UNITED STATES DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

DOCKET NO. NHTSA-2017-0093

Ford Motor Company; Denial of Petition for Inconsequentiality

AGENCY: National Highway Traffic Safety Administration (NHTSA), Department of Transportation.

ACTION: Denial of petition.

SUMMARY: On July 10, 2017, Takata Corporation ("Takata") filed a defect information report ("DIR") in which it determined that a safety-related defect exists in phase-stabilized ammonium nitrate ("PSAN") driver-side air bag inflators that it manufactured with a calcium sulfate desiccant and supplied to Ford Motor Company ("Ford"), Mazda North American Operations ("Mazda"), and Nissan North America Inc. ("Nissan") for use in certain vehicles. Ford petitioned the Agency for a decision that the equipment defect determined to exist by Takata is inconsequential as it relates to motor vehicle safety in the Ford vehicles affected by Takata's DIR, and that Ford should therefore be relieved of its notification and remedy obligations under the National Traffic and Motor Vehicle Safety Act of 1966 and its applicable regulations. After reviewing the petition, NHTSA has concluded that Ford has not met its burden of establishing that the defect is inconsequential to motor vehicle safety, and denies the petition.

ADDRESSES: For further information about this decision, contact Stephen Hench, Office of Chief Counsel, National Highway Traffic Safety Administration, 1200 New Jersey Avenue SE, W41-229, Washington, D.C., 20590 (Tel. 202.366.2262).

For general information about NHTSA's investigation into Takata air bag inflator ruptures and the related recalls, visit https://www.nhtsa.gov/takata.

SUPPLEMENTAL INFORMATION:

I. Background

The Takata air bag inflator recalls ("Takata recalls") are the largest and most complex vehicle recalls in U.S. history. These recalls currently involve 19 vehicle manufacturers and approximately 67 million Takata air bag inflators in tens of millions of vehicles in the United States alone. The recalls are due to a design defect, whereby the propellant used in Takata's air bag inflators degrades after long-term exposure to high humidity and temperature cycling. During air bag deployment, this propellant degradation can cause the inflator to over-pressurize, causing sharp metal fragments (like shrapnel) to penetrate the air bag and enter the vehicle compartment. To date, these rupturing Takata inflators have resulted in the deaths of 18 people across the United States[1] and over 400 alleged injuries, including lacerations and other serious consequences to occupants' face, neck, and chest areas.

In May 2015, NHTSA issued, and Takata agreed to, a Consent Order,[2] and Takata filed four defect information reports ("DIRs")[3] for inflators installed in vehicles manufactured by twelve[4] vehicle manufacturers. Recognizing that these unprecedented recalls would involve

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[1] Globally, including the United States, the deaths of at least 30 people are attributable to these rupturing Takata inflators.

[2] The May 2015 Consent Order is available at: https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/consent-order-takata-05182015_0.pdf.

[3] Recall Nos. 15E-040, 15E-041, 15E-042, and 15E-043.

[4] The twelve vehicle manufacturers affected by the May 2015 recalls were: BMW of North America, LLC;

many challenges for vehicle manufacturers and consumers, NHTSA began an administrative proceeding in June 2015 providing public notice and seeking comment (Docket Number NHTSA-2015-0055). This effort culminated in NHTSA's establishment of a Coordinated Remedy Program ("Coordinated Remedy") in November 2015.[5] The Coordinated Remedy prioritizes and phases the various Takata recalls not only to accelerate the repairs, but also—given the large number of affected vehicles—to ensure that repair parts are available to fix the highest-risk vehicles first.[6]

Under the Coordinated Remedy, vehicles are prioritized for repair parts based on various factors relevant to the safety risk—primarily on vehicle model year (MY), as a proxy for inflator age, and geographic region. In the early stages of the Takata inflator recalls, affected vehicles were categorized as belonging to one of two regions: the High Absolute Humidity ("HAH") region (largely inclusive of Gulf Coast states and tropical island states and territories), or the

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FCA US, LLC (formerly Chrysler); Daimler Trucks North America, LLC; Daimler Vans USA, LLC; Ford Motor Company; General Motors, LLC; American Honda Motor Company; Mazda North American Operations; Mitsubishi Motors North America, Inc.; Nissan North America, Inc.; Subaru of America, Inc.; and Toyota Motor Engineering and Manufacturing.

[5] *See* Notice of Coordinated Remedy Program Proceeding for the Replacement of Certain Takata Air Bag Inflators, 80 FR 32197 (June 5, 2015).

The Coordinated Remedy Order, which established the Coordinated Remedy, is available at: https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/nhtsa-coordinatedremedyorder-takata.pdf. The Third Amendment to the Coordinated Remedy Order incorporated additional vehicle manufacturers, that were not affected by the recalls at the time that NHTSA issued the CRO into the Coordinated Remedy, and is available at: https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/final_public_-_third_amendment_to_the_coordinated_remedy_order_with_annex_a-corrected_12.16.16.pdf. The additional affected vehicle manufacturers are: Ferrari North America, Inc.; Jaguar Land Rover North America, LLC; McLaren Automotive, Ltd.; Mercedes-Benz US, LCC; Tesla Motors, Inc.; Volkswagen Group of America, Inc.; and, per Memorandum of Understanding dated September 16, 2016, Karma Automotive on behalf of certain Fisker vehicles.

[6] *See* Coordinated Remedy Order at 15–18, Annex A; Third Amendment to the Coordinated Remedy Order at 14–17. These documents, among other documents related to the Takata recalls discussed herein, are available on NHTSA's website at http://www.nhtsa.gov/takata.

non-HAH region (inclusive of the remaining states and the District of Columbia). On May 4, 2016, NHTSA issued, and Takata agreed to, an amendment to the November 3, 2015 Consent Order ("ACO"), wherein these geographic regions were refined based on improved understanding of the risk, and were then categorized as Zones A, B, and C. Zone A encompasses the higher risk HAH region as well as certain other states,[7] Zone B includes states with more moderate climates (*i.e.*, lower heat and humidity than Zone A),[8] and Zone C includes the cooler-temperature States largely located in the northern part of the country.[9]

While the Takata recalls to date have been limited almost entirely to Takata PSAN inflators that do not contain a desiccant (a drying agent)—*i.e.*, "non-desiccated" inflators—under a November 3, 2015 Consent Order issued by NHTSA and agreed to by Takata, Takata is required to test its PSAN inflators that do contain a desiccant—*i.e.*, "desiccated" inflators—in cooperation with vehicle manufacturers "to determine the service life and safety of such inflators and to determine whether, and to what extent, these inflator types suffer from a defect condition,

[7] Zone A comprises the following U.S. states and jurisdictions: Alabama, California, Florida, Georgia, Hawaii, Louisiana, Mississippi, South Carolina, Texas, Puerto Rico, American Samoa, Guam, the Northern Mariana Islands (Saipan), and the U.S. Virgin Islands. Amendment to November 3, 2015 Consent Order at ¶ 7.a.

[8] Zone B comprises the following U.S. states and jurisdictions: Arizona, Arkansas, Delaware, District of Columbia, Illinois, Indiana, Kansas, Kentucky, Maryland, Missouri, Nebraska, Nevada, New Jersey, New Mexico, North Carolina, Ohio, Oklahoma, Pennsylvania, Tennessee, Virginia, and West Virginia. Amendment to November 3, 2015 Consent Order at ¶ 7.b.

[9] Zone C comprises the following U.S. states and jurisdictions: Alaska, Colorado, Connecticut, Idaho, Iowa, Maine, Massachusetts, Michigan, Minnesota, Montana, New Hampshire, New York, North Dakota, Oregon, Rhode Island, South Dakota, Utah, Vermont, Washington, Wisconsin, and Wyoming. Amendment to November 3, 2015 Consent Order at ¶ 7.c.

regardless of whether it is the same or similar to the conditions at issue" in the DIRs Takata had filed for its non-desiccated PSAN inflators.[10]

In February 2016, NHTSA requested Ford's assistance in evaluating Takata calcium-sulfate desiccated PSDI-5 driver-side air bag inflators, to which Ford agreed. In June 2016, Ford and Takata began a field-recovery program to evaluate Takata calcium-sulfate desiccated PSDI-5 driver-side air bag inflators that were original equipment in MY 2007–2008 Ford Ranger vehicles in Florida, Michigan, and Arizona.[11] Nissan also initiated a similar field-recovery program for its Versa vehicles in March 2016.[12] By January 2017, a very limited number of samples from Ford had been recovered and tested.[13] In March 2017, Takata and Ford met to review the field data collected from the inflators returned by Ford and Nissan.[14] Between March and June 2017, additional Ford inflators were subjected to live dissection, which included chemical and dimensional propellant analyses, as well as ballistic testing.[15] Also in June, Takata

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10 Consent Order ¶ 28.

11 *See also* Recall No. 17E-034. Later, under Paragraph 43 of the Third Amendment to the Coordinated Remedy Order ("ACRO"), NHTSA ordered each vehicle manufacturer "with any vehicle in its fleet equipped with a desiccated PSAN Takata inflator" (and not using or planning to use such an inflator as a final remedy) to develop a written plan describing "plans to confirm the safety and/or service life" of desiccated PSAN Takata inflators used in its fleet. ACRO ¶ 43. Such plans were to include coordination with Takata for parts recovery from fleet vehicles, testing, and anticipated/future plans "to develop or expand recovery and testing protocols of the desiccated PSAN inflators." *Id.*

12 Recall No. 17V-449. The specific Takata calcium-sulfate desiccated PSDI-5 driver-side air bag inflators installed in these Nissan Versa vehicles are a different variant than those installed in the Ford and Mazda vehicles. There are several differences in design between the variant installed in Nissan vehicles and the variants installed in the Ford and Mazda vehicles, which are discussed further below.

