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

NHTSA

DOT HS 813 017

July 2021

# Special Crash Investigations: On-Site Inadvertent Air Bag Deployment Crash Investigation; Vehicle: 2010 Nissan Frontier; Location: Texas; Crash Date: March 2017

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Suggested APA Format Citation:

Indiana University Transportation Research Center. (2021, July). *Special Crash Investigations: On-Site Inadvertent Air Bag Deployment Crash Investigation; Vehicle: 2010 Nissan Frontier; Location: Texas; Crash Date: March 2017* (Report No. DOT HS 813 017). National Highway Traffic Safety Administration.

## Technical Report Documentation Page

| 1. Report No.<br>DOT HS 813 017 | 2. Government Accession No. | 3. Recipient's Catalog No. | |
|---|---|---|---|
| 4. Title and Subtitle<br>Special Crash Investigations:<br>On-Site Inadvertent Air Bag Deployment Crash Investigation;<br>Vehicle: 2010 Nissan Frontier;<br>Location: Texas;<br>Crash Date: March 2017 | | 5. Report Date:<br>July 2021<br>6. Performing Organization Code | |
| 7. Author<br>Indiana University, Transportation Research Center | | 8. Performing Organization Report No.<br>IN17020 | |
| 9. Performing Organization Name and Address<br>Transportation Research Center Indiana University<br>501 South Madison Street, Suite 110<br>Bloomington, Indiana 47403 | | 10. Work Unit No. (TRAIS)<br>11. Contract or Grant No.<br>DTNH22-12-C-00270 | |
| 12. Sponsoring Agency Name and Address<br>National Center for Statistics and Analysis (NSA-110)<br>National Highway Traffic Safety Administration<br>1200 New Jersey Avenue SE<br>Washington, D.C. 20590 | | 13. Type of Report and Period Covered<br>Technical Report<br>Crash Date: March 2017<br>14. Sponsoring Agency Code | |

**15. Supplementary Notes**

Each crash represents a unique sequence of events, and generalized conclusions cannot be made concerning the crashworthiness performance of the involved vehicle(s) 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.

**16. Abstract**

This report documents the on-site investigation of an alleged inadvertent deployment of the driver's frontal air bag in a 2010 Nissan Frontier, which was involved in a single-vehicle crash that occurred on the west roadside of a two-lane, undivided State highway. The Nissan was a 4-door crew cab pickup truck, equipped with multi-stage frontal air bags, front-seat-mounted side impact air bags, and rollover/side impact inflatable curtain (IC) air bags. A belted 27-year-old female drove the vehicle. The Nissan was traveling north. According to the driver, her driver's frontal air bag deployed, and she was not able to maintain control of the vehicle. The Nissan traveled in a northwest direction off the left side of the roadway, and the front plane struck a fence (Event 1) constructed of steel pipe and heavy gauge wire. The vehicle continued northwest and the front left corner struck a 76 cm (29.9 in) diameter tree (Event 2). As a result of the tree impact, the vehicle rotated counterclockwise, and the right end of the back bumper struck a wooden fence post (Event 3). The Nissan came to final rest heading west. As determined in this investigation, during the crash sequence the driver's frontal air bag and both IC air bags deployed. The driver sustained minor injuries and was treated by emergency medical personnel at the scene. She was not transported and did not seek further medical attention. The Nissan was towed due to damage. The SCI investigation found that the driver sustained facial injuries consistent with loading her face on the deployed frontal air bag during a moderate severity frontal impact with a tree. The Nissan engineer's report concluded that the driver's frontal air bag deployed as a result of the tree impact, and that the IC air bags deployed as a result of post-tree-impact roll orientation changes.

| 17. Key Words<br>inadvertent air bag deployment, motor vehicle traffic crash, minor injury | | 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>**29** | 22. Price |

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**Special Crash Investigations**
**On-Site Alleged Inadvertent Air Bag Deployment Crash Investigation**
**Office of Defects Investigation**
**Case Number: IN17020**
**Vehicle: 2010 Nissan Frontier**
**Location: Texas**
**Crash Date: March 2017**

## BACKGROUND

**Figure 1.** 2010 Nissan Frontier.

This report documents the on-site investigation of an alleged inadvertent deployment of the driver's frontal air bag in a 2010 Nissan Frontier (**Figure 1**), which was involved in a single-vehicle crash. This investigation was initiated by the National Highway Traffic Safety Administration in April 2017 and assigned to the Special Crash Investigation (SCI) Team at the Indiana University Transportation Research Center. The crash occurred in March 2017 in daylight in Texas and was investigated by a local police agency. Initial contact with the driver's insurance company was made in April 2017. Final cooperation and authorization to inspect the vehicle was obtained in May 2017. The vehicle and scene inspections were completed in May 2017. The driver interview was completed in June 2017. The SCI vehicle inspection was conducted in conjunction with a Nissan product safety engineer who used the Nissan Consult III tool to image the vehicle's event data recorder (EDR). Nissan provided to SCI a copy of the EDR report and a summary of findings based on analysis of the EDR hexadecimal data. SCI was unable to independently image the vehicle's EDR since it was not supported by the Bosch Crash Data Retrieval tool.

This crash occurred on the west roadside of a two-lane, undivided State highway. The Nissan was a 4-door crew cab pickup truck, equipped with multi-stage frontal air bags, front seat-mounted side impact air bags, and rollover/side impact inflatable curtain (IC) air bags. A belted 27-year-old female drove the vehicle. The Nissan was traveling north. According to the driver, her frontal driver's air bag deployed, and she was not able to maintain control of the vehicle. The Nissan traveled in a northwest direction off the left side of the roadway, and the front plane struck a fence (Event 1) constructed of steel pipe and heavy-gauge wire. The vehicle continued northwest, and the front left corner struck a 76 cm (29.9 in) diameter tree (Event 2). As a result of the tree impact, the vehicle rotated counterclockwise, and the right end of the back bumper struck a wooden fence post (Event 3). The Nissan came to final rest heading southwest. As determined in this investigation, during the crash sequence, the driver's frontal air bag and both IC air bags deployed. The driver sustained minor injuries and was treated by emergency medical personnel at the site. She was not transported and did not seek further medical attention. The Nissan was towed due to damage.

The Nissan engineer's report concluded that the driver's frontal air bag deployed as a result of the tree impact and the IC air bags deployed as a result of post-tree-impact roll orientation changes. The SCI investigation found that the driver sustained facial injuries consistent with loading her face on the deployed frontal air bag during a moderate severity frontal impact with a tree.

## SUMMARY

### *Crash Site*

This crash occurred during the afternoon on the west roadside of a two-lane, undivided, State highway. The Nissan was traveling north in the northbound lane. The weather conditions were clear, south winds at 32 km/h (20 mph), a temperature of 12.7 °C (55 °F), and a dew point of 10.0 °C (50 °F), according to local weather reports. The State highway traversed in a north-south direction with one 3.5 m (11.5 ft) wide through lane in each direction and 2.0 m (6.6 ft) shoulders on both sides. The pavement markings consisted of a solid yellow center line for northbound traffic and a dashed yellow centerline for southbound traffic. There were solid white edge lines for both lanes. The roadway was level, bituminous, and bordered by bituminous shoulders. The speed limit was 113 km/h (70 mph). The Crash Diagram is included at the end of this report.

