INFORMATION REDACTED PURSUANT TOTHE FREEDOM
OF INFORMATION ACT (FOIA), 5 U.S.C.552(B)(6)

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April 20, 2016

Mr. Jeffrey L. Quandt, Chief
Vehicle Control Division
Office of Defects Investigation
National Highway Traffic Safety Administration
1200 New Jersey Avenue SE, Room W48-302
Washington, DC 20590

Dear Mr. Quandt:

Subject: PE16-003:NEF130-jao

The Ford Motor Company (Ford) response to the Agency's March 3, 2016 letter concerning reports of allegations of brake fluid leaking from the master cylinder into the brake booster resulting in a loss of brake effectiveness in certain model year 2013-2014 Ford F-150 vehicles equipped with 3.5L engines is attached.

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

Sincerely,

for Wayne E. Bahr

Attachment

FORD MOTOR COMPANY (FORD) RESPONSE TO PE16-003

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 March 3, 2016, the date of your inquiry. Ford has searched within the following offices for responsive documents: Ford Customer Service Division, North American Product Development, and the Office of the General Counsel.

Request 1

State, by model and model year, the number of subject and peer 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. Engine (by displacement and company engine code);
e. Model Year;
f. Date of manufacture;

g. Date warranty coverage commenced; and
h. 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 "PE16-003 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 subject 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 419,151.

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

Model	2013 MY	2014 MY	Total
Ford F-150 w/ 3.5L V6 GTDI Ecoboost Engine	241,259	177,892	419,151

Ford records indicate that the approximate total number of peer 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 750,097.

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

Model	2013 MY	2014 MY	Total
Ford F-150 w/ All Other Engine Types	389,553	360,544	750,097

For the subject and peer vehicles, only one master cylinder and brake booster part assemblies were used in production and service. Brake fluid type DOT 3 was used throughout the 2013 model year, DOT 4 for the 2014 model year. 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 and peer 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; and
f. Lawsuits, both pending and closed, in which Ford is or was a defendant or codefendant.

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

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

Answer

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

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

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

Category	Allegation
A1	No brake function, no brake warning light mentioned, master cylinder to brake booster fluid migration mentioned
A2	No brake function, brake warning light mentioned, master cylinder to brake booster fluid migration mentioned
A3	No brake function, brake warning light mentioned, no master cylinder to brake booster fluid migration mentioned
A4	Reduced brake function, no brake warning light mentioned, master cylinder to brake booster fluid migration mentioned
A5	Reduced brake function, brake warning light mentioned, master cylinder to brake booster fluid migration mentioned
A6	Reduced brake function, brake warning light mentioned, no master cylinder to brake booster fluid migration mentioned
A7	No reference to or no issue with brake function, brake warning light mentioned, master cylinder to brake booster fluid migration mentioned
A8	No reference to or no issue with brake function, brake warning light not mentioned, master cylinder to brake booster fluid migration mentioned
B1	No brake function, no warning light or master cylinder to brake booster fluid migration mentioned, or references to them are ambiguous
B2	Reduced brake function, no brake warning light or master cylinder to brake booster fluid migration mentioned, or references to them are ambiguous
B3	No reference to or no issue with brake function, no brake warning light or master cylinder to brake booster fluid migration mentioned, or references to them are ambiguous

We are providing electronic copies of reports categorized as B1, B2 and B3 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 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 FMC360 portion of the two databases, separated by subject and peer vehicles, in the respective 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. Ford has not identified any Legal Contacts that are responsive to the Agency's request.

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 failure of the brake booster seal resulting in brake fluid leakage from the master cylinder into the brake booster, extended brake pedal travel, and/or extended stopping distance in a subject or peer 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 contained 44 Vehicle Owner Questionnaires (VOQs), 40 with full VINs and 4 reports with no VIN shown. Ford made inquiries of its FMC360 database for customer contacts, its CQIS database for field reports, and its AWS system for warranty repairs regarding the vehicles identified on the VOQs with full VINs.

Crash/Injury/Fatality Incident Claims: Ford identified four reports of accident allegations in the VOQs provided by the Agency. Further, Ford identified six reports of accident allegations, one of which is duplicative of a VOQ. Ford also identified one report of an alleged knee injury (VIN 1FTFX1CT5DKG47506), but there was no associated report of an accident. Ford did not identify any fatalities on subject vehicles that may be related to the alleged defect. Ford found no reports of accidents, alleged injuries, or fatalities related to this condition on any peer vehicles.

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 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. 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 D. With regard to these

lawsuits and claims, Ford has not undertaken to contact outside law firms to obtain additional documentation.

Request 3

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

a. Ford's file number or other identifier used;
b. The category of the item, as identified in Request No, 2 (i.e., consumer complaint, field report, etc.);
c. Vehicle owner or fleet name (and fleet contact person), address, and telephone number;
d. Vehicle's VIN;
e. Vehicle's make, model and model year;
f. Vehicle's mileage at time of incident;
g. Vehicle's speed at time of incident;
h. Incident date;
i. Report or claim date;
j. Whether a crash is alleged;
k. Whether property damage is alleged;
l. Number of alleged injuries, if any; and
m. 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 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 are provided in Appendix D. 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 on the subject components to date that relate to, or may relate to, the alleged defect in the subject and peer 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(s);
h. Problem code(s);
i. Replacement part number(s) and description(s);
j. Concern stated by customer;
1. Cause as stated on the repair order;
m. Correction as stated on the repair order; and
n. Additional 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 may related to the alleged defect in a subject or peer vehicle are provided in the AWS portion of the two databases contained in the respective 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. 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.

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, part numbers and any other pertinent parameters used.

Provide a list of all labor operations, labor operation descriptions, problem codes, and problem code descriptions applicable to the alleged defect in the subject vehicles.

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

Answer

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

For 2013-2014 model year Ford F-150 vehicles, the New Vehicle Limited Warranty, Bumper-to-Bumper Coverage begins at the warranty start date and lasts for three years or 36,000 miles, whichever occurs first. Optional Extended Service Plans (ESPs) are available to cover various vehicle systems, time in service, and mileage increments. The details of the various plans are provided in Appendix E. As of the date of the information request, 191,797 new vehicle ESP policies had been purchased on 2013-2014 model year Ford F-150 subject and peer vehicles.

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, 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 issued one SSM (SSM 45379, issued 9-29-15; 2013-2014 MY F-150 - Increased Brake Pedal Travel - Low Brake Fluid Level) that may relate to the Agency's request. Ford has not identified any TSBs that may relate to the Agency's request.

Internal Service Messages: Ford identified one ISM (04-05-037, issued 5-26-04 for all 1995-2015 MY vehicles with vacuum-assisted brake boosters / vacuum brake booster step through diagnosis) any ISMs that may relate to the Agency's request.

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

Ford currently has no plans to issue communications related to the alleged defect that is the subject of NHTSA's investigation. Copies of Ford's OASIS message and ISM are provided in Appendix F.

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 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 additional 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.

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, supply, or installation of the subject components, from the start of production to date, which relate to, or may relate to, the alleged defect in the subject vehicles. For each such modification or change, provide the following information:

a. The date or approximate date on which the modification or change was incorporated into vehicle production;
b. A detailed description of the modification or change;
c. The reason(s) for the modification or change;
d. The part 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 is providing a table summarizing the requested information in Appendix I and engineering drawings for the master cylinder and brake booster assemblies are provided 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.

Ford currently is reviewing potential modifications related to the subject components in the subject vehicles.

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), 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 components; 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-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 master cylinder and brake booster assemblies by part number (both service and engineering), year of sale, where available, and supplier point of contact information in Appendix J.

Request 11

Provide the following information regarding the subject vehicle brake system, the subject components and the alleged defect condition:

a. Provide cross-sectioned side views of the subject components showing the locations and names of all fluid and vacuum seals;
b. Provide Ford's assessment of the effect of the alleged defect on the primary and secondary brake circuits and the conditions necessary for fluid leakage to occur from each circuit to the brake booster assembly;
c. State the amount of brake fluid leakage required for each circuit to go from a nominally full brake fluid reservoir to (1) illuminate the warning lamp for low fluid level, and (2) empty the reservoir to a level that results in loss of the affected circuit;
d. Based on testing and/or evaluation of returned parts or incident vehicles prior to part replacement, provide Ford's assessment of the worst case leak rates from both the primary and secondary circuits to the booster assembly (1) when the engine is running, and (2) when the engine is off;

e. Provide Ford's assessment of all variables that may affect the leak rates provided in 12.d and describe all assumptions used in making the assessment;
f. Describe all part return/collection actions taken by, or for, Ford related to investigating the alleged defect;
g. Provide a chronology of all failed part return/collection efforts or communications issued by Ford that relate to the alleged defect and provide a log of all vehicles from which parts were obtained by Ford for the purpose of testing or analysis, including the VIN, the repair date, and the current status of the parts;
h. Describe current part availability and provide a chronology of all periods in which subject components were on backorder;
i. Describe the brake warning lamp control logic in the subject vehicles, including conditions required to illuminate for low fluid level or pressure differential between circuits;
j. Describe the effects of the alleged defect on brake system performance, including effects on pedal travel and ability to generate and control hydraulic pressure in each circuit (using hydraulic circuit diagrams for each condition), in the event of (1) the reservoir chamber for the primary circuit is emptied by leakage to the brake booster, (2) the reservoir chambers for both circuits are emptied by leakage;
k. Provide Ford's assessment of the effects of the alleged defect on brake booster performance;
l. Provide copies of all FMVSS 135 compliance test reports showing the braking performance of the subject vehicles in all load states for (1) normal system operation, (2) loss of primary circuit and (3) loss of secondary circuit;
m. Provide block diagrams/schematics of the vacuum systems of the subject and peer vehicles, including all check valves and supplemental vacuum subsystems and describe all differences in booster vacuum supply or control that may relate to the alleged defect in the subject vehicles; and
n. Describe all other differences between the subject vehicles and other MY 2013 through 2014 Ford F-150 pickup trucks that may be relevant to the alleged defect.

Answer

Ford is providing information regarding the subject vehicle brake system, the subject components and the alleged defect condition detailed in Request 11 "a" through "n" in Appendix K. Ford is also providing specification and design requirements for the subject components 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.

For the 2013 - 2014 model years, Hitachi manufactured the master cylinder assembly, and Bosch produced the brake booster assembly. The same parts were used on all 2013-2014 F-150 vehicles regardless of engine type. Hitachi moved production of the subject components from Japan to their U.S. facility in the October – November 2012 time frame.

Ford is providing quality control requirements and procedures for the subject components and related documents from the production period 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.

Ford is providing the requested test results 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.

Request 12

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

Answer

Both the subject and peer vehicles are equipped with a vacuum assisted hydraulic brake system. The Ford F-150 is equipped with a front to rear split brake system, where the front and rear brakes operate on separate hydraulic circuits in the master cylinder. In the event that a sufficient loss of brake fluid occurs, the operator will receive an audible chime, a full screen message center alert, and a red brake light in the instrument cluster – all indicating that brake system service is required. These indicators are activated when the brake fluid in the reservoir is depleted to a pre-determined level. Braking ability would still be unchanged at that time. If a vehicle continues to be operated and additional fluid is depleted, the driver may begin to experience a change in brake pedal travel and feel. In the event that a loss of brake fluid is substantial enough to reduce brake function to the front wheels, full braking function would remain in the rear wheel circuit. This is consistent with the reports indicating a brake light and/or warning, but no change in brake function.

As part of Ford's investigation, Ford conducted a search of its databases to identify reports responsive to this Information Request. In addition, Ford conducted part return analysis, supplier process and supply chain reviews, bench testing of subject components, vehicle test drive evaluations, and comprehensive data analysis. The field data seems to indicate a different performance between the subject vehicles and the peer vehicles as well as an elevated rate of reports for subject vehicles built during certain months of production. In addition, Ford's vehicle drive evaluations using a returned field part confirmed the brake warnings, progressive change in pedal feel and travel, and the rear brakes remained fully operational.

Based on the above, it is Ford's engineering assessment that a fluid leak in the primary circuit could lead to a loss of brake fluid from the master cylinder reservoir into the brake booster. The conditions that could lead to a loss of brake fluid in the subject vehicles are still under investigation.

Ford is continuing its analysis of data and of master cylinders, brake boosters and fluid samples obtained from the field, including additional engineering evaluations, customer follow-up calls, and testing. Ford is continuing to monitor reports related to this investigation and will keep the Agency apprised of our findings.

# # #

2013-2014 F-150 3.5L GTDI
Master Cylinder to Brake Booster Fluid Loss

OWNER REPORTS

As the agency is aware, within FCSD's North American Customer Service Operations, there is a Customer Relationship Center (CRC) that is responsible for facilitating communication between customers, dealerships and Ford Motor Company. Among other things, the CRC handles telephonic, electronic, and written inquiries, suggestions, informational requests, and concerns ("contacts") from Ford and Lincoln-Mercury vehicle owners about their vehicles or sales and service experience. The contacts are handled by CRC customer service representatives who enter a summary of the customer contact into a database known as FMC360.

The CRC assigns to each vehicle-related contact report a "symptom code" or category that generally characterizes the nature of the customer contact or vehicle concern, as described by the owner. The CRC does not undertake to confirm the accuracy of the description provided by the owner; they simply record what is reported. Therefore, given the complexity of the modern motor vehicle, it is Ford's experience that a significant percentage of owner contacts do not contain sufficient information to make a technical assessment of the condition of the vehicle or the cause of the event reported. Accordingly, although owner contact reports may be useful in identifying potential problems and trends, the records are not the empirical equivalent of confirmed incidents and/or dealership's diagnosis. In the interest of responding promptly to this inquiry, Ford has not undertaken to gather the electronic images related to these contacts because of the largely duplicative nature of the information contained in the images, as well as the time and the burden associated with locating and producing those documents. The pertinent information related to those contacts generally would be included in the contact reports obtained from the FMC360 system. To the extent that those documents exist, they are characterized in the comments of FMC360 contact reports. Upon request, Ford will attempt to locate any specific items that are of interest to the agency.

In responding to this information request, Ford electronically searched the FMC360 database using the following criteria:

Model Year: 2013-2014

Subject Vehicle: 3.5L GTDI F-150 trucks manufactured for sale or lease in the United States, District of Columbia, Puerto Rico, Northern Mariana Islands, Guam, American Samoa and the Virgin Islands.

Peer Vehicle: All engines, except 3.5L GTDI F-150 trucks manufactured for sale or lease in the United States, District of Columbia, Puerto Rico, Northern Mariana Islands, Guam, American Samoa and the Virgin Islands.

Date Parameters: January 1, 2012 thru March 3, 2016 (the date of this inquiry)

Types of Contacts: All, including suspended data, canceled contacts and inquiries

FMC360 Case Classifications:

Level 1	Level 2	Level 3	Level 4
Dealer – Vehicle Concern	Legal		
Vehicle Concern	Legal		
Feedback	Product	Negative	Vehicle Safety/Quality

FMC360 Symptom Code(s):

Symptom Category	Symptom Code	Symptom Description
Stop/Steer/Ride	6601	Steering, Performance/Effectiveness
Stop/Steer/Ride	6603	Stopping, Pedal Feel
Stop/Steer/Ride	6651	Pedals/Lever, Brake
Stop/Steer/Ride	6662	Fluids, Brake Fluid

LEGAL CONTACTS

Beginning in early 2008, most consumer complaints and all legal claim processing has been centralized in OGC within the Consumer Litigation team. A transition has occurred such that all legal contacts (including those formerly handled by "Litigation Prevention") are coordinated through this team.

Prior to the transition, there was a Consumer Affairs Department within FCSD that managed customer concerns, which could not be resolved by the Customer Relationship Center (CRC). Among other things, the Consumer Affairs Department had a section, known as "Litigation Prevention," that handled a variety of informal (i.e., non-litigation) claims, such as property damage claims or attorney demand claims.

The Litigation Prevention section had been centralized in the Consumer Affairs Department since 1995, in Dearborn, Michigan. Prior to that time, Litigation Prevention personnel operated on a regional basis. For matters that the Litigation Prevention section handled, there were typically paper files that reflected the handling, investigation and resolution of property damage claims.

The claims, known as "Legal Contacts" are entered into the FMC360 database that the CRC uses to enter other customer communications. When a customer contact is designated as a Legal Contact, it is so indicated near the top of the contact report.

FIELD REPORTS

Within FCSD, there is a Vehicle Service & Programs Office that has overall responsibility for vehicle service and technical support activities, including the administration of field actions. That Office is the primary source within Ford of vehicle concern information originating from Ford and Lincoln-Mercury dealerships, field personnel, and other sources. The information is maintained in a database known as the Common Quality Indicator System (CQIS). The CQIS database includes reports compiled from more than 40 Company sources (e.g., Company-owned vehicle surveys, service technicians, field service and quality engineers, and technical hot line reports, etc.) providing what is intended to be a comprehensive concern identification resource. As with FMC360 contact reports, CQIS reports are assigned a "symptom code" or category that generally reflects the nature of the concern.

In responding to this information request, Ford electronically searched CQIS using the following criteria:

Model Year: 2013-2014

Subject Vehicle: 3.5L GTDI F-150 trucks manufactured for sale or lease in the United States, District of Columbia, Puerto Rico, Northern Mariana Islands, Guam, American Samoa and the Virgin Islands.

Peer Vehicle: All engines, except 3.5L GTDI F-150 trucks manufactured for sale or lease in the United States, District of Columbia, Puerto Rico, Northern Mariana Islands, Guam, American Samoa and the Virgin Islands.

Date Parameters: January 1, 2012 thru March 3, 2016 (the date of this inquiry)

Base Part Number(s): 2005 – Brake Booster
2140 – Master Cylinder
2152 – Master Cylinder Gasket

Symptom Code(s):

Symptom Category	Symptom Code	Symptom Description
Stop/Steer/Ride	6601	Steering, Performance/Effectiveness
Stop/Steer/Ride	6603	Stopping, Pedal Feel
Stop/Steer/Ride	6651	Pedals/Lever, Brake
Stop/Steer/Ride	6662	Fluids, Brake Fluid

OASIS MESSAGES

FCSD is responsible for communicating a variety of vehicle and service information, such as warranty information for up to the past 360 days, Extended Service Plan part coverage information, and technical repair information, to North American Ford and Lincoln dealers. This information is communicated primarily through OASIS, which serves as an electronic link between Ford Motor Company and the dealers. OASIS covers all North American Ford and Lincoln-Mercury cars and light trucks, and medium and heavy-duty Ford trucks, for the ten most current model years. Technical diagnostic and repair information on OASIS is contained in Special Service Messages (SSMs) and Technical Service Bulletin (TSBs) titles and brief summaries. It should be noted that dealers cannot access brief summaries.

SSMs and TSB titles are coded in OASIS by model year and vehicle line, and may be coded to other specific vehicle attributes (body style, engine code, or vehicle identification number) and one or more OASIS Service Code(s). The dealers with access to OASIS usually search for information on the database by entering a VIN and the applicable Service Codes. SSMs and TSB titles that become inactive or superseded continue to be accessible by Ford employees, but no longer are accessible by the dealers. Dealers also are able to determine the recalls applicable to a particular vehicle by searching a particular VIN in OASIS. Recall information available on OASIS cannot be searched by Service Codes.

In July 2011, FCSD launched a new coding system for OASIS. All active SSMs and TSB titles have been re-coded using the new OASIS coding system. All inactive and superceded SSMs and TSB titles are still maintained under the old coding system.

In responding to this information request, Ford searched Global OASIS using both the new and old OASIS service codes for active, inactive, and superceded TSB titles and SSMs using the following search criteria:

Model Year: 2013-2014

Subject Vehicle: 3.5L GTDI F-150 trucks manufactured for sale or lease in the United States, District of Columbia, Puerto Rico, Northern Mariana Islands, Guam, American Samoa and the Virgin Islands.

Peer Vehicle: All engines, except 3.5L GTDI F-150 trucks manufactured for sale or lease in the United States, District of Columbia, Puerto Rico, Northern Mariana Islands, Guam, American Samoa and the Virgin Islands.

Date Parameters: January 1, 2012 thru March 3, 2016 (the date of this inquiry)

OASIS Service Code(s):

Symptom Category	Symptom Code	Symptom Description
Stop/Steer/Ride	6601	Steering, Performance/Effectiveness
Stop/Steer/Ride	6603	Stopping, Pedal Feel
Stop/Steer/Ride	6651	Pedals/Lever, Brake
Stop/Steer/Ride	6662	Fluides, Brake Fluid

OASIS 2 and Global OASIS are not capable of performing electronic word searches, so the search results are reviewed manually to determine their applicability to the alleged defect in the subject vehicles.

The OASIS database also contains Broadcast Messages. Typically, these messages are directed to all dealerships and either are notifications of new SSMs/TSBs, or announcements with non-technical information (for example, "the Dealer Hotline will be closed today"). Broadcast Messages cannot be searched by OASIS service codes, and can be retrieved only while active (approximately 2 to 4 days). Ford has not undertaken to search for Broadcast Messages because Ford expects that any responsive information obtained with such a search generally would be non-substantive in nature or duplicative of the information obtained with the TSB title and SSM search described above.

INTERNAL SERVICE MESSAGES

FCSD, as part of its technical support activities, maintains fleet and technical telephone "hotlines." During the early stages of Ford's efforts to identify and resolve potential vehicle concerns, hotline personnel may draft Internal Service Messages (ISMs) on CQIS for their internal use. The ISMs are assigned a CQIS "symptom code" or category that generally reflects the nature of the concern. An ISM can form the basis for an oral response over the technical hotline to an inquiry from an individual dealer or fleet technician. The ISMs, however, are not made available electronically to fleets and dealers. Therefore, although ISMs are not "issued" to dealers like OASIS messages, Ford is construing this request broadly to include ISMs that may be related to the alleged defect in the subject vehicles.

In responding to this information request, Ford searched CQIS for active ISMs using the following search criteria:

Model Year: 2013-2014

Subject Vehicle: 3.5L GTDI F-150 trucks manufactured for sale or lease in the United States, District of Columbia, Puerto Rico, Northern Mariana Islands, Guam, American Samoa and the Virgin Islands.

Peer Vehicle: All engines, except 3.5L GTDI F-150 trucks manufactured for sale or lease in the United States, District of Columbia, Puerto Rico, Northern Mariana Islands, Guam, American Samoa and the Virgin Islands.

Date Parameters: January 1, 2012 thru March 3, 2016 (the date of this inquiry)

CQIS Symptom Code(s):

Symptom Category	Symptom Code	Symptom Description
Stop/Steer/Ride	6601	Steering, Performance/Effectiveness
Stop/Steer/Ride	6603	Stopping, Pedal Feel
Stop/Steer/Ride	6651	Pedals/Lever, Brake
Stop/Steer/Ride	6662	Fluides, Brake Fluid

The CQIS database in which the ISMs reside is not capable of performing word searches, so the search results were reviewed manually to determine their applicability to the alleged defect in the subject vehicles.

FIELD REVIEW COMMITTEE

Ford's Field Review Committee reviews all potential field service actions, including safety recalls and customer satisfaction programs, and recommends appropriate actions to corporate management. A Vehicle Service & Programs representative serves as Secretary to the Field Review Committee. Following approval of a field service action, the Vehicle Service & Programs Office prepares and launches the action. A representative copy of the communication to Ford's dealers, fleets, and Regional offices announcing the field service action is maintained in the Field Review Committee files.

WARRANTY

Ford's Analytical Warranty System (AWS) contains warranty claims and vehicle information for model years 1991 and forward for North America, and model years 1992 and forward for Europe.

Ford performed a search of AWS for potentially responsive reports using the following search criteria:

Model Year: 2013-2014

Subject Vehicle: 3.5L GTDI F-150 trucks manufactured for sale or lease in the United States, District of Columbia, Puerto Rico, Northern Mariana Islands, Guam, American Samoa and the Virgin Islands.

Peer Vehicle: All engines, except 3.5L GTDI F-150 trucks manufactured for sale or lease in the United States, District of Columbia, Puerto Rico, Northern Mariana Islands, Guam, American Samoa and the Virgin Islands.

Date Parameters: January 1, 2012 thru March 3, 2016 (the date of this inquiry)

Base Part Number(s): 2005 – Brake Booster
2140 – Master Cylinder
2152 – Master Cylinder Gasket

Customer Concern Code(s)

CCC	Description
H05	Excessive "brake pedal effort" required
H15	Brake pedal spongy
H19	Brake-ABS warning light troubles
H20	Other brake troubles (incl. Air Brakes)
L63	Brake fluid leak
F99	Insufficient fluid