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

NHTSA

DOT HS 812 548

June 2018

# Special Crash Investigations
# Remote Vehicle Fire/ Child Restraint System Investigation
# Vehicle: 1998 Ford Explorer
# Location: Arizona
# Incident Date: April 2012

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The crash investigation process is an inexact science which requires that physical evidence such as skid marks, vehicular damage measurements, and occupant contact points be coupled with the investigator's expert knowledge and experience of vehicle dynamics and occupant kinematics to determine the pre-crash, crash, and post-crash movements of involved vehicles and occupants.

Because each crash is a unique sequence of events, 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 published.

Suggested APA Format Citation:

Dynamic Science, Inc. (2018, June). *Special crash investigations remote vehicle fire/child restraint system investigation; vehicle: 1998 Ford Explorer; location: Arizona; incident date: April 2012* (Report No. DOT HS 812 548). Washington, DC: National Highway Traffic Safety Administration.

**Technical Report Documentation Page**

| | | | |
|---|---|---|---|
| 1. Report No.<br>DOT HS 812 548 | 2. Government Accession No. | 3. Recipient Catalog No. | |
| 4. Title and Subtitle<br>Special Crash Investigations;<br>Remote Vehicle Fire/Child Restraint System Investigation;<br>Vehicle: 1998 Ford Explorer;<br>Location: Arizona;<br>Incident Date: April 2012 | | 5. Report Date<br>June 2018<br>6. Performing Organization Code | |
| 7. Author<br>Dynamic Science, Inc. | | 8. Performing Organization Report No.<br>DS16029 | |
| 9. Performing Organization name and Address<br>Dynamic Science, Inc.<br>299 West Cerritos Avenue<br>Anaheim, CA 92805 | | 10. Work Unit No. (TRAIS)<br>11. Contract or Grant no.<br>DTNH22-12-C00271 | |
| 12. Sponsoring Agency Name and Address<br>National Highway Traffic Safety Administration<br>1200 New Jersey Ave, SE<br>Washington, DC 20590 | | 13. Type of report and period Covered<br>Technical Report April 2012<br>14. Sponsoring Agency Code | |
| 15. Supplemental Notes<br>The interest of this Remote Vehicle Fire/Child Restraint System (CRS) Investigation is the post-impact fire in a 1998 Ford Explorer involved in a two-vehicle crash and the 3-year-old male occupant of the Ford who was seated in a CRS. | | | |
| 16. Abstract<br>This investigation was intended to determine the events leading to the fire, how quickly the fire spread to the occupant compartment, the magnitude of the fire, how quickly EMS and other responders arrived on-scene, and occupant restraint usage. The crash occurred during late afternoon in April 2012 in Arizona. Conditions were daylight, clear, and dry. The Ford was being driven eastbound in the first lane from the right at an unknown speed by a belted 19-year-old male. The second row of the Ford was occupied by the 3-year-old male who was restrained in a forward-facing CRS. The other vehicle involved in the crash was a 2007 GMC C3500 being driven westbound in the first lane from the right at an unknown speed by a belted 58-year-old male. According to the police report, the Ford departed the roadway on the right edge, the driver overcorrected his steering to the left, and returned the vehicle to the roadway. It traveled across the adjacent eastbound lane, center turn lane, and into the westbound lanes where the right plane of the Ford struck the front plane of the GMC. The Ford was displaced off the north edge of the roadway, traveled down an embankment and came to rest on the roadside. The first witnesses on scene reported that the driver of the Ford was unconscious and the child occupant had a severe head injury. Witnesses noticed at that time that a fire had begun in the engine compartment. They removed the driver from the vehicle first and the 3-year-old occupant from the CRS in the second row and placed them on the ground. Within 10 minutes after the crash the Ford was completely engulfed in flames. Both occupants of the Ford were later declared deceased at the scene. | | | |
| 17. Key Words<br>child restraint system, CRS, fire, injury, fatality | | 18. Distribution Statement<br>Document is available to the public from the National Technical Information Service www.ntis.gov. | |
| 19. Security Classif. (of this report)<br>Unclassified | 20. Security Classif. (of this page)<br>Unclassified | 21. No of pages<br>17 | 22. Price |