13 Recall No. 17E-034.

14 *Id.*

15 *Id.*

reviewed with Ford and NHTSA field-return data from Ford inflators.[16] Ford then met with NHTSA on July 6, 2017 to discuss the data collected to date, as well as an expansion plan for evaluating Takata calcium-sulfate desiccated PSDI-5 driver-side air bag inflators.

Takata analyzed 423 such inflators from the Ford program—as well as 895 such inflators from the Nissan program.[17] After a review of field-return data, on July 10, 2017, Takata, determining that a safety-related defect exists, filed a DIR for calcium-sulfate desiccated PSDI-5 driver-side air bag inflators that were produced from January 1, 2005 to December 31, 2012 and installed as original equipment on certain motor vehicles manufactured by Ford (the "covered Ford inflators"),[18] as well as calcium-sulfate desiccated PSDI-5 driver-side air bag inflators for those same years of production installed as original equipment on motor vehicles manufactured by Nissan (the "covered Nissan inflators") and Mazda (the "covered Mazda inflators") (collectively, the "covered inflators").[19] As described further below, the propellant tablets in these inflators may experience density reduction over time, which could result in the inflator rupturing, at which point "metal fragments could pass through the air bag cushion material, which may result in injury or death to vehicle occupants."[20]

Takata's DIR filing triggered Ford's obligation to file a DIR for its affected vehicles.[21] Ford filed a corresponding DIR, informing NHTSA that it intended to file a petition for

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16 *Id.*
17 *See* Recall No. 17V-449.
18 These covered Ford inflators are identified by the prefixes ZN and ZQ.
19 Recall No. 17E-034.
20 *Id.*
21 *See* 49 U.S.C. 30102(b)(1)(F); 49 CFR Part 573; November 3, 2015 Coordinated Remedy Order ¶¶ 45–46.

inconsequentiality.[22] Ford then petitioned the Agency, under 49 U.S.C. 30118(d), 30120(h), and 49 CFR Part 556, for a decision that, because Takata's analysis of the covered Ford inflators does not show propellant tablet-density degradation, or increased inflation pressure, and certain inflator design differences exist between the covered Ford inflators and the covered Nissan inflators, the equipment defect determined to exist by Takata is inconsequential as it relates to motor vehicle safety in the Ford vehicles affected by Takata's DIR.[23] In addition, citing its commitment to further investigation, Ford stated that it was expanding its acquisition, testing, and analysis of the covered Ford inflators, and requested that the Agency allow Ford until March 31, 2018 to complete certain testing and analysis before deciding on the Petition.[24]

In a Notice published in the Federal Register on November 16, 2017, NHTSA acknowledged its receipt of Ford's Petition, opened a public comment period on the Petition to expire on December 18, 2017, and denied Ford's request that the Agency allow Ford until March 31, 2018 to complete certain testing and analysis before the Agency decided on the Petition.[25] NHTSA received four comments in response to this Notice, none of which advocated granting

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Under 49 CFR 573.5(a), a vehicle manufacturer is responsible for any safety-related defect determined to exist in any item of original equipment. *See also* 49 U.S.C. 30102(b)(1)(C).

[22] *Ford Petition for a Determination of Inconsequentiality and Request for Deferral of Determination Regarding Certain Ford Vehicles Equipped with Takata PSDI-5 Desiccated Driver Airbag Inflators* (August 16, 2017) ("Petition") (cover letter).

[23] *Id.* at 1, 11–16. Ford also suggested differences in "vehicle environment" between affected Ford and Nissan vehicles as a potential explanation for inflator degradation-risk differences between the covered Ford inflators and the covered Nissan inflators. *See* Petition at 2. However, Ford did not elaborate on this suggestion elsewhere in its Petition. *See id.* at 14–16 (focusing on design differences between the covered Ford inflators and covered Nissan inflators).

[24] *Id.* at 16–20.

[25] *See* 82 Fed. Reg. 53561.

Ford's Petition. Two individual commenters appeared to express general discontent with the state of the Takata recalls for non-desiccated PSAN inflators, and a third individual simply stated opposition to Ford's Petition without extensive substantive explanation.

The fourth commenter, the Center for Auto Safety ("CAS"), emphasized the dangers that Takata air bag inflators can pose, including the PSDI-5 inflators at issue in Ford's Petition. CAS also stated a concern that granting Ford's Petition "would effectively serve as a decision that these inflators are exempt from future recall should additional PSAN testing prove a danger."[26] Specific to the substance of Ford's Petition, CAS commented that the Petition "contains unsupported assertions as fact, and . . . no corresponding data or scientific studies confirming the safety of the PSDI-5 airbag inflators," and stated that "[w]here the petition does reference the testing conducted by Takata on Ford inflators, there is little evidence provided to suggest that these inflators will continue to perform after years of exposure."[27] CAS concluded that, "[a]t best, the testing performed by Takata suggests that propellant degradation and inflator chamber pressure have not *yet* developed the potential to harm occupants after ten years in service," and that NHTSA should deny Ford's Petition.[28]

On October 26, 2018, at an in-person meeting with NHTSA, Ford shared additional information in support of its Petition, including internal analyses, test methodologies, and results

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26 Comments at 2.
27 *Id.*
28 *Id.* at 2–3 (emphasis in original).

of tests performed by Ford and outside parties on behalf of Ford or at Ford's request.[29] At a subsequent virtual meeting with NHTSA on November 4, 2020, Ford shared further information in support of its Petition related to additional work done by a third party since October 2018.[30]

II. Classes of Motor Vehicles Involved

Ford's Petition involves approximately 3.04 million light vehicles that contain the covered Ford inflators. These vehicles are: [31]

- Ford Ranger (MY 2007–2011) (build dates January 9, 2006 through December 16, 2011);
- Ford Fusion (MY 2006–2012) (build dates March 15, 2005 through July 29, 2012);
- Lincoln Zephyr/MKZ (MY 2006–2012) (build dates March 15, 2005 through July 29, 2012);
- Mercury Milan (MY 2006–2011) (build dates March 15, 2005 through June 4, 2011);
- Ford Edge (MY 2007–2010) (build dates June 15, 2006 through July 12, 2010); and

[29] Ford submitted an accompanying slide deck, hereinafter "October 2018 Presentation." This presentation is available on the public docket.

The written materials Ford submitted do not explicitly identify one of these third parties, which his hereinafter referred to as "Third Party."

[30] Ford submitted an accompanying slide deck, hereinafter "November 2020 Presentation." This presentation is available on the public docket.

[31] Petition at 9–10 & cover letter thereto at 1.

- Lincoln MKX (MY 2007–2010) (build dates June 15, 2006 through July 12, 2010).

III. Defect

The defect is present in Takata calcium-sulfate desiccated PSDI-5 driver-side air bag inflators.[32] According to its DIR, Takata produced 2.7 million of these defective inflators from January 1, 2005, to December 31, 2012.[33] These inflators are the earliest generation of Takata desiccated PSAN inflators, and were installed as original equipment in vehicles sold by Ford, Mazda, and Nissan.[34] The evidence makes clear that these inflators pose a significant safety risk. In these inflators, "[t]he propellant tablets . . . may experience an alteration over time"—specifically, "some of the inflators within the population analyzed show a pattern of propellant density reduction over time that is understood to predict a future risk of inflator rupture"—"which could potentially lead to over-aggressive combustion" when the air bag in which they are installed deploys.[35] This "could create excessive internal pressure, which could result in the body of the inflator rupturing upon deployment."[36] In the event of such a rupture, "metal fragments could pass through the air bag cushion material, which may result in injury or death to

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32 Recall No. 17E-034.

33 *Id.* The Agency notes that there is a discrepancy between this figure of potentially involved inflators cited in Takata's DIR, and Ford's approximate volume of affected vehicles subject to its petition (approximately 3.04 million). Recall 17E-034; Petition at 9–10 & cover letter thereto at 1. That discrepancy does not affect NHTSA's decision on Ford's Petition.

34 Recall No. 17E-034.

35 *Id.*

36 *Id.*

vehicle occupants."[37] Rupture potentiality may be influenced by "several years of exposure to persistent conditions of high absolute humidity," as well as other factors, including "manufacturing variability or vehicle type."[38]

IV. Legal Background

The National Traffic and Motor Vehicle Safety Act (the "Safety Act"), 49 U.S.C. Chapter 301, defines "motor vehicle safety" as "the performance of a motor vehicle or motor vehicle equipment in a way that protects the public against unreasonable risk of accidents occurring because of the design, construction, or performance of a motor vehicle, and against unreasonable risk of death or injury in an accident, and includes nonoperational safety of a motor vehicle."[39] Under the Safety Act, a manufacturer must notify NHTSA when it "learns the vehicle or equipment contains a defect and decides in good faith that the defect is related to motor vehicle safety," or "decides in good faith that the vehicle or equipment does not comply with an applicable motor vehicle safety standard."[40] The act of filing a notification with NHTSA is the first step in a manufacturer's statutory recall obligations of notification and remedy.[41] However, Congress has recognized that, under some limited circumstances, a manufacturer may petition NHTSA for an exemption from the requirements to notify owners, purchasers, and dealers and to

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37 *Id.*

38 *Id.*

39 49 U.S.C. 30102(a)(9).

40 *Id.* 30118(c)(1). "[A] defect in original equipment, or noncompliance of original equipment with a motor vehicle safety standard prescribed under this chapter, is deemed to be a defect or noncompliance of the motor vehicle in or on which the equipment was installed at the time of delivery to the first purchaser." 49 U.S.C. 30102(b)(1)(F).

