



U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**

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1200 New Jersey Avenue SE.
Washington, DC 20590

VIA FEDERAL EXPRESS AND ELECTRONIC MAIL

Matthew W. Liddane
Head of Vehicle Concepts and Integration
Chrysler Group, LLC
CIMS 483-20-02
800 Chrysler Drive
Auburn Hills, MI 48326-2757

NVS-212pco
EA12-005

Dear Mr. Liddane,

On June 12, 2012, the Office of Defects Investigation (ODI) of the National Highway Traffic Safety Administration (NHTSA) opened Engineering Analysis (EA) 12-005 to investigate an alleged safety-related defect concerning fuel tank system integrity in rear-impacts or crashes in certain Jeep vehicles, model years (MY) 1993 through 2007, manufactured by Chrysler Group LLC and its predecessors (Chrysler). These vehicles include the MY 1993-2004 Grand Cherokee and MY 2002 – 2007 Liberty.

This investigation revealed numerous fire-related deaths and injuries, fires that did not result in deaths and fuel leaks in rear impacts. As discussed more fully below, ODI believes that the MY 1993-2004 Grand Cherokee and MY 2002 – 2007 Liberty contain defects related to motor vehicle safety. Accordingly, ODI requests that Chrysler initiate a safety recall of these vehicles.

I. Summary of ODI's Investigation

In November, 2009 the Center for Auto Safety submitted a Defect Petition requesting that NHTSA “initiate a defect investigation into and recall all 1993-2004 Jeep Grand Cherokee with a fuel tank located behind the rear axle.” (DP09-004). In August, 2010, NHTSA granted the petition and opened an investigation denominated Preliminary Evaluation (PE) 10-031. In June, 2012 the PE was upgraded to an Engineering Analysis EA12-005 and the scope was expanded to include the MY 2002 – 2007 Liberty.

During the EA, NHTSA collected a substantial amount of information. As you know, an information request letter was sent to Chrysler requesting pertinent information, including



vehicle production data¹, information on incidents involving rear impact and subsequent fire or fuel leaks, and data related to Chrysler's self-certification tests for Federal Motor Vehicle Safety Standard (FMVSS) 301, Fuel System Integrity. Information requests were also sent to manufacturers of peer vehicles to the Grand Cherokee and Liberty, including to Ford, General Motors, Toyota, Nissan, Mitsubishi, Isuzu and Suzuki. Like the Grand Cherokee and Liberty, the peer vehicles are sport utility vehicles. The peer vehicles include the Toyota 4Runner, Ford Explorer, Jeep Wrangler, Nissan Pathfinder, Chevrolet Blazer, Mitsubishi Montero, Isuzu Rodeo, Isuzu Trooper, Suzuki Sidekick and Suzuki XL-7.²

Chrysler and the other companies responded to the information requests. In addition to this information, ODI obtained incident information from the fatality analysis reporting system (FARS) and NHTSA complaint databases regarding Jeep vehicles and the peer vehicles in rear crashes. For crashes where police accident reports were available, the police reports were collected for both peer vehicles and the Jeep vehicles. ODI analyzed the information.

ODI's analysis revealed that the MY 2002- 2007 Jeep Liberty and the MY 1993-2004 Grand Cherokee performed poorly when compared to all but one of the MY 1993-2007 peer vehicles, particularly in terms of fatalities, fires without fatalities, and fuel leaks in rear end impacts and crashes.

II. Fuel Tank Locations

A. Historical advances in gas tank location

Prior to the 1970's, fuel tanks in motor vehicles were predominately located aft of the rear axle. The vulnerability of tanks located behind solid rear axles in rear impacts became well known following a series of fiery crashes involving the Ford Pinto. NHTSA's investigation of the MY 1971-1976 Ford Pinto and MY 1975-1976 Mercury Bobcat vehicles in August 1977 revealed that the Pinto and Bobcat had been involved in 38 rear end impacts resulting in 27 deaths and 24 injuries. It was a well-publicized, terrible tragedy that people burned to death in these vehicles. In June 1978, Ford agreed to recall the Pinto and Bobcat. The defect was that the fuel tanks installed on these vehicles are subject to failure when the vehicles are struck from the rear. Such failure can result in fuel leakage which in the presence of external ignition sources can result in fire. *See* Ford Motor Company letter to NHTSA's Office of Defects Investigation, June 15, 1978 at 2.

Thereafter, manufacturers began to adopt designs in which fuel tanks were located in less vulnerable locations than behind the rear axle. Chrysler was certainly aware of the safety benefits of placing the tank in front of the rear axle. An August 24, 1978 Chrysler internal memorandum from L.L. Baker to R.M. Sinclair, Director of Product of Development, noted that its new Omni and Horizon models had fuel tanks below the rear seat, that the upcoming K-Car would use the same location as well. The advantages of this location were described as follows: "This location provides the protection of all the structure behind the rear wheels – as well as the rear wheels themselves – to protect the tank from being damaged in a collision."

¹ ODI requested information for each subject vehicle Chrysler produced including date of manufacture, date of sale, and whether the vehicle was equipped with optional equipment such as a tow receiver.

² These model names also represent other models built on the same platform. For example, the Chevrolet Blazer group included the GMC Jimmy and the Oldsmobile Bravada.

Throughout the 1980's, increasing numbers of new model vehicles appeared with fuel tanks located either above or in front of the rear axle. Chrysler itself incorporated mid-ship tanks in new models. The new 1987 Dodge Dakota featured a mid-ship mounted fuel tank. Similarly, the 1998 Dodge Durango also had its fuel tank mounted in a mid-ship location when it was released. When introduced in 1994, the Dodge Ram full-size pickup truck featured a mid-ship mounted fuel tank. A 1993 study of fire related deaths in rear crashes occurring from 1977 to 1989 concluded that the increasing relocation of tanks ahead of the rear axle had a substantial effect on the reduction of these deaths in rear impacts.³

A survey of 74 vehicles produced during the 2002 and 2003 model years, including 41 passenger cars, 15 SUVs, 8 pickup trucks, 7 mini-vans and 3 full size vans found that 65 vehicles had fuel tanks located ahead of the rear axle, 6 vehicles had fuel tanks over the rear axle and 4 vehicles (Ford Mustang, Ford Grand Marquis/Crown Victoria, Jeep Liberty and Jeep Grand Cherokee) had tanks located aft of the rear axle.⁴

B. The Grand Cherokee and Jeep Liberty gas tank location

Chrysler purchased American Motors Corporation (AMC) in 1987. Among other things, Chrysler acquired the Jeep vehicle line, including the Jeep Wrangler and Jeep Cherokee, and rights to the Jeep nameplate. Chrysler also acquired design studies for the nascent Jeep Grand Cherokee ZJ (ZJ refers to the platform), which was released as a MY 1993 vehicle in 1992. Unlike other new Chrysler products of this era, the MY 1993 Grand Cherokee ZJ was designed with a fuel tank located aft of the rear axle and within close proximity to the rear bumper. Consistent with other vehicles in this class, the Grand Cherokee ZJ has more ground clearance and a higher ride height than conventional passenger cars, a characteristic that make rear mounted fuel tanks more vulnerable in rear impacts with passenger cars.

The Grand Cherokee was substantially redesigned later in 1990's. The redesigned Grand Cherokee, known as the WJ, was also configured with a fuel tank located behind the rear axle. Production began with MY 1999 vehicles and continued to MY 2004 vehicles.

A similar fuel tank design was employed in the Jeep Liberty (KJ platform) when it was introduced in 2001. The MY 2002 through 2007 Liberty has a fuel tank located aft of the rear axle and less than a foot forward of the aft face of the rear bumper. This tank is also more exposed to impacts from passenger cars because of the Liberty's comparatively high ground clearance and ride height. In fact, the driver of a car following a Jeep Liberty can readily see the gas tank sticking down. Beginning with MY 2008, Chrysler modified its design and manufactured the Liberty with the fuel tank forward of the rear axle.

Chrysler's decision to place the Grand Cherokee and first-generation Liberty fuel tanks aft of the rear axle contravened industry trends, as well as Chrysler's practices in non-Jeep vehicles, to place fuel tanks in less vulnerable locations. As discussed below, ODI's examination of rear-impact related fire and fuel leak incident frequency, and specifically whether these incidents

³ Robertson, L. Fatal Car Fires from Rear-End Crashes: The Effects of Fuel Tank Placement before and After Regulation. *American Journal of Public Health*, Vol. 83, No. 8. August 1993 pp. 1168-1169.

⁴ Fournier, E. Bayne, T. and Kot, J. Review of the State-of-the-art In Fuel Tank Systems – Phase II. Report No. R03-01, Biokinetics and Associates Ltd., Ottawa, Ontario. 2003. (This survey also found that the Mustang, Liberty and Grand Cherokee tanks were all located between 29 and 31 centimeters from the rear bumper.)

became less frequent in later model years, revealed that fire and fuel leak rates for peer vehicles improved while these rates for the Grand Cherokee and Liberty actually increased.

Chrysler maintains, and we do not dispute, that the Grand Cherokee and Liberty vehicles complied with the requirements of Federal motor vehicle safety standard (FMVSS) No. 301, Fuel System Integrity, that was applicable when the vehicles were manufactured. As NHTSA has noted in the past, a federal motor vehicle safety standard is a “minimum standard for a motor vehicle . . . performance.” 49 U.S.C. 30102(a)(9). The existence of a minimum standard does not require NHTSA to ignore deadly problems. Viewed another way, a FMVSS does not preclude a finding of a safety related defect in a vehicle when supported by the evidence.

III. Fatal fires, Non-fatal fires and Fuel leaks in Rear Crashes of SUVs.

A. Data Analysis

As noted above, ODI collected post-crash fire information on the Grand Cherokee (both WJ and ZJ) and the Liberty as well as peer vehicles such as the General Motors S10 Blazer, Ford Explorer, Toyota 4Runner, Isuzu Rodeo, Isuzu Trooper, Mitsubishi Montero, Suzuki Sidekick and Suzuki XL-7. ODI also considered the numbers of various models of vehicles on the road.

Because of the large numbers of vehicles that were examined for this investigation, ODI calculated rates using millions of registered vehicle years (MRVY) as a unit of measure. Under this unit of measure, if 10 million vehicles were registered for use in a single year, that population of vehicle would be expressed as 10 MRVY. The same expression, 10 MRVY would also accurately reflect 1 million vehicles that were registered for use for 10 years if none of the vehicles were scrapped, wrecked or withdrawn from use. In this case, MRVY allows calculations reflecting both the large vehicle populations involved and the multiple years that these vehicles were used on public roads.

ODI relied on information provided by Chrysler indicating that about 3 million Grand Cherokee and 1 million Liberty vehicles were produced. The Grand Cherokee was produced on two unique platforms, the “ZJ” platform from MYs 1993 to 1998 (1.5 million vehicles), and the “WJ” platform from MYs 1999 to 2004 (1.5 million vehicles). Polk vehicle registration data obtained by ODI shows that roughly 2.7 of the 4 million Liberty and Grand Cherokee vehicles produced remained on the road in 2011.⁵ The MY 1993 through 2004 Grand Cherokees and MY 2002 through 2007 Liberty vehicles accumulated approximately 37.3 million registered vehicle years (RVYs) through the 2011 calendar year.

Similarly, ODI used information obtained from Chrysler and other manufacturers stating that approximately 17 million MY 1993-2007 peer vehicles were produced. Individual peer models (nameplates) that were produced on the same platform, where the fuel tank installation was the same, were grouped together, resulting in 12 peer vehicle groups. Manufacturer data was also used to establish fuel tank location, changes in tank location, timing of changes, and whether or not any form of protective tank covering was used. Polk registration data showed that about 11.1 million peer vehicles remained in use in 2011 and that the peer vehicles accumulated approximately 154 million RVYs through the 2011 calendar year.

⁵ Vehicle registration data was purchased from R.L. Polk & Co.

ODI analyzed the available data and information for fatal peer vehicle, Grand Cherokee and Liberty crashes to see if the vehicles suffered a rear impact and experienced a subsequent fire or fuel leak. We included fatalities that occurred in other vehicles when the available evidence indicated that a fire began after a rear impact into a peer vehicle, a Liberty or a Grand Cherokee. For instance, a 1999 fatal crash in New York involved a vehicle striking the rear of a Grand Cherokee and puncturing the fuel tank. Gasoline from the Grand Cherokee's fuel tank spilled into the interior of the striking vehicle and ignited, fatally burning the driver and seriously injuring a passenger.

ODI's tentative assessment is that there have been at least 32 fatal rear impact fire crashes involving Grand Cherokees resulting in 44 deaths. ODI's has identified at least 5 fatal rear impact crashes involving the Liberty that have resulted in 7 deaths.⁶ Taking the cumulative total of million registered vehicle years of 31 MRVYs to derive a rate for the Grand Cherokee leads to an overall exposure adjusted fatal incident rate of 1.0 per MRVY. A similar calculation for the Liberty produces 0.90 fatal incidents per MRVY. When compared to the peer group, which, as discussed below, has 80 fatal crashes and an overall rate of 0.5 fatal incidents per MRVY, the Grand Cherokee and Liberty are poor performers.

Other popular SUV's on the market at the time have rear impact fatal fire incident rates lower than the Grand Cherokee and Liberty. The 1993 through 2007 Toyota 4Runner was involved in 3 rear impact fatal fires and had a fatal fire rate of 0.22 per MRVY. For the same period, the General Motors S10 Blazer was involved in 26 fatal rear impact fire crashes with a rate of 0.59 per MRVY. The Ford Explorer had a rear impact fatal fire rate of 0.35 per MRVY with 18 rear impact fatal fire incidents. The Nissan Pathfinder was involved in 4 fatal rear impact fire crashes with a rate of 0.46 crashes per MRVY. The Mitsubishi Montero performed similarly to the Pathfinder, with a rate of 0.48 fatal rear impact fire crashes per MRVY stemming from 2 incidents. The Isuzu Rodeo had a fatal rear impact fire rate of 0.71 per MRVY based on 6 rear impact fatal fire incidents.

In ODI's review, other crash incidents are considered non-fatal crashes; these involve either a fire or a fuel leak (only). Non-fatal crashes meet the same criteria as fatal crashes in that they involve a rear-impact and a subsequent fire or fuel leak.

For non-fatal rear impact fires and rear impact related fuel leaks, ODI's tentative rate calculations also show that the Liberty and Grand Cherokee perform poorly when compared to the peer group. ODI identified at least 17 Grand Cherokee and 11 Liberty non-fatal rear crash fire incidents. Where fire did not result from rear impact but a fuel leak occurred, ODI's initial assessment is that there was 1 Grand Cherokee incident and 5 Liberty incidents. The non-fatal fire rate for the Grand Cherokee and Liberty are, respectively, 0.55 and 1.76 per MRVY. The rate for Grand Cherokee and Liberty rear impact crash leaks without fire are, respectively, 0.03 and 0.80 per MRVY. In contrast, the peer group had a non-fatal fire rate of 0.03 per MRVY and a fuel leak rate of 0.01 per MRVY. Overall, the peer group had 4 non-fatal rear impact fires and 1 rear impact related fuel leak while the Grand Cherokee and Liberty experienced 27 non-fatal fires or leaks.

⁶ These counts do not include incidents where official reports indicated death was not due to fire. For the purposes of this letter, fatal crashes with fire where all deaths were not caused by fire are counted toward the total of non-fatal fire incidents.

Because post-crash fires or fuel leaks pose a substantial risk to safety, ODI calculated exposure adjusted rates for rear-impact crash related fires and fuel leaks and then ranked vehicles by rate in descending order. With the exception of the Suzuki Sidekick, which was produced in relatively small numbers and went out of production in 1998, the worst performers were the Liberty at 3.4 incidents per MRVY and the Grand Cherokee at 1.5 incidents per MRVY.

Further, ODI's analysis showed that peer vehicle performance for post-rear impact fires and fuel tank leaks improved over time while Grand Cherokee and Liberty performance actually declined. ODI's initial analysis is that the MY 1993-2004 peer vehicles experienced a combined post-rear impact fires and fuel tank leak rate of 0.6 per MRVY. The same analysis showed that the MY 2002-2007 peers experienced rates of 0.3 fatal and non-fatal incidents per MRVY, showing an improving trend. In contrast, the MY 1993-2004 Grand Cherokee has a combined rate of 1.5 fatal and non-fatal incidents per MRVY and the MY 2002-2007 Liberty has a combined rate of 3.4 incidents per MRVY.