### *Pre-Crash*

The Nissan was traveling north in the northbound lane (**Figure 2**). The driver stated during the SCI interview that she was traveling with the cruise control set to 97 km/h (60 mph). According to the driver, the front air bag deployed while the vehicle was in motion on the roadway and she tried to reach around it to re- grasp the steering wheel. The driver lost control of the vehicle and it departed the west edge of the roadway (**Figure 3**). The vehicle traveled northwest down an 8 percent grade into a ditch, then up the 12 percent backslope of the ditch and across a gravel driveway.

**Figure 2**. Nissan's northbound approach.

**Figure 3**. Roadway departure, northwest.

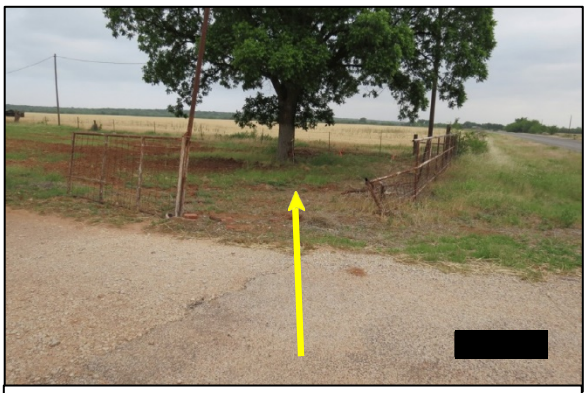


**Figure 4**. Northwest view, fence impact.

***Crash***

The front plane of the Nissan struck a fence (Event 1) constructed of steel pipe and heavy gauge wire (**Figure 4**). The impact damaged and displaced the fence. The severity of the damage to the front plane was minor. The Nissan continued northwest for 12.5 m (41.0 ft) and the front left corner struck a 76 cm (29.9 in) diameter tree (Event 2, **Figure 5**), resulting in a force direction on the vehicle in the 12 o'clock sector. The damage algorithm of the WinSMASH program calculated the total delta V as 29 km/h (18 mph). The longitudinal and lateral velocity changes were -29 km/h (-18 mph) and 0 km/h, respectively. The results were considered borderline since there was overlapping damage from the fence impact. The tree impact caused the Nissan to rotate counterclockwise and the right end of the back bumper struck a 21 cm (8.3 in) diameter wooden fence post (Event 3, **Figure 6**), displacing the fence post in the ground (**Figure 7**). The WinSMASH program could not be used to calculate delta V or a barrier equivalent speed for this event since yielding objects are out of scope for the program. However, WinSMASH was used to calculate a barrier equivalent speed (BES) of 11 km/h (4.3 mph), based on crush to the back bumper. The vehicle came to final rest approximately 6m (19 ft) north of the tree impact, heading southwest and traveled approximately 52m (171 ft) from the point of roadway departure to final rest.

**Figure 5**. Tree impact.

**Figure 6**. North view, trajectory from tree impact to fence line.

**Figure 7**. Fence post impact.

***Post-Crash***

The police were notified of the crash at 1605 hours and arrived at 1617 hours. Rescue and medical personnel also responded. The driver sustained minor injuries and she exited the vehicle under her own power through the right rear door. She was treated by medical personnel at the crash scene but was not transported and did not seek further medical treatment. The vehicle was towed due to damage.

**2010 NISSAN FRONTIER**

***Description***

The Nissan was a rear-wheel-drive, 5-occupant, pickup truck with the Vehicle Identification Number 1N6AD0ER8ACxxxxxx manufactured in March 2010. The vehicle was equipped with a

4.0-liter, V-6 engine, a 5-speed automatic transmission, 4-wheel antilock brakes with electronic brake force distribution, traction control, and electronic stability control. The vehicle was also equipped with multi-stage frontal air bags, front-seat-mounted side impact air bags, rollover/side impact IC air bags, and front seat belt pretensioners. The vehicle had a tilt steering column, which was adjusted between the center and full down positions. The driver estimated the vehicle's mileage was 135,000 miles (241,395 kilometers). The specified wheelbase was 320 cm (125.9 in).

The vehicle manufacturer's recommended tire size was P265/75R16. The vehicle was equipped with Goodyear Wrangler SR/A tires sized P265/60R16 on both left side and right front wheels. The right rear wheel was equipped with a BF Goodrich Rugged Trail T/A tire with a size that could not be determined. The manufacturer's recommended cold tire pressure for the front and rear tires was 241 kPa (35 psi). All tires were in good condition prior to the crash.

**Figure 8**. 2010 Nissan Frontier, front plane impact with fence.

The front row was equipped with driver and front right occupant leather-covered bucket seats with adjustable head restraints. The second row was equipped with a leather-covered split bench seat with folding backs and adjustable head restraints. The driver's seat track was adjusted between the forward-most and middle positions and the top of the driver's head restraint was located 17 cm (6.7 in) above the top of the seat back.

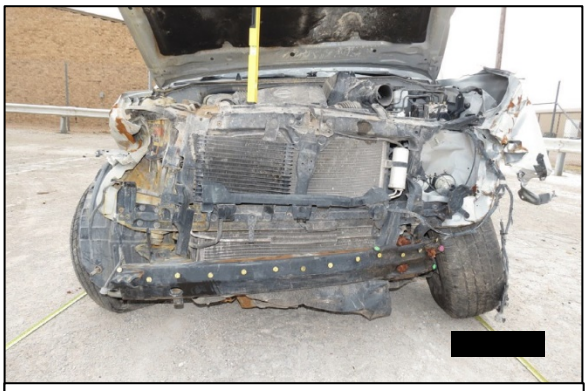


**Figure 9**. 2010 Nissan Frontier, front plane damage from tree impact.

***Exterior Damage***

***Exterior Damage Event 1***

The Nissan sustained damage to the front plane (**Figure 8**) during the impact with the fence that was constructed of steel pipes and heavy-gauge wire. There was direct damage to the front bumper fascia, grille, hood, upper radiator support, right headlamp/turn signal assembly, and the right fender. Direct damage began at the left edge of the hood and extended 167 cm (65.7 in) across the front plane. No crush measurements were taken since there was overlapping damage from the subsequent tree impact.

***Damage Classification, Event 1***

The collision deformation classification (CDC) was 12FDEW1 (0 degrees). The severity of the damage was minor.