41 *Id.* 30118–20.

remedy the vehicles or equipment on the basis that the defect or noncompliance is inconsequential to motor vehicle safety.[42]

"Inconsequential" is not defined either in the statute or in NHTSA's regulations, and so must be interpreted based on its "ordinary, contemporary, common meaning."[43] The inconsequentiality provision was added to the statute in 1974, and there is no indication that the plain meaning of the term has changed since 1961—meaning definitions used today are substantially the same as those used in 1974.[44] The Cambridge Dictionary defines "inconsequential" to mean "not important," or "able to be ignored."[45] Other dictionaries similarly define the term as "lacking importance"[46] and "unimportant."[47]

The statutory context is also relevant to the meaning of "inconsequential."[48] The full text of the inconsequentiality provision is:

> On application of a manufacturer, the Secretary shall exempt the manufacturer from this section if the Secretary decides a defect or noncompliance is inconsequential to motor

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42 *Id.* 30118(d), 30120(h); 49 CFR part 556.

43 *See, e.g.*, *Food Mktg. Institute v. Argus Leader Media*, 139 S. Ct. 2356, 2363 (2019) (quoting *Perrin v. United States*, 444 U.S. 37, 42 (1979)).

44 *See* Pub. L. 93-492, Title I, § 102(a), 88 Stat. 1475 (Oct. 27, 1974); WEBSTER'S THIRD NEW INT'L DICTIONARY (principal copyright 1961) (defining "inconsequential" as "inconsequent;' defining "inconsequent" as "of no consequence," "lacking worth, significance, or importance").

The House Conference Report indicates that the Department of Transportation planned to define "inconsequentiality" through a regulation; however, it did not do so. *See* H.R. Rep. 93-1191, 1974 U.S.C.C.A.N. 6046, 6066 (July 11, 1974). Instead, NHTSA issued a procedural regulation governing the filing and disposition of petitions for inconsequentiality, but which did not address the meaning of the term "inconsequential." 42 FR 7145 (Feb. 7, 1977). The procedural regulation, 49 CFR part 556, has remained largely unchanged since that time, and the changes that have been made have no effect on the meaning of inconsequentiality.

45 https://dictionary.cambridge.org/us/dictionary/english/inconsequential.

46 https://ahdictionary.com/word/search.html?q=inconsequential.

47 https://www.merriam-webster.com/dictionary/inconsequential.

48 *See, e.g.*, *Taniguchi v. Kan Pac. Saipan, Ltd.*, 566 U.S. 560, 569–72 (2012) (considering ordinary and technical meanings, as well as statutory context, in determining meaning of a "interpreter" under 28 U.S.C. 1920(6)).

> vehicle safety. The Secretary may take action under this subsection only after notice in the Federal Register and an opportunity for any interested person to present information, views, and arguments.[49]

As described above, the statute defines "motor vehicle safety" to mean "the performance of a motor vehicle or motor vehicle equipment in a way that protects the public against unreasonable risk of accidents . . . and *against unreasonable risk of death or injury in an accident* . . . ."[50] This is also consistent with the overall statutory purpose: "to reduce traffic accidents and deaths and injuries resulting from traffic accidents."[51]

The statute explicitly allows a manufacturer to seek an exemption from carrying out a recall on the basis that either a defect or a noncompliance is inconsequential to motor vehicle safety.[52] However, in practice, substantially all inconsequentiality petitions have related to noncompliances, and it has been extremely rare for a manufacturer to seek an exemption in the case of a defect. This is because a manufacturer does not have a statutory obligation to conduct a recall for a defect unless and until it "learns the vehicle or equipment contains a defect and decides in good faith that the defect is related to motor vehicle safety," or NHTSA orders a recall by making a "final decision that a motor vehicle or replacement equipment contains a defect related to motor vehicle safety."[53] Until that threshold determination has been made by either the manufacturer or the Agency, there is no need for a statutory exception on the basis that

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49 49 U.S.C. 30118(d), 30120(h).
50 *Id.* 30102(a)(9) (emphasis added).
51 *Id.* 30101.
52 *Id.* 30118(d), 30120(h).
53 *Id.* 30118(c)(1).

a defect is inconsequential to motor vehicle safety. And since a defect determination involves a finding that the defect poses an unreasonable risk to safety, asking the Agency to make a determination that a defect posing an unreasonable risk to safety is inconsequential has heretofore been almost unexplored.[54]

Given this statutory context, a manufacturer bears a heavy burden in petitioning NHTSA to determine that a defect related to motor vehicle safety (which necessarily involves an unreasonable risk of an accident, or death or injury in an accident) is nevertheless inconsequential to motor vehicle safety. In accordance with the plain meaning of "inconsequential," the manufacturer must show that a risk posed by a defect is not important or is capable of being ignored. This appropriately describes the actual consequence of granting a petition as well. The manufacturer would be relieved of its statutory obligations to notify vehicle owners and to remedy the defect, and effectively to ignore the defect as unimportant from a safety perspective. Accordingly, the threshold of evidence necessary for a manufacturer to carry its burden of persuasion that a defect is inconsequential to motor vehicle safety is difficult to satisfy. This is particularly true where the defect involves a potential failure of safety-critical equipment, as is the case here.

The Agency necessarily determines whether a defect or noncompliance is inconsequential to motor vehicle safety based on the specific facts before it. The scarcity of defect-related inconsequentiality petitions over the course of the Agency's history reflects the heavy burden of

[54] NHTSA notes that the current petition is different in that the inflators were declared defective by the supplier of the airbag, and that Ford's defect notice was filed in response to the supplier's notice.

persuasion, as well as the general understanding among regulated entities that the grant of such relief would be quite rare. The Agency has recognized this explicitly in the past. For example, in 2002, NHTSA stated that "[a]lthough NHTSA's empowering statute alludes to the possibility of an inconsequentiality determination with regard to a defect, the granting of such a petition would be highly unusual."[55]

Of the four known occasions in which the Agency has previously considered petitions contending that a defect is inconsequential to motor vehicle safety, the Agency has granted only one of the petitions, nearly three decades ago, in a vastly different set of circumstances.[56] In that case, the defect was a typographical error in the vehicle's gross vehicle weight rating (GVWR) that had no impact on the actual ability of the vehicle to carry an appropriate load. NHTSA granted a motorcycle manufacturer's petition, finding that a defect was inconsequential to motor vehicle safety where the GVWR was erroneously described as only 60 lbs., which error was readily apparent to the motorcycle operator based upon both common sense and the fact that the 330 lbs. front axle rating and 540 lbs. rear axle rating were listed directly below the GVWR on the same label.[57] Moreover, the error did not actually impact the ability of the motorcycle to carry the weight for which it was designed.[58]

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[55] Letter from J. Glassman, NHTSA, to V. Kroll, Adaptive Driving Alliance (Sept. 23, 2002), https://www.nhtsa.gov/interpretations/ada3.

[56] *See id.*

[57] *Suzuki Motor Co., Ltd.; Grant of Petition for Inconsequential Defect*, 47 FR 41458, 41459 (Sept. 20,1982) and 48 FR 27635, 27635 (June 16, 1983).

[58] *Id.*

On the other hand, NHTSA denied another petition concerning a vehicle's weight label where there was a potential safety impact. NHTSA denied that petition from National Coach Corporation on the basis that the rear gross axle weight rating (RGAWR) for its buses was too low and could lead to overloading of the rear axle if the buses were fully loaded with passengers.[59] NHTSA rejected arguments that most of the buses were not used in situations where they were fully loaded with passengers and that there were no complaints.[60] NHTSA noted that its Office of Defects Investigation had conducted numerous investigations concerning overloading of suspensions that resulted in recalls, that other manufacturers had conducted recalls for similar issues in the past, and that, even if current owners were aware of the issue, subsequent owners were unlikely to be aware absent a recall.[61]

NHTSA also denied a petition asserting that a defect was inconsequential to motor vehicle safety where the defect involved premature corrosion of critical structure components (the vehicle's undercarriage), which could result in a crash or loss of vehicle control.[62] Fiat filed the petition preemptively, following NHTSA's initial decision that certain Fiat vehicles contained a safety-related defect.[63] In support of its petition, Fiat argued that no crashes or

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[59] *Nat'l Coach Corp.; Denial of Petition for Inconsequential [Defect]*, 47 FR 49517, 49517 (Nov. 1, 1982). NHTSA's denial was erroneously titled "Denial of Petition for Inconsequential Noncompliance"; the discussion actually addressed the issue as a defect. *See id.*; *see also Nat'l Coach Corp.; Receipt of Petition for Inconsequential Defect*, 47 FR 4190 (Jan. 28, 1982).

[60] *Id.* at 49517–18.

[61] *Id.* at 49518.

[62] *Final Determination & Order Regarding Safety Related Defects in the 1971 Fiat Model 850 and the 1970-74 Fiat Model 124 Automobiles Imported and Distributed by Fiat Motors of N. Am., Inc.; Ruling on Petition of Inconsequentiality*, 45 FR 2134, 2137, 41 (Jan. 10, 1980).

[63] *Fiat Motors of N. Am., Inc.; Receipt of Petition for Determination of Inconsequential Defect*, 44 FR 60193,

injuries resulted from components that failed due to corrosion, and that owners exercising due diligence had adequate warning of the existence of the defect.[64] NHTSA rejected those arguments and both finalized its determination that certain vehicles contained a safety-related defect (*i.e.*, ordered a recall) and found that the defect was not inconsequential to motor vehicle safety.[65] NHTSA explained that the absence of crashes or injuries was not dispositive: "the possibility of an injury or accident can reasonably be inferred from the nature of the component involved."[66] NHTSA also noted that the failure mode was identical to another population of vehicles for which Fiat was carrying out a recall.[67] The Agency rejected the argument that there was adequate warning to vehicle owners, explaining that the average owner does not inspect the underbody of a car and that interior corrosion may not be visible.[68]

Most recently, the Agency denied a petition asserting that a defect in non-desiccated Takata PSAN air bag inflators was inconsequential to motor vehicle safety, where the defect involved the degradation of inflator propellant that could cause the inflator to over-pressurize during air bag deployment—causing metal fragments to penetrate the air bag and enter the

60193 (Oct. 18, 1979); *Fiat Motors Corp. of N. Am.; Receipt of Petition for Determination of Inconsequential Defect*, 44 FR 12793, 12793 (Mar. 8, 1979).

