

NHTSA issued this Initial Decision on September 5, 2023, pursuant to 49 U.S.C. § 30118(a) and 49 C.F.R. § 554.10. This is a pre-publication copy of the Federal Register notice.

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**DEPARTMENT OF TRANSPORTATION**

**National Highway Traffic Safety Administration**

**[Docket No. NHTSA-2023-0038]**

**Initial Decision That Certain Frontal Driver and Passenger Air Bag Inflators**

**Manufactured by ARC Automotive Inc. and Delphi Automotive Systems LLC Contain a Safety Defect; and Scheduling of a Public Meeting**

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

**ACTION:** Notice of initial decision and public meeting

**SUMMARY:** NHTSA will hold a public meeting regarding its initial decision that certain frontal and passenger air bag inflators manufactured by ARC and Delphi through January 2018 contain a defect related to motor vehicle safety and should be recalled.

**DATES:** The public meeting will be held at DOT headquarters in Washington, DC beginning at 9:30 a.m. on October 5, 2023.

**ADDRESSES:**

You may submit written submissions to the docket number identified in the heading of this document by any of the following methods:

- *Federal eRulemaking Portal:* Go to <https://www.regulations.gov>. Follow the online instructions for submitting comments.
- *Mail:* Docket Management Facility: U.S. Department of Transportation, 1200 New Jersey Avenue SE, West Building Ground Floor, Room W12-140, Washington, DC 20590-0001.

- *Hand Delivery or Courier:* 1200 New Jersey Avenue SE, West Building Ground Floor, Room W12–140, between 9 a.m. and 5 p.m. ET, Monday through Friday, except Federal holidays.

- *Fax:* 202–493–2251.

*Instructions:* All submissions must include the agency name and docket number. Note that all written submissions received will be posted without change to <https://www.regulations.gov>, including any personal information provided. Please see the Privacy Act discussion below. We will consider all written submissions received before the close of business on Friday, October 20, 2023.

*Docket:* For access to the docket to read background documents or written submissions received, go to <https://www.regulations.gov> at any time or to 1200 New Jersey Avenue SE, West Building Ground Floor, Room W12–140, Washington, DC 20590, between 9 a.m. and 5 p.m., Monday through Friday, except Federal Holidays. Telephone: 202–366–9826.

*Privacy Act:* In accordance with 49 U.S.C. 30118(b)(1), NHTSA will make a final decision only after providing an opportunity for manufacturers and any interested person to present information, views, and arguments. DOT posts written submissions submitted by manufacturers and interested persons, without edit, including any personal information the submitter provides, to [www.regulations.gov](http://www.regulations.gov), as described in the system of records notice (DOT/ALL–14 Federal Docket Management System (FDMS)), which can be reviewed at [www.transportation.gov/privacy](http://www.transportation.gov/privacy).

*Confidential Business Information:* If you wish to submit any information under a claim of confidentiality, you must submit your request directly to NHTSA’s Office of the Chief Counsel. Requests for confidentiality are governed by [49 CFR part 512](https://www.ecfr.gov/current/title-49/chapter-I/subchapter-B/part-512). NHTSA is currently treating electronic submission as an acceptable method for submitting confidential business information

(CBI) to the agency under part 512. If you would like to submit a request for confidential treatment, you may email your submission to Ashley Simpson in the Office of the Chief Counsel at [Ashley.Simpson@dot.gov](mailto:Ashley.Simpson@dot.gov) or you may contact her for a secure file transfer link. At this time, you should not send a duplicate hardcopy of your electronic CBI submissions to DOT headquarters. If you claim that any of the information or documents provided to the agency constitute confidential business information within the meaning of [5 U.S.C. 552\(b\)\(4\)](#), or are protected from disclosure pursuant to [18 U.S.C. 1905](#), you must submit supporting information together with the materials that are the subject of the confidentiality request, in accordance with part 512, to the Office of the Chief Counsel. Your request must include a cover letter setting forth the information specified in our confidential business information regulation ([49 CFR 512.8](#)) and a certificate, pursuant to § 512.4(b) and part 512, appendix A. In addition, you should submit a copy, from which you have redacted the claimed confidential business information, to the Docket at the address given above.

**FOR FURTHER INFORMATION CONTACT:** Ashley Simpson, Office of the Chief Counsel, National Highway Traffic Safety Administration, 1200 New Jersey Avenue, SE., Washington, DC 20590; (202) 366-8726. Persons wishing to attend the public meeting or make oral statements must register at <https://www.nhtsa.gov/events/public-meeting-arc-delphi-air-bag-inflators> before the close of business on September 22, 2023. Please refer to the supplementary information section for additional information on registering for the public meeting.

The publicly available information on which this initial decision is based will be available on the agency's website at <https://www.nhtsa.gov/recalls?nhtsaId=EA16003>, <https://www.nhtsa.gov/recalls?nhtsaId=PE15027>, and on the public docket under Docket No. NHTSA-2023-0038.

**SUPPLEMENTARY INFORMATION:** Pursuant to 49 U.S.C. 30118(a) and 49 CFR 554.10, NHTSA has made an initial decision that certain frontal driver and passenger air bag inflators manufactured by ARC Automotive Inc. (ARC) and Delphi Automotive Systems LLC (Delphi) through January 2018 contain a defect related to motor vehicle safety. These air bag inflators may rupture when the vehicle's air bag is commanded to deploy, causing metal debris to be forcefully ejected into the passenger compartment of the vehicle. A rupturing air bag inflator poses an unreasonable risk of serious injury or death to vehicle occupants. At least seven people have been injured and one person has been killed by these rupturing air bag inflators within the United States. Based on its investigation, NHTSA believes that ruptures may result from the weld slag produced by the friction welding manufacturing process. Should weld slag of a sufficient size become dislodged, it can cause a blockage of the inflator exit orifice when the air bag deploys. A blockage of sufficient size will cause an over pressurization and rupture of the inflator, leading to the potential forced propulsion of shrapnel or metal fragments from the inflator into the passenger compartment. Additional inflator ruptures are expected to occur in the future, risking more serious injuries and deaths, if they are not recalled and replaced.

#### **A. Inflators Subject to this Initial Decision**

The inflators subject to this initial decision are hybrid, toroidal inflators manufactured by ARC and Delphi for use in driver and passenger air bag modules, subsequently incorporated into passenger vehicles. ARC has been manufacturing driver hybrid, toroidal inflators since 2000. In July 2001, ARC granted Delphi a license to manufacture driver inflators for use in Delphi's driver air bag modules.<sup>1</sup> Delphi stopped manufacturing the inflators in 2004, having

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<sup>1</sup> The Delphi entity that manufactured these inflators no longer exists. NHTSA indicated in its April 27, 2023 recall request letter that it was acquired by Autoliv ASP, Inc. ("Autoliv"). Autoliv has since provided NHTSA with some information indicating that it may not have legal liability for the Delphi-manufactured inflators. At this time,

manufactured approximately 11 million inflators under the agreement. ARC continued to manufacture the driver inflators and began to manufacture passenger inflators in 2010. In January 2018, ARC fully implemented an automated borescope examination process on its production lines that manufactured toroidal inflators, which is used to detect excessive weld slag or other debris in the inflator center support, mitigating the risk of a field rupture due to exit orifice blockage. The agency is unaware of a field rupture of a frontal hybrid, toroidal inflator manufactured after the implementation of the borescope examination process.

Therefore, the inflators subject to this initial decision are the approximately 41 million frontal hybrid, toroidal driver and passenger inflators manufactured by ARC from 2000 through the implementation of the borescope examination process in January 2018, and the approximately 11 million driver hybrid, toroidal inflators manufactured by Delphi under its licensing agreement with ARC.<sup>2</sup> For simplicity, the inflators subject to this initial decision are described as the “subject inflators.” The subject inflators were incorporated into air bag modules used in vehicles manufactured by 12 vehicle manufacturers: BMW of North America, LLC, FCA US LLC, Ford Motor Company, General Motors LLC, Hyundai Motor America, Inc., Kia America, Inc., Maserati North America, Inc., Mercedes-Benz USA LLC, Porsche Cars North America, Inc., Tesla Inc., Toyota Motor North America, Inc., and Volkswagen Group of America, Inc.

## **B. Known Inflator Ruptures Resulting in Death and Injuries**

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NHTSA has not verified the entity that has legal responsibility under 49 U.S.C. Chapter 301 for those inflators. However, as described herein, the vehicle manufacturers that used the inflators as original equipment would be responsible for carrying out any recalls.

<sup>2</sup> NHTSA’s April 27, 2023 recall request letter estimated the number of subject inflators as approximately 67 million. Since that time, NHTSA has lowered its estimate of the population to approximately 52 million inflators, correcting for over-inclusive responses reported to the agency by certain manufacturers over the course of the investigation. The exact population of inflators and vehicles (including the specific vehicle makes, models, and model years) subject to any recall that may result will be determined by the manufacturers. *See* 49 CFR 573.6(c)(3).

The agency is currently aware of seven confirmed subject inflator ruptures in the United States. These seven ruptures involve both single stage and dual stage air bag inflators (as explained below), inflators manufactured at different times and in three different manufacturing facilities, and inflators incorporated into air bag modules by four different module suppliers and used in four different vehicle manufacturers' vehicles:

- On January 29, 2009, a driver side air bag inflator ruptured in a Model Year (MY) 2002 Chrysler Town and Country minivan in Ohio. The air bag module was produced by Key Safety Systems, Inc. later d/b/a Joyson Safety Systems and used a dual stage ARC inflator. The inflator was manufactured in Knoxville, Tennessee. The driver was severely injured during the incident.
- On April 8, 2014, a driver side air bag inflator ruptured in a MY 2004 Kia Optima in New Mexico. The air bag module was manufactured by Delphi and had a single stage ARC inflator. The inflator was manufactured in Knoxville, Tennessee. The driver sustained injuries to the face and legs.
- On September 22, 2017, a driver side air bag inflator ruptured in a MY 2010 Chevrolet Malibu in Pennsylvania. The air bag module was produced by ZF-TRW and used a dual stage ARC inflator. The inflator was manufactured in Xian, China. The driver sustained injuries to the face and head.
- On August 15, 2021, a driver side air bag inflator in a MY 2015 Chevrolet Traverse ruptured in Michigan. The air bag module was produced by Toyoda Gosei and used a dual stage ARC inflator. The inflator was manufactured in Reynosa, Mexico. The air bag module was a replacement module. The vehicle had been in a prior frontal collision and the original air bag module deployed with no issue. The original air bag module was also produced by Toyoda Gosei and used a dual stage ARC inflator. The driver was killed.
- On October 20, 2021, a driver side air bag inflator in a MY 2015 Chevrolet Traverse ruptured in Kentucky. The air bag module was produced by Toyoda Gosei and used a dual stage ARC inflator. The inflator was manufactured in Reynosa, Mexico. The driver sustained injuries to the face.
- On December 18, 2021, a passenger side air bag inflator ruptured in a MY 2016 Audi A3 e-Tron in California. The air bag module was produced by Key Safety Systems, Inc. d/b/a Joyson Safety Systems and used a dual stage ARC inflator. The inflator was manufactured in Reynosa, Mexico. The driver and passenger were injured.
- On March 22, 2023, a driver side air bag inflator in a MY 2017 Chevrolet Traverse ruptured in Michigan. The air bag module was produced by Toyoda Gosei and used a dual stage ARC inflator. The inflator was manufactured in Reynosa, Mexico. The driver sustained injuries to the face.

NHTSA is also aware of at least two confirmed field ruptures outside of the United States, again involving the same universe of inflators of varying origins and uses:

- On July 11, 2016, a driver side air bag inflator ruptured in a MY 2009 Hyundai Elantra in Canada. The air bag module was produced by Mobis and used a single stage ARC air bag inflator. The inflator was manufactured in Xian, China. The driver was killed.
- On October 16, 2017, a passenger side air bag inflator ruptured in a MY 2015 Volkswagen Golf in Turkey. The air bag module was produced by Key Safety Systems, Inc. later d/b/a Joyson Safety Systems and used a single stage ARC inflator. The inflator was manufactured in Knoxville, Tennessee. The driver sustained no injuries. There was no passenger in the vehicle.

### **C. Background Regarding Air Bags**

Air bags are safety equipment designed to protect vehicle occupants in the event of a crash. Air bags have been used in passenger vehicles since the 1970s and were mandated by NHTSA in 1991. All new vehicles were required to have frontal air bags by September 1998. Paired with seat belts, air bags control the movement of the occupant's upper body and head during a moderate to severe crash—defined as a frontal or near-frontal impact with a solid, fixed barrier at 8 to 14 mph or higher. Upon such an occurrence, a signal to the air bag system's electronic control unit initiates the ignition of the inflator propellant to generate the gas to immediately fill the air bag cushion.

The subject inflators are hybrid, toroidal inflators. A hybrid inflator uses stored gas that is excited by the propellant to fill the air bag cushion. Toroidal inflators are round, non-cylindrical inflators. The subject inflators include both single stage and dual stage inflators. Single stage inflators deploy at a preset speed and at full force. Dual stage inflators deploy at two different stages depending on the size of the occupant as measured by the load sensor in the front seat and

the severity of the impact.<sup>3</sup> The subject inflators were incorporated into air bag modules produced by multiple suppliers. The air bag “inflator” is a component of the air bag “module” – the inflator is the part that generates the gas that fills the air bag cushion. The air bag module is typically comprised of a mounting bracket, inflator, cushion (bag that fills with gas), cover (the decorative part that matches the interior of the vehicle), and connecting wires.

Although air bags, when properly deployed, provide significant safety benefits—NHTSA estimates that frontal air bags have saved more than 50 thousand lives over the past 30 years—the rupture of an air bag inflator during deployment is rare and extremely dangerous. Although the incidence of rupture is rare, NHTSA and the industry have acted to address confirmed ruptures through recalls. Other confirmed inflator field ruptures in the United States, excluding illegal counterfeit products, have resulted in recalls.<sup>4</sup> There is widespread acceptance in the industry that rupturing air bag inflators are safety defects requiring a recall.<sup>5</sup>

#### **D. Legal Background on Safety Defects and Recall Responsibilities**

The National Traffic and Motor Vehicle Safety Act (Safety Act), as amended, requires manufacturers to conduct a recall for safety defects in motor vehicles and motor vehicle

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<sup>3</sup> The two inflation stages can deploy sequentially or simultaneously. Typically, the first stage is approximately 80% of the full force of the air bag, and the second stage is approximately 20% of the full force of the air bag. The second stage can deploy simultaneously with the first stage should the severity of the impact warrant dual deployment. The second stage can deploy subsequent to the deployment of the first stage for lower severity impacts.