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**Case Number: DS16029**
**Vehicle: 1998 Ford Explorer**
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## BACKGROUND

The interest of this Remote Vehicle Fire/Child Restraint System (CRS) Investigation is the post-impact fire in a 1998 Ford Explorer (**Figure 1**) involved in a two-vehicle crash and the 3-year-old male occupant of the Ford who was seated in a CRS. The investigation is intended to determine the events leading to the fire, how quickly the fire spread to the occupant compartment, the magnitude of the fire, how quickly emergency medical services (EMS) and other responders arrived on-scene and occupant restraint usage. The report will include demographics, injury data and CRS data. The crash was identified during a review of Fatality Analysis Reporting System (FARS) crash reports. The criteria for the crash type includes an impact not involving the rear plane, fire that spreads to the occupant compartment and at least one occupant seated in a CRS. The case was initiated by the SCI group of the National Highway Traffic Safety Administration on December 29, 2016. SCI obtained the police report, police images, and the two fire incident reports.

**Figure 1**. 1998 Ford Explorer (police photo)

The crash occurred during late afternoon in April 2012 in Arizona. Conditions were daylight, clear, and dry. The crash site was a straight section of an east/west State highway consisting of two lanes for each direction separated by a continuous left turn lane. The Ford was being driven eastbound by a belted 19-year-old male. The second row of the Ford was occupied by the 3-year-old male who was restrained in a forward-facing CRS. The Ford was traveling eastbound in the first lane from the right at an unknown speed. The other vehicle involved in the crash was a 2007 GMC C3500 being driven westbound at an unknown speed by a belted 58-year-old male. The GMC was a commercial vehicle towing a two-axle trailer loaded with asphalt tar. It was traveling westbound in the first lane from the right. According to the police report, the Ford departed the roadway on the right edge, the driver overcorrected his steering to the left and returned the vehicle to the roadway. It traveled across the adjacent eastbound lane, center turn lane, and into the westbound lanes. At that time the front end of the GMC struck the right plane of the Ford in an angled configuration. The Ford was displaced off the north edge of the roadway, traveled down an embankment, and came to rest on the roadside. The first witnesses on scene reported that the driver of the Ford was unconscious and the child occupant had a severe head injury. Witnesses noticed at that time that a fire had begun in the engine compartment. They removed the driver from the vehicle first and the 3-year-old occupant from the CRS in the second row and placed them on the ground. Within 10 minutes after the crash the Ford was completely engulfed in flames. Both occupants of the Ford were later declared deceased at the scene. The driver of the GMC sustained police-reported

"B" (non-incapacitating) injuries and was transported by ambulance to a local hospital where he was treated and released. Both vehicles were towed due to damage.

## SUMMARY

### *Crash Site*

The crash occurred on a straight and level section of an undivided east/west state-maintained highway in Arizona (**Figure 2**). Crash site data including roadway measurements were obtained from the police report, police on-scene images and satellite images. The roadway was asphalt surfaced and was configured with two eastbound lanes, two westbound lanes and a continuous center left turn lane. The eastbound and westbound lanes each measured between 3.5 m (11.5 ft) and 3.9 m (12.8 ft) wide and the center left turn lane measured 4.6 m (15.3 ft) wide. The eastbound lanes were bordered by a paved shoulder measuring 2.7 m (7.7 ft) wide and the westbound lanes were bordered by a paved shoulder measuring 3.2 m (10.4 ft) wide. The travel lanes were separated by dashed white painted stripes and bordered by solid white painted fog lines. The center left turn lane was delineated by double solid and dashed yellow painted stripes. The roadway and shoulders were paved with asphalt in good condition. The roadsides each descended slightly for approximately 2.0 m (6.0 ft) and then leveled out. The posted speed limit was 89 km/h (55 mph). The investigating police officer noted no unusual conditions were present at the time of the crash.


**Figure 2**. Crash site looking west (Google photo)

Conditions at the time of the crash as reported by the nearest weather station were as follows: temperature 30.0 °C (86.0 °F), 11 percent humidity, southwest winds at 20.4 km/h (12.7 mph), 16.0 km (10.0 mi) visibility and clear skies. A crash diagram is included on page 12 of this report.