64 *See, e.g.*, 45 FR 2134, 2141 (Jan. 10, 1980).

65 *Final Determination & Order Regarding Safety Related Defects in the 1971 Fiat Model 850 and the 1970-74 Fiat Model 124 Automobiles Imported and Distributed by Fiat Motors of N. Am., Inc.; Ruling on Petition of Inconsequentiality*, 45 FR 2137-41 (Jan. 10, 1980). Fiat also agreed to a recall of certain of the vehicles, and NHTSA found that Fiat did not reasonably meet the statutory recall remedy requirements. *Id.* at 2134–37.

66 *Id.* at 2139.

67 *Id.*

68 *Id.* at 2140.

vehicle compartment toward vehicle occupants.[69] In support of this petition and its argument that the inflators at issue were not at risk of rupture—being "more resilient" to rupture than other Takata PSAN inflators—General Motors made arguments and submitted evidence regarding inflator design differences and vehicle features, testing and field data analyses, inflator aging studies, predictive modeling, risk assessments, and potential risk created by conducting repairs.[70] The Agency rejected these arguments and, among other things, observed the severe nature of the safety risk and that the defect could not be discerned even by a diligent vehicle owner.[71] The Agency also specifically noted the heavy burden on General Motors to demonstrate inconsequentiality, stating that "[t]he threshold of evidence necessary to prove the inconsequentiality of a defect such as this one—involving the potential performance failure of safety-critical equipment—is very difficult to overcome."[72]

Agency practice over several decades therefore shows that inconsequentiality petitions are rarely filed in the defect context, and virtually never granted. Nonetheless, in light of the importance of the issues here, and the fact that Ford's defect notification was filed in response to the notification provided by Ford's supplier, the Agency also considered the potential usefulness of the Agency's precedent on noncompliance. The same legal standard—"inconsequential to motor vehicle safety"—applies to both defects and noncompliances.[73]

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69 *Gen. Motors LLC, Denial of Consolidated Petition for Decision of Inconsequential Defect*, 85 FR 76159 (Nov. 27, 2020).
70 *Id.* at 76161–164, 76167.
71 *Id.* at 76173.
72 *Id.*
73 49 U.S.C. 30118(d), 30120(h).

In the noncompliance context, in some instances, NHTSA has determined that a manufacturer met its burden of demonstrating that a noncompliance was inconsequential to safety. For example, labels intended to provide safety advice to an occupant that may have a misspelled word, or that may be printed in the wrong format or the wrong type size, have been deemed inconsequential where they should not cause any misunderstanding, especially where other sources of correct information are available.[74] These decisions are similar in nature to the lone instance where NHTSA granted a petition for an inconsequential defect, as discussed above.

However, the burden of establishing the inconsequentiality of a failure to comply with a *performance requirement* in a standard—as opposed to a *labeling requirement*—is more substantial and difficult to meet. Accordingly, the Agency has not found many such noncompliances inconsequential.[75] Potential performance failures of safety-critical equipment, like seat belts or air bags, are rarely deemed inconsequential.

An important issue to consider in determining inconsequentiality based upon NHTSA's prior decisions on noncompliance issues was the safety risk to individuals who experience the type of event against which the recall would otherwise protect.[76] NHTSA also does not consider

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[74] *See, e.g.*, *Gen. Motors, LLC.; cf. Grant of Petition for Decision of Inconsequential Noncompliance*, 81 FR 92963 (Dec. 20, 2016). By contrast, in *Michelin*, we reached the opposite conclusion under different facts. There, the defect was a failure to mark the maximum load and corresponding inflation pressure in both Metric and English units on the sidewall of the tires. *Michelin N. America, Inc.; Denial of Petition for Decision of Inconsequential Noncompliance*, 82 FR 41678 (Sept. 1, 2017).

[75] *Cf. Gen. Motors Corporation; Ruling on Petition for Determination of Inconsequential Noncompliance*, 69 FR 19897, 19899 (Apr. 14, 2004) (citing prior cases where noncompliance was expected to be imperceptible, or nearly so, to vehicle occupants or approaching drivers).

[76] *See Gen. Motors, LLC; Grant of Petition for Decision of Inconsequential Noncompliance*, 78 FR 35355 (June 12, 2013) (finding noncompliance had no effect on occupant safety because it had no effect on the proper

the absence of complaints or injuries to show that the issue is inconsequential to safety.[77] "Most importantly, the absence of a complaint does not mean there have not been any safety issues, nor does it mean that there will not be safety issues in the future."[78] "[T]he fact that in past reported cases good luck and swift reaction have prevented many serious injuries does not mean that good luck will continue to work."[79]

Arguments that only a small number of vehicles or items of motor vehicle equipment are affected have also not justified granting an inconsequentiality petition.[80] Similarly, NHTSA has rejected petitions based on the assertion that only a small percentage of vehicles or items of equipment are actually likely to exhibit a noncompliance. The percentage of potential occupants that could be adversely affected by a noncompliance does not determine the question of inconsequentiality. Rather, the issue to consider is the consequence to an occupant who is

operation of the occupant classification system and the correct deployment of an air bag); *Osram Sylvania Prods. Inc.; Grant of Petition for Decision of Inconsequential Noncompliance*, 78 FR 46000 (July 30, 2013) (finding occupant using noncompliant light source would not be exposed to significantly greater risk than occupant using similar compliant light source).

[77] *See Combi USA Inc., Denial of Petition for Decision of Inconsequential Noncompliance*, 78 FR 71028, 71030 (Nov. 27, 2013).

[78] *Morgan 3 Wheeler Ltd.; Denial of Petition for Decision of Inconsequential Noncompliance*, 81 FR 21663, 21666 (Apr. 12, 2016).

[79] *United States v. Gen. Motors Corp.*, 565 F.2d 754, 759 (D.C. Cir. 1977) (finding defect poses an unreasonable risk when it "results in hazards as potentially dangerous as sudden engine fire, and where there is no dispute that at least some such hazards, in this case fires, can definitely be expected to occur in the future").

[80] *See Mercedes-Benz, U.S.A., L.L.C.; Denial of Application for Decision of Inconsequential Noncompliance,* 66 FR 38342 (July 23, 2001) (rejecting argument that noncompliance was inconsequential because of the small number of vehicles affected); *Aston Martin Lagonda Ltd.; Denial of Petition for Decision of Inconsequential Noncompliance*, 81 FR 41370 (June 24, 2016) (noting that situations involving individuals trapped in motor vehicles—while infrequent—are consequential to safety); *Morgan 3 Wheeler Ltd.; Denial of Petition for Decision of Inconsequential Noncompliance*, 81 FR 21663, 21664 (Apr. 12, 2016) (rejecting argument that petition should be granted because the vehicle was produced in very low numbers and likely to be operated on a limited basis).

exposed to the consequence of that noncompliance.[81] These considerations are also relevant when considering whether a defect is inconsequential to motor vehicle safety.

V. Information before the Agency

Ford advances several arguments in support of its Petition. In sum, Ford asserts that there is a difference in expected performance between desiccated and non-desiccated Takata PSAN inflators; that there are design differences between its covered inflators and another variant of the same type; that although there are signs of aging in field returns, there is no indication of propellant degradation that could lead to rupture and no imminent safety risk; and that no ruptures of the covered inflators are expected to occur for at least over twenty-six years of cumulative exposure in the worst-case environment, for the worst-case vehicle configuration, and worst-case customer usage. Ford supports these arguments with its own analyses, results of inflator testing and analyses conducted by three outside entities, and predictive modeling.

A. Ford's Statistical Analysis of MEAF Data

Ford undertook its own statistical analysis of data in the Master Engineering Analysis File ("MEAF"),[82] which Ford contends "shows a clear difference in expected field performance between desiccated and non-desiccated inflators," and "suggests that the factors causing

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[81] *See Gen. Motors Corp.; Ruling on Petition for Determination of Inconsequential Noncompliance*, 69 FR 19897, 19900 (Apr. 14, 2004); *Cosco Inc.; Denial of Application for Decision of Inconsequential Noncompliance*, 64 FR 29408, 29409 (June 1, 1999).

[82] For several years, Takata has inspected, tested, and analyzed inflators returned from the field. The compiled and summarized test results for hundreds of thousands of inflators are contained in the Takata MEAF, which is updated on an ongoing basis. Takata's MEAF file was available to the Agency in making its determination, and it is from this file that some of the information considered by the Agency was derived, and discussed herein.

degradation in the non-desiccated population of inflators are not currently affecting" the covered Ford inflators.[83] Four charts underpin Ford's assertions.