<sup>4</sup> In the largest air bag inflator recall, TK Holdings, Inc. (Takata) issued recalls after determining that certain driver and passenger inflators ruptured when activated. *See, e.g.*, 15E-040, 15E-041, 15E-042, 15E-043. In fact, NHTSA’s recall request letter to Takata identified six inflator ruptures, one less than identified here. In that case, the safety defect was degradation of propellant. Takata subsequently recalled certain non-azide driver inflators (NADI) due to rupture risk caused by excess moisture in the propellant. 19E-080. Other inflator ruptures have also been addressed through recalls. In 2021, Key Safety Systems, Inc. d/b/a Joyson Safety Systems recalled certain curtain air bag inflators which carried a risk of rupture due to moisture corrosion. 21E-080. In 2021, FCA recalled certain Mopar side curtain air bag inflators for risk of separated inflator cap or rupture. 21E-740. Volvo Car USA, LLC conducted a recall in 2021 of certain vehicles equipped with inflators manufactured by ZF North America, Inc. for susceptibility to rupture due to excess moisture and propellant degradation. *See* 21V-766, 21V-800.

<sup>5</sup> Failure of an air bag module to deploy in a crash when it should have deployed also puts vehicle occupants at risk and therefore has resulted in recalls. *See, e.g.*, 22V-031. The severity of risk of a module that ruptures is even greater in that it not only fails to protect vehicle occupants from crash forces, but itself becomes the cause of injury or death by shooting metal shrapnel into the occupant compartment.



equipment. *See* 49 U.S.C. 30118-20. Specifically, a manufacturer must notify NHTSA, owners, dealers, and distributors of any “defect . . . related to motor vehicle safety.” 49 U.S.C. 30118. The Safety Act defines “defect” as “includ[ing] any defect in performance, construction, a component, or material of a motor vehicle or motor vehicle equipment.” 49 U.S.C. 30102(a)(2). “Motor vehicle safety” means “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.” *Id.* § 30101(a)(8). A safety defect therefore may be determined to exist without knowing its precise cause.

A motor vehicle or component contains a “defect” if it is subject to a significant number of failures in normal operation. *See United States v. General Motors Corp.*, 518 F.2d 420, 427 (D.D.C. 1975). To establish that a significant number of failures exists, the agency need only show that the figure is more than *de minimis*. *See id.* at 438 n.84. The agency must also show that the failure condition occurred under circumstances which, in the absence of a defect, would not have occurred. *See United States v. General Motors Corp.*, 841 F.2d 400, 412 (D.C. Cir. 1988).

Any safety defect determination, whether made by NHTSA or by a manufacturer, requires notification to owners pursuant to 49 U.S.C. 30119 and a free remedy pursuant to 49 U.S.C. 30120. Under the Safety Act, an air bag inflator installed in a new vehicle is original equipment. *See id.* § 30102(a)(8), (b)(1)(C). For recall purposes, “a defect in original equipment . . . is deemed to be a defect . . . of the motor vehicle in which the equipment was installed at the time of delivery to the first purchaser.” *Id.* § 30102(b)(1)(F).

When a safety defect exists in original equipment used by more than one vehicle manufacturer, as in this case, the equipment supplier and each vehicle manufacturer must notify the agency by filing a recall report pursuant to 49 CFR Part 573. 49 CFR 573.3(f). Vehicle manufacturers are then generally responsible for carrying out recalls for their vehicles containing defective parts, such as air bag inflators, by notifying vehicle owners and providing a free remedy. *See* 49 U.S.C. 30102(b)(1)(F), 30118-20. An equipment manufacturer is responsible under the Safety Act for recalling its replacement equipment. *See id.* 30118. Replacement equipment is “motor vehicle equipment . . . that is not original equipment.” *Id.* § 30102(b)(1)(D).

#### **E. The Agency’s Investigation**

On July 13, 2015, NHTSA’s Office of Defects Investigation (ODI) opened a Preliminary Evaluation (PE) defect investigation, identified as PE15-027, to investigate an alleged safety defect in hybrid, toroidal inflators designed and manufactured by ARC<sup>6</sup> for use in vehicles sold or leased in the United States.

NHTSA’s investigation was prompted by reports of driver air bag inflator ruptures in a MY 2002 Chrysler Town & Country and a MY 2004 Kia Optima. Both vehicles were equipped with inflators manufactured by ARC in Knoxville, Tennessee. During the PE phase of the investigation, NHTSA obtained information from ARC identifying the air bag module manufacturers to which it supplied inflators during the time period of June 2000 through October 2004. The time frame for the initial inquiry was bracketed by the date that ARC commenced production of the hybrid toroidal inflator and the build date of the Kia Optima. NHTSA then obtained information from the module manufacturers to identify the vehicle manufacturers that used the inflators.

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<sup>6</sup> Approximately 11 million of the subject inflators were designed by ARC but manufactured by Delphi.

NHTSA also ordered vehicle and inflator manufacturers, including ARC, to report to the agency information related to any inflator field ruptures.<sup>7</sup> Standing General Order (SGO) 2015-02. The agency also began to work with the involved manufacturers to conduct a field recovery program to better understand the potential failure modes.

On July 11, 2016, the ARC-manufactured inflator in a MY 2009 Hyundai Elantra ruptured in Canada. That rupture, which resulted in a fatality, prompted ODI's upgrade of the investigation to the Engineering Analysis phase, then identified as EA16-003, on August 4, 2016. The ruptured inflator was manufactured by ARC in Xian, China. ARC confirmed that the ruptured inflator was substantially similar to the inflator at issue in the prior Kia Optima rupture in that the inflators underwent the same assembly and manufacturing process.

The agency continued its investigation, issuing information request letters to the manufacturers and issuing Standing General Order 2016-01. Standing General Order 2016-01 requires ARC to notify the agency of an inflator rupture occurring during a lot acceptance test,<sup>8</sup> hydroburst test,<sup>9</sup> or assembly line gas fill.<sup>10</sup> This initial notification must be made within 24 hours of ARC's notice of such an event. The order also requires ARC to make additional reporting about the rupture as its investigation into such a rupture progresses. SGO 2016-01 was

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<sup>7</sup> The term field rupture refers to an inflator rupture that occurs when a vehicle is in a crash.

<sup>8</sup> A lot acceptance test refers to the random testing of completed air bag inflators. This test is conducted at the beginning, middle, and end of a manufacturing shift, or at any time the assembly line is shifted to production of a different part. If an inflator ruptures or fails in some way during a lot acceptance test, the entire lot of inflators is quarantined. The term "lot" refers to the number of inflators that were manufactured in an identified manufacturing plant on a specific assembly line for a specific shift.

<sup>9</sup> A hydroburst test is a destructive examination of the strength of the inflator housing. An inflator subject to a hydroburst test is filled with water until its housing fails. The housing is instrumented to measure the water pressure attained. An inflator that bursts prior to attaining the pressure specifications for its housing fails the test.

<sup>10</sup> An assembly line gas fill refers to the process of filling the inflator with compressed gas. During that process, ruptures may occasionally occur when the compressed gas is exposed to the heat generated during the gas fill and welding of the burst disc.

superseded by SGO 2017-01, which revised the reportable rupture incidents to include only those occurring during lot acceptance tests.

Since issuing these Standing General Orders, vehicle manufacturers have confirmed and reported to the agency five additional field ruptures in the United States involving the subject inflators. To date, manufacturers have generally conducted small lot-specific recalls to address inflator ruptures.<sup>11</sup> In May 2023, General Motors LLC also initiated a recall to address a somewhat broader scope of vehicles by model and model year.<sup>12</sup> The vast majority of the subject inflators covered by this notice are not covered by these existing recalls.

NHTSA's investigation revealed a potential failure mechanism most likely causing the ruptures. ARC designed and manufactured the subject inflators using a method called friction welding to join the inflator upper and lower pressure vessels. The friction welding process, in some circumstances, produced excess weld slag, which, if loose, will be propelled toward the inflator exit orifice during an air bag deployment, along with any other debris in the inflator center support. As explained in the agency's recall request letter to ARC:

ARC's inflator design is such that during a triggered deployment, the stored gas, excited by the propellant, has a single path through the exit orifice to exit the inflator and fill the air bag cushion. Should any debris of sufficient size be in the inflator center support, the exit orifice could become blocked. Blockage of the exit orifice could cause over pressurization of the air bag inflator. Over pressurization of the inflator has the potential to cause it to rupture resulting in metal fragments being forcefully propelled into the passenger compartment.

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<sup>11</sup> See Recalls 17V-189, 17V-529, 19V-019, 21V-782, 22V-246, 22E-040, and 22V-543. These recalls collectively cover a population of 6,289 vehicles and 74 service parts.

<sup>12</sup> See Recall 23V-334. This recall covers 995,085 MY 2014-2017 Buick Enclave, Chevrolet Traverse, and GMC Acadia vehicles.

NHTSA's April 27, 2023 Recall Request Letter to ARC, page 2. This occurrence can lead to injury or death of the vehicle occupants in what would otherwise be a normal and safe air bag deployment.

ARC took steps to address this issue in January 2018, when it completed the borescope installation on its toroidal inflator manufacturing lines. The borescope examination process effectively allows ARC to detect the occurrence of excess weld slag or other debris in its inflators, and there are no known field ruptures in ARC's hybrid, toroidal inflators manufactured after January 2018. However, prior to the implementation of the borescope inspections, ARC and Delphi collectively manufactured and sold approximately 52 million subject inflators for use in vehicles sold or leased in the United States that may contain excess slag.

NHTSA continued its investigation, with further testing and coordination with the involved manufacturers, to determine appropriate next steps to address the risk associated with these inflators. A field recovery program of the subject inflators concluded in April 2018, in which subject inflators in MY 2001-2005 vehicles were collected from salvage yards and tested at ARC's Knoxville facility. None of the over 900 inflators ruptured in that testing program.