***Exterior Damage Event 2***
The front plane (**Figure 9**) was damaged during the impact with the tree. There was direct damage to the left portion of the front bumper, bumper fascia, upper radiator support, left headlamp/turn signal assembly, and the left fender. Direct damage began at the left front bumper corner and extended 30 cm (11.8 in) across the front plane. Crush measurements were taken on the bumper bar and the Field L 135 cm (53.1 in). The crush values were $C_1$ = 21 cm (8.3 in), $C_2$ = 26 cm (10.2 in), $C_3$ = 28 cm (11 in), $C_4$ = 14 cm (5.5 in), $C_5$ = 10 cm (3.9 in), and $C_6$ = 0 cm. The maximum residual crush was 28 cm (11 in), occurring 10 cm (3.9 in) left of the center of the front plane.

***Damage Classification Event 2***
The CDC was 12FLEE2 (0 degrees). The severity of the damage was moderate.

***Exterior Damage Event 3***
The Nissan sustained damage to the back plane (**Figure 10**) during the impact with the 21 cm (8.3 in) diameter wooden fence post. There was a previous crash to this portion of the vehicle that damaged the bumper and right rear tail lights. In this impact, only the back bumper was directly contacted. Direct damage to the back bumper began at the right rear bumper corner and extended 42 cm (16.5 in) to the left. Crush measurements were taken on the back bumper and the Field L was 164 cm (64.6 in). The crush values were $C_1$ = 0 cm, $C_2$ = 1 cm (0.4 in), $C_3$ = 1 cm (0.4 in), $C_4$ = 2 cm (0.8 in), $C_5$ = 7 cm (2.8 in), and $C_6$ = 3 cm (1.2 in). The maximum residual crush was 7 cm (2.8 in), occurring 70 cm (27.6 in) right of the center of the bumper.

**Figure 10**. 2010 Nissan Frontier, Rear bumper damage from tree/previous impacts.

***Damage Classification, Event 3***
The CDC was 05BRLW1 (160 degrees). The damage severity was minor.

***Interior Damage***
The interior of the Nissan did not sustain any damage from intrusion. There was a scuff to the knee bolster, probably from contact by the driver's right knee. No other discernable occupant contacts were noted. All doors remained closed and operational.

***Manual Restraint System***
The front row seating positions were equipped with three-point lap and shoulder seat belts with sliding latch plates and adjustable upper anchors and both were set to the full up position. The front row seat belts were also equipped with retractor-mounted pretensioners that actuated during the crash.

The driver was restrained by her lap and shoulder seat belt. The retractor was jammed with a portion of the belt webbing spooled out, consistent with usage and there was a 7 cm (2.8 in) long load mark on the belt webbing made by the D-ring, located 158 cm (62.2 in) from the floor anchor. There were also load marks on the latch plate belt guide.

***Supplemental Restraint Systems***
The Nissan was equipped with multi-stage frontal, front-seat-mounted side impact, and rollover/side impact IC air bags. Issues and discussion related to the alleged inadvertent deployment of the driver's frontal air bag follow.

***NHTSA Recalls and Investigations***
The Safecar.gov website was searched on September 28, 2017, for air-bag-related issues to the 2010 Nissan Frontier. There were no air-bag-related recalls or investigations listed for this vehicle. There were six manufacturer communications listed, three of which regarded voluntary campaigns for reprogramming of the air bag control unit (ABCU). The communication stated:

> The current [ABCU] rollover-sensing calibration logic could allow for unintended curtain air bag deployment in rare instances occurring under certain unique driving scenarios, usually involving unpaved roads or off-road where one side of the vehicle is higher than the other. The [ABCU] reprogramming will improve rollover-sensing calibration to address certain unique driving scenarios, and help prevent unintended curtain air bag deployment, while maintaining the design intent for deployment in rollover crashes.

Both side curtain air bags deployed during this crash.

A Carfax report on the Nissan reported that the vehicle had two owners, no reported issues, no air-bag-related maintenance, and no reported manufacturer recalls. The only reported crash was the one involving this investigation. The driver reported during the interview that the vehicle was involved in a prior crash that involved the right tail light and back bumper. The damage from the prior crash had not been repaired and was evident on the vehicle at the SCI vehicle inspection. The damage was minor and would have had no effect on the subsequent performance of the air bag system.

***Alleged Inadvertent Air Bag Deployment Discussion***
A technical compliance representative from Nissan attended the SCI vehicle inspection and imaged the vehicle's EDR using Nissan's CONSULT-III Plus tool via the diagnostic link connector. A report detailing Nissan's findings based on their engineering analysis of the EDR data was emailed to the SCI 2 team in August 2017. A sanitized copy of the Nissan EDR report is attached to the end of this report as Appendix and a summary of Nissan's findings follows.

The Nissan report stated that no EDR data was recorded. The report stated, "This appears to be due to the system never progressing past the initial stage of writing the data to permanent memory. This was likely due to a power disruption during that process." The report also indicated that deployment data in the form of hexadecimal data was present, which captured the deployment judgement and timing information for the air bag system. The report stated that "Contained in this data is a parameter that records the relative timing of the rollover air bag system. In this case, it records (through the interpretation of the hexadecimal data) that the rollover event was at the same time or after the frontal impact event. This is in agreement with the current understanding of the collision events." The report concluded by stating, "The frontal air bag likely deployed as a result of the tree impact and the rollover curtain air bags likely

deployed as a result of post-impact roll orientation changes as the vehicle yawed away from the tree." Screen images that captured the download of the Nissan's air bag control unit are included at the end of this report as **Appendix A**.

The SCI investigation determined that the driver sustained a 3 cm (1.2 in) long contusion on the forehead over the right eye and a contusion on the nose from the nose piece of her eyeglasses. These injuries were consistent with her face loading on the deployed frontal air bag during the moderate severity frontal impact with the tree. In addition, while the driver sustained contusions on both hips from loading the lap portion of the seat belt, she sustained no contusions to her chest from loading the shoulder portion of the seat belt, suggesting that the driver's chest rode down the crash by also loading the deployed frontal air bag.

## 2010 NISSAN FRONTIER OCCUPANT

### *Driver Demographics*

| | |
|---|---|
| Age/sex: | 27 years/female |
| Height: | 175 cm/69 in |
| Weight: | 73 kg/160 lbs |
| Eyewear: | Glasses |
| Seat type: | Bucket |
| Seat track position: | Between forward-most and middle |
| Manual restraint usage: | Lap and shoulder seat belt |
| Usage source: | Vehicle inspection; frontal and IC air bags deployed; side impact air bags not deployed |
| Alcohol/drug data: | None |
| Egress from vehicle: | Exited under own power |
| Transport from scene: | None |
| Medical treatment: | Treatment at scene |

### *Driver Injuries*

| Injury No. | Injury | Injury Severity AIS 2015 | Involved Physical Components (IPC) | IPC Confidence Level |
|---|---|---|---|---|
| 1 | Contusion, 3 cm (1.2 in) in length on right forehead over right eye | 210402.1 | Isolated<br>Left Air Bag - Steering wheel hub | Certain |
| 2 | Contusion nose | 210402.1 | Isolated<br>Left Air Bag - Steering wheel hub | Certain |
| 3 | Contusions, 5 to 8 cm (2.0 - 2.8 in) in diameter over right hip | 810402.1 | Isolated<br>Interior - Lap portion of belt restraint | Certain |
| 4 | Contusions, 5 to 8 cm (2.0 – 2.8 in) in diameter over left hip | 810402.1 | Isolated<br>Interior - Lap portion of belt restraint | Certain |

