has not received any such information. Due to the lack of response and review of other available documentation related to this claim, Ford closed this matter and believes the circumstances and timing of these events demonstrate that these two incidents are independent and this unfortunate life event was not related to the alleged defect. Ford also identified one owner report with a Vehicle Identification Number (VIN) of 1FM5K8D83DG [REDACTED] that contained an allegation of a crash that resulted after the driver allegedly passed out due to exhaust fumes entering the vehicle. This report was duplicative of two VOQs provided by the Agency and did not result in any injuries. Copies of reports corresponding to these alleged incidents are provided in the FMC360 and Analytical Warranty System (AWS) portions of the database provided in Appendix C and a copy of the claim is provided in Appendix E.

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

Lawsuits and claims gathered in this manner were reviewed for relevance and sorted in accordance with the categories described above. Ford has also located other lawsuits, claims, or consumer breach of warranty lawsuits, each of which is ambiguous as to whether it meets the alleged defect criteria. We have included these lawsuits and claims as "non-specific allegations" for your review because of the broad scope of the request. Based on our

engineering judgment, the information in these lawsuits and claims is insufficient to support a determination that they pertain to the alleged defect.

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 C in the Legal Claim/Lawsuits tab. The number of relevant lawsuits and claims identified is also provided in this log. To the extent available, copies of complaints, first notices, or FMC360 reports relating to matters shown on the log are provided in Appendix E. With regard to these lawsuits and claims, Ford has not undertaken to contact outside law firms to obtain additional documentation.

Additionally, the Agency has requested information related to vehicle repurchases in accordance with state "lemon law" or similar programs. Ford has provided this information in the "NHTSA Comments" field of the database provided in Appendix C. When we were able to identify duplicate reports for a buyback vehicle, each of these duplicate reports was marked accordingly, and the group counted as one buyback.

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; and
- l. Number of alleged fatalities, if any.

Provide this information in Microsoft Access 2010, 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 C in the Legal Claim/Lawsuits tab.

Request 4

Produce electronic 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. Copies of complaints, first notices, or FMC360 reports relating to matters shown on the Log of Lawsuits and Claims provided in Appendix C in the Legal Claim/Lawsuits tab. To the extent information sought in Request 4 is available, it is provided in the referenced appendices.

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. Number of prior repair attempts to this specified VIN for the same complaint;
- 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. Comments, if any, by dealer/technician relating to claim and/or repair.

Provide this information in Microsoft Access 2010, 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 AWS database, as described in Appendix B, were reviewed for relevance and sorted in accordance with the categories described in the response to Request 2. The number and copies of relevant warranty claims identified in this search that allege exhaust odors inside the vehicle cabin in a subject vehicle are provided in the AWS 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 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. Warranty claims that are duplicative of owner and field reports are provided in Appendix C but are not included in the report count above.

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 FMC360 reports identified above in response to Request 2. Such claims that were honored are included in the warranty data provided.

Request 6

Describe in detail the search criteria used by Ford to identify the claims identified in response to Request 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, 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.

State, by make and model year, the terms of the new vehicle warranty coverage offered by Ford on the subject vehicles (i.e., the number of months and mileage for which coverage is provided and the vehicle systems that are covered). Describe any extended warranty coverage option(s) that Ford offered for the subject vehicles and state by option, model, and model year, the number of vehicles that are covered under each such extended warranty.

Answer

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

To the extent available, all labor operation descriptions, problem codes, diagnostic trouble codes, and applicable descriptions for the claims provided in response to Request 5 are in Appendix C. Ford notes that diagnostic trouble codes are entered into the warranty database manually at the dealership.

For 2011 through 2015 model year Ford Explorer vehicles, the New Vehicle Limited Warranty, Bumper-to-Bumper Coverage begins at the warranty start date and lasts for three years or 36,000 miles, whichever occurs first. No Optional Extended Service Plans that include coverage for the exhaust system or rear hatch seal are available on the Ford Explorer.

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 exhaust odors inside the vehicle cabin 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 CQIS; and Field Review Committee (FRC) files. We assume this request does not seek information related to electronic communications between Ford and its dealers regarding the order, delivery, or payment for replacement parts, so we have not included these kinds of information in our answer.

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

OASIS Messages: Ford has identified two TSBs that may relate to the Agency's request and is providing copies of them in Appendix F1. Ford has not identified any SSMs that may relate to the Agency's request.

Internal Service Messages: Ford has identified two ISMs that may relate to the Agency's request and is providing copies of them in Appendix F2.

Field Review Committee: Ford has not identified any field service action communications that may relate to the Agency's request.