The first chart is of box plots of primary-chamber pressures of covered Ford inflators by age, which Ford asserts shows there is "[n]o significant trend of primary pressure increase with inflator age."[84] The second chart Ford provides is a lognormal histogram illustrating the frequency of maximum values of primary-chamber pressure of covered Ford inflators, which Ford asserts shows that the probability of a covered Ford inflator exceeding a 92.37 MPa "threshold"[85] is estimated as less than 1×10^{-15}.[86] Ford's third chart illustrates predicted primary-chamber pressure for covered Ford inflators with probability curves for three module ages—15, 20, and 30 years old, which Ford contends shows that the probability of a module with thirty years in service exceeding a 92.37 MPa threshold is 6.56×10^{-6}.[87] And a fourth chart consists of probability plots (log normalized, 95% confidence) comparing primary-chamber pressure maximum values between Ford modules with desiccated Takata PSAN inflators and Ford modules with non-desiccated Takata PSAN inflators.[88] Ford states this shows that the probability of exceeding a 92.37 MPa threshold for desiccated parts "is several orders of magnitude lower than that of non-desiccated parts."[89]

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83 November 2020 Presentation at 11; October 2018 Presentation at 14.
84 November 2020 Presentation at 7; October 2018 Presentation at 10.
85 This appears to be the level at which Ford considers an abnormal deployment to be a potentiality. This 92.37 figure is used throughout Ford's materials.
86 November 2020 Presentation at 8; October 2018 Presentation at 11.
87 November 2020 Presentation at 9; October 2018 Presentation at 12.
88 November 2020 Presentation at 10; October 2018 Presentation at 13.
89 *Id.*

B. Takata's Live Dissections and Ballistic Testing

According to Ford, Takata analyzed 1,992 calcium-sulfate desiccated PSDI-5 driver-side air bag inflators returned from the field from Ford vehicles, which included 1,008 inflators from Ford Ranger vehicles[90] and 984 from Fusion/Edge vehicles.[91] Analysis involved both live dissections and ballistic testing, with 1,257 inflators subject to ballistic testing, and 735 inflators subject to live dissection.[92] Ford concludes from the results that while "no indication of degradation that could lead to a rupture and no imminent risk to safety has been identified," Takata's analysis did "identif[y] signs of aging" in the inflators.[93]

Ford did not much further explain the nature or results of this ballistic testing and live dissection in either its October 2018 or November 2020 Presentations. Ford does, however, further describe such analyses with respect to the approximately 423 inflators from Ford Rangers that Takata had analyzed at that point.[94]

Ford asserts that about 360 live dissections of the Ford Ranger inflators demonstrated "consistent inflator output performance"—specifically, that measurements of ignition-tablet

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90 Ford noted in its Petition that twenty of these inflators were from salvage yards "where the conditions used to store the parts cannot be determined." Petition at 11.

91 November 2020 Presentation at 12; October 2018 Presentation at 7. Takata also analyzed 895 inflators from Nissan Versa vehicles. *See* Recall No. 17V-449; Petition at 11 ("approximately 1,000").

92 November 2020 Presentation at 12; October 2018 Presentation at 15; *see* Petition at 14.

93 November 2020 Presentation at 12; October 2018 Presentation at 15.

94 Petition at 14. Ford noted that twenty of the inflators from Ford Rangers were from salvage yards "where the conditions used to store the parts cannot be determined." *Id.* at 11.

When Ford filed its Petition, Takata had analyzed over 1,300 of its calcium-sulfate desiccated PSDI-5 driver-side air bag inflators: the approximately 423 inflators from Ford Rangers, and the remainder from Nissan Versa vehicles. *Id.* at 14.

discoloration, "generate" density,[95] and moisture content of certain inflator constituents did not indicate a reduction-in-density trend.[96] Ford describes in its Petition that during visual inspection of the covered Ford inflators, "Takata observed slight discoloration of the propellant tablets in the primary and secondary chambers," but that such discoloration "is not an indicant by itself that the propellant has degraded"—only that the propellant had been exposed to elevated temperatures.[97] Takata also observed changes in color in the primary and secondary booster auto-ignition tablets.[98] On a scale of 1–10, with a discoloration of 10 "indicating severe exposure" to elevated temperatures, Ford states that "the vast majority"[99] of observed discoloration in inflators obtained from vehicles in certain high-heat-and-humidity states "was within the 1–3 range after seven to eleven years of vehicle service," while acknowledging that "[s]even samples were in the 5–6 range."[100] Accordingly, Ford asserts, the results of visual inspection "evidence time-in-service, but not tablet density loss."[101] Ford's Petition also states that Takata took density measurements of propellant tablets in the primary and secondary

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95 Ford utilizes the term "generate" throughout its Petition. *See, e.g.*, Petition at 3 ("generate system") & 6 ("generate"). In the Agency's experience, "generate" is not among nomenclature commonly used with respect to air bag inflators—NHTSA is more familiar with the term "genera*nt*." In context, however, it appears that Ford is referring to an inflator's function generating gas to inflate the air bag, or the air bag inflator's propellant itself. *See id.*; *see also id.* at 15 (referring to "Generate – 2004," indicating a reference to a particular type of propellant produced by Takata).

96 *Id.* at 11–12.

97 *Id.* at 12.

98 *Id.*

99 Ford did not state the exact size of this "vast majority."

100 Petition at 12.

101 *Id.*

chambers of covered Ford inflators.[102] "[A] small number of samples[103] were measured with a density slightly below the minimum average tablet production specification," although Ford noted that "a nearly equal number . . . measured densities higher than the maximum average tablet production specification."[104] Ford argues that such data does "not support a conclusion that tablet density is degrading in the inflators designed for Ford after 10 years of service."[105]

Ford contends in its Petition that its conclusions are further supported by forty-seven ballistic deployment tests that showed no inflator exceeding the production primary-chamber pressure performance specifications.[106] The results of these tests are, according to Ford, consistent with data from newly manufactured PSDI-5 inflators in Ford vehicles.[107] Ford also emphasizes that Takata did not observe pressure vessel ruptures or pressure excursions on any desiccated PSDI-5 inflator, and that "[t]he maximum primary chamber pressure that Takata measured" in covered Ford inflators was about 15 MPa lower than that measured in a covered Nissan inflator (which exhibited primary chamber pressure exceeding 60 MPa).[108]

C. "Design Differences" in Inflators Equipped in Ford Vehicles

In its Petition, Ford contends that "[t]here are significant design differences" in the covered Ford inflators when compared to the covered Nissan inflators, and that such differences

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102 *Id.*
103 Ford did not state the exact size of this sample.
104 Petition at 12–13.
105 *Id.* at 13.
106 *Id.* at 12–13.
107 *Id.* at 14.
108 *Id.*

may explain differences observed between the inflator variants in generate properties and during testing.[109] Ford cites its inflator variant as having "fewer potential moisture sources" because the inflators contain only two, foil-wrapped auto-ignition tablets (instead of three that are not foil-wrapped), contain divider disk foil tape, and utilize certain EPDM generate cushion material (instead of ceramic) that "reduces generate movement over time, maintains generate integrity, and leads to consistent and predictable burn rates."[110] Ford posits that such differences may explain differences observed between the two inflator variants' generate material properties, and ballistic-testing results.[111]

D. Northrop Grumman's Analysis

Northrop Grumman ("NG") analyzed the covered Ford inflators, results of which were presented to the Agency subsequent to Ford's filing of its Petition. According to Ford, NG's assessment of field-return parts and modeling "identified expected signs of aging but no indication of degradation that could lead to rupture," and the assessment "identified clear and significant differences between desiccated and non-desiccated inflators of similar age and design."[112]

Specifically, NG undertook 58 dissections, 138 tank tests, MEAF analysis, design comparisons, CT scans, and ballistic modeling. The inflators subject to dissection and tank tests

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109 *Id.* at 14–15.
110 *Id.* at 15–16 (providing table).
111 *Id.* at 14–15; *see also* November 2020 Presentation at 31; October 2018 Presentation at 29–30.
112 November 2020 Presentation at 13; October 2018 Presentation at 16.

included inflators from Ford Rangers (2006-2007, prefix ZN) and Fusions (2006-2008, prefix ZQ) in South Florida; Edges (2006-2008, prefix ZQ) in South Florida and Georgia; Rangers (2006-2007, prefix ZN) in Arizona, Rangers in Michigan (2006-2008, prefix ZN); and virgin inflators (prefixes ZN and ZQ).[113]

NG also completed probability-of-failure projections for the covered Ford inflators under its inflator aging model, on which Ford updated the Agency in November 2020.[114] Ford considered the results of those projections in conjunction with anticipated vehicle attrition and the probabilities of crashes with air bag deployments.[115]

1. Live Dissections

According to Ford, NG performed various assessments related to live dissections of inflators:[116]

- Propellant health analysis. According to Ford, the covered Ford inflators are susceptible to energetic disassembly when tablet density is at 1.64 g/cc or lower,[117] and the densities of the tablets from such returned inflators were measured "well above" 1.63-1.64 g/cc.
- AI-1 analysis. NG measured the propellant tablets for outer diameter ("OD"), weight, and color. Ford states that the OD and weight of field returns were "similar" to virgin

113 November 2020 Presentation at 14; October 2018 Presentation at 17.
114 November 2020 Presentation at 22.
115 *Id.*
116 November 2020 Presentation at 15–16; October 2018 Presentation at 18–19.
117 Although not explained, this assertion appears to be derived from NG's ballistic modeling, which found that "[a]n equivalent low press tablet density below 1.631 g/cc was required to produce sufficient augmented burning." *See* November 2020 Presentation at 17; October 2018 Presentation at 20.

inflators. Also according to Ford, "[i]n older undesiccated inflators, the AI-1 tablet color is an indicator of age based on humidity and temperature exposure in the field, and the returned inflators retained a 0-2 color (10 the darkest)," which was "similar" to virgin inflators. Ford further notes that thermogravimetric analysis "indicated similar weight loss to virgin samples."

- Moisture content. According to Ford, the propellants from the returned inflators were lower in moisture content than non-desiccated PSDI-5 inflators (prefix ZA) and desiccated PSDI-5 (prefix YT) inflators.
- X-ray micro-computed tomography (micro-CT scan). Ford asserts that "[n]o definitive trend was observed with respect to void count, size, or total volume, and tablet density." According to Ford, "[t]ypically, 20,000 voids were identified ranging in size from $1x10^{-5}$ to .3 cubic millimeters."
- Scanning electron microscope (SEM). NG processed 2004 tablets from non-desiccated PSAN inflators (prefix ZA) through the Independent Testing Coalition's ("ITC") aging study (1920 cycles).[118] Those had "higher surface roughness than tablets from Ford desiccated inflators." Propellant in desiccated PSDI-5 inflators (prefixes GE and YT) aged at 1920 cycles, according to Ford, also had higher surface roughness than propellant in the field-returned Ford PSDI-5 inflators (prefixes ZN and ZQ)—which had surface roughness "similar" to propellant in virgin inflators.

[118] The ITC is funded by a consortium of vehicle manufacturers.