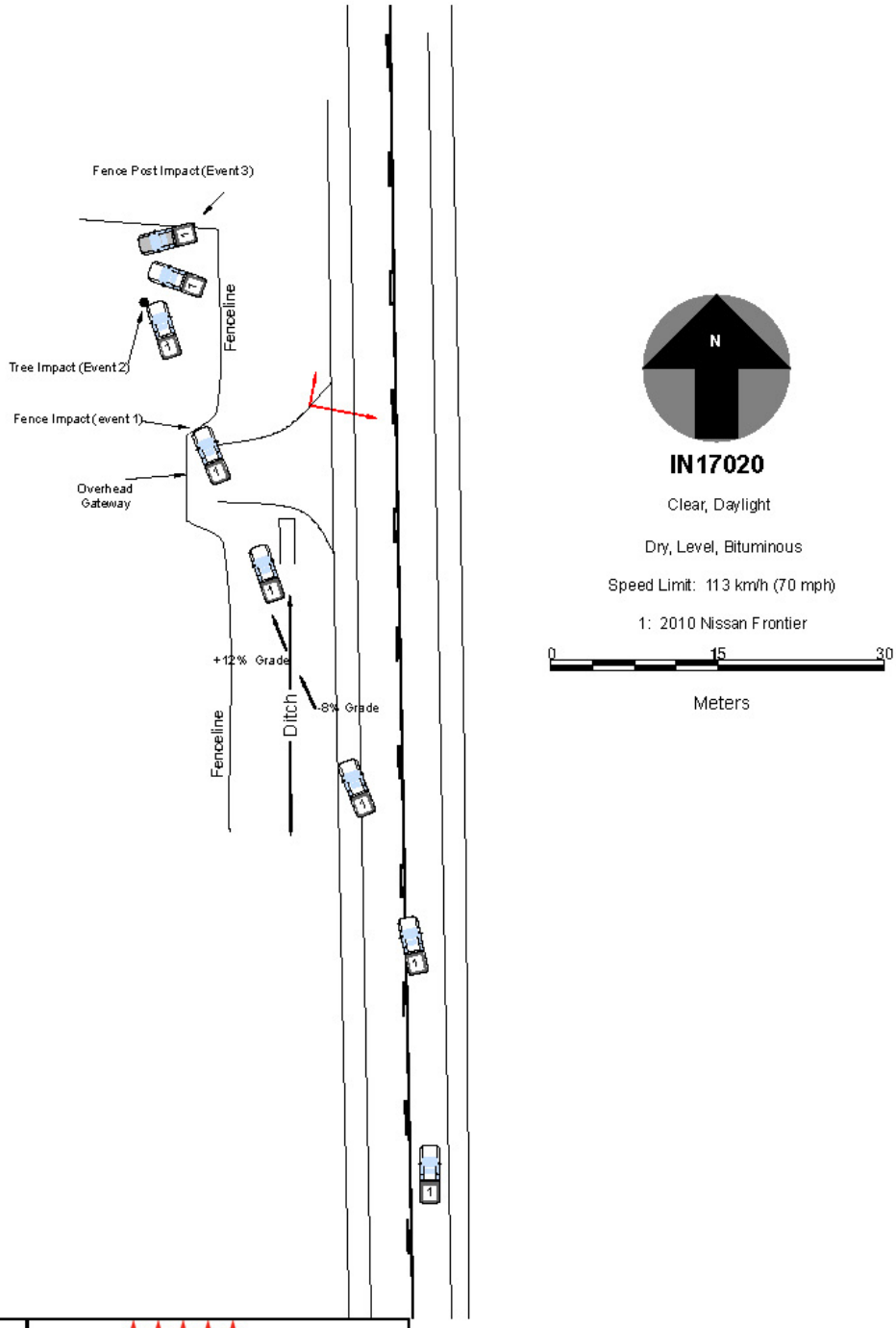
| Injury No. | Injury | Injury Severity AIS 2015 | Involved Physical Components (IPC) | IPC Confidence Level |
|---|---|---|---|---|
| 5 | Contusions, 10 to 15 cm (3.9 – 5.9 in) in length, laterally, over right knee cap and medial (inside of) bilateral knee | 810402.1 | Isolated<br>Front - Left lower instrument panel (includes knee bolster) | Probable |
| 6 | Contusions, 10 to 15 cm (3.9 – 5.9 in) in length, laterally, over left knee cap and medial (inside of) bilateral knee | 810402.1 | Isolated<br>Front - Left lower instrument panel (includes knee bolster) | Probable |
| 7 | Laceration, 5 to 6 cm (2.0 - 2.4 in), Y-shaped, on mid-shin of right lower leg | 810602.1 | Isolated<br>Front - Left lower instrument panel (includes knee bolster) | Probable |

*Source: Interviewee data–same person.*

### *Driver Kinematics*

The driver was restrained by the lap and shoulder seat belt. The seat track was adjusted between the forward most and middle positions and the seatback was reclined 27 degrees aft of vertical. The top of the head restraint was located 17 cm (6.7 in) above the top of the seatback. The vehicle's travel into and out of the ditch had little effect on the driver's kinematics. The front plane impact to the fence displaced the driver forward in her seat belt. The front plane impact to the tree resulted in actuation of the driver's seat belt pretensioner and deployment of the driver's frontal air bag. The driver was displaced forward and loaded the seat belt and frontal air bag. She sustained a 3 cm (1.2 in) long contusion on her forehead over her right eye and a contusion on her nose from the nosepiece of her eyeglasses due to loading the air bag. She sustained a 5 to 6 cm (2.0 - 2.4 in) long Y-shaped laceration on the mid-shin of her right leg and 10 - 15 cm (3.9 – 5.9 in) long contusions on the insides of both patellas from contact to the lower left instrument panel. She also sustained 5 - 8 cm (2.0 – 2.8 in) diameter contusions to both hips when she loaded the lap portion of her seat belt. She was redirected to the right as the vehicle rotated counterclockwise after the tree impact and also rearward as a result of the impact to the back bumper with the wooden fence post as the vehicle came to final rest. The driver was treated at the scene by medical personnel but was not transported by ambulance and did not seek any further medical treatment.

# CRASH DIAGRAM

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| | NHTSA www.nhtsa.gov |
| Case Number: | IN17020 |

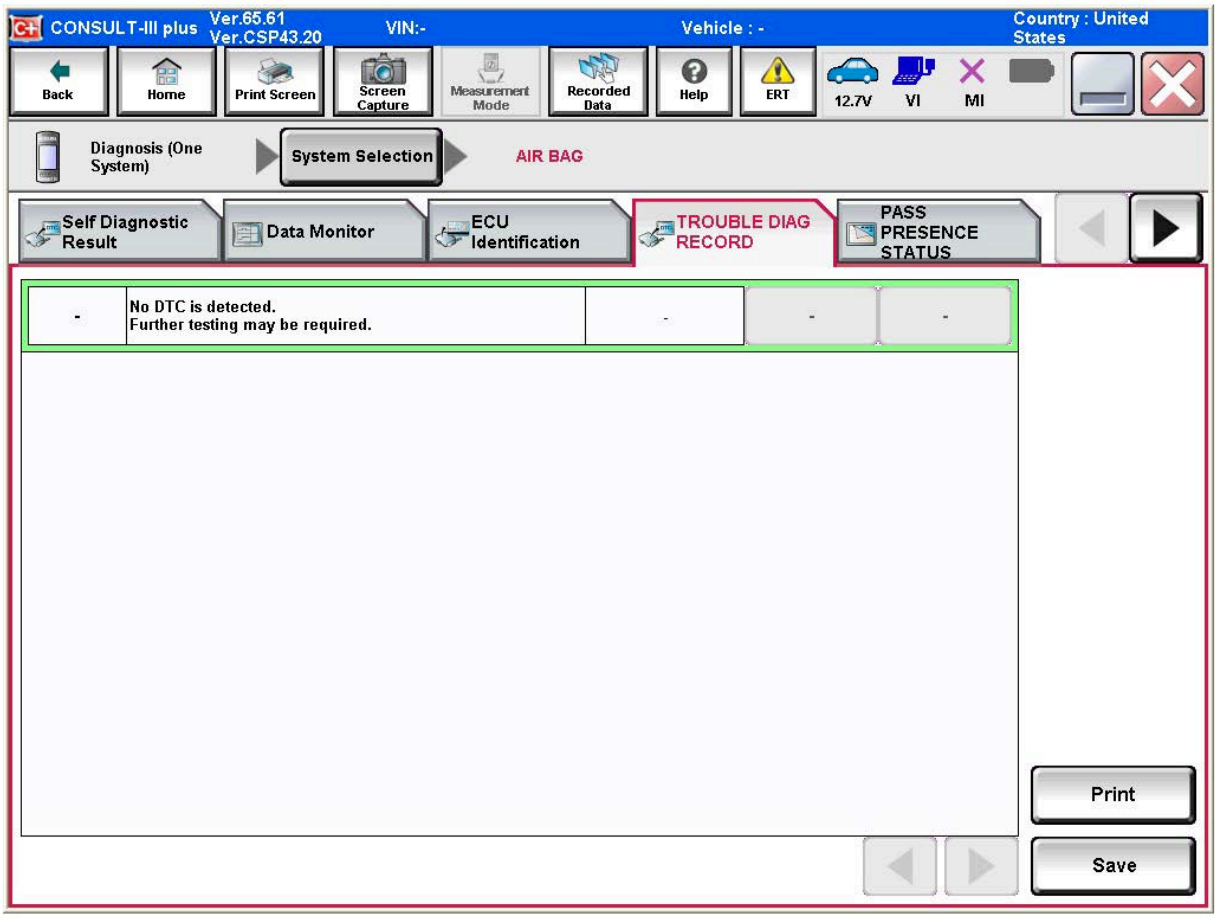
# APPENDIX A: 2010 Nissan Frontier Air Bag Control Unit[1]

[1] Screen images were captured by the Nissan product safety engineer using Nissan's Consult III proprietary tool.

Self Diagnosis
Result

1N6AD0ER8[redacted]

| SYSTEM | PART NUMBER | DTC | Detailed Information | TIME |
|---|---|---|---|---|
| AIR BAG | f6b2 | B1052 | DRIVER AIRBAG MODULE [SHORT] | CRNT |
| AIR BAG | f6b2 | B1057 | DRIVER AIRBAG MODULE [SHORT] | CRNT |
| AIR BAG | f6b2 | B1081 | PRE-TEN FRONT RH [OPEN] | CRNT |
| AIR BAG | f6b2 | B1086 | PRE-TEN FRONT LH [OPEN] | CRNT |
| AIR BAG | f6b2 | B1145 | CURTAIN MODULE RH [OPEN] | CRNT |
| AIR BAG | f6b2 | B1150 | CURTAIN MODULE LH [OPEN] | CRNT |
| AIR BAG | f6b2 | B1209 | FRONTAL COLLISION DETECTION | CRNT |
| AIR BAG | f6b2 | B1211 | ROLLOVER DETECTION | CRNT |


CONSULT-III plus Ver.65.61 Ver.CSP43.20
VIN:-
Vehicle : -
Country : United States
Back
Home
Print Screen
Screen Capture
Measurement Mode
Recorded Data
Help
ERT
12.7V
VI
MI
Diagnosis (One System)
System Selection
AIR BAG
Self Diagnostic Result
Data Monitor
ECU Identification
TROUBLE DIAG RECORD
PASS PRESENCE STATUS
-
No DTC is detected.
Further testing may be required.
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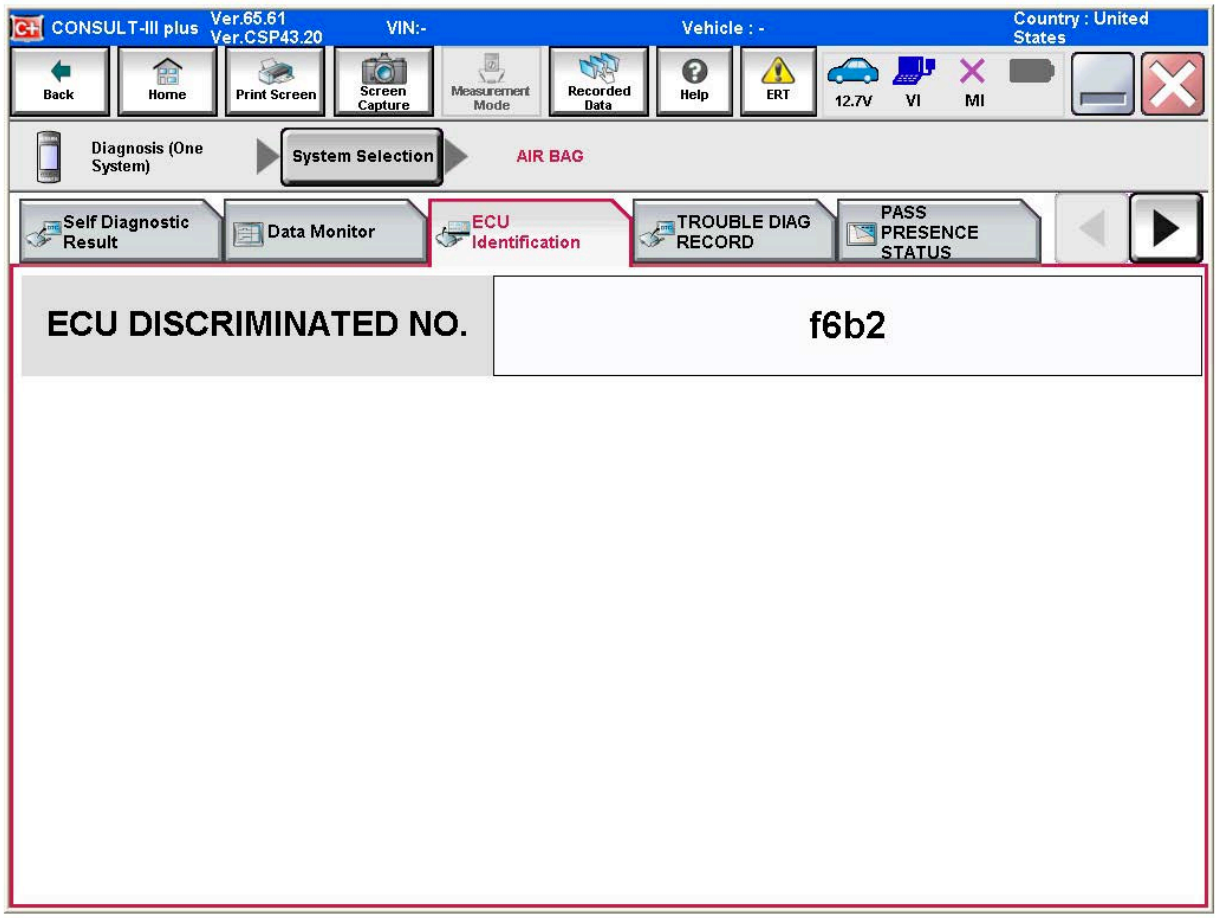
Print
Save


CONSULT-III plus
Ver.65.61
Ver.CSP43.20
VIN:-
Vehicle : -
Country : United States
Back
Home
Print Screen
Screen Capture
Measurement Mode
Recorded Data
Help
ERT
12.7V
VI
MI
Diagnosis (One System)
System Selection
AIR BAG
Self Diagnostic Result
Data Monitor
ECU Identification
TROUBLE DIAG RECORD
PASS PRESENCE STATUS
ECU DISCRIMINATED NO.
f6b2

Load Data 1N6AD0ER8AC[redacted]

| | |
|---|---|
| SYSTEM | AIR BAG |
| PART NUMBER | f6b2 |
| VIN | 1N6AD0ER8AC[redacted] |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| f | 00 | r | 01 | a0 | D1 | a1 | D3 |
| a2 | 34 | a3 | 51 | a4 | 56 | a5 | 39 |
| a6 | 91 | a7 | 96 | a8 | 00 | aa | 00 |
| ac | 00 | ad | 00 | ae | 00 | af | 00 |
| A1 | 00 | A2 | 00 | A3 | 00 | A4 | 00 |
| A5 | 00 | B1 | 00 | B2 | 00 | B3 | 00 |
| B4 | 00 | B5 | 00 | C1 | 00 | C2 | 00 |
| C3 | 00 | C4 | 00 | C5 | 00 | D1 | 00 |
| D2 | 00 | D3 | 00 | D4 | 00 | D5 | 00 |
| E1 | 00 | E2 | 00 | E3 | 00 | E4 | 00 |
| E5 | 00 | F1 | 00 | F2 | 00 | G | 00 |
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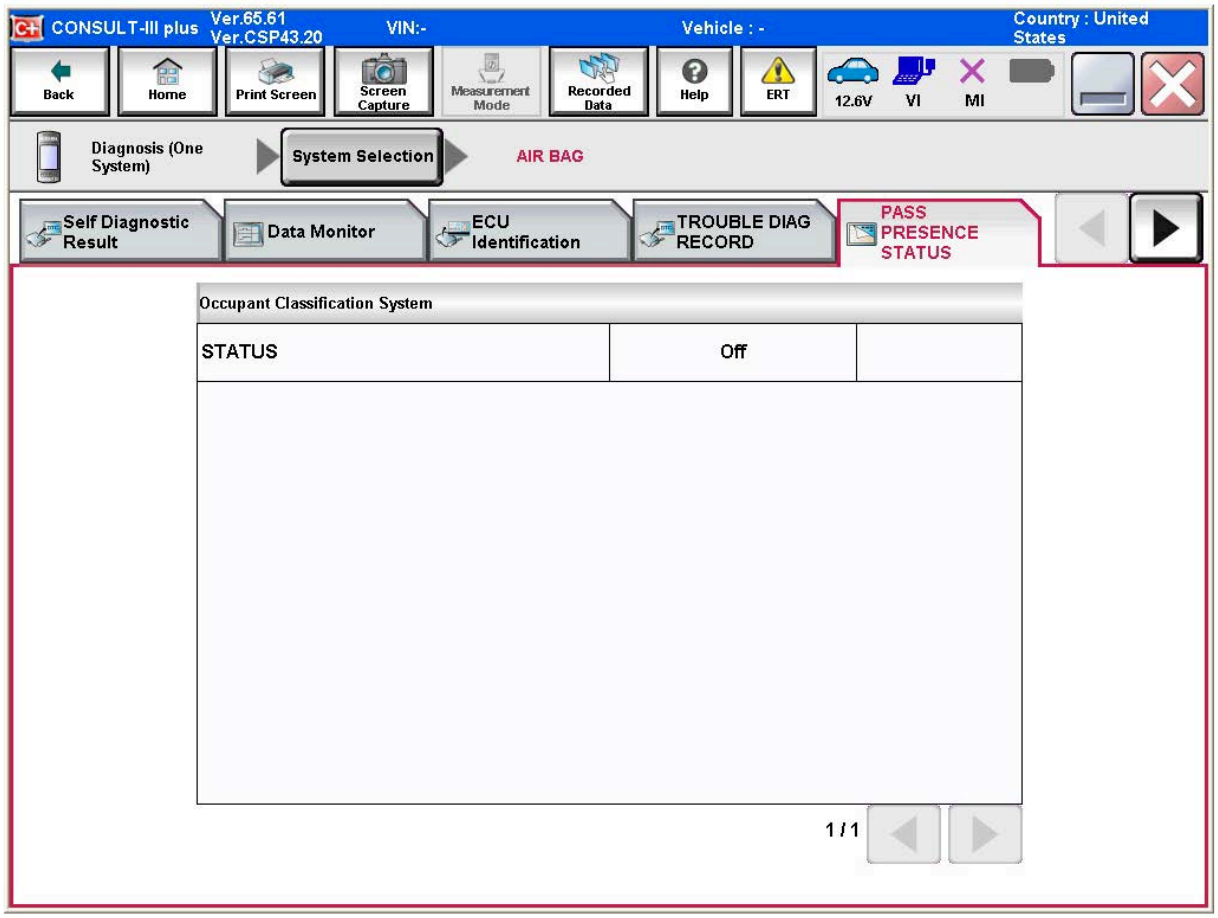
| L1 | 0C | M1 | 04 | I2 | FF | J2 | 6E |
| K2 | 00 | L2 | FF | M2 | 04 | IR | FF |
| JR | FF | KR | 46 | LR | 15 | MR | FF |
| IL | FF | JL | FF | KL | 17 | LL | 1A |
| ML | FF | R | 81 | S1 | A5 | S2 | 08 |
| S3 | 08 | S4 | 1A | S5 | 1F | S6 | 6E |
| S7 | FF | S8 | 5A | W | 00 | O1 | 00 |
| O2 | 00 | O3 | 00 | O4 | FF | O5 | 0D |
| O6 | 8B | O7 | B8 | O8 | 03 | O9 | 00 |
| OA | 00 | OB | 00 | OC | 00 | OD | 5A |
| P | F6B2 | | | | | | |