Further work determined that any loose debris in the center support will follow the air flow during a deployment to exit through the center support exit orifice. If the debris is smaller than the exit orifice, the debris will not block the airflow and result in a rupture. However, if the debris is larger than the diameter of the exit orifice, it will not be able to pass through the exit orifice, causing a blockage. A blockage of sufficient size will lead to an over pressurization of the inflator that results in an inflator rupture.

Despite no ruptures observed in the field recovery program testing of inflators removed from MY 2002-2005 vehicles and described above, manufacturers subsequently reported and

confirmed three field ruptures of the subject inflators in 2021. The agency continued its investigation and although 2022 passed with no known incidents, another field rupture occurred in March 2023.

#### **F. The Agency's April 2023 Request that ARC Conduct a Recall**

After learning of a March 22, 2023, driver-side air bag inflator rupture in a MY 2017 Chevrolet Traverse in Michigan, in which the driver was injured, the agency determined that the then current response to the incidents (lot recalls) was insufficient and advised ARC by letter on April 27, 2023 of its tentative conclusion that the subject inflators pose an unreasonable risk of death and injury and therefore contain a safety-related defect within the meaning of the Safety Act. The earlier lot recalls were insufficient to address the safety risk, as new ruptures continued to occur outside of the recalled populations. In the April 27, 2023 letter, ODI requested that ARC initiate a recall of all subject inflators, in accordance with 49 U.S.C. 30118-20. In its May 11, 2023 response to ODI, ARC declined to submit a Part 573 recall report for the subject inflators, arguing that the agency lacks sufficient evidence to find the existence of a safety defect and minimizing the seven confirmed ruptures in the United States as merely “occasional or isolated failures that are an inevitable part of any volume manufacturing process.”<sup>13</sup> Additional arguments raised by ARC in its response are addressed further below.

#### **G. Additional Information on the Initial Decision of a Safety Defect**

Based on its investigation, NHTSA has made an initial decision, pursuant to 49 U.S.C. 30118(a) and 49 CFR 554.10, that the subject inflators contain a safety-related defect. Air bag inflators that rupture when commanded to deploy are plainly defective, as they both fail to protect vehicle occupants as they should, and, themselves, pose an unreasonable risk of serious

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<sup>13</sup> See ARC's May 11, 2023 response to NHTSA's Recall Request letter, page 2.

injury or death to vehicle occupants. Air bags are essential and required items of motor vehicle equipment. *See* 49 CFR 571.208. Absent a defect, an air bag inflator inflates the air bag, helping to minimize or avoid injury to occupants in a crash. An air bag inflator that fails by rupture not only does not perform its job as a safety device, but instead actively threatens injury or death, even in a crash where the vehicle occupants would otherwise have been unharmed. This defect poses an unreasonable risk of injury or death from metal fragments forcibly propelled into the passenger compartment of a vehicle when the inflator ruptures.

As explained in NHTSA’s April 27, 2023, recall request letter, identifying the root cause of the failure is not necessary to make a safety defect determination. *See United States v. Gen. Motors Corp.*, 518 F.2d 420, 432 (D.C. Cir. 1975). A defect can occur in the “performance, construction, a component, or material of a motor vehicle or motor vehicle equipment.” 49 U.S.C. 30102(a)(3). Similarly, “motor vehicle safety” is “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.” 49 U.S.C. 30102(a)(9). The D.C. Circuit explained that “a determination of ‘defect’ does not require any predicate of a finding identifying engineering, metallurgical, or manufacturing failures.” *Gen. Motors Corp.*, 518 F.2d at 432.

Here, NHTSA believes that the evidence does identify a likely cause. The manufacture of the subject inflators included a friction welding process that in some inflators produces weld slag. Upon normal deployment of an air bag in a crash, any debris, if larger than the 5-millimeter diameter of the exit orifice of the inflator center support, can become lodged in that exit orifice and block the air flow required to fill the air bag cushion. The inability of the air to exit the

inflator due to the blocked exit orifice can lead to over pressurization of the air bag inflator. The over pressurization can lead to a rupture of the air bag inflator. A rupture of the air bag inflator will forcefully propel metal fragments into the passenger compartment, likely causing significant injury or death to the vehicle occupant(s).

ARC's argument that the root cause "has not been confirmed," or purportedly is not the cause of some of the ruptures, is not a reason for delaying a recall. "A determination of 'defect' may be based exclusively on the performance record of the vehicle or component." *Id.* "[T]he Government need only establish a significant number of ... failures" where significant is defined as a "non-*de minimis* number of failures." *Id.* at 438. Here, there is no dispute that ARC inflators have repeatedly ruptured and that those ruptures have severely injured and killed vehicle occupants.

While establishing the root cause is unnecessary for a recall determination, these ruptures certainly constitute evidence of failure in the performance of motor vehicle equipment. The seven ruptures confirmed thus far in the United States are not *de minimis* in equipment that is specifically manufactured to save lives and minimize or prevent injuries, but instead have *caused* deaths and injuries in survivable crashes. For these reasons, ARC's attempts to distinguish the ruptures from each other misses the point. The fact that the subject population has experienced seven confirmed ruptures, no matter the root cause, warrants the initial determination of a safety defect.