### *Pre-Crash*

The Ford was traveling eastbound in the first lane from the right at an unknown speed. For unknown reasons, the Ford departed the roadway on the right edge. The driver overcorrected his steering to the left and the Ford returned to the roadway. The vehicle continued traveling to the left, crossing the eastbound lanes, center lane and entering the westbound lanes while initiating a right side leading counterclockwise yaw. The GMC was traveling westbound in the first lane from the right at an unknown speed. A witness following immediately behind the GMC indicated he was traveling approximately 77 km/h (48 mph). Tire skid marks documented by police indicated the driver of the GMC applied the brakes and skidded 27 m (88 ft) with lockup prior to impact.

**Figure 3**. Area of impact looking west (police photo)

***Crash***

The front plane of the GMC struck the right plane of the Ford in an angled configuration in the first westbound lane from the right (Event 1) (**Figure 3**). Following the impact, the Ford was displaced to the left relative to its direction of travel and departed the roadway on the north edge while traveling in a clockwise rotation. It traveled down a slight embankment and came to rest facing west on level ground on the roadside facing west (**Figure 4**). After coming to rest, a fire began in the engine compartment of the Ford (Event 2). The GMC continued to travel westbound while in a clockwise rotation. During this movement the trailer separated from the vehicle. The GMC came to rest 20 m (65 ft) west of the point of impact (**Figure 5)**. The vehicle was facing north with the front tires on the north shoulder. The trailer rolled after being separated from the GMC and came to rest on its right side on the north roadside.

**Figure 4**. 1998 Ford Explorer, final rest position looking south (police photo)

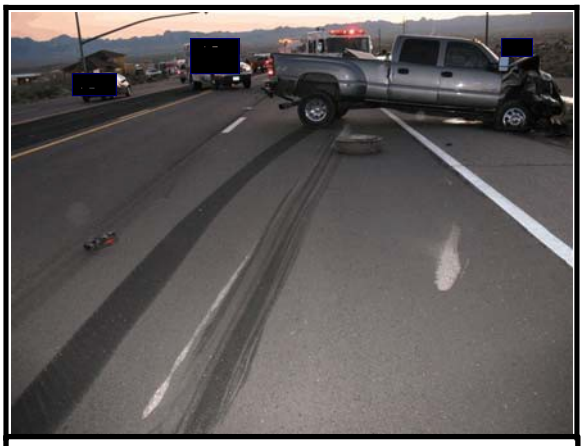


**Figure 5**. 2007 GMC 3500 final rest, looking west (police photo)

***Post-Crash***

Witnesses stopped their vehicles and approached the involved vehicles to render aide. The driver of the Ford was observed to be unconscious and the 3-year-old occupant was observed to have sustained a severe head injury. Witnesses observed a fire present in the engine compartment of the Ford prior to the occupants being removed. They removed the driver first and then the 3-year-old occupant. The witnesses cut the harness straps from the child before removing him from the CRS. They laid both occupants on the ground and when the fire spread within the vehicle they moved the occupants further away from the vehicle. Police arrived approximately 10 minutes after the crash and stated in their report that the Ford was fully engulfed in flames upon their arrival.

Given the witness statements and police report, the investigation determined the fire began in the engine compartment of the Ford almost immediately following the crash and within a few minutes spread to the occupant compartment. The Ford sustained severe fire damage to the exterior and interior. Apparently, the CRS used by the second row occupant of the Ford remained in the vehicle and was destroyed by fire. No mention was made in the police report regarding the CRS being taken from the vehicle and it was not visible in the on-scene images. Both vehicles were towed due to damage.

***Fire Company and EMS Response***

Two fire companies responded to the crash. The larger fire company was in command, arrived first and responded with multiple fire service apparatus including fire and EMS personnel. SCI obtained the incident and EMS reports for that fire company which are summarized in the narrative and tables below. The smaller fire company arrived after the first, responded with a single engine apparatus and assisted in support of the larger company. SCI obtained the incident report for that company which is summarized in the narrative and tables below.