Ford is currently planning to consolidate and republish certain ISMs and TSBs above in the near future to further aid technicians in properly identifying and repairing this condition. Ford is currently in process of developing this TSB and will provide the Agency with a draft copy as soon as one becomes available.

Request 8

Describe all assessments, analyses, tests, test results, studies, surveys, simulations, investigations, inquiries and/or evaluations (collectively, "actions") that relate to, or may relate to, the alleged defect in the subject vehicles that have been conducted, are being

conducted, are planned, or are being planned by, or for, Ford. For each such action, provide the following information:

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

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

Answer

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

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 responsive documentation in Appendix H 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 under separate cover, on separate media, to the Agency's Office of Chief Counsel as Appendix H – Redacted.

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 I.

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. 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 9

Describe all modifications or changes made by, or on behalf of, Ford in the design, material composition, manufacture, quality control, and supply of vehicle components or software from the start of production to date, which relate to, or may relate to, the

alleged defect in the subject vehicles. For each such modification or change, provide the following information:

- a. The date or approximate date on which the modification or change was incorporated into vehicle production;
- b. A detailed description of the modification or change;
- c. The reason(s) for the modification or change;
- d. The part numbers (service and engineering) of the original component;
- e. The part number (service and engineering) of the modified component;
- f. The revision level of the original software (software items only);
- g. The revision level of the updated software (software items only);
- h. Whether the original unmodified component was withdrawn from production and/or sale, and if so, when;
- i. When the modified component was made available as a service component; and
- j. 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 is providing a table summarizing the requested changes in Appendix J.

Ford currently has no plans for modifications related to the subject components in the subject vehicles.

Request 10

State the number of each of the following components that Ford has sold, that may have been used in conjunction with the application of Ford TSB 12-12-4 and/or Ford TSB 14-0130 in the subject vehicles, by component name, part number (both service and engineering/production), model and model year of the vehicle in which it is used and month/year of the sale (including the cut-off date for sales, if applicable).

- a. Air extractor assembly – left hand side;
- b. Air extractor assembly – right hand side;
- c. Rear hatch drain valve; and
- d. Rear hatch opening gasket

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-Mercury dealers. Ford has no means to determine how many of the parts were actually installed on vehicles, the vehicle model or model year on which a particular part was installed, the reason for any given installation, or the purchaser's intended use of the components sold.

Ford is providing the total number of Ford service replacement air extractor assemblies, rear hatch drain valves, and rear hatch opening gaskets by part number (both service and engineering) and year and month/year (last three years only) of sale, where available, and supplier point of contact information in Appendix K.

Request 11

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

- a. The causal or contributory factor(s);
- b. The failure mechanism(s);
- c. The failure mode(s);
- d. The risk to motor vehicle safety that it poses;
- e. What warnings, if any, the operator and the other persons both inside and outside the vehicle would have that the alleged defect was occurring or subject component was malfunctioning; and
- f. The reports included with this inquiry.

AnswerBackground and Investigation

Ford first became aware of concerns of exhaust odor in the cabin of the subject vehicles through customer complaints and warranty claims analysis. Ford engineering then located a management lease vehicle where the customer had complained of exhaust odor in the cabin for testing. Subsequent evaluation and testing revealed that a slight exhaust odor could be detected in the cabin under very specific driving conditions which included wide open throttle (WOT) events with the vehicles climate control system in the recirculation mode. Testing also showed that this odor would dissipate within approximately ten seconds of the WOT event. Further investigation revealed that a combination of factors contributed to the potential for a more detectable exhaust odor under these specific driving conditions. First, the fuel enrichment used for the exhaust catalyst protection strategy commonly used during wide open throttle events caused a more detectable odor being emitted from the tailpipe. Second, a negative cabin pressure was created from the vehicle climate control system being in recirculation mode. Ford notes that the vehicle drive cycle necessary to reproduce this condition is beyond what Ford would consider normal or typical customer usage.

