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Special Crash Investigations: Remote Child Restraint System/Fire Crash Investigation; Vehicle: 2012 Chevrolet Impala; Location: Kentucky; Crash Date: November 2015

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Each crash represents a unique sequence of events, and generalized conclusions cannot be made concerning the crashworthiness performance of the involved vehicles or their safety systems. This report and associated case data are based on information available to the Special Crash Investigation team on the date this report was submitted.

16. Abstract

This remote investigation documents the road departure/fixed-object crash and subsequent vehicle fire in a 2012 Chevrolet Impala, which resulted in fatal injuries to the driver, a passenger, and a 21-month-old male infant restrained in a child restraint system (CRS) secured in the second-row left position of the vehicle. On-scene images show the orientation of the CRS as rear-facing. The Chevrolet was driven by a belted 50-year-old male with a 7-year-old male passenger in the second-row right position, restraint status unknown. The Chevrolet was traveling south on a two-lane roadway when it departed the roadway to the right and traveled an estimated 66 m (217 ft) before striking a tree. A fire developed in the engine compartment and spread to consume the occupant compartment. A passerby saw the Chevrolet on fire and attempted to put the fire out with an extinguisher; however, the fire became too intense. County sheriffs, emergency medical services, and the local fire department responded to the crash site. All the occupants of the Chevrolet were declared deceased at the scene.

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Special Crash Investigations
Remote Child Restraint System/Fire Crash Investigation
Case Number: CR20017
Vehicle: 2012 Chevrolet Impala
Location: Kentucky
Crash Date: November 2015

Background

This remote investigation documents the road departure/fixed object crash and subsequent vehicle fire in a 2012 Chevrolet Impala (Figure 1), which resulted in fatal injuries to the driver, a passenger, and a 21-month-old male infant restrained in a child restraint system (CRS) in the second-row left position of the vehicle. On-scene images show the orientation of the CRS as rear-facing. The Chevrolet was driven by a belted 50-year-old male with a 7-year-old male passenger in the second-row right position, restraint status unknown. The Chevrolet was traveling south on a two-lane roadway when it departed the roadway to the right and traveled an estimated 66 m (217 ft) before striking a tree. A fire developed in the engine compartment and spread to consume the occupant compartment. A passerby saw the Chevrolet on fire and attempted to put the fire out with an extinguisher; however, the fire became too intense. County sheriffs, emergency medical services, and the local fire department responded to the crash site with the fire department extinguishing the flames. All the occupants of the Chevrolet were declared deceased at the scene.



Figure 1. The 2012 Chevrolet Impala. (Photo provided by the local law enforcement)

The Chevrolet was traveling south on a rural two-lane roadway driven by a 50-year-old male in the morning. There was a 21-month-old passenger in the second-row left seating position in a CRS, and a 7-year-old passenger in the second-row right position. According to the police report and their interview of the driver's wife, the crash occurred when the driver may have suffered a medical incident, resulting in the Chevrolet departing the right side of the roadway and striking a tree with its front plane. The Chevrolet rebounded and rotated clockwise, coming to final rest and facing west against the tree. A post-crash fire started in the engine compartment that spread

across the entire vehicle. All the occupants succumbed to the smoke and fire, and they were declared deceased at the scene by the local assistant coroner.

This crash was identified through a search of the Fatality Analysis Reporting System (FARS) for fatal crashes involving vehicle fires and children restrained in CRSs. The police crash report (PCR) was forwarded to the SCI team at Crash Research and Analysis, Inc., in May 2020 by NHTSA's Crash Investigation Division. The SCI team initiated contact with the investigating police department and obtained a detailed crash investigation report. Additionally, on-scene and follow-on images of the crash site and the involved vehicle were obtained from the investigating police department.

Summary

Crash Site

This crash occurred on a two-lane roadway during the morning. Reported weather conditions in the locale included fair conditions, a temperature of 15 ºC (59 ºF), 62 percent humidity, and calm winds. In the southbound travel direction, the roadway had an uphill grade and curved slightly to the left. Travel lanes were approximately 3.7 m (12 ft) wide. The southbound lane was delineated from the northbound lane by a solid yellow lane line that was clear and visible. Rumble strips were present on the west and east edges of the roadway. No fog lines were present on either edge of the roadway. Figure 2 depicts a south-facing view of the roadway on approach to the crash site. Speed was regulated by a posted limit of 89 km/h (55 mph). A crash diagram is included at the end of this report.