The first and larger fire company responded with one engine apparatus, one quick attack apparatus,[1] one car apparatus and one chief car apparatus transporting a crew of seven personnel including a chief, captain, acting captain, two engineers and two firefighters. The main use for each of the four responding apparatus was EMS and the highest medical experience level at the scene was EMS paramedic. Fire company apparatus times are summarized in the following table:

| Apparatus Type | Dispatch | Arrival | Clear |
|---|---|---|---|
| Engine | 1902 | 1916 | 2003 |
| Attack | 1902 | 1916 | 1925 |
| Chief | 1902 | 1910 | 1949 |
| Car | 1902 | 1909 | 2003 |

Source: Incident report

Upon their arrival, the company crew split into two crews, one for fire suppression and one for EMS. The fire crew had water on the Ford fire at 1913 hours and the fire was out at 1921 hours. It was extinguished with 2,271 liters (600 U.S. gallons) of water. EMS observed the driver of the Ford lying under a blanket and initiated treatment. They attempted to obtain basic and secondary vital signs beginning at time 1914, followed by procedures including cardiocerebral resuscitation at time 1915 and electrocardiogram monitoring beginning at 1917. No vital signs were present, his Glasgow Coma Score was 3 and the driver was declared deceased on-scene. EMS observed the 3-year-old occupant of the Ford lying under a blanket and noted in their report that trauma to the occupant's head and face made death obvious and the occupant was declared deceased without further intervention. EMS response analysis for the driver of the Ford is summarized in the table below.

| Occupant No. | Unit Notified | Unit en Route | Arrived Scene | ALS Arrival | Cleared |
|---|---|---|---|---|---|
| 1 | 1902 | 1906 | 1916 | 1916 | 2003 |

Source: Out of Hospital Care Report

The second and smaller fire company responded with one engine apparatus. Their response data is summarized in the following table

[1] Quick attack units are small and light trucks designed to move quickly to areas that larger apparatus cannot readily access.

| Apparatus Type | Alarm | Dispatched | Arrival | Last Unit Cleared |
|---|---|---|---|---|
| Engine 1 | 1901 | Not reported | 1914 | 1932 |

Source: Incident Detail Report

**1998 FORD EXPLORER**

***Description***

The 1998 Ford Explorer was identified by police using the Vehicle Identification Number 1FMZU34E3WWxxxxxx. The vehicle's mileage was unknown. The Ford was a four-door, mid-size SUV configured with a 6-cylinder 4.0-liter gasoline engine, automatic transmission, four-wheel drive, power steering and brakes, antilock braking system (ABS), and power moon roof. No tire data was available for this vehicle.

The Ford's interior was equipped with two rows of seating to accommodate a total of five occupants. The front row was configured with two bucket seats with adjustable head restraints. The seat track settings for the driver was unknown. The second row was configured with a bench seat and adjustable head restraints. The Ford was not configured with Lower Anchors and Tethers for CHildren (LATCH). The vehicle owner's manual included instructions for installing an optional latch anchor on the rear aspect of the front row right seat to install a CRS with a top tether in that location. No provisions were made to attach top tethers in the second row seat positions. Some vehicles of this year/make/model were equipped with a built-in forward-facing CRS in the second row right seat position. It is unknown whether the vehicle involved in this crash was equipped with the built-in seat, but the 3-year-old male occupant was seated in the second row left position and the Ford did not have a built-in CRS in that location. CRS usage is discussed further in the Manual Restraints and Child Restraint System sections of this report.

***Exterior Damage***

Exterior images of the Ford taken by police were used to conduct a partial exterior vehicle inspection. The vehicle sustained direct contact damage to the right plane caused by the impact with the GMC. This damage was caused by direct contact damage during the vehicle-to-vehicle impact, the subsequent fire and post-crash activities (**Figure 6**). The crush damage from the initial vehicle-to–vehicle event appeared in images to be located primarily beginning at the right A-pillar and extending to the right C-pillar. The vehicle was severely bowed to the right by the impact and induced damage was present on the right, front, back and top planes. The estimated Collision Deformation Classification (CDC) for the Ford in Event 1 was 02RZAW4. Thermal damage included burned paint on all planes, scorched sheet metal, melted plastic components and melted tires.