To further evaluate what the vehicle occupants smelled as well as the effect on air quality in the vehicle cabin, the exhaust constituents were measured. As expected, the exhaust was comprised of odorless carbon monoxide as well as many different components that could potentially cause an odor such as sulfur dioxide, hydrogen sulfide, nitrogen oxide, and many others. Next, carbon monoxide detectors were installed in the rear most seating position of

both the complaint vehicle as well as a Ford test vehicle. Both vehicles were driven using the same drive cycle discussed above with multiple WOT events in succession with the climate control system in recirculation mode and the carbon monoxide levels were measured. The maximum level of carbon monoxide in the rear seating position of the complaint vehicle occurred when the vehicle was subjected to a WOT event with the climate control in recirculation mode and measured approximately 8 parts per million (ppm) and quickly dissipated. Ford notes that a similarly equipped test vehicle exhibited even lower levels of carbon monoxide in the rear seating position during testing. These results are well below Ford's internal air quality standards as well as the Global Vehicle Interior Air Quality Standard that allows continuous exposure to carbon monoxide for an hour at a level of 25 ppm. Results are also well below any other known air quality standards such as the Consumer Product Safety Commission's Indoor Environment Standard, or the Occupational Safety and Health Administration (OSHA) Standard which allows an average permissible exposure level (PEL) of up to 50 ppm for 8 consecutive hours. Therefore, despite the potential for a very small amount of exhaust odor to enter the cabin of the subject vehicles, the amount of carbon monoxide associated with that exhaust is clearly at a level that is not harmful to vehicle occupants. A summary of known carbon monoxide standards along with Ford's test results and internal engineering test procedures and standards have been provided in Confidential Appendix L with a request for confidentiality under separate cover to the Agency's Office of the Chief Counsel pursuant to 49 CFR Part 512.

To reduce customer dissatisfaction associated with this condition, Ford evaluated ways to reduce the likelihood that exhaust odor could enter the vehicle despite there being no harmful effects to vehicle occupants and the limited number of customers that would potentially be affected by this condition. It was determined that there were several locations near the rear lift gate hatch that could potentially allow exhaust odors to enter the vehicle cabin. The rear air extractor vent, the rear lift gate drain holes (used to allow drainage while applying e-coat in manufacturing), and some minor seams or gaps created during vehicle assembly. Ford engineering immediately began work on developing special drain hole plugs, a redesigned air extractor, and a method of sealing any seams or gaps that may be present that could allow exhaust odor to enter the vehicle cabin when negative cabin pressure is created by the usage and drive cycle discussed above. A pilot study was conducted and indicated a 100% customer satisfaction rating of these repairs, so Ford issued a Technical Service Bulletin (TSB) to all dealers to alert them of these new service parts and provide a step-by-step repair procedure to install them and seal the vehicle.

Ford continued to monitor field data which, over time, indicated that the TSB was approximately 85% effective, leaving a small percentage of customers unsatisfied with the service. It should be noted that there is a wide variation in the olfactory sensitivity across the population, and therefore some customers are more sensitive and able to detect odors than others. Ford continued to evaluate ways to mitigate the likelihood of exhaust odor entering the cabin of the vehicle. As a result, Ford developed a modification to the heating, ventilation, and air conditioning (HVAC) module strategy that would briefly override the recirculation mode during WOT events. This strategy not only reduced the negative cabin pressure of the vehicle, but also allowed fresh air to be introduced into the cabin of the vehicle. Similar to the previous repairs, Ford issued an updated TSB to dealers that included an additional step in the repair procedure of updating the HVAC module with this new calibration. Field data indicated that this added calibration was 95% effective in addressing customers concerns, leaving only a very small number of customers who continued to be unsatisfied despite these repair attempts. Ford then revised the HVAC strategy to open the recirculation door even sooner during a WOT event to introduce even more fresh air into the cabin. In addition, Ford also released an Internal Service Message (ISM) notifying dealers that a revised muffler

assembly containing downturned exhaust tips was available for service if necessary. This muffler design was developed for hot markets outside of the U.S. where opening the recirculation door during WOT events was not feasible due to the negative affect on climate control performance that would be caused by introducing extremely hot fresh air into the vehicle cabin. Ford has provided all of these part changes and TSBs and ISMs in our response to Requests 9 and 7 respectively.

Third Party Involvement

Ford contracted an independent third party to investigate Ford Explorer vehicles and measure, among other things, the carbon monoxide levels inside the vehicle under various driving scenarios, and evaluate the overall condition of the rear body structure of the vehicle for potential exhaust ingress locations.

Four Explorer vehicles were selected for testing. Each of these vehicles were instrumented with carbon monoxide (CO) detectors on the driver's headrest and the rear third row driver side headrest. The instrumented vehicles were driven on a route that included several WOT accelerations and approximately 40 minutes of driving time.