Figure 2. Southbound view of the Chevrolet's pre-crash approach to the crash site. (Photo provided by the local law enforcement)

Pre-Crash

The Chevrolet was driven south on the roadway by a 50-year-old male. According to the police crash report, he likely suffered a medical incident resulting in the Chevrolet departing the roadway. The Chevrolet continued straight when the roadway curved left, resulting in the vehicle departing the right side of the roadway. The vehicle traveled approximately 66 m (217 ft) off the roadway and struck a large-diameter tree.

It cannot be confirmed whether the driver did suffer a medical episode due to lack of medical information and refusal of an autopsy by the coroner's office. The police crash report indicated that the local law enforcement spoke with the driver's wife and was informed that the driver had several medical issues in the past, including having a stroke and passing out due to his diabetes.

Crash

The front plane and right aspect of the Chevrolet struck the tree. The direction of force was in the 12 o'clock sector (0 degree) for the Chevrolet. The Chevrolet rapidly decelerated, rotated clockwise around the tree, and rebounded, coming to final rest and facing west against the tree.

Post-Crash

After the Chevrolet came to final rest, a fire began in the engine compartment and spread to completely engulf the passenger compartment. A passerby attempted to extinguish the fire without success. All three occupants were declared deceased on scene due to the fire. Figure 3 shows the Chevrolet at final rest after the local fire department personnel extinguished the fire.



Figure 3. The Chevrolet's final rest position facing west.
(Photo provided by the local law enforcement)

Local police, fire, and emergency medical service personnel were called to the scene by a witness. All occupants were pronounced deceased at the crash scene by the local assistant coroner. A local recovery service towed the vehicle to the local fire department garage, where the occupants were removed, and the local law enforcement could conduct its investigation. The local law enforcement spoke to the driver's spouse and was informed of the driver's medical conditions.

2012 Chevrolet Impala

Description

The 2012 Chevrolet Impala (Figure 4) was a front-wheel-drive, 5-passenger, 4-door sedan with a Vehicle Identification Number of 2G1WG5E34C1xxxxxx. The Chevrolet was equipped with a 3.6-liter, 6-cylinder gasoline engine linked to a continuously variable automatic transmission. The curb weight was 1,658 kg (3,655 lb). The service brakes were power-assisted 4-wheel disc with ABS and electronic brake force distribution. The interior of the Chevrolet had seating for five occupants with front bucket seats and a second-row bench seat with folding backs.



Figure 4. An exemplar 2012 Chevrolet Impala LT. (Image found from online web search)

Vehicle History

The Chevrolet was registered to two previous owners during its 4-year history. The current owner purchased the Chevrolet used approximately three years prior to the crash at the reported odometer reading of 50,383 km (31,307 mi). A CARFAX report listed mechanical service for the Chevrolet, along with two crashes prior to this collision. The CARFAX reported one safety recall on June 23, 2014, for unintended ignition key rotation with a remedy available.

NHTSA Recalls and Investigations

A VIN check on the 2012 Chevrolet Impala was performed with the NHTSA recall database (www.nhtsa.gov/recalls) in July 2021. This VIN check showed one unrepaired recall issued in June 2014 with a NHTSA Recall Number of 14V355, stating that if the key ring is carrying added weight and the vehicle goes off road or experiences some other jarring event, it may unintentionally move the key away from the “Run” position.

Exterior Damage

The crash involved the front-right aspect of the Chevrolet, and the damage pattern resembled a frontal impact (Figure 5). Direct damage started at the right-front bumper corner (RFBC) and extended left across the front of the reinforced bumper. The damage resulted in the left-front frame rail displacing to the right as the RFBC was crushed rearward. The collision deformation classification (CDC) for this damage profile was 12FZEW99. After the initial impact, a fire began in the engine compartment and resulted in damage throughout the entire exterior of the vehicle.



Figure 5. The Chevrolet's frontal impact damage. (Photo provided by the local law enforcement)

Interior Damage

The fire in the engine compartment spread to the interior of the Chevrolet and completely consumed it. Due to the extent of the fire, specific damage to the interior of the vehicle could not be determined.

Manual Restraint Systems

The front and second rows had lap and shoulder belts for all five seating positions. The front-row seat belts had retractor-mounted pretensioners. The driver and front-row passenger seat belt upper anchorages could be adjusted. The position of these upper anchorages was unknown due to the fire damage.