**Figure 6**. 1998 Ford Explorer, exterior damage looking south (police photo)

***NHTSA Recalls and Investigations***
A search using the vehicle's VIN revealed 14 NHTSA recalls and 8 investigations. Affected components followed by the number of recalls for those components were as follows: electrical system (1), exterior lighting (4), fuel system, gasoline (1), latches/locks/linkages (1), seats (1), tires (2) and vehicle speed control (4). The vehicle history is unknown and whether any of the recalled components were serviced is unknown.

***Interior Damage***
The Ford sustained catastrophic interior damage caused by impact forces and the post-impact fire. The vehicle also sustained integrity loss to the front, left, right, and back planes. All side glass was disintegrated either at impact with the other vehicle, during the fire or during post-crash activities. The right front side door was removed during post-crash activities. Both rows of seats were destroyed by fire. Few components in the occupant compartment were recognizable in the police photos (**Figure 7**). Intrusion as seen in photographs was present in the right aspect of the front and second rows and included the right roof side rail, front and second row door panels, right B-pillar and right sill.

**Figure 7**. 1998 Ford Explorer, interior damage looking west (police photo)

***Manual Restraint Systems***
The Ford was equipped with seating for five occupants and all seats were configured with three-point lap and shoulder seat belts. The front row belts were equipped with retractor pretensioners, sliding latch plates and adjustable D-rings. The driver's belt was configured with an emergency locking retractor (ELR). Police indicated the driver of the Ford was using the lap and shoulder seat belt properly at the time of the crash. The second row seat belts were configured ELR/automatic locking retractors (ALR) and sliding latch plates. Police indicated the 3-year-old male occupant seated in the second row right position was using a CRS in combination with the manual lap and shoulder seat belt properly at the time of the crash. No further seat belt data was available.

The Ford was not equipped with LATCH and no provisions were made available to install a top tether anchor to the second row of seats.

***Supplemental Restraint Systems***
The Ford's supplemental restraint systems (SRS) included frontal air bags for the driver and right passenger seated in the front row. There was no indication in the police report or images that the driver's air bag deployed during the crash.

***Child Restraint System***
*Unknown Make/Model*
The 3-year-old male occupant of the Ford was reportedly seated in the second row left seat position and using a CRS of an unknown make and model. Witnesses who were the first to arrive on-scene indicated to police that they cut the child from the CRS prior to removing him from the vehicle.

The vehicle was not equipped with LATCH so it is presumed the CRS was installed using the vehicle's lap and shoulder seat belt and the child was restrained by a harness system integrated into the CRS. The CRS used by the occupant was not described in the police report and was not visible in on-scene images. It was likely left inside the vehicle and burned during the fire.

## 1998 FORD EXPLORER OCCUPANTS

### *Driver Demographics*

| | |
|---|---|
| Age/Sex: | 19 years/male |
| Height: | 173 cm (68 in) |
| Weight: | 84 kg (185 lb) |
| Eyewear: | Unknown |
| Seat type: | Bucket seat with adjustable head restraint |
| Seat track position: | Unknown |
| Manual restraint usage: | Lap and shoulder seat belt used Usage source: Police report |
| Air bags: | Frontal air bag not deployed |
| Alcohol/drug data: | Tested, no positive findings of toxicological significance |
| Egress from vehicle: | Removed while unconscious through left side door |
| Transport from scene: | To coroner's office |
| Type of medical treatment: | None |

### *Driver Injuries*

| Inj. No. | Injury | Injury Severity AIS 2015 | Involved Physical Component (IPC) | IPC Confidence Level |
|---|---|---|---|---|
| 1 | Pneumocephalus, cerebrum | 140682.3 | Right roof rail | Possible |
| 2 | Hemothorax NFS, left lung | 442200.3 | Center console | Possible |
| 3 | Multiple fractures NFS, skull | 150400.2 | Right roof rail | Possible |
| 4 | Fracture NFS, cervical spine | 650216.2 | Center console (indirect) | Possible |
| 5 | Multiple fractures NFS, bilateral ribs | 450200.1 | Center console | Possible |
| 6 | Lacerations, minor, frontal scalp | 110602.1 | Right roof rail | Possible |
| 7 | Abrasions, face | 210202.1 | Unknown | Unknown |

