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Special Crash Investigations: On-Site Guardrail End Terminal Investigation; Vehicle: 2006 Ford F-150; Location: Missouri; Crash Date: February 2018

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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 submitted.			
16. Abstract This report documents the on-site investigation of a pickup truck impact to an ET-Plus 4-inch channel width guardrail end terminal that is of interest to the Federal Highway Administration (FHWA). The investigation was conducted on behalf of FHWA. This crash occurred on the south roadside of the eastbound lanes of a four-lane, divided U.S. highway. The Ford F-150 was a 2-door pickup truck equipped with multi-stage frontal air bags and a powertrain control module event data recorder. A belted 58-year-old male drove the vehicle and reported to the police that he had fallen asleep as the Ford traveled east in the right lane of the highway. The vehicle departed the right side of the road where the right-side view mirror struck a delineator (Event 1) and the front plane struck the end terminal (Event 2). The vehicle came to final rest heading northwest with the vehicle partially in the eastbound lane. The driver sustained police-reported "C" (possible) injuries and was transported by ambulance to a hospital where he was hospitalized for three days.			
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Special Crash Investigations
On-Site Guardrail End Terminal Investigation
Case Number: IN18003
Vehicle: 2006 Ford F-150
Location: Missouri
Crash Date: February 2018

BACKGROUND

This report documents the on-site investigation of a pickup truck impact to an ET-Plus 4-inch channel width guardrail end terminal (**Figure 1**) that is of interest to the Federal Highway Administration (FHWA). The investigation was conducted on behalf of FHWA. This crash was identified by an engineer with the Missouri Department of Transportation (MoDOT), who submitted photographs of the damaged end terminal and vehicle to the FHWA. The FHWA determined that the end terminal and crash type were of interest. This crash investigation was then initiated by the National Highway Traffic Safety Administration in February 2018 and assigned to the Special Crash Investigation team at the Indiana University Transportation Research Center. This single-vehicle crash involved a 2006 Ford F-150 (**Figure 2**). The crash occurred in Missouri in February 2018 during nighttime hours and was investigated by a local police agency. The guardrail, crash scene, and vehicle were inspected in February 2018. A telephone interview was conducted with the driver in August 2018.

Figure 1. The damaged end terminal and guardrail.

Figure 2. The damaged 2006 Ford F-150.

This crash occurred on the south side of the eastbound lanes of a four-lane, divided U.S. highway. The Ford F-150 was a 2-door pickup truck equipped with multi-stage frontal air bags and a powertrain control module (PCM) event data recorder (EDR). A belted 58-year-old male drove the vehicle and reported to the police he fell asleep as the Ford traveled east in the right lane of the highway. The vehicle departed the right side of the road where the right-side view mirror struck a delineator (Event 1). The front plane then struck the end terminal (Event 2). The vehicle came to final rest heading northwest with the vehicle partially in the eastbound lane. The driver sustained police-reported "C" (possible) injuries and was transported by ambulance to a hospital where he was hospitalized for three days. The Ford was towed from the crash scene due to damage.

SUMMARY

Crash Site

This crash occurred at night on the south side of the eastbound lanes of a four-lane, divided U.S. highway. The weather conditions were cloudy with clear visibility, easterly winds at 5.6 km/h (3.5 mph), a temperature of -1.1 °C (30 °F), and a dew point of -13.9 °C (7 °F), according to local weather reports. The highway was straight and traversed in an east/west direction and had two bituminous through lanes in each direction that were divided by a grass median. The eastbound roadway was bordered by a 1.0 m (3.3 ft) wide bituminous median shoulder and a 2.9 m (9.5 ft) wide bituminous right shoulder. A rumble strip was cut into the right shoulder at the fog line. The right eastbound through lane was 3.9 m (12.8 ft) wide and the left eastbound through lane was 4.0 m (13.1 ft) wide. A W-beam guardrail equipped with an ET-Plus 4-inch channel width end terminal was located on the right side of the road adjacent to the shoulder. The speed limit was 105 km/h (65 mph). A crash diagram is included at the end of this report.

Figure 3. Eastbound approach of the Ford.

Figure 4. Impact with delineator and approach to impact with end terminal, view east.

Pre-Crash

The Ford was traveling east in the right northbound lane[1] (**Figure 3**). A witness told police that the Ford slowly drifted to the right and departed the roadway. The SCI crash site investigation determined that the vehicle departed the right side of the lane onto the shoulder at an approximate distance of 81 m (266 ft) prior to the end terminal. The vehicle then traveled 51.5 m (168.9 ft) on the shoulder and entered the grass.

Figure 5. Damage to the Ford's front plane.

Crash

The vehicle traveled 19.2 m (63.0 ft) with the right-side tires in the grass and the right-side view mirror struck a delineator (**Figure 4,** Event 1). The vehicle then traveled an additional 10.8 m (35.4 ft) and the right corner of the front plane (**Figure 5**) struck the end terminal (**Figure 6**). The force direction on the vehicle was in the 12 o'clock sector and the impact resulted in no

[1] No pre-crash speed data was reported by the PCM since no restraint deployment signal was received by the PCM during the crash event. As a result, the pre-crash data relevant to this crash was not locked and was overwritten in the circular buffer.

deployment of the driver's frontal air bag. WinSMASH could not be used to calculate delta V since an impact with a yielding object is out of scope for the program. WinSMASH could also not be used to calculate a barrier equivalent speed based on the crush to the bumper since the bumper was pulled outward during towing operations and a crush profile could not be determined. The impact to the end terminal extruded 11.7 m (38.5 ft) of guardrail and damaged 8 posts. The vehicle came to final rest heading northwest partially in the eastbound lane with the back portion of the vehicle on top the guardrail. The vehicle traveled 22.6 m (74.1 ft) from the impact with the terminal head to the final rest position.

Post-Crash

The police were notified of the crash and arrived on scene in 10 minutes. Emergency responders removed the driver from the vehicle. The driver told the investigating police officer that he was very tired and suffered from several medical conditions (not specified) and that he thought he had fallen asleep. A witness stated to police that she saw the Ford drift to the right and depart the roadway, which was consistent with the driver's statement that he fell asleep. The driver sustained police-reported "C" (possible) injuries and was transported by ambulance to a local hospital where he was hospitalized for three days, though not due to injuries from the crash. The Chevrolet was towed from the crash scene due to damage.

END TERMINAL AND GUARDRAIL DAMAