

Request 2

Provide responses to the following requests:

- a. Provide all root cause analyses performed regarding the alleged defect after Ford's submission of PE23-021 Information Request Response;
- b. Provide the justification and analysis performed to determine Subject Recall scope; and
- c. Provide all relevant information, testing, research, and communications at Ford that identified the alleged defect may be present in vehicles excluded from the Subject Recall.

Answer

The stated purpose of RQ24-015 is to investigate the scope of recall 24V-099 (Ford Recall 24S06). This recall encompasses 2018-2020 Ford Expedition and 2018-2020 Lincoln Navigator vehicles built between October 1, 2018, and June 30, 2019 ("Recalled Vehicles"). These Recalled Vehicles are equipped with driver and front passenger seat belt retractor pretensioner assemblies with part numbers starting with JL1Z and JL7Z. These parts are not manufactured by Ford and are supplied to Ford by ZF. The Subject Vehicles identified in this IR were built with the same driver and front passenger seat belt retractor pretensioner assemblies part numbers as the Recalled Vehicles.

As described in Ford's Defect Information Report (DIR) for recall 24S06, root cause was not conclusively determined. Ford was able to determine that certain seatbelt retractor pretensioners may develop corroded squib pins. As noted in the DIR, at the time of the recall, Ford was unable to specify the cause of corrosion in the squib pins inside the sealed micro-gas-generator. Ford hypothesized the moisture/ water needed to corrode the squib pins could potentially come from an undefined supplier manufacturing issue which allows the moisture to be trapped inside the sealed micro-gas-generator during the manufacturing process. At the time of recall, Ford was unable to determine the operation in the supplier's manufacturing process that led to the corrosion. Ford's alternative hypothesis was that the micro-gas-generator is not properly sealed which could allow the moisture inside the vehicle cab, caused by increased humidity due to air-conditioning usage and subsequent water leakage, to enter the micro-gas-generator and corrode the squib pins.

Because Ford was able to determine that there was a supplier manufacturing defect, but the root cause for that manufacturing defect was undetermined, Ford relied on the performance record for these vehicles to determine the subject recall scope.

- (a) Root cause analyses performed regarding the alleged defect after Ford's submission of PE23-021 Information Request Response-

After the submission of response to PE23-021 and subsequent recall 24S06 launch, Ford continued to monitor the field data of inadvertent deployment and diagnostic trouble codes and now believes that the humidity inside the vehicle cab is less likely to be the contributing factor. Recent data shows that seatbelt pretensioners of vehicles that were produced after February 2020, which included the permanent corrective action of "reverting back to original drain seal material to prevent water leakage in the cab," have also experienced inadvertent deployment and diagnostic trouble codes.

Additionally, the supplier, ZF, conducted parts analysis of seatbelt pretensioners with high bridge circuit resistance and from the vehicles built after June 30, 2019 (end-date of recall

24S06 vehicle population). Their analysis found bridge wire resistance to be out-of-specification and corrosion in the squib pins. At least two of these seatbelt pretensioners analyzed under microscope/ CT scans were from the vehicles built after February 17, 2020. This indicates that the moisture inside the cab was unlikely to be the contributing factor for corrosion observed on these squib pins.

Furthermore, independent analysis conducted by ZF and Daicel, contained in the 8D report received by Ford on December 05, 2024, lists two potential theories for this concern, both of which requires moisture entry.

(b) Justification and analysis performed to determine Subject Recall scope-

As Ford explained in the DIR for 24S06, Ford tested several hypotheses to determine why corrosion was developing on the pretensioner squib pins. Despite extensive testing, Ford was only able to determine that the cause of the defect was “an undefined supplier manufacturing issue.” Without a specific root cause, Ford assessed the field performance for these pretensioners to determine the Subject Recall scope.

At the time of Ford’s 24S06 DIR filing, Ford was aware of 131 reports of inadvertent retractor pretensioner deployment on subject and peer vehicles in the US. All 131 reports were submitted to NHTSA in Ford’s Part-1 submission for PE23-021 on February 05, 2024. Ford provided owner and field reports in the database contained in the file “PE23-021 REQUEST NUMBER TWO DATA” in response to Request 3 of the Part-1 submission of PE23-021. Ford also provided relevant warranty claims in the document “PE23-021 Request 5 - Warranty Data” in response to Request 5 of Part-1 submission of PE23-021.

Ford includes Plot A below, which depicts the 131 reports by vehicle production month. Plot A shows that 130 of those inadvertent deployment incidents corresponded to a clearly defined vehicle production window from October 2018 through June 2019. This data indicated to Ford that that there could be a supplier quality concern within this production window. Ford also includes Table 1 below, which depicts the overall rate of inadvertent deployment.

Plot A: Inadvertent Deployment count by Vehicle Production Month at the time of 24S06 Part 573 filing



Table 1: Overall Rate of Inadvertent Deployment of two populations at the time of 24S06 Part 573 filing



Third Party Data Analysis - Since November 2023, Ford has shared information with NHTSA on its internal investigations, root cause, and rate analyses. Specifically, on November 02, 2023, Ford presented to NHTSA the root cause assessment and the warranty analysis conducted by a third party (Bates Beg - RQ24-015_000000001; Bates End - RQ24-015_000000012). The Plot B below depicts the Pretensioner Warranty analysis from that presentation and shows claims by production month for US and Canada. Third Party analysis also showed that the number of repairs with retractor pretensioner open-circuit DTCs (B007E:13 & B007F:13) increased starting from Oct 2018 (MY 2019) and dropped for vehicles produced after March 2019 and dropped to background levels after June 2019.

Ford also provided its assessment as part of the response to PE23-021. As to the “spike period” that formed the basis of recall 24V-099, Ford reviewed this “spike period” with NHTSA prior to the opening of PE23-021 and showed that the number of pretensioner inadvertent deployments were in a well-defined vehicle production time window from October 2018 to June 2019. Ford did not include vehicles outside of the October 2018 to June 2019 production window because they did not exhibit a defect trend. As indicated in the November 2023 presentation, the number of retractor open circuit and inadvertent deployment repairs in the period before and after recall 24V-099 was a non-zero number.

Plot B: Pretensioner Warranty Analysis - Expedition with Retractor Open-circuit DTC claims by production month (US/CAN)



- (c) Relevant information, testing, research, and communications at Ford that identified the alleged defect may be present in vehicles excluded from the Subject Recall-

This request appears to be duplicative of Request #1, which sought “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”. To the extent this request seeks information, communications, or documents that show Ford “identified the alleged defect may be present in vehicles excluded from the Subject Recall,” Ford does not believe such documents exist. Ford has not determined that any vehicles other than the Recalled Vehicles contain a safety defect.

Ford interprets NHTSA’s request to be looking for information, testing, research, and communications at Ford that relate to Ford’s determination of the Subject Recall scope. As NHTSA reviews these documents, the agency will see that Ford relied on the performance record of these vehicles in making a safety defect determination because the engineering root cause was unknown.

As of December 09, 2024, Ford is aware of 17 reports of inadvertent retractor pretensioner deployment on subject components outside of the 24S06 vehicle population in the US. See Plot C below, which depicts the 16 reports that occurred after Ford’s Part 573 filing. The chart shows that, at the time Ford filed the Part 573, Ford was aware of one non-24S06 inadvertent deployment. In contrast, Ford has received 93 incremental reports of inadvertent pretensioner deployment in the 24S06 population post 24S06 Part 573 filing. See Table 2 for overall rate of inadvertent deployments.

Plot C: Inadvertent Deployment count by Vehicle Production Month post 24S06 Part 573 filing



Table 2: Overall Rate of Inadvertent Deployment of two populations at two different timelines



As stated earlier, after the submission of Ford's response to PE23-021 and subsequent recall 24S06 launch, Ford continued to monitor the field data of inadvertent deployment and diagnostic trouble codes. Over the last year, Ford has continued to monitor this data through its internal processes and has shared that information with NHTSA. Ford also continues to work with its supplier to better understand the root cause as part of Ford's established supplier recovery process.

Prior to 24S06 recall, as Ford was investigating the root cause for the issue, seatbelt pretensioner supplier, ZF, was unable to provide the supplier manufacturing issue that may have led to the corrosion in the squib pins. After the 24S06 DIR filing, ZF and its supplier, Daicel, provided Ford with the 8D report on December 05, 2024, as part of a supplier recovery process. The report specifically mentioned (a) degradation of one lot of IMR 4350 (lot 6910), and (b) dissolving potassium perchlorate in nitric acid accelerating corrosion as being high likelihood of contributing factors. Therefore, the root cause for this issue remains a hypothesis and Ford has confirmed that this remains a supplier manufacturing quality issue. The ZF documents are submitted in response to Request-1 of Part-2 submission of RQ24-015. Please refer to (Bates Beg - RQ24-015_0000002808; Bates End - RQ24-015_0000002815) and (Bates Beg - RQ24-015_0000002818; Bates End - RQ24-015_0000002843) for ZF documents.

Summary-

Ford acknowledges that a seatbelt that does not retract or extend may result in injury in the event of a crash. To address populations that fall outside the 24S06 safety recall, Ford's Critical Concern Review Group (CCRG) is conducting further investigation and continues to monitor the field data of inadvertent deployment. Ford also continues to work with its supplier to better understand the root cause as part of Ford's established supplier recovery process.

At the time Ford filed its DIR for 24S06, Ford was only able to determine that the cause of the defect was "an undefined supplier manufacturing issue." Without a specific root cause, Ford assessed the field performance for these pretensioners to determine the Subject Recall scope. Absent new information, Ford continues to believe that the 24S06 safety recall scope is appropriate based on the available performance data.