| | | | | |
|---|---|---|---|---|
| 8<br>9 | Abrasions and contusions, bilateral chest | 410202.1<br>410402.1 | Seat belt webbing | Possible |
| 10 | Abrasions, left upper and lower back | 410202.1 | Seat back | Possible |
| 11 | Abrasions, upper and lower abdomen | 510202.1 | Seat belt webbing | Possible |
| 12 | Abrasions, right lateral abdomen (flank) | 510202.1 | Seat belt webbing | Possible |
| 13<br>14 | Abrasions and contusions covering right upper arm and forearm | 710202.1<br>710402.1 | Right door panel | Possible |
| 15 | Abrasion, right lower leg | 810202.1 | Lower left IP | Possible |
| 16 | Contusion, left lower leg | 810402.1 | Lower left IP | Possible |

Source: Autopsy report

***Driver Kinematics***

The belted 19-year-old male driver of the Ford was seated in an unknown posture and was operating the vehicle at an unknown speed. For unknown reasons the Ford departed the roadway on the right edge and the driver steered left reentering the eastbound lanes. The driver overcorrected his steering and the Ford continued across the center lane and entering the westbound lanes. The vehicle was in a right side leading counterclockwise yaw when the front plane of the GMC struck the right plane of the Ford. At impact with the other vehicle, the driver of the Ford was displaced to the right in response to the direction of force. There was significant right-side intrusion and the driver likely contacted the right door, right roof rail, and the center console. The Ford was displaced rearward and to the left and departed the roadway on the left edge. The driver was held in his seated position by the vehicle's seat belt but it is probable the driver's head was displaced in multiple directions due to the vehicle's rotational forces and changes in surface elevation. The Ford traveled down an embankment and came to rest on level ground on the roadside. The driver remained in his seated position with his seat belt in place and was found to be unresponsive by witnesses who stopped to render aide.

Witnesses observed a fire had begun in the engine compartment and they removed the unconscious driver from the vehicle through the left side door and laid him on the ground. The fire quickly spread to the occupant compartment and in response to the intensified heat the witnesses moved the driver further away from the vehicle (approximately 15 m [50 ft]). The driver did not regain consciousness and was pronounced deceased on-scene twenty minutes after the crash.

***Second Row Left Occupant Demographics***

| | |
|---|---|
| Age/Sex: | 3 years/male |
| Height: | 97 cm (38 in) |
| Weight: | 15 kg (33 lb) |
| Eyewear: | None |
| Seat type: | Bench with adjustable head restraint |
| Seat track position: | Not adjustable |
| Manual restraint usage: | Forward-facing CRS installed using the vehicle's lap and shoulder seat belt |
| Usage source: | Police report |
| Air bags: | None available |
| Egress from vehicle: | Removed due to age and injuries by witnesses |
| Transport from scene: | To coroner's office |
| Type of medical treatment: | None |

***Second Row Left Occupant Injuries***

| Inj. No. | Injury | Injury Severity AIS 2015 | Involved Physical Component (IPC) | IPC Confidence Level |
|---|---|---|---|---|
| 1 | Multiple fractures, complex, open, loss of brain tissue, frontal and parietal, left skull | 150406.4 | Right roof rail | Possible |
| 2 | Hemothorax NFS, right lung, with 200 cc blood in right pleural cavity | 442200.3 | CRS shell | Possible |
| 3 | Fracture NFS, along mid-line, displaced, maxilla | 250800.2 | Right roof rail | Possible |
| 4 | Lacerations, minor, liver | 541822.2 | CRS harness | Possible |
| 5 | Fracture NFS, displaced, mandible | 250600.1 | Right roof rail | Possible |
| 6 | Multiple fractures NFS, facial bones | 250400.1 | Right roof rail | Possible |
| 7 | Avulsion (tear), upper frenulum; laceration, buccal mucosa | 243099.1 | Right roof rail | Possible |
| 8 | Abrasion, right scalp | 110202.1 | Right roof rail | Possible |
| 9<br>10 | Abrasions and contusions, right face | 210202.1<br>210402.1 | Window frame | Possible |