- Burn rate (closed bomb). According to Ford, "[n]o significant differences were observed between 2004 propellant from virgin and returned inflators," and "[n]o anomalous pressure traces were observed."
- O-ring. Ford states that "[a]lthough a significant decrease in [O]-ring squeeze is observed in the 2006-8 PSDI-5D inflator igniter assembly sealing system, the remaining squeeze is deemed acceptable to prevent moisture leakage around the O-ring." According to Ford, older O-rings have a loss of resiliency from a decrease in the horizontal diameter that occurs with increasing age.
- Inflator Tank Testing. Ford states that results showed one Ford PSDI-5 inflator (ZN prefix) with a chamber pressure approximately 20% higher than the average of the other tested inflators. "All other PSDI-5 ZN curves were grouped tightly with the virgin inflators," as were, according to Ford, the ZQ prefix inflators. Ford also notes that the inflator with the higher pressure was from a vehicle in Michigan, and that the pressure "was well below any expected inflator rupture pressure."

2. Ballistic Modeling

NG developed ballistic models "to investigate the observed performance behavior of Ford PSDI-5 ZN and ZQ inflators and to evaluate the potential sensitivity of the inflators to certain design deviations."[119] Representative performance models were anchored to measured pressure data from virgin inflators.[120] "The models simulated inflator ignition, chamber

[119] November 2020 Presentation at 17; October 2018 Presentation at 20.
[120] *Id.*

volumetric filling, burst tape rupture, ignition delay between chambers and steady state combustion."[121] According to Ford, the PSDI-5 design required "significant degradation of the 2004 propellant tablets" to obtain failure pressures.[122] Specifically, "[a]n equivalent low press tablet density below 1.631 g/cc was required to produce sufficient augmented burning."[123] Ford states that such degradation was not observed in the field returns of covered Ford inflators.[124]

3. MEAF Assessment

NG analyzed MEAF data up to February 2018 to determine whether covered Ford inflators had energetic deployment ("ED") rates were dependent on platform, inflator age, climate zone, or other factors.[125] Among the "key" findings according to Ford: for non-desiccated PSDI-5 inflators, abnormal deployments began to occur after 10.5 years, and EDs after 11.5 years; inflator variants with calcium-sulfate desiccant experienced normal deployments up to 12.5 years (which at the time were the oldest inflators contained in the MEAF); the calcium-sulfate desiccant "appear[ed] to be largely saturated after 8 years;" and the covered Ford inflators contained less moisture in the 3110 booster propellant than the non-desiccated inflators.[126]

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121 *Id.*
122 *Id.*
123 *Id.*
124 *Id.*
125 *Id.*
126 *Id.*

4. Probability-of-Failure Projections

In its November 2020 Presentation to the Agency, Ford cites NG's PSAN Inflator Test Program and Predictive Aging Model Final Report from October 2019 ("NG Model"),[127] first observing that this report indicates that for another OEM's PSDI-5 inflator with a calcium-sulfate desiccant (prefix YT), a T3 vehicle in Miami with the most severe aging (top 1%, hereinafter a "1% usage" vehicle), may reach a probability of failure of 1 in 10,000 (.01%) in less than thirty years.[128] Ford then states that under the NG model, for the Ford covered inflators prefixes ZN and ZQ, a 1% usage T3 vehicle in Miami has an expected 25.7 and 25.6 years, respectively, to a .01% probability of failure.[129] Ford further states that this is an additional two years when compared to the YT prefix version of the inflator (of another OEM).[130]

Ford then asserts that the earliest Fusion/Milan/MKZ vehicles equipped with the covered Ford inflators were built in 2005, and that if those vehicles perform as T3 vehicles, the earliest calendar year for a 1 in 10,000 probability of failure is 2031 for a 1% usage vehicle.[131] Similarly, Ford asserts that the earliest Ranger, Edge/MKX vehicles equipped with the covered

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127 NG previously submitted this report to the Agency, which contains information regarding the safety of desiccated Takata PSAN inflators. The report is available at https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/ngis_takata_investigation_final_report_oct_2019.pdf.

128 November 2020 Presentation at 23. T3 refers to a "temperature band." Under NG's report, there are three temperature bands—T1, T2, T3. T3 is the highest temperature band, representing vehicles with maximum inflator temperatures near or slightly above 70°C. NG Report at 18–19; *see* November Presentation at 24. The "1% usage vehicle" refers to a vehicle with the most severe environmental exposure based on customer usage. *See* November 2020 Presentation at 24.

129 November 2020 Presentation at 25.

130 *Id.*

131 *Id.* at 26.

Ford inflators were built in 2006, and that if those vehicles perform as T3 vehicles, the earliest calendar year for a 1 in 10,000 probability of failure is 2032 for a 1% usage vehicle.[132]

Ford builds on these assertions by stating that "for a rupture to occur the vehicle must be in service and experience a crash resulting in airbag deployment," and that based on vehicle attrition and crash statistics, Ford does not project a field event at twenty-six years of service.[133] Ford provides the below data in support:[134]

Vehicle	Model Year	Volume (Florida)	Probability of Inflator Rupture[135] at 26 Years in Service	Expected Cumulative Events at 26 Years in Service
Fusion	2006 – 2012	75,232	5.08E-07	0.038
MKZ	2006 – 2012			
Milan	2006 – 2011			
Edge	2007 – 2010	39,161	6.34E-07	0.025
MKX	2007 – 2010			
Ranger	2007 – 2011			

Ford therefore states that the earliest a Ford vehicle in a Miami-type environment may reach a .01% probability of failure is over a decade in the future for a 1%-usage T3 vehicle and that, in other words, "the predictive model suggests that no inflator ruptures are expected to

132 *Id.*
133 *Id.*
134 *Id.*
135 Ford notes this was "[a]djusted for the population attrition & accident probabilities using vehicles currently registered in Florida (not all of which have always been registered in Florida)." *Id.*

occur for at least 26 years of cumulative exposure in the worst case environment, worst case vehicle configuration, and worst case customer usage" (*i.e.*, 2031 for the oldest vehicles).[136]

Ford also makes several other observations, including that:[137]

- "[s]tudying parts prior to approximately 16-18 years in service would not identify meaningful inflator aging information" (*i.e.*, 2023 for the oldest vehicles);
- the ITC, in coordination with NG, is conducting a surveillance program for desiccated Takata PSAN inflators, and data gathered from that program can validate the NG models;
- "[w]ith newer inflators that have not yet shown signs of aging, there is a significant opportunity for improving the fidelity and accuracy of the model with enhanced anchoring data"; and
- there is time for a separate surveillance program for the covered Ford inflators "well before any potential risk is projected" after the results of NG's surveillance program that are expected in 2021.

Ford concludes that it "believes that the current data indicates that the subject inflators do not present an unreasonable risk to safety and that it supports granting the petition."[138]

136 *Id.* at 26–27.
137 *Id.* at 27.
138 *Id.*

E. Additional Third-Party Analysis

According to Ford, an additional Third Party found that no pressure excursions were detected in the covered Ford inflators analyzed to date.[139] The Third Party also found that some field inflators experienced porosity growth greater than virgin inflators with 2004 propellant, "but not to a level sufficient to cause pressure excursions in bomb testing."[140] In addition, "[n]o significant increase in tablet ODs was observed for field populations" of covered inflators.[141] These findings were derived from live dissections performed on 39 inflators and deployment tests on 65 inflators.[142] The inflators were field-return parts obtained from Florida, Michigan, and Ohio.[143]

VI. Response to Ford's Supporting Information and Analyses

Ford, through its Petition and supporting analysis, seeks to show that the covered Ford inflators are not at risk of rupture such that the defect is inconsequential to safety. First, as noted above, when taking into consideration the Agency's noncompliance precedent, an important factor is also the severity of the consequence of the defect were it to occur—*i.e.*, the safety risk to an occupant who is exposed to an inflator rupture. Ford did not provide any information to suggest that result would be any different were a covered Ford inflator to rupture in a Ford vehicle.

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139 *Id.* at 18; October 2018 Presentation at 21.
140 *Id.*
141 *Id.*
142 *Id.*
143 *Id.*

And second, as a general matter, at various points, Ford's Petition implicitly appears to adopt the covered Nissan inflators as a standard for inconsequentiality. However, differentiating the covered Ford inflators from the covered Nissan inflators, *e.g.*, through ballistic-testing or live-dissection results, does not directly answer the question of whether the defect in the covered Ford inflators is, on its own merits, inconsequential to motor vehicle safety. Even assuming that the covered Ford inflators compare favorably to the covered Nissan inflators, NHTSA has not made an inconsequentiality determination for the covered Nissan inflators—nor will it be doing so.[144] Ford similarly argued in subsequent materials, for example, with regard to NG's live dissections and predictive-model results, as well as Ford's statistical analysis of the MEAF, that the covered Ford inflators compared favorably to other inflator variants, and even to non-desiccated inflators. Merely demonstrating that one's own defective product compares favorably to another's defective product does not suffice for an inconsequentiality determination.

Relatedly, Ford's argument regarding "design differences" between the covered Ford and covered Nissan inflators appears to be more of an identification of areas for further study or potential explanation—not a standalone argument in support of an inconsequentiality determination. Ford identifies design differences "that *may* account for the difference in material properties of the generate," and differences in pressures measured during ballistic testing of the

[144] Ford's comparisons might carry more evidentiary weight if, for instance, the Agency had previously granted an inconsequentiality petition from Nissan for its covered inflators. Nissan did not petition the Agency for an inconsequentiality determination for its covered inflators. *See also* 49 CFR 556.4(c) (requiring such a petition is submitted not later than thirty days after defect or noncompliance determination).

inflators.[145] Ford did not persuasively connect these design differences to meaningful improved performance in generate properties and pressure differences[146] and, even if Ford had, the covered Nissan inflators are not a proxy standard for inconsequentiality.

