U.S. Department
of Transportation
**National Highway
Traffic Safety
Administration**

1200 New Jersey Avenue SE.
Washington, DC 20590

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. James Vondale, Director
Automotive Safety Office
Environmental and Safety Compliance
Ford Motor Company
330 Town Center Drive, Suite 400
Dearborn, MI 48126

NVS-212pco
EA10-001

Dear Mr. Vondale,

On January 13, 2010, the Office of Defects Investigation ("ODI") of the National Highway Traffic Safety Administration ("NHTSA") opened Engineering Analysis EA10-001 to investigate an alleged safety-related defect concerning the deployment of the driver's side airbag in the absence of a crash in certain F-150 vehicles, model years ("MY") 2004 through 2006[1] ("base subject vehicles"), manufactured by Ford Motor Company ("Ford").

Airbags in the base subject vehicles have deployed - absent any crash or collision - in situations where they should not deploy ("inadvertent airbag deployment"). The airbags of the base subject vehicles have deployed, for instance, at vehicle start up, while leaving a parking space, while waiting to enter a roadway or intersection, and in a couple of instances, while being driven on a highway. ODI has completed its investigation. As discussed more fully below, ODI believes that the deployment of the driver's side airbag absent a crash constitutes a performance related defect related to motor vehicle safety. Accordingly, ODI requests that Ford initiate a safety recall to notify all owners, purchasers, and dealers of the base subject vehicles of this defect.

I. ODI's Investigation

ODI began its investigation of the subject vehicles when it opened Preliminary Evaluation ("PE") 09-046 on September 24, 2009. The investigation was upgraded to Engineering Analysis ("EA") 10-001 on January 13, 2010. The current EA covers approximately 1.6 million vehicles, manufactured at three different plants located in Dearborn, Michigan, Kansas City, Missouri, and Norfolk, Virginia. The base subject vehicles account for 1.3 million of the 1.6 million vehicles.

During its investigation, ODI collected, reviewed, and analyzed information from a number of sources. It considered complaints and data provided by Ford and consumers. ODI interviewed

[1] ODI originally included all model year 2004-2006 F-150 trucks in its definition of the subject vehicle population. However, on approximately January 26, 2006, Ford made certain changes (discussed more fully below) to its model year 2006 F-150 trucks which appear to remedy the defect. Due to the low inadvertent airbag deployment rates in these vehicles, they are not included in NHTSA's recall request.

consumers, inspected vehicles, and reviewed repair invoices and medical records. It conducted tests on the base subject vehicles and their components, and analyzed failed and new parts. Further, ODI compiled data, identified trends, and made comparisons to peer vehicles and other similar safety recalls. ODI considered Ford's responses to ODI's formal and informal requests for information, as well as a presentation made by Ford, and evaluated Ford's assertions.

II. The Defect and its Frequency

ODI believes that there is a defect in the base subject vehicles. Specifically, the airbags in the base subject vehicles are deploying in situations when they should not: when a consumer puts the key into the ignition and turns the key, backs out of a parking space or driveway, or drives on a road or highway. In other words, the airbags in the base subject vehicles are deploying during normal vehicle usage, absent any crash, collision, or adverse action by an owner.

A. Ford Recognized that Inadvertent Airbag Deployments Result from a Short Circuit in its Vehicles

Ford has identified, and ODI has confirmed, that the inadvertent airbag deployments are caused by a sharp metal edge on the horn plate (which Ford calls a "flange") that chafes the driver's side airbag wiring, which creates an electrical short circuit that can cause the driver's side airbag to deploy. The sharp edge of the horn plate comes into contact with certain wires in the steering wheel assembly. Over time, the sharp edge of the horn plate will abrade the protective coating sometimes referred to as insulation on these wires, exposing the bare copper wires to the metal horn plate. A short circuit occurs when the metal horn plate comes into contact with the exposed wires. If the short circuit occurs under certain conditions, the airbag will deploy.

Ford recognizes that in early 2006, it investigated the very same defect at issue here. In or about January 2006, Ford implemented a fix for the problem in vehicles produced on and after that date: it added protective tape to the sharp edge of the horn plate to help prevent wire chafing ("Mod A changes"). This modification was made on approximately 257,036 model year 2006 F-150 trucks. To further remedy the defect, Ford modified its model year 2007 F-150 trucks by (1) re-designing the horn plate to eliminate the sharp edge which chafed the subject wires; (2) re-orienting the wires such that they would point in a different direction that avoids chafing; and (3) adding a more robust protective sleeve to cover the wires (collectively, "Mod B changes").

B. The Incident Rate is Properly Based on Inadvertent Airbag Deployments

"[A] *prima facie* case of [a] defect can be made simply by showing a significant number of failures." *U.S. v. General Motors Corp.*, 518 F.2d 420, 438 (D.C. Cir. 1975) (*Wheels*). "[Courts] use the term 'significant' to indicate that there must be a non-de minimus [*sic*] number of failures." This standard is clearly met here.

To date, ODI has counted a total of 269 inadvertent driver's side airbag deployments in the base subject vehicle population[2], which translates to approximately 20 incidents for every 100,000 vehicles. Two hundred sixty-nine airbag deployment incidents represents the most incidents ever recorded in any inadvertent airbag deployment investigation or recall in NHTSA history, although we recognize that the population of vehicles here is large compared to other investigations. Of the 269 deployments, 92 deployments were specifically attributed to a chafed wire. Because ODI has recognized the performance related defect as inadvertent airbag deployment (not "wire chafing"), NHTSA counts all 269 deployments, regardless of whether a detailed inspection was performed by a Ford dealer or other technician as to the root cause of the incident. Moreover, because the defect is performance related, the defect's root cause is not controlling.

To date, Ford has taken the position that that the incident rate is too low to warrant a recall. Ford calculates the incident rate to be approximately 5.3 incidents per 100,000 vehicles.[3] This is drastically lower than ODI's calculated rate of 20 incidents per 100,000 vehicles. What accounts for this difference is Ford's exclusion of a significant number of driver's side airbag deployment incidents where the cause was not stated or determined based on the information available in the report.

In calculating its rates, Ford excludes the incidents where a chafed wire was not specifically identified. This proposed exclusion is not justified. First, the performance defect is inadvertent airbag deployment, not wire chafing. Second, as discussed below, peer data supports the position that a sharp metal edge's chafing of the wires at issue caused the inadvertent deployments in the base subject vehicles. Third, once Ford removed the possibility of wire chafing by making Mod A and Mod B changes to its model year 2006 vehicles built after January, 2006, and all of its model year 2007 vehicles, the incident rate dropped drastically. Fourth, Ford has not provided an explanation for the deployments it seeks to exclude. Finally, in the deployments Ford seeks to exclude, Ford has not definitively ruled out the possibility that chafed wiring caused the deployments.[4]

In any event, whether Ford's or ODI's complaint rate is used, the number of failures here is significant.

C. Peer Data Corroborates Ford's and ODI's Analysis that the Inadvertent Deployments Result from a Short Circuit Caused by the Sharp Metal Edge on the Horn Plate

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[2] This latest incident count is based on consumer complaints made directly to ODI as of January 3, 2011, and Ford owner complaints, field reports, legal claims and warranty claims provided to NHTSA as of March 23, 2010.
[3] When calculating this rate, Ford counted only 73 of the 269 reports and also did not include ODI complaint data.
[4] In some of the instances where a chafed wire was not specifically identified, ODI believes that (a) dealers simply failed to understand the cause of deployment, or (b) the cause was simply not mentioned in the report. Indeed, in some cases, when ODI investigated the complaints Ford excluded from its calculation by interviewing consumers, obtaining broken parts and/or conducting visual inspections, NHTSA was able to verify that a chafed wire was the cause for the inadvertent deployment. In other cases, the dealer was simply unable to identify the cause of the deployment.

An examination of peer vehicle data provided by Ford only further supports the conclusion that the sharp metal edge on the horn plate caused the inadvertent airbag deployments. At the request of ODI, Ford provided complaint, crash, and injury data from inadvertent airbag deployment incidents in comparable trucks and sport utility vehicles. We group these comparable vehicles into two categories for analysis.

The first set of vehicles includes model year 2006 F-150 trucks produced after January 2006 (vehicles with Mod A changes) and model year 2007 F-150 trucks (vehicles with Mod B changes). Among these vehicles, NHTSA counted a total of 2 inadvertent airbag deployments in a combined population of 700,000 vehicles. Normalizing for population, the incident rate in vehicles with Mod A and Mod B changes is 70 times less than the base subject vehicle rate.

The second set of vehicles includes the Ford Explorer, model years 2002–2005, and the Mercury Mountaineer, model years 2002-2005. These vehicles have a different type of horn plate than the base subject vehicles which lack the problematic sharp metal edge. In this set of vehicles, NHTSA found a total of 31 inadvertent airbag deployments in a combined population of 1.1 million vehicles. Normalizing for population, the incident rate in the Explorer and Mountaineer is 7 times less than the base subject vehicle rate.

This evidence supports both Ford's and ODI's identification of the cause of the defect, and indicates that while an investigation as to the existence of a chafed wire may not have been conducted and a chafed wire specifically found in some of the inadvertent deployment incidents, other causes may reasonably be ruled out.

D. Rates in this Investigation are Consistent with Rates in Prior Inadvertent Airbag Deployment Investigations in which Manufacturers Conducted a Recall

Accounting for population and years in service, the failure rate of the base subject vehicles is consistent with rates of inadvertent deployments in airbags that resulted in recalls in the past. The injuries here are comparable to those of past investigations and recalls. Moreover, historically, vehicles with inadvertent airbag deployment defects are recalled.

Since manufacturers began equipping automobiles with airbag systems about 27 years ago, NHTSA has been involved in 33 inadvertent airbag deployment investigations and recalls. Among these investigations and recalls, two were precipitated by an electrical short condition: (1) recall 98V-040, involving the Range Rover, model years 1995-1998, and (2) recall 99V-113, involving the Chrysler Minivan, model years 1994-1995. This investigation's inadvertent deployment rate falls between the Range Rover and Chrysler rates. Other inadvertent airbag investigations and recalls stemmed from causes other than an electrical short condition: inflator corrosion, liquid intrusion, electrostatic discharge (ESD), transient voltage spikes, and oversensitive object impact. Disregarding the investigations or recalls relating to oversensitive object impact[5], all but 2 of the investigations (or, 13 out of 15) resulted in a recall.[6]

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[5] In cases where oversensitive object impact was the issue, the defects were not clearly determined. In those 18 cases ODI found that abnormal or extreme driving conditions contributed to the airbag deployments. For instance,

After ODI informed Ford that its rate was almost 6 times higher than the recall rates in the Chrysler investigation and recall[7], Ford developed a skewed incident rate by counting only 38 reports where a chafed wire was specifically identified[8] to produce a rate on par with or slightly lower than Chrysler's rate. In doing so, Ford ignores 181 reports of driver's side air bag deployment, and 35 field reports and warranty claims, all with "unknown causes." Ford argues that its calculations are justifiable because Chrysler did not provide field reports and warranty claims. This argument is only partially correct. Upon a more careful examination of the reports in the Chrysler investigations, Chrysler did produce independent field report data, but not independent warranty claim data. Two of the 28 field reports were unique and did not have any associated owner complaints, warranty claims or ODI consumer complaints.[9] By omitting warranty claims, field reports, and the "unknown cause" deployment reports, Ford reduced its rate by 85%.

Ford's position, which minimizes rates, is untenable for two reasons. First, Ford appears to interpret the failure rates in the Chrysler investigation as baseline rates for the recall of any vehicle with inadvertent airbag deployment issues. This is wrong. NHTSA has neither stated nor implied that the Chrysler investigation set a baseline whereby all inadvertent airbag deployment investigations whose rates fell below Chrysler's would not warrant a recall. Second, Ford argues that its rates are lower than rates in the Chrysler investigation based on an incorrect calculation of its own incident rate, as discussed above.

E. Ford's Reporting Does Not Prejudice It

Ford has raised concerns about a direct rate comparison with the Chrysler investigation, on the grounds that Chrysler did not provide any field reports or warranty claims, while Ford did, resulting in a higher incident rate in the subject investigation. However, adjusting for differences in the warranty claim reporting hardly affects the rate comparison.

After adjusting Chrysler's rate to reflect the same percentage increase brought on by the stand alone warranty claims provided by Ford, Chrysler's "direct comparable" rate would only increase by 7%, and would still be 6 times lower than Ford's rate. Moreover, because inadvertent airbag deployment is an unexpected and shocking occurrence, information regarding this issue cannot be expected to reside in the manufacturer's warranty claims data system alone. An owner complaint, field report, or legal claim will often accompany or precede the warranty claim. This fact is borne out in part in the subject investigation, where only 19 warranty claims

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road debris or objects, potholes, and the striking of the vehicle against pavement or railroad crossings at high speeds were found to be contributing factors to the airbag deployments.

[6] Among the two investigations that did not result in a recall, one defect was caused by water coming through an open window and soaking the carpet, which caused an electrical short (SQ97-017). However, in that case, the manufacturer still issued an advisory notice to owners. In the second investigation that did not result in a recall (PE04-076), there were only 5 total reported inadvertent airbag deployment incidents, and, unlike here, an analysis of the data indicated a declining failure trend.

[7] Investigations PE97-046 and EA98-006 of Chrysler led to recall 99V-113.

[8] Ford's total report count of 254 incidents was based on data as of March 23, 2010 and did not include ODI's consumer complaints.

[9] *See* PE97-046 investigative file, INRL-PE97046-41961P.pdf, Bates # 000030-000031 and Bates # 000169-000170.

out of a total of 133 were unique (i.e. not duplicated by consumer complaints, field reports, or NHTSA complaints). In short, Ford's better warranty claim search capability did not drastically affect its incident rate.

F. Inadvertent Deployment Rates Will Increase in the Future

ODI's analysis of the data demonstrates that inadvertent airbag deployments will steadily increase over time.

Ford's own inspection[10] of 124 vehicles in 2006 also forecasted an impending issue that would affect the bulk of the subject vehicle population. During the survey, Ford found one vehicle whose airbag wire insulation was completely abraded, with the copper wire exposed. In addition, Ford found that at least 1 in 4 vehicles had signs of a chafed wire condition. This showed that the potential for wire chafing was very high, and that in time, more and more vehicles would be at risk of the short condition that leads to inadvertent airbag deployment.

Moreover, the population is large. At least 1.3 million vehicles are at risk. Coupled with the large population, the fact that Ford dealers are generally unaware of this problem magnifies it further. When consumers brought their trucks in for service after the airbag deployed, some dealers had never heard of the issue and could not diagnose the problem. In one case, a Ford dealer offered to provide service on a subject vehicle, but could not guarantee that the airbag would not deploy again because he was unable to diagnose the problem. This lack of knowledge on the part of Ford dealers may account for the large number of "unknown cause" deployments that Ford seeks to exclude from NHTSA's defect rate calculations.

While diligent Ford consumers and employees may be able to figure out the defect's cause by conducting their own research online, Ford's attitude in remedying this defect may present obstacles. One airbag deployment victim refused to drive his truck unless the subject components were replaced with updated parts, different from those that malfunctioned. Ford refused his request. It was not until the consumer had an attorney write a letter to Ford that Ford agreed to repair his model year 2005 truck with an updated 2007 airbag module.

The bottom line is that this problem will only multiply. To remedy it, NHTSA firmly believes that Ford must initiate a recall.

III. The Safety Consequences

ODI believes that the defect is safety related. The safety consequences here are twofold. First, there is a potential for loss of vehicular control. Second, there is a risk of injury resulting from the actual deployment.

A. There is a Risk of Loss of Vehicular Control

[10] *See* PE09-046 investigation file, Ford information request letter dated November 19, 2009, Appendix H, Engineering Review, pages 282-286.

It is well-settled that the potential for loss of vehicular control presents a prima facie unreasonable risk to safety. *U.S. v. General Motors Corp.*, 561 F.2d 923, 929 (D.C. Cir. 1977) (*Pitman Arms*); *U.S. v. Ford Motor Co.*, 421 F. Supp. 1239, 1244 (D.D.C. 1976) (*Seats*); *U.S. v. Ford Motor Co.*, 453 F. Supp. 1240, 1250 (D.D.C. 1978) (*Wipers*). Here, the risk of loss of vehicular control is a very real threat. As courts have held in the past, ODI believes that this threat poses an unreasonable risk to safety.

Airbag deployments are intense, forceful events. Consumers have stated, and NHTSA testing demonstrates, that airbag deployment sounds like a gunshot, which caused at least one owner to jump out of her Ford F-150 truck while the vehicle was still in the reverse gear. It is reasonably anticipated that this shock, coupled with the loss of visibility that results when an airbag deploys, may cause a driver to panic and lose control of a vehicle.

NHTSA interviewed a number of consumers in connection with this investigation. While many of the vehicles were parked when their airbags deployed, among the consumers interviewed thus far, more than 1 in 3 consumers said their vehicles were in drive or reverse gears when the airbag deployed. Many were backing out of parking spaces or driveways. One consumer had his foot on the brake and was waiting to pull out onto a busy road. Even when stationary, the potential for loss of vehicular control is present if the vehicle is in gear. While the vehicle is in gear or moving, if, during an airbag deployment, a driver presses the accelerator or reverses instead of braking, injuries and crashes can result. A handful of consumers were on roads or highways. In these instances, consumers are at an increased risk of swerving, losing vehicular control, crashing, and/or sustaining injuries. In this investigation, the shock of the deployment caused a couple of consumers to swerve. Moreover, due to the nature of airbags, drivers will only naturally lose visibility and steering control when their airbag deploys.

B. The Injuries are of Concern

Of the 269 inadvertent airbag incidents NHTSA has identified, 98 consumers reported injuries. This translates to about 1 in 3 consumers being injured. There have been some serious injuries, particularly in light of the circumstances. Some sustained neck and back injuries, and one person ruptured his elbow. Two consumers were hit in the face and sustained blurred vision, neither of which has fully recovered. One of these consumers also complained of severe headaches and was out of work for a couple days; the other complained of neck pain and was out of work for three months. Two consumers reported blacking out after being hit by their airbags. One consumer reported a crash into bushes: she was in reverse when the airbag deployed, panicked, and jumped out of her truck without shifting back into park. She was knocked to the ground by the driver's side door as the truck rolled backwards, and allegedly over her foot. A few people lost or chipped a tooth.

At vehicle start up, some consumers are in positions that place them at greater risk of injury as opposed to a normal driving position. Some tend to lean forward with their chin or chest close to the steering wheel. Others are out of the normal driving position because they are looking over their shoulder. This can increase the possibility for injury.

IV. Conclusion

A defect exists in the model year 2004-2006 F-150 truck. The incident rate in this investigation is consistent with rates of past recalls. The rate here is higher than rates of Ford peer vehicles which have a different or modified horn plate lacking the problematic sharp metal edge. ODI's analysis of the data demonstrates that these inadvertent deployments will steadily increase over time. The potential for loss of vehicular control poses an unreasonable risk to safety. Also, the injury rate and severity of injuries is comparable to those in past investigations and recalls. Accordingly, ODI requests that Ford initiate a safety recall on all model year 2004-2006 F-150 trucks that were built through January 2006. In accordance with 49 U.S.C. §§ 30118-30120, ODI requests that Ford notify all owners, purchasers, and dealers of the problem and that it provide a free remedy to the owners of each of the base subject vehicles.

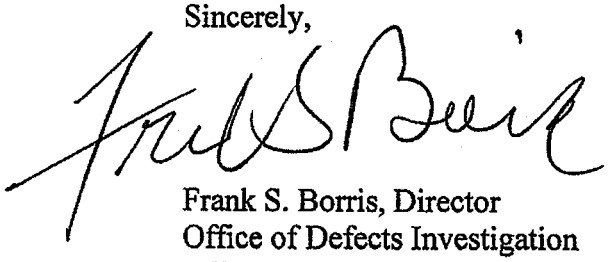
If Ford decides not to conduct the requested recall, it must provide ODI with a full explanation of its decision, including any additional analysis of the problem beyond Ford's past presentations. If Ford fails to initiate a recall, the agency may proceed to an Initial Decision that these vehicles contain a safety-related defect. An Initial Decision will be accompanied by the publication of a Federal Register notice describing the alleged defect and the ODI investigation, the scheduling of a public meeting, and the issuance of a press release to inform the public of this matter.

ODI's recommendation that Ford conduct a safety recall does not constitute a formal conclusion by NHTSA with respect to the evidence in our investigative file. Also, this recommendation does not constitute an initial or final agency decision that the base subject vehicles contain a safety-related defect pursuant to 49 U.S.C. § 30118, or an order to recall those vehicles.

Ford's written response to this letter, in duplicate, referencing the identification codes in the upper right hand corner on page 1 of this letter, must be submitted to this office no later than February 10, 2011. It is important that Ford respond to this letter on time. This letter is being sent pursuant to 49 U.S.C. § 30166, which authorizes this agency to conduct investigations and require the submission of reports that may be necessary to enforce Chapter 301 of Title 49. Failure to respond promptly and fully to this letter may be construed as a violation of 49 U.S.C. § 30116, which could subject Ford to civil penalties pursuant to 49 U.S.C. § 30165.

If you have any questions about this letter, please contact Mr. Scott Yon of my staff at (202) 366-0139. If you have any questions regarding the recall procedures, please contact Ms. Jennifer Timian of my staff at (202) 366-0209.

Sincerely,



Frank S. Borris, Director
Office of Defects Investigation
Office of Enforcement