| | | | | |
|---|---|---|---|---|
| 11 | Lacerations, minor, lower face, lips and chin | 210602.1 | Window frame | Possible |
| 12 | Abrasions, underside of chin | 210202.1 | Window frame | Possible |
| 13 | Contusions, right neck | 310402.1 | CRS harness | Possible |
| 14<br>15 | Abrasions, bilateral chest | 410202.1<br>410202.1 | CRS harness | Possible |
| 16<br>17 | Abrasions and contusions, abdomen, multiple locations | 510202.1<br>510402.1 | CRS harness | Possible |
| 18 | Abrasion, penis | 543010.1 | CRS harness | Possible |
| 19<br>20<br>21 | Abrasions, dicing lacerations and contusions, left elbow | 710202.1<br>710402.1<br>710602.1 | Side glass | Possible |
| 22 | Contusions, right thigh, knee and lower leg | 810402.1 | Door | Possible |
| 23<br>24 | Abrasions and contusions, left thigh and lower leg | 810202.1<br>810402.1 | Unknown | Unknown |
| 25 | Contusions, left ankle | 810402.1 | Unknown | Unknown |

Source: Autopsy report

***Second Row Left Occupant Kinematics***

The 3-year-old male occupant was harnessed in a forward-facing orientation in a forward-facing CRS in the second row left seat position. As the vehicle departed the roadway and then returned, this occupant was displaced forward and to the right in response to the counterclockwise rotation. At impact with the other vehicle, he was displaced to the right in response to the direction of force and contacted the intruding right roof rail, right door, and window frame. The Ford was displaced rearward and to the left and departed the roadway on the left edge. The occupant was displaced in multiple directions in response to the rotational forces and changing surface elevations. The occupant was held in the CRS by the integrated harness. The Ford traveled down an embankment and came to rest on level ground on the roadside. The occupant remained in his seated position with his CRS in place and was found to be unresponsive and with obvious head injuries by witnesses who stopped to render aide. Witnesses observed a fire had begun in the engine compartment and they cut the harness restraints holding the child in the CRS. They then removed the unconscious occupant from the vehicle through the left side door and laid him on the ground. The fire quickly spread to the occupant compartment and in response to the intensified heat the witnesses moved the occupant further away from the vehicle (approximately 15 m [50 ft]). The occupant did not regain consciousness and was pronounced deceased on-scene 11 minutes after the crash.

**2007 GMC SIERRA C3500 CREW CAB PICKUP UNKNOWN YEAR/MAKE/MODEL TRAILER**

***Description***

The 2007 GMC Sierra C3500 (**Figure 8**) was identified in the police report using the VIN 1GTJK33D17Fxxxxxx. The vehicle was a four-door crew cab large truck configured with four-wheel drive, dual-wheel rear axle, and gross vehicle weight rating (GVWR) of 5,171 kg (11,400 lbs). It was configured with seating for five occupants. The GMC was being used as a commercial vehicle at the time of the crash. It was equipped with an 8-cylinder, 6.6-liter diesel engine and automatic transmission. The vehicle was equipped with standard daytime running lights, power steering and brakes, ABS brakes and optional power moon roof and trailer hitch. The GMC was towing a two-axle flat-bed trailer of an unknown year, make, and model. The contents of the trailer included a cargo tank loaded with asphalt. The police report indicated the trailer had no VIN or GVWR placards and the axle weight of the trailer was unknown.