A failure of an air bag inflator has far more serious safety consequences than that of most other vehicle equipment. Therefore, fewer failures are necessary to exceed the *de minimis* threshold. This is acknowledged by the industry based on the prior history of recall precedents addressing confirmed field ruptures of other air bag inflators, as described above.



ARC inappropriately minimizes the severity of risk from its rupturing inflators by describing these events as manufacturing anomalies or a part of normal business.<sup>14</sup> Specifically, ARC characterized the ruptures as “isolated events” and “an inevitable part of any volume manufacturing process.” NHTSA rejects any suggestion that the seven inflator ruptures are in some way normal or to be expected, absent a safety defect. Indeed, the industry has recognized the serious safety impact of inflator ruptures even in this specific case by conducting the eight recalls that have already occurred for parts of the subject inflator population. An inflator that explosively ruptures, propelling metal fragments at a high velocity into an occupied passenger compartment of a motor vehicle—and into the occupants themselves—cannot simply be dismissed as a normal manufacturing anomaly, with vehicle owners left uninformed yet bearing the risk of the peril they and their occupants face.

Nor are after-the-fact recalls of sub-populations of the subject inflators enough to address the unreasonable risk. The subject air bag inflators have repeatedly ruptured in vehicles, injuring and killing vehicle occupants. Those rupturing inflators were manufactured at different times in plants located in three different countries, used in air bag modules manufactured by four different suppliers, and installed in vehicles produced by four different manufacturers. New ruptures have unpredictably occurred outside the sub-populations of vehicles recalled, and it is expected that additional ruptures will occur in the future. *See United States v. General Motors*, 565 F. 2d 754, 758 (D.C. Cir. 1977) (“[W]here a defect—a term used in the sense of an ‘error or mistake’—has been established in a motor vehicle, and where this defect results in hazards as potentially dangerous as a sudden engine fire, and where there is no dispute that at least some

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<sup>14</sup> “ARC recognizes, however, that even with appropriate industry standards . . . and efforts by manufacturers to minimize the risks of failures, the manufacturing processes may not completely eliminate the risk of occasional or isolated failures.” ARC June 14, 2023 Special Order Response at 5.

such hazards, in this case fires, can definitely be expected to occur in the future, then the defect must be viewed as one ‘related to motor vehicle safety.’”) (footnotes omitted). The Safety Act is preventive, and a recall of the subject inflators should not wait for more injuries or deaths to occur. *See, e.g., United States v. Gen. Motors Corp.*, 565 F.2d 754, 759 (D.C. Cir. 1977) (“The purpose of the Safety Act ... is not to protect individuals from the risks associated with defective vehicles only after serious injuries have already occurred; it is to prevent serious injuries stemming from established defects before they occur.”).

The large size of the subject population involved here does not negate the need for a recall. ARC suggested that the rupture risk of the subject inflators is properly captured by noting that only 7 of the then estimated 67 million subject inflators have been known to rupture, concluding that the rupture rate is 7 out of 67 million.<sup>15</sup> ARC argued that—

the existence of seven (or, more accurately, five) field incidents among the 67 million toroidal driver and passenger inflators produced for the U.S. market during the 18-year period referenced in the RRL across multiple manufacturing lines in different plant locations does not support a finding that a systemic and prevalent defect exists across this population.

ARC’s May 11, 2023 Response to NHTSA’s Recall Request Letter, page 2. However, ARC’s use of the entire subject inflator population as the baseline results in an inaccurate assessment of the risk. As crashes are relatively uncommon events, the vast majority of the subject inflators have not experienced a command for deployment, and the defect manifests itself only upon air bag deployment. Therefore, the rupture rate of the subject inflators is properly estimated as the ratio of inflators ruptures to total *field air bag deployments*—not to the total subject inflator population. NHTSA estimates that approximately 2,600,000 of the subject air bag inflators have

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<sup>15</sup> As noted above, the estimated population is now corrected to approximately 52 million.

deployed in the field.<sup>16</sup> A more accurate representation of the rupture risk of the subject inflators is, therefore, 7 out of 2.6 million.

Finally, in response to ARC's argument that it was not a proper recipient of the recall request letter (which it mischaracterizes as "procedurally faulty"), NHTSA notes that its recall request was based on ARC's legal obligation to file notice of a safety defect with NHTSA (*See* 49 CFR 573.3(f)) and in accordance with established practice. NHTSA previously sent a recall request letter to Takata concerning six identified ruptures of its air bag inflators, which ultimately resulted in recalls carried out by the vehicle manufacturers that used the approximately 67 million defective Takata inflators.<sup>17</sup> As described above, when a safety defect is identified in original equipment supplied to more than one manufacturer, the equipment manufacturer and each manufacturer of vehicles in which the equipment has been installed must file Part 573 recall reports with NHTSA, which are each assigned a unique recall number. *See* 49 CFR 573.3.

To be clear, the vehicle manufacturers that used the subject inflators as original equipment would be legally responsible for carrying out any recalls of those inflators, including providing notice to vehicle owners and a free remedy. *See* 49 U.S.C. 30118-20. That does not excuse ARC—the manufacturer and designer of the inflators—from complying with its own obligations under the Safety Act and regulations.

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<sup>16</sup> This estimate assumes that: 1) In any given year, 0.4% of the vehicles with subject inflators on the road experience a frontal impact with a delta-V of 15 mph or more. (This figure was derived from the light trucks in the 2015 Fatality Analysis Reporting System (FARS), 2015 General Estimates System (GES), 2016 vehicle registration data from S&P Global Mobility's (f/k/a R.L. Polk, Inc), and 2015 Crashworthiness Data System.); 2) The subject inflators deploy at about a change in velocity of 15 mph, regardless of other conditions (such as, in the case of passenger air bags, whether a person of a threshold weight is in the passenger seat); and 3) the vehicles with subject inflators remain on the road according to the average of the car and class 1-2a light truck attrition models from NHTSA's 2016 CAFE Model.

<sup>17</sup> November 26, 2014 Recall Request Letter to TK Holdings Inc., <https://static.nhtsa.gov/odi/inv/2014/INRM-PE14016-60978.pdf>.

To address the risk that additional vehicle occupants will be killed and injured from these rupturing inflators, the agency has made this initial determination that the subject hybrid, toroidal inflators designed by ARC and manufactured by ARC and Delphi from 2000 through January 2018 are defective and pose an unreasonable risk of death or injury, and therefore should be recalled.

Pursuant to the Safety Act, NHTSA may make a final decision “only after giving the manufacturer[s] an opportunity to present information, views, and arguments showing that there is no defect or noncompliance or that the defect does not affect motor vehicle safety. Any interested person also shall be given an opportunity to present information, views, and arguments.” 49 U.S.C. 30118(b)(1). If NHTSA makes a final decision that the subject inflators contain a safety defect, NHTSA will order ARC to comply with the obligation to file notice of the safety defect with the agency<sup>18</sup> and will order the vehicle manufacturers to carry out recalls by providing notice and a free remedy. *See id.* § 30118(b)(2).

#### **H. Public Meeting**

Pursuant to 49 U.S.C. 30118(b)(1) and 49 CFR 554.10(b), NHTSA will conduct a public meeting, beginning at 9:30 a.m., October 5, 2023, in the West Atrium, U.S. Department of Transportation Building, 1200 New Jersey Avenue, SE., Washington, DC, at which time ARC, the manufacturers that used the subject inflators in their vehicles, and other interested persons will have an opportunity to present information, views, and arguments on the issue of whether the subject inflators contain a safety defect. A transcript of the public meeting will be taken.

The public meeting will also be livestreamed on NHTSA’s website. The livestream will allow viewing only.

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<sup>18</sup> Any entity determined responsible for the Delphi-manufactured inflators may also be subject to this order.

Interested persons are invited to participate in this proceeding through written and/or oral statements. Written submissions must be submitted with the docket number identified in the heading of this document through the Federal eRulemaking Portal, mail, hand delivery, or fax as outlined above before the close of business on Friday, October 20, 2023.

Persons wishing to attend the public meeting or make oral statements must register at <https://www.nhtsa.gov/events/public-meeting-arc-delphi-air-bag-inflators> before the close of business on September 22, 2023. Each person wishing to attend must provide his or her name, organization, and country of citizenship. Non-U.S. citizens must also provide date of birth, title or position, and passport or diplomatic ID number, along with expiration date. Media is invited to attend in-person or watch the event's livestream. Members of the media should register by emailing [NHTSAMedia@dot.gov](mailto:NHTSAMedia@dot.gov) with their name, outlet, and attendance preference.

Anyone wishing to make an oral statement must attend the public meeting in person and should specify in registering the amount of time that the statement is expected to last. Any exhibits should be submitted into the public docket in accordance with the instructions in this notice rather than be presented during the public meeting. The agency will prepare a schedule of oral statements. Depending upon the number of persons who wish to make oral statements and the anticipated length of those statements, the agency may limit the length of oral statements to ensure the public meeting may be completed on October 5. Registrants who request to make oral statements will be notified in advance, on or about September 29, 2023, with additional details.

NHTSA is committed to providing equal access to this event for all participants, and people who need accommodations should send a request to Carla Bridges, Office of the Chief Counsel, National Highway Traffic Safety Administration by email at [Carla.Bridges@dot.gov](mailto:Carla.Bridges@dot.gov) before the close of business on September 22, 2023.

This will not be a formal adjudicatory proceeding. There is no cross-examination of witnesses.

Authority: 49 U.S.C. 30118(a), (b); 49 CFR 554.10; delegations of authority at 49 CFR 1.50(a) and 49 CFR 501.8.

Issued on: September 5, 2023

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**Cem Hatipoglu,**

*Acting Associate Administrator for Enforcement*