In addition to these issues, signs of aging were observed in the covered Ford inflators; the sample sizes used for the analyses were limited; and there are shortcomings regarding various analyses that undermine their conclusions—including some information that was missing or unclear. Ford's probability-of-failure projections are also unpersuasive—and notably belied by the limited evidence available from ballistic testing and analysis on real-world field returns of the covered Ford inflators. These additional issues are discussed below.

A. Signs of Aging

Ford admits that signs of aging were observed in the covered Ford inflators. While Ford indirectly dismisses this is as a non-issue—concluding that there is no degradation "that would signal either an imminent or developing risk to safety"—aging leads to degradation, which leads to risk of inflator rupture. Further, the 2004 propellant that is present in the covered Ford inflators degrades until, at some point, it no longer burns normally, but in an accelerated and unpredictable manner that can cause an inflator rupture. "The purpose of the Safety Act . . . is to prevent serious injuries stemming from established defects before they occur."[147] And as CAS

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145 Petition at 14–15 (emphasis added).

146 Moreover, as described further below, based on recent MEAF data, one covered Ford inflator has the highest chamber pressure tested for Takata calcium-sulfate desiccated PSDI-5 inflators.

147 *United States v. Gen. Motors Corp.*, 565 F.2d 754, 759 (D.C. Cir. 1977).

commented, "tests demonstrating that inflators are 'OK for now' in no way ensures safety throughout the maximum useful life of these vehicles."[148]

B. Samples

The Agency finds shortcomings in the sample sizes utilized in the analyses. Ford's total field-return sample was, across the Takata, NG, and the additional Third Party analyses, less than 3,000 inflators for an affected population of over 3 million vehicles. Ford presented analysis from Takata of fewer than 2,000 inflators, while NG analyzed only 196, and the additional Third Party analyzed just over 100. In total, Ford cites to 1,460 ballistic tests, which is approximately .05% of the total population subject to Ford's Petition. By comparison, for example, that percentage of the population tested is much smaller than the percentage of inflators tested as of November 2019 in a mid-sized pick-up vehicle population equipped with non-desiccated PSAN inflators—1.81%—with one observed test rupture. Ford's own statistical analysis of the MEAF regarding Pc Primary Max Value frequency[149] was also based on only 1,247 inflators.[150]

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148 *See* Comments at 3.

149 *See* November 2020 Presentation at 8.

150 Moreover, twenty of the inflators (from Ranger vehicles) were from salvage yards, "where the conditions used to store the parts cannot be determined." Petition at 11. Further highlighting the significance of this shortcoming, Ford noted in its Petition the potential importance of "vehicle environment" with respect to inflator-degradation risk but did not elaborate on this suggestion elsewhere in its Petition. *See id.* at 2; *id.* 14–16 (focusing on design differences between the covered Ford inflators and covered Nissan inflators). For purposes of its arguments related to the NG Model, Ford presented a worst-case scenario, where it was assumed for purposes of that scenario that the vehicles at issue would be in the T3 temperature band.

C. Additional Underlying Information

Other shortcomings regarding various analyses presented here—including some information that was missing or unclear—further undermine the associated conclusions. These are identifiable in both Ford's Petition and in the subsequent Presentations to the Agency.

1. Ford's Petition

As an initial matter, Ford submitted little of the relevant underlying data, and did not fully explain the underlying methodologies and results, associated with the arguments in its 2017 Petition. More specifically, one of Ford's arguments in its 2017 Petition is that Takata's live dissections of covered Ford inflators does not show tablet-density degradation or increased inflation pressure, and therefore, Takata "did not identify a reduction in density trend" in the covered Ford inflators.[151] Tablet discoloration was graded on a qualitative 1–10 scale, but to what discoloration characteristics each level of this scale corresponds is not explained. And Ford's conclusion that a "vast majority" of discoloration in certain inflators was within a certain low range of discoloration (with seven samples in a certain mid-range) is vague, and Ford did not provide information about the specific distribution of the results (*e.g.*, the number of inflators receiving each discoloration value or the number of inflators in each Zone).[152]

Ford also provides little information about the specific inflators tested and associated results with regard to density measurements—such as actual dimensions, mass, and densities,

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151 *Id.* at 11.

152 *See id.* at 12.

among measurements—instead largely relying on general descriptions the results.[153] For inflation pressure, Ford offers evidence of ballistic tests, although the breakdown of this sample with regard to vehicle model year and location, as well as how many of these inflators were obtained from salvage yards with unknown environment exposures (and the associated results), was not provided.[154]

2. Subsequent Submissions to the Agency

Ford's statistical analysis of the MEAF contains several shortcomings in the first two charts—box plots of primary-chamber pressure by age of inflator, and a lognormal histogram of maximum values illustrating the frequency of maximum values of primary-chamber pressure of covered Ford inflators. In the box plots, Ford does not specify or illustrate what a "normal" or "expected" primary-chamber pressure would be. Nor did Ford provide information showing how many inflators each age group comprises—although the lack of whiskers in the box plot for inflators aged thirteen years suggests that, at least for that age group, the sample size is small. There are also outlier pressure values observed in the nine- to twelve-year age groups, which concern the Agency. And in the histogram, Ford does not distinguish among different inflator ages—which would have highlighted any trends in primary-chamber pressure maximum values based on age.

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153 *See id.* at 12–13 ("[A] small number of samples were measured with a density slightly below the minimum average tablet production specification, while a nearly equal number of samples measured densities higher than the maximum. . . .").

154 *See id.* at 13.

There are also several shortcomings with the second two charts—the probability curves for module ages, and probability plots comparing primary-chamber pressure maximum values of Ford modules with desiccated and non-desiccated inflators, respectively. As to the probability curves, while details were not provided by Ford, this analysis appears to assume that degradation will proceed linearly. However, researchers that have been most closely involved in analyzing Takata inflators, including NG, all seem to agree that the degradation process is, at the very least, complex, and does not follow a linear trajectory. Instead, 2004 propellant (which is contained in the covered Ford inflators) degrades until, at some point, it no longer burns normally, but in an accelerated and unpredictable manner that can cause an inflator rupture. As to the probability plots, while a comparison between desiccated and non-desiccated inflators is somewhat informative from a broad perspective, it is too general to lend much support to Ford's Petition, and as noted above, the performance of non-desiccated Takata PSAN inflators is not a sound benchmark for whether the defect in the covered Ford inflators is inconsequential to safety.

Regarding NG's analysis, as an initial matter, over a quarter of the 196 inflators analyzed were non-aged/virgin inflators and, further, degradation would not be expected in the inflators from Michigan (from which, collectively, 55 of the inflators were obtained). Ford also acknowledges aging in inflator O-rings from this analysis. In addition, there are several particular issues with NG's live dissections worth noting. Findings regarding moisture content are of limited value, and Ford did not present important information on the referenced comparator prefix ZA and YT inflators—*e.g.*, age and the geographic region in which they were used. As to the SEM results, Ford does not explain how the concept of surface roughness relates

to the long-term safety of the inflators at issue here. Similarly, regarding the additional Third Party's analysis, OD growth for the tablet grain form has not been found to be reliable indicator of propellant health, and Ford does not demonstrate otherwise.

D. Probability-of-Failure Projections

Ford's probability-of-failure projections are also unpersuasive. As previously described, these projections, submitted in support of Ford's Petition in November 2020, are based on the NG Model. While the projections are informative in various respects, NHTSA does not view the Model's outputs for the covered Ford inflators as fully squaring with the evidence available for those inflators from real-world field returns[155]—which renders what Ford provides unpersuasive for the purposes of its Petition. Even with the limited testing evidence available, ballistic testing of field returns of the covered Ford inflators includes three inflator deployments with primary-chamber pressures between 60 and 70 MPa—coming from two ZQ inflators with a field age between 12 and 13 years (one of which exhibited a pressure of 68 MPa), and one ZN inflator with a field age between 10 and 11 years.[156] In the Agency's experience, such primary-chamber pressure results are indicative of propellant degradation and potential future rupture risk. The nature of these results, in addition to causing concern, undercuts one of Ford's notable arguments

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[155] While it may be possible to age an inflator artificially in a manner that replicates aging characteristics in the field (and then test those inflators), Ford did not attempt to do this for the covered Ford inflators.

[156] Also notable is that all three results are over three standard deviations above even the average field-return results for ZN and ZQ inflators collectively (for which the Agency would expect a higher average than virgin inflators).

Ford also noted a ZN inflator tested by NG with a chamber pressure approximately 20% higher than the average of the other inflators in tank testing. The specific measurement (and measurements of other NG tests) does not appear to have been provided to the Agency.

in its Petition: that "[t]he maximum primary chamber pressure that Takata measured" in covered Ford inflators was about 15 MPa lower than that measured in a covered Nissan inflator (which exhibited primary chamber pressure exceeding 60 MPa). Indeed, at least three covered Ford inflators have now exceeded 60 MPa in ballistic testing (one ZN, two ZQ), and according to recent MEAF data, one of these inflators (of the ZQ variant) has the highest chamber pressure tested for Takata calcium-sulfate desiccated PSDI-5 inflators.

Data from the MEAF also may suggest the beginning stages of notable density changes in propellant tablets in the covered Ford inflators with increasing field age. Recent results from primary tablets in inflators with field ages between 12 and 14 years show four inflators with density measurements near (or below) 1.68 g/cc; according to Ford, 1.64 g/cc is the point at which the PSDI-5 inflators with 2004 tablets are susceptible to energetic disassembly.[157] Similarly, there are a number of field returns measured with secondary-chamber tablet densities under 1.66 g/cc (mostly ZN, although one ZQ inflator), including ZN inflators under 1.64 g/cc—one of which was measured as low as 1.62 g/cc. This undermines the contention that the densities of the tablets from returned covered Ford inflators were measured "well above" 1.63-1.64 g/cc, as well as assertions regarding the results of visual inspections that it contends "evidence time-in-service, but not tablet density loss."

[157] These results regard recently tested ZQ inflators with greater field ages than previously tested ZN inflators, although it should also be noted that one ZN inflator with a field age of about 10 years measured a primary-tablet density just above 1.66 g/cc—lower than any result for a ZQ inflator.