According to the PCR, the driver was restrained by the lap and shoulder belt. The restraint status of the 7-year-old male in the second-row right seating position could not be determined due to the extent of the fire damage. It should be noted that the PCR had reported both usage and non-usage, resulting in conflicting information. The 21-month-old male was restrained in a CRS.

Supplemental Restraint Systems

The Chevrolet's supplemental restraint system consisted of an air bag control module (ACM), dual-stage driver and passenger frontal air bags, front-seat retractor-mounted pretensioners, front-seat-mounted side-impact air bags, and roof-side-rail-mounted side-impact inflatable curtain (IC) air bags. Due to the extent of the fire damage, it cannot be determined whether any

air bags deployed. The ACM was not imaged by the local law enforcement officials and therefore cannot be reported.

Child Restraint Systems

The CRS was an unknown make and model. The 21-month-old male was secured in the CRS in the second-row left seating position. The CRS was secured to the seat with the available lap and shoulder belt. An investigating officer from the local law enforcement spoke with the driver's wife, who advised the officer that she could not remember the make and model of the CRS. The only information she could provide was that it was secured in a rear-facing orientation behind the driver's seat in the second row.

2012 Chevrolet Impala Occupants

Driver Demographics

Age/sex:	50 years/male
Height:	Unknown
Weight:	Unknown
Eyewear:	Unknown
Seat type:	Bucket seat with adjustable head restraint
Seat track position:	Unknown track position
Manual restraint usage:	Lap and shoulder belt
Usage source:	Police crash report
Air bags:	Front, seat-mounted side and IC air bags available; deployment unknown
Alcohol/drug data:	Unknown
Egress from vehicle:	Fatal before removal
Transport from scene:	None
Type of medical treatment:	None

Driver Injuries

Injury No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
1	Burn, 2nd or 3rd degree; partial or full-thickness including incineration	912032.6	Isolated IPC Non-contact Injury – Fire in vehicle	Certain
2	Multiple blunt force trauma, NFS	099999.9	Unknown	Unknown

Source: death certificate and on-scene photos.

Driver Kinematics

The driver was restrained by the lap and shoulder seat belt in the driver's bucket seat, posture at the point of impact unknown. The PCR indicated that the driver may have experienced a medical episode that could have put the driver in an abnormal posture. The impact to the tree resulted in a fire that spread from the engine compartment throughout the Chevrolet. The Chevrolet was removed from the scene and transferred to a secure location, where the driver was removed. The driver was transferred to the local coroner's office, where the coroner reported that the driver sustained multiple blunt force trauma and fatal fire injuries resulting in his death.

Second-Row Left Occupant Demographics

Age/sex:	21 months/male
Height:	Unknown
Weight:	Unknown
Eyewear:	Unknown
Seat type:	Bench with folding back

Seat track position:	Non-adjustable
Manual restraint usage:	Lap and shoulder belt with child safety seat
Usage source:	PCR
Air bags:	IC air bag available; deployment unknown
Alcohol/drug data:	None
Egress from vehicle:	Fatal before removal
Transport from scene:	None
Type of medical treatment:	None

Second-Row Left Occupant Injuries

Injury No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
1	Burn, 2nd or 3rd degree; partial or full-thickness including incineration	912032.6	Isolated IPC Non-contact Injury – Fire in vehicle	Certain
2	Multiple blunt force trauma, NFS	099999.9	Unknown	Unknown

Source: death certificate and on-scene photos.

Second-Row Left Occupant Kinematics

The 21-month-old male passenger was secured in a CRS secured by the available lap and shoulder belt in the second-row left sitting position. After the Chevrolet was removed from the scene and transferred to a secure location, he was removed and transferred to the local coroner's office. The coroner reported that he sustained fatal fire injuries resulting in his death.

Second-Row Right Occupant Demographics

Age/sex:	7 years/male
Height:	Unknown
Weight:	Unknown
Eyewear:	Unknown
Seat type:	Rear-facing CRS in a bench with folding back
Seat track position:	Non-adjustable
Manual restraint usage:	Unknown
Usage source:	PCR
Air bags:	IC air bag available; deployment unknown
Alcohol/drug data:	None
Egress from vehicle:	Fatal before removal
Transport from scene:	None
Type of medical treatment:	None