CONSULT-III plus
Ver.65.61
Ver.CSP43.20
VIN:-
Vehicle : -
Country : United States
Back
Home
Print Screen
Screen Capture
Measurement Mode
Recorded Data
Help
ERT
12.6V
VI
MI
Diagnosis (One System)
System Selection
AIR BAG
Self Diagnostic Result
Data Monitor
ECU Identification
TROUBLE DIAG RECORD
PASS PRESENCE STATUS
Occupant Classification System
STATUS
Off
1 / 1

Load Data 1N6AD0ER8AC[redacted]

| SYSTEM | AIR BAG |
|---|---|
| PART NUMBER | f6b2 |
| VIN | 1N6AD0ER8AC[redacted] |

| f | 00 | r | 01 | a0 | D1 | a1 | D3 |
|---|---|---|---|---|---|---|---|
| a2 | 34 | a3 | 51 | a4 | 56 | a5 | 39 |
| a6 | 91 | a7 | 96 | a8 | 00 | aa | 00 |
| ac | 00 | ad | 00 | ae | 00 | af | 00 |
| A1 | 00 | A2 | 00 | A3 | 00 | A4 | 00 |
| A5 | 00 | B1 | 00 | B2 | 00 | B3 | 00 |
| B4 | 00 | B5 | 00 | C1 | 00 | C2 | 00 |
| C3 | 00 | C4 | 00 | C5 | 00 | D1 | 00 |
| D2 | 00 | D3 | 00 | D4 | 00 | D5 | 00 |
| E1 | 00 | E2 | 00 | E3 | 00 | E4 | 00 |
| E5 | 00 | F1 | 00 | F2 | 00 | G | 00 |
| U | 0C | I1 | CC | J1 | 6E | K1 | 04 |
| L1 | 0C | M1 | 04 | I2 | FF | J2 | 6E |
| K2 | 00 | L2 | FF | M2 | 04 | IR | FF |
| JR | FF | KR | 46 | LR | 15 | MR | FF |
| IL | FF | JL | FF | KL | 17 | LL | 1A |
| ML | FF | R | 81 | S1 | A5 | S2 | 08 |
| S3 | 08 | S4 | 1A | S5 | 1F | S6 | 6E |
| S7 | FF | S8 | 5A | W | 00 | O1 | 00 |
| O2 | 00 | O3 | 00 | O4 | FF | O5 | 0D |
| O6 | 8B | O7 | B8 | O8 | 03 | O9 | 00 |
| OA | 00 | OB | 00 | OC | 00 | OD | 5A |
| P | F6B2 | | | | | | |

All Self Diagnosis Results FRONTIER D40 /2010- 1N6AD0ER8A[redacted]

| SYSTEM | PART NUMBER | DTC | Detailed Information | TIME |
|---|---|---|---|---|
| ABS | 47660-ZZ71D | C1104 | FR LH SENSOR-1 | 0 |
| ABS | 47660-ZZ71D | C1143 | ST ANG SEN CIRCUIT | 8 |
| ABS | 47660-ZZ71D | C1163 | ST ANGL SEN SAFE | 0 |
| BCM | 284B2-ZE61B | C1704 | LOW PRESSURE FL | PAST |
| BCM | 284B2-ZE61B | C1705 | LOW PRESSURE FR | PAST |
| BCM | 284B2-ZE61B | C1706 | LOW PRESSURE RR | CRNT |
| BCM | 284B2-ZE61B | C1707 | LOW PRESSURE RL | PAST |
| BCM | 284B2-ZE61B | C1710 | [NO DATA] RR SEE SERVICE MANUAL | CRNT |
| BCM | 284B2-ZE61B | C1711 | [NO DATA] RL SEE SERVICE MANUAL | PAST |
| BCM | 284B2-ZE61B | C1725 | [BATT VOLT LOW] FR SEE SERVICE MANUAL | CRNT |
| BCM | 284B2-ZE61B | C1726 | [BATT VOLT LOW] RR SEE SERVICE MANUAL | CRNT |
| BCM | 284B2-ZE61B | C1727 | [BATT VOLT LOW] RL SEE SERVICE MANUAL | CRNT |
| BCM | 284B2-ZE61B | C1735 | IGN CIRCUIT OPEN | PAST |
| AIR BAG | f6b2 | B1052 | DRIVER AIRBAG MODULE [SHORT] | CRNT |
| AIR BAG | f6b2 | B1057 | DRIVER AIRBAG MODULE [SHORT] | CRNT |
| AIR BAG | f6b2 | B1081 | PRE-TEN FRONT RH [OPEN] | CRNT |
| AIR BAG | f6b2 | B1086 | PRE-TEN FRONT LH [OPEN] | CRNT |
| AIR BAG | f6b2 | B1145 | CURTAIN MODULE RH [OPEN] | CRNT |
| AIR BAG | f6b2 | B1150 | CURTAIN MODULE LH [OPEN] | CRNT |
| AIR BAG | f6b2 | B1209 | FRONTAL COLLISION DETECTION | CRNT |
| AIR BAG | f6b2 | B1211 | ROLLOVER DETECTION | CRNT |
| ENGINE | 23710-ZZ88A | No DTC | | |
| METER/M&A | | No DTC | | |
| TRANSMISSION | 31020-ZZ72C | No DTC | | |

All Self Diagnosis Results FRONTIER D40 /2010- 1N6AD0ER8AC[redacted]

| SYSTEM | PART NUMBER | DTC | Detailed Information | TIME |
|---|---|---|---|---|
| IPDM E/R | | No DTC | | |

| | |
|---|---|
| Saved Date | |
| System | AIR BAG |
| P/# | |

Vehicle Info

Vehicle Name : FRONTIER

Market : NAM Model Year : 2010

Area : North America

Country : U.S.A.

| | |
|---|---|
| Customer | |
| Print Date | 2017/05/18 12:34:03 |
| Worker | |

## LOW FREQUENCY DATA

### BRAKE PEDAL SW STATE

| TIME | DATA |
|---|---|
| -7s | D.N.A. |
| -6s | D.N.A. |
| -5s | D.N.A. |
| -4s | D.N.A. |
| -3s | D.N.A. |
| -2s | D.N.A. |
| -1s | D.N.A. |
| 0s | D.N.A. |
| 1s | D.N.A. |
| 2s | D.N.A. |
| 3s | D.N.A. |
| 4s | D.N.A. |
| 5s | D.N.A. |
| 6s | D.N.A. |

### BUCKLE SW STATE[DR]

| TIME | DATA |
|---|---|
| -7s | D.N.A. |
| -6s | D.N.A. |
| -5s | D.N.A. |
| -4s | D.N.A. |
| -3s | D.N.A. |
| -2s | D.N.A. |
| -1s | D.N.A. |

| | |
|---|---|
| Saved Date | |
| System | AIR BAG |
| P/# | |

Vehicle Info

Vehicle Name : FRONTIER

Market : NAM Model Year : 2010

Area : North America

Country : U.S.A.

| | |
|---|---|
| Customer | |
| Print Date | 2017/05/18 12:34:02 |
| Worker | |

## AIR BAG - RECORDED DATA[DEV]

### HIGH FREQUENCY DATA

### FRONTAL DELTA-V

| TIME | DATA |
|---|---|
| -100ms | D.N.A. |
| -90ms | D.N.A. |
| -80ms | D.N.A. |
| -70ms | D.N.A. |
| -60ms | D.N.A. |
| -50ms | D.N.A. |
| -40ms | D.N.A. |
| -30ms | D.N.A. |
| -20ms | D.N.A. |
| -10ms | D.N.A. |
| 0ms | D.N.A. |
| 10ms | D.N.A. |
| 20ms | D.N.A. |
| 30ms | D.N.A. |
| 40ms | D.N.A. |
| 50ms | D.N.A. |
| 60ms | D.N.A. |
| 70ms | D.N.A. |
| 80ms | D.N.A. |
| 90ms | D.N.A. |
| 100ms | D.N.A. |

| TIME | DATA |
|---|---|
| 110ms | D.N.A. |
| 120ms | D.N.A. |
| 130ms | D.N.A. |
| 140ms | D.N.A. |
| 150ms | D.N.A. |
| 160ms | D.N.A. |
| 170ms | D.N.A. |
| 180ms | D.N.A. |
| 190ms | D.N.A. |
| 200ms | D.N.A. |
| 210ms | D.N.A. |
| 220ms | D.N.A. |
| 230ms | D.N.A. |
| 240ms | D.N.A. |
| 250ms | D.N.A. |
| 260ms | D.N.A. |
| 270ms | D.N.A. |
| 280ms | D.N.A. |
| 290ms | D.N.A. |
| 300ms | D.N.A. |

| | |
|---|---|
| Saved Date | |
| System | AIR BAG |
| P/# | |

Vehicle Info

Vehicle Name : FRONTIER

Market : NAM Model Year : 2010

Area : North America

Country : U.S.A.

| | |
|---|---|
| Customer | |
| Print Date | 2017/05/18 12:34:02 |
| Worker | |

## HIGH FREQUENCY DATA

### LATERAL G

| TIME | DATA |
|---|---|
| -100ms | D.N.A. |
| -90ms | D.N.A. |
| -80ms | D.N.A. |
| -70ms | D.N.A. |
| -60ms | D.N.A. |
| -50ms | D.N.A. |
| -40ms | D.N.A. |
| -30ms | D.N.A. |
| -20ms | D.N.A. |
| -10ms | D.N.A. |
| 0ms | D.N.A. |
| 10ms | D.N.A. |
| 20ms | D.N.A. |
| 30ms | D.N.A. |
| 40ms | D.N.A. |
| 50ms | D.N.A. |
| 60ms | D.N.A. |
| 70ms | D.N.A. |
| 80ms | D.N.A. |
| 90ms | D.N.A. |
| 100ms | D.N.A. |

| TIME | DATA |
|---|---|
| 110ms | D.N.A. |
| 120ms | D.N.A. |
| 130ms | D.N.A. |
| 140ms | D.N.A. |
| 150ms | D.N.A. |
| 160ms | D.N.A. |
| 170ms | D.N.A. |
| 180ms | D.N.A. |
| 190ms | D.N.A. |
| 200ms | D.N.A. |
| 210ms | D.N.A. |
| 220ms | D.N.A. |
| 230ms | D.N.A. |
| 240ms | D.N.A. |
| 250ms | D.N.A. |
| 260ms | D.N.A. |
| 270ms | D.N.A. |
| 280ms | D.N.A. |
| 290ms | D.N.A. |
| 300ms | D.N.A. |

| | |
|---|---|
| Saved Date | |
| System | AIR BAG |
| P/# | |

Vehicle Info

Vehicle Name : FRONTIER

Market : NAM Model Year : 2010

Area : North America

Country : U.S.A.

| | |
|---|---|
| Customer | |
| Print Date | 2017/05/18 12:34:04 |
| Worker | |

## STATIC DATA

### D/L COUNT AFTER EVENT

| | STATE | |
|---|---|---|
| | 53 count | |

### EDR RECORDING COMPLETE

| | STATE | |
|---|---|---|
| Priority 1 | INITIAL | |
| Priority 2 | INITIAL | |
| Priority 3 | INITIAL | |
| Priority 4 | INITIAL | |

| | |
|---|---|
| Saved Date | |
| System | |
| P/# | |

Vehicle Info

Vehicle Name : FRONTIER

Market : NAM Model Year : 2010

Area : North America

Country : U.S.A.

| | |
|---|---|
| Customer | |
| Print Date | 2017/05/18 14:03:27 |
| Worker | |

All DTC Reading

| DTC RESULTS | TIME | DTC RESULTS | TIME |
|---|---|---|---|
| ABS | | IPDM E/R | |
| C1143 : ST ANG SEN CIRCUIT | 7 | No DTC is detected. Further testing may be required. | |
| C1104 : FR LH SENSOR-1 | 0 | BCM | |
| | | C1704 : LOW PRESSURE FL | PAST |
| C1163 : ST ANGL SEN SAFE | 0 | C1705 : LOW PRESSURE FR | PAST |

| | |
|---|---|
| Saved Date | |
| System | AIR BAG |
| P/# | |

Vehicle Info

Vehicle Name : FRONTIER

Market : NAM Model Year : 2010

Area : North America

Country : U.S.A.

| | |
|---|---|
| Customer | |
| Print Date | 2017/05/18 12:34:03 |
| Worker | |

## STATIC DATA

### MAX.FRONTAL G&TIME

| | FRONTAL | TIME |
|---|---|---|
| | D.N.A. | 0.0ms |
| | LATERAL | |
| | D.N.A. | |
| | VERTICAL | |
| | D.N.A. | |

### MAX.LATERAL G&TIME

| | FRONTAL | TIME |
|---|---|---|
| | D.N.A. | 50.0ms |
| | LATERAL | |
| | D.N.A. | |
| | VERTICAL | |
| | D.N.A. | |

DOT HS 813 017
July 2021

U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**


14667-062321-v10