The above results from real-world field returns signal that propellant degradation in the covered Ford inflators is occurring. While the predictive model that Ford references (and its applicable results) is informative in certain respects, the specific metrics Ford cites in support cannot be sufficiently squared with the actual testing that has been completed on real-world field returns to be persuasive for Ford's Petition.[158]

Further, there are shortcomings particular to the metrics on which Ford relies regarding the Model. Notably, Ford contends that "there are no expected field events projected at 26 years of service."[159] However, Ford's figures for an expected number of cumulative field events[160] were cut off at 26 years in service and limited to an analysis of vehicles in Florida—a combined volume of 114,393 vehicles, which is less than 4% of the total population of Ford vehicles at issue.[161] While such vehicles may be among the highest risk populations, unless it is assumed that there is a cumulative zero probability of inflator rupture (through 26 years in service) for every vehicle in every other State (including States other than Florida with high heat and

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158 *See also* Exhibit A (Report of Dr. Harold Blomquist) to *Gen. Motors LLC, Denial of Consolidated Petition for Decision of Inconsequential Defect*, 85 FR 76159 (Nov. 27, 2020) at para.272 (indicating that—in assessing a similar model with regard to a petition for inconsequentiality—apparent inconsistencies between that model's predictions and high-pressure ballistic test results of field returns—of inflators not at issue here—"suggest caution should be used" in applying the results of that model).

159 *See* November 2020 Presentation at 26.

160 These figures, which appear based on the twenty-sixth year of service (the point at which, under the NG Model and according to Ford, there is a 1% probability of failure for a covered Ford inflator in a T3 vehicle with the most severe (top 1%) usage factors in Miami), were 0.038 for a population of approximately 75,000 Fusion, MKZ, and Milan vehicles, and 0.025 for a population of approximately 39,000 Edge, MKX, and Ranger vehicles. *See* November 2020 Presentation at 26.

161 Ford did not submit evidence demonstrating that none of the vehicles subject to the Petition would be in service after 26 years—in Florida or otherwise. And while Ford adjusted relevant metrics for attrition and crash probabilities, Ford did not submit specific information about how these adjustments were made.

humidity),[162] these calculations do not reflect the expected cumulative events for the entire population of 3.04 million vehicles installed with calcium-sulfate desiccated Takata inflators through 26 years in service—thereby understating the risk, as suggested by the Model, for the vehicles at issue in Ford's Petition. In other words, Ford does not provide a fleet-level assessment here—the total number of cumulative events expected to occur in the coming years for such vehicles. And in any case, Ford's metrics are undercut by the ballistic results and analysis of field-returned inflators showing elevated pressures and propellant density changes discussed above.

VII. Decision

The relief sought here is extraordinary. Ford's Petition is quite distinct from previous petitions discussed above relating to defective labels that may (or may not) mislead the user of the vehicle to create an unsafe condition.[163] Nor is the risk here comparable to a deteriorating exterior component of vehicle that—even if an average owner is unlikely to inspect the component—might (or might not) be visibly discerned.[164] Rather, similar to the defect at issue in NHTSA's recent decision on a petition regarding certain non-desiccated Takata PSAN air bag

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[162] Although 26 years is—under the NG Model and according to Ford—the point at which there is a 1% probability of failure for a covered Ford inflator in a vehicle with the most severe (top 1%) usage factors in Miami, Ford does not explain why this is an appropriate point at which to end its analysis of the expected number of cumulative field events.

[163] *See Nat'l Coach Corp.; Denial of Petition for Inconsequential [Defect]*, 47 FR 49517 (Nov. 1, 1982); *Suzuki Motor Co., Ltd.; Grant of Petition for Inconsequential Defect*, 48 FR 27635 (June 16, 1983).

[164] *See Final Determination & Order Regarding Safety Related Defects in the 1971 Fiat Model 850 and the 1970-74 Fiat Model 124 Automobiles Imported and Distributed by Fiat Motors of N. Am., Inc.; Ruling on Petition of Inconsequentiality*, 45 FR 2134 (Jan. 10, 1980).

inflators installed in General Motors vehicles, the defect here poses an unsafe condition caused by the degradation of an important component of a safety device that is designed to protect vehicle occupants in crashes.[165] Instead of protecting occupants, this propellant degradation can lead to an uncontrolled explosion of the inflator and propel sharp metal fragments toward occupants in a manner that can cause serious injury and even death.[166] This unsafe condition—hidden in an air bag module—is not discernible even by a diligent vehicle owner, let alone an average owner.[167]

NHTSA has been offered no persuasive reason to think that without a recall, even if current owners are aware of the defect and instant petition, subsequent owners of vehicles equipped with covered Ford inflators would be made aware of the issue.[168] This is not the type of defect for which notice alone enables an owner to avoid the safety risk. A remedy is required to address the underlying safety defect.

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165 *See Gen. Motors LLC, Denial of Consolidated Petition for Decision of Inconsequential Defect*, 85 FR 76159 (Nov. 27, 2020).

166 *See id.* at 76173; *cf. Gen. Motors, LLC; Grant of Petition for Decision of Inconsequential Noncompliance*, 78 FR 35355-01, 2013 WL 2489784 (June 12, 2013) (finding noncompliance inconsequential where "occupant classification system will continue to operate as designed and will enable or disable the air bag as intended").

167 *See Gen. Motors LLC, Denial of Consolidated Petition for Decision of Inconsequential Defect*, 85 FR 76159, 76173 (Nov. 27, 2020)*; Final Determination & Order Regarding Safety Related Defects in the 1971 Fiat Model 850 and the 1970-74 Fiat Model 124 Automobiles Imported and Distributed by Fiat Motors of N. Am., Inc.; Ruling on Petition of Inconsequentiality*, 45 FR 2134 (Jan. 10, 1980) (rejecting argument there was adequate warning to vehicle owners of underbody corrosion, as the average owner does not undertake an inspection of the underbody of a vehicle, and interior corrosion of the underbody may not be visible).

168 *See Nat'l Coach Corp.; Denial of Petition for Inconsequential [Defect]*, 47 FR 49517 (Nov. 1, 1982) (observing, *inter alia*, that other manufacturers had conducted recalls for similar issues in the past, and that, even if current owners were aware of the issue, subsequent owners were unlikely to be aware absent a recall).

As discussed above, the threshold of evidence necessary to prove the inconsequentiality of a defect such as this one—involving the potential performance failure of safety-critical equipment—is very difficult to overcome.[169] Ford bears a heavy burden, and the evidence and argument Ford provides suffers from numerous, significant deficiencies, as previously described in detail. In all events, the information that Ford presents in its Petition and subsequent Presentations to the Agency is inadequate to support a grant of its Petition.

As noted above, at various points Ford's Petition appears to focus on differentiating the covered Ford inflators from the covered Nissan inflators—not directly answering the question of whether the defect in the covered Ford inflators is, on its own merits, inconsequential to motor vehicle safety. Ford similarly argued in subsequent materials that the covered Ford inflators compared favorably to another inflator variant of the same type, and even to non-desiccated inflators. These comparisons do not suffice for an inconsequentiality determination. Relatedly, Ford's argument regarding design differences does not suffice to support an inconsequentiality determination. This argument, furthermore, was not persuasively connected to meaningful improved performance in generate-properties and pressure differences (and even if it had been, the covered Nissan inflators are not an appropriate proxy standard for inconsequentiality). The sample sizes used for the analyses were also limited, and there are shortcomings regarding various analyses that undermine their conclusions—including some information was missing or unclear.

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169 *See Gen. Motors LLC, Denial of Consolidated Petition for Decision of Inconsequential Defect*, 85 FR 76159, 76173 (Nov. 27, 2020).

As a general matter, signs of aging were observed in the covered Ford inflators, which leads to propellant degradation, which leads to inflator rupture—and the 2004 propellant that is present in the covered Ford inflators degrades until, at some point, it no longer burns normally, but in an accelerated and unpredictable manner that can cause an inflator rupture. Perhaps most importantly, even with the limited testing evidence available, ballistic testing of field returns of the covered Ford inflators includes three inflator deployments with primary-chamber pressures between 60 and 70 MPa— coming from two ZQ inflators with a field age between 12 and 13 years (one of which exhibited a pressure of 68 MPa), and one ZN inflator with a field age between 10 and 11 years. Data from the MEAF also appears to indicate the beginning stages of density changes in propellant tablets in the covered Ford inflators with increasing field age. These results from real-world field returns signal that propellant degradation in the covered Ford inflators is occurring, and belie the probability-of-failure projections that Ford provides (which have their own additional shortcomings that lead to an understatement of the potential risk).

Given the severity of the consequence of propellant degradation in these air bag inflators—the rupture of the inflator and metal shrapnel sprayed at vehicle occupants—a finding of inconsequentiality to safety demands extraordinarily robust and persuasive evidence. What Ford presents here, while valuable and informative in certain respects, suffers from far too many shortcomings, both when the evidence is assessed individually and in its totality, to demonstrate that the defect in covered Ford inflators is not important or can otherwise be ignored as a matter of safety.

In consideration of the forgoing, NHTSA has decided Ford has not demonstrated that the defect is inconsequential to motor vehicle safety. Accordingly, Ford's Petition is hereby denied, and Ford is obligated to provide notification of, and a remedy for, the defect pursuant to 49 U.S.C. 30118 and 30120. Within 30 days of the issuance of this decision, Ford shall submit to NHTSA a proposed schedule for the notification of vehicle owners and the launch of a remedy required to fulfill those obligations.

Authority: 49 U.S.C. 30101, *et seq*., 30118, 30120(h), 30162, 30166(b)(1), 30166(g)(1); delegation of authority at 49 CFR 1.95(a); 49 CFR Parts 556, 573, 577.

Issued:

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Jeffrey Mark Giuseppe
Associate Administrator for Enforcement

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