Second-Row Right Occupant Injuries

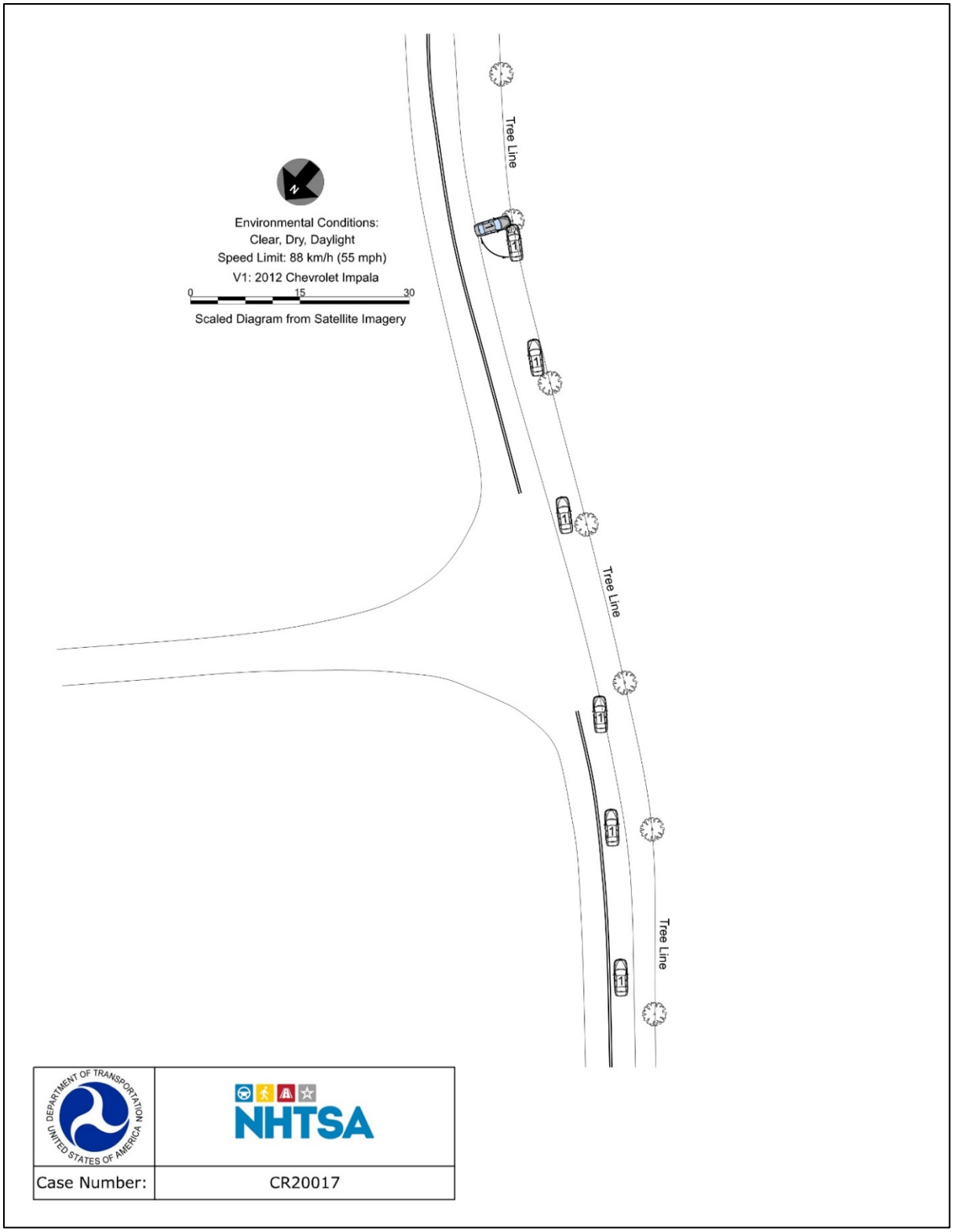
Injury No.	Injury	Injury Severity AIS 2015	Involved Physical Component (IPC)	IPC Confidence Level
1	Burn, 2nd or 3rd degree; partial or full-thickness including incineration	912032.6	Isolated IPC Non-contact Injury – Fire in vehicle	Certain
2	Multiple blunt force trauma, NFS	099999.9	Unknown	Unknown

Source: death certificate and on-scene photos.

Second-Row Right Occupant Kinematics

The 7-year-old male passenger was in the second-row right sitting position. Manual restraint use could not be determined due to the fire damage. After the fire was extinguished, he was found facing rearward. His legs were on the floorboard, his head resting on the seat cushion. After the Chevrolet was removed from the scene and transferred to a secure location, he was removed and transferred to the local coroner's office. The coroner reported that he sustained multiple blunt force trauma and fatal fire injuries resulting in his death.

Crash Diagram



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