B. Record of Deaths, Injuries, Fires and Leaks

Rear Impacts with Fatal Fires

Based on ODI's initial investigation to date, the Grand Cherokee and Liberty vehicles were involved in the following fatal rear impact fire crashes:

GRAND CHEROKEE (ZJ)

An example of a Grand Cherokee involved in a rear impact fatal fire crash is pictured below.



Figure 1 Post-Crash photograph of Grand Cherokee (ZJ) fatal rear impact vehicle.

There were rear impacts to Grand Cherokees (ZJ) with fatal fires in:

Texas: January 16, 1998, 1 fatality.

Indiana: April 27, 1998, 2 fatalities.

Florida: July 12, 1999, 1 fatality.

New York: September 1, 1999, 1 fatality, 1 seriously burned.

California: October 27, 1999, 1 fatality.

Mississippi: December 27, 1999, 3 fatalities.

Louisiana: August 31, 2000, 1 fatality.

California: July 20, 2001, 1 fatality.

California: August 30, 2002, 1 fatality.

Wyoming: April 4, 2003, 1 fatality.

Virginia: August 8, 2003, 1 fatality.

California: February 5, 2004, 1 fatality.

Texas: December 12, 2004, 1 fatality.

South Carolina: April 25, 2005, 1 fatality.

Texas: February 12, 2006, 1 fatality, 1 seriously burned.

New Jersey: February 24, 2007, 1 fatality.

New York: August 15, 2007, 1 fatality.

Florida: September 5, 2007, 2 fatalities.

Illinois: October 16, 2007, 2 fatalities.

Arizona: December 22, 2009, 2 fatalities.

Florida: November 16, 2011, 1 fatality.

Virginia: October 5, 2012, 2 fatalities.

GRAND CHEROKEE (WJ)

The photograph provided below shows a Grand Cherokee in flames after being struck in the rear by a Dodge Dakota pickup truck. A child seated in a rear seat died in this crash.



Figure 2- 1999 Grand Cherokee (WJ) Fatal Fire.

There were rear impacts to Grand Cherokees (WJ) with fatal fires in:

California: July 20, 2003, 2 fatalities.

California: October 4, 2003, 2 fatalities.

South Carolina, December 17, 2003, 2 fatalities.

Pennsylvania: February 27, 2004, 2 fatalities.

Michigan: April 30, 2005, 1 fatality.

Texas: April 28, 2006, 2 fatalities.

Puerto Rico: March 17, 2007, 1 fatality.

Wisconsin: July 3, 2007, 1 fatality.

Texas: July 10, 2009, 1 fatality.

Georgia: March 6, 2012, 1 fatality.

LIBERTY

There were rear impacts to MY 2002 – 2007 Liberty vehicles (KJ) with fatal fires in:

Louisiana: October 31, 2006, 1 fatality.

Pennsylvania, November 3, 2006, 2 fatalities.

California: May 6, 2007, 2 fatalities.

California: April 20, 2008, 1 fatality.

Pennsylvania: July 25, 2010, 1 fatality.

Non-Fatal Post-Rear Impact Fires

A Jeep Liberty that burst into flame after being struck in the rear by a Plymouth Neon is pictured below. The occupants were able to exit the vehicle without being burned.



Figure 3 - Post-Crash photograph of 2004 Jeep Liberty Struck from behind by a Plymouth Neon.

The Grand Cherokee and Liberty have been involved in the following rear impact fire crashes where fire-related fatalities did not occur:

GRAND CHEROKEE (ZJ)

North Carolina, July 9, 1996.

Pennsylvania, October 14, 1996.

New Jersey, March 3, 1998.

Florida, October, 9, 1999.

Maryland, August 3, 2000.

Georgia, November 29, 2000.

Florida, December 27, 2000.

Georgia: August 13, 2001.

Florida, October 6, 2001.

Pennsylvania, June 30, 2002.

Washington, March 15, 2006.

California, August 9, 2006.

Alabama, March 1, 2007.