1. The first Explorer tested was a complaint vehicle that had been repurchased by Ford in which the TSB repairs had been properly performed as evidenced by an inspection of the rear of the vehicle. This vehicle did not register any measureable level of CO in either the front or rear seating position.
2. The second Explorer tested was a complaint vehicle in which further inspection revealed the TSB repairs had only partially been performed as there was no underbody sealant or lift gate drain valves installed. This vehicle registered a brief maximum CO level of 7 ppm in the rear seating position that quickly dissipated resulting in an average of less than 1 ppm over the duration of the test drive.
3. The third Explorer tested was a non-complaint vehicle in which visual inspection confirmed that none of the TSB repairs had been performed and that the vehicle had previously been involved in a rear end collision. This vehicle also measured a brief maximum CO level of 7 ppm in the rear seating position that quickly dissipated resulting in an average of less than 1 ppm over the duration of the test drive.
4. The fourth Explorer tested was a non-complaint vehicle in which visual inspection confirmed that none of the TSB repairs had been performed and that the vehicle had previously been involved in a rear end collision. This vehicle measured a brief maximum CO level of 16 ppm in the rear seating position that also quickly dissipated resulting in an average of approximately 4.5 ppm over the duration of the test drive.

Similar to Ford's testing; all of these vehicles are well below any standard for carbon monoxide exposure. In addition, Ford notes that the independent investigator stated not only that the maximum CO levels recorded were "momentary" and dissipated rather quickly, but that when each of these vehicles was driven as he would "normally drive [his] personal vehicle" in a manner "consistent with current traffic patterns and safe driving habits," the level of CO recorded was 0 ppm. The full test report and results summarized above have been provided in Appendix M.

These results clearly confirm Ford's testing that demonstrates even with none of the vehicle repairs outlined in the published TSB performed, the level of CO potentially in the vehicle is

well below a level that is harmful to vehicle occupants. This is true even in extreme cases where not only have the TSB actions not been performed; but the vehicle has also been damaged in a rear end collision such as test vehicle number 3 and 4 above. In addition, due to the very unique drive cycle necessary to, in some cases, allow exhaust odor to be detected in the cabin of the vehicle, only a small percentage of drivers would even experience this odor. This is highlighted by the fact that both test vehicles number 3 and 4 tested above had never reported any type of exhaust odor inside the vehicle. Furthermore, when properly performed, the actions Ford has taken to date are extremely effective in eliminating the potential for exhaust odor and CO to enter the vehicle cabin.

Report Review

In response to this inquiry, Ford also conducted an extensive search of consumer complaints, field reports, lawsuits and claims, and warranty claims for reports alleging exhaust odor in the cabin of the subject vehicles. These reports indicate that a very small number of customers have alleged exhaust odor in the vehicle cabin. Report analysis shows that approximately 0.29% of all 2011 through 2015 model year Explorer owners have complained of some sort of exhaust odor in their vehicle (categorized as "A") including Agency VOQs. Even if reports of ambiguous odors (categorized as "B1" and "B2") are included in this analysis, the resulting percentage is still very low at 0.38% of all vehicle owners. This is consistent with Ford and independent testing discussed above that shows the potential for this condition only occurs under a very unique drive cycle that would only affect a very small number of vehicle owners.

Further analysis also shows that, after an initial spike in reports early in the life of each model year of vehicles, the number of reports shows a steadily declining trend. This further supports Ford's position that the actions taken through various TSBs have been extremely effective in addressing this customer satisfaction concern.

While there are no physical injuries associated with these reports, Ford notes that an extremely low percentage of customers (0.01%) also allege some form of occupant discomfort such as headaches, nausea, or sickness as a result of this condition. However, there has been no evidence to support that this discomfort is a result of exhaust odor or carbon monoxide in the vehicle cabin and not due to some other factor such as general sickness, or nausea to passengers from the potentially atypical driving habits required to duplicate this condition, or other odors commonly attributed to new vehicles.

Conclusions

Ford's analysis of the alleged defect on the subject vehicles shows that a very small number of customers are affected by the potential for exhaust odor to enter the vehicle cabin. This is supported by the very low percentage of customers who have complained of exhaust odors in the vehicle. In addition, Ford as well as independent testing shows that the amount of carbon monoxide that some associate with exhaust odor is well below all of Ford's internal standards as well as any other known air quality standards and is therefore not harmful to vehicle occupants.

Despite this condition not being harmful to vehicle occupants and only affecting a small percentage of vehicle owners, in the interest of customer satisfaction, Ford has taken steps to mitigate the potential for exhaust odors to enter the vehicle cabin that have proven to be extremely effective. This is evidenced by both independent testing as well as declining trend of reports for each model year of the subject vehicles.

Ford believes that consideration of all of these findings support a conclusion that there is no unreasonable risk to motor vehicle safety associated with this subject in these vehicles.

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