**Figure 8**. 2007 GMC C3500 at final rest (police photo)

***Exterior Damage***

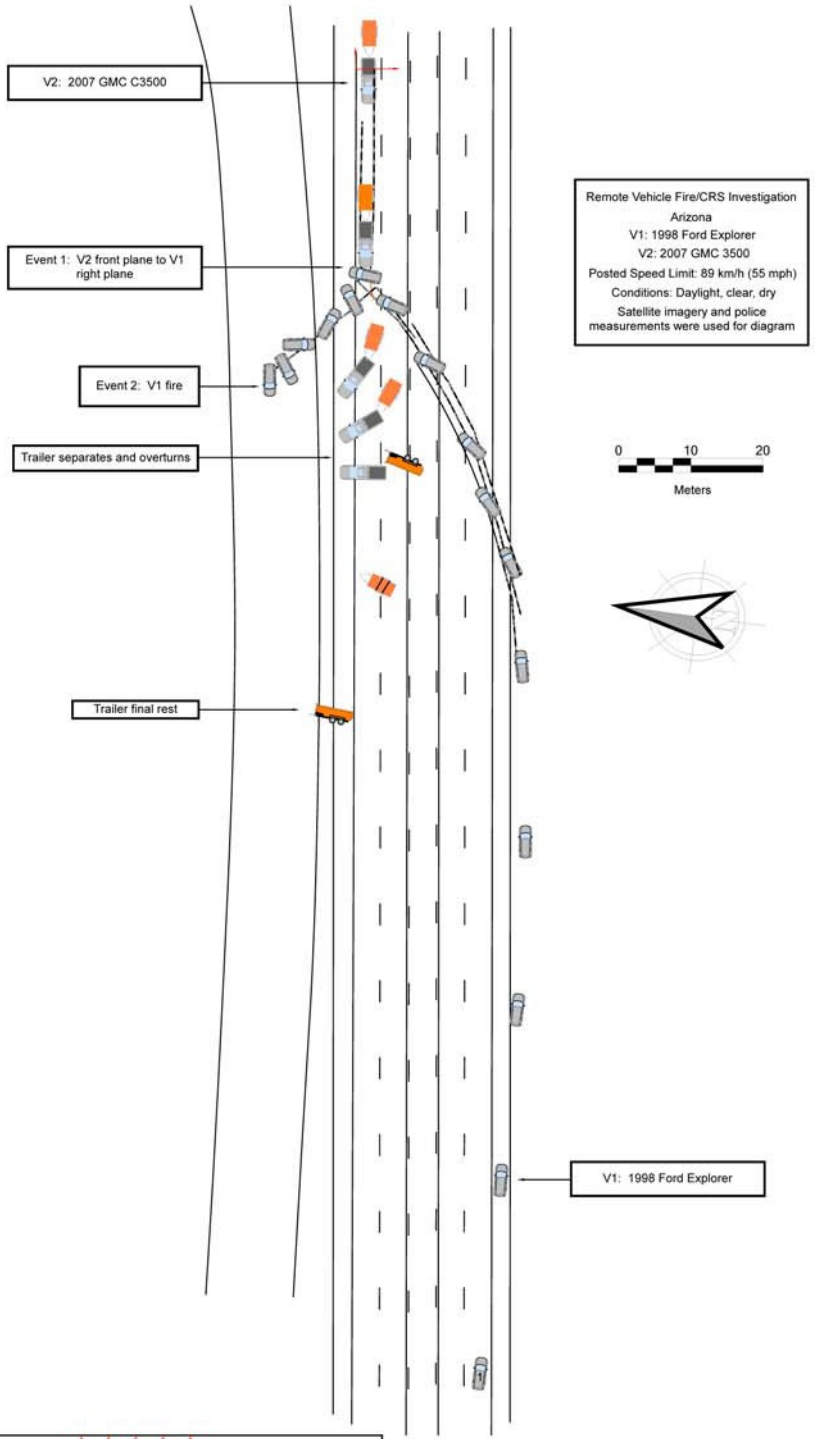
The GMC sustained direct contact damage to the front plane caused during the impact with the Ford. Crush damage was distributed across the front plane and induced damage was present on the left and right front fenders and hood. The estimated CDC for the GMC in Event 1 was 11FDEW2 (**Figure 9**). The police report stated the trailer tongue separated from the GMC during the crash causing the trailer to be displaced from the vehicle and subsequently overturned coming to rest on the roadside.

**Figure 9**. 2007 GMC C3500 front plane damage (police photo)

***Occupant Data***

The 58-year-old male driver of the GMC was employed by the owner of the vehicle. He was belted at the time of the crash and his frontal air bag deployed at impact with the Ford. The driver of the GMC sustained police-reported non- incapacitating injuries including multiple abrasions. He was transported by ambulance to a local hospital where he was treated and released.

## CRASH DIAGRAM

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13714-052918-v3