GRAND CHEROKEE (WJ)

Georgia, October 17, 2000.

Kentucky, November 3, 2002.

Georgia, October 30, 2004.

Texas, October 1, 2009.

LIBERTY

Arizona, January 15, 2004.

Texas, September 17, 2004.

Illinois, November 3, 2004.

Florida, July 11, 2005.

New York, September 30, 2005.

Georgia, November 11, 2006.

Tennessee, November 25, 2006.

Colorado, April 4, 2009.

Virginia, March 30, 2010.

Massachusetts, September 21, 2010.

West Virginia, August 16, 2011.

Post-Rear Impact Fuel Leaks

The photograph below depicts a Jeep Liberty fuel tank that ruptured and leaked after the Liberty was struck from behind by a van in stop-and-go traffic.



Figure 4 Rear Impact Damaged 2002 Liberty Fuel Tank.

The Grand Cherokee and Liberty have been involved in the following rear impacts where post-impact fuel leaks occurred but no fire resulted:

GRAND CHEROKEE (ZJ)

Michigan, July 5, 2012.

LIBERTY

New Jersey, June 14, 2002.

Kentucky, July 19, 2002.

Virginia, November 3, 2003.

Michigan, January 19, 2006.

Georgia, November 22, 2007.

C. Conclusion

ODI's tentative assessment is that MY 1993 – 2004 Jeep Grand Cherokee (ZJ and WJ) and the MY 2002 – 2007 Jeep Liberty contain defects related to motor vehicle safety. In our tentative view, there is a performance defect and a design defect. The performance defect is that the fuel tanks installed on these vehicles are subject to failure when the vehicles are struck from the rear. Such failure can result in fuel leakage, which in the presence of external ignition sources, can result in fire. The design defect is the placement of the fuel tanks in the position behind the axle and how they were positioned, including their height above the roadway. The defects present an unreasonable risk to motor vehicle because people in the MY 1993 – 2004 Jeep Grand Cherokee (ZJ and WJ), the MY 2002 – 2007 Jeep Liberty and in striking vehicles have burned to death in rear impact crashes, there have been fires (without fatalities) in these vehicles from rear impact crashes that have, or could have, led to deaths and injuries, and there have been leaks from Grand Cherokee and Liberty gas tanks from rear impact crashes that could have led to fire and death or injury.

ODI requests that Chrysler initiate a safety recall on MY 1993-2004 Jeep Grand Cherokee and MY 2002-2007 Jeep Liberty vehicles and implement a remedy action that improves their performance in rear-impacts and crashes. ODI requests that Chrysler notify all owners of the defect and that it provide a free remedy to the owners of each of the above vehicles in accordance with 49 U.S.C. § 30118-30120.

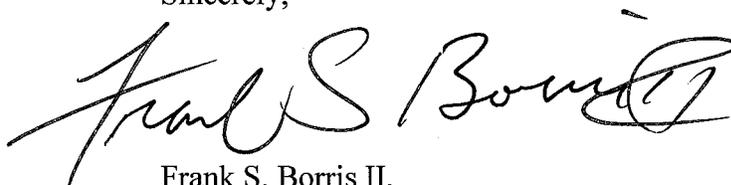
If Chrysler decides not to conduct the requested recall, it must provide ODI with a full explanation of its decision, including any additional analysis of the problem beyond Chrysler's past presentations. If Chrysler fails to initiate a recall, NHTSA may proceed to an Initial Decision that these vehicles contain a safety-related defect. *See* 49 U.S.C. § 30118. An Initial Decision will be accompanied by the publication of a Federal Register notice describing the alleged defects, the safety consequences of these defects, 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 Chrysler conduct a safety recall does not constitute a formal finding or 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 MY 1993-2004 Jeep Grand Cherokee and the 2002-2007 Jeep Liberty vehicles contain a safety-related defect pursuant to 49 U.S.C. § 30118, an order to recall those vehicles, or a final agency action.

Chrysler'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 June 18, 2013. It is important that Chrysler 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. § 30166, which could subject Chrysler 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,

A handwritten signature in black ink, appearing to read "Frank S. Borris II". The signature is written in a cursive style with a large, prominent initial "F" and a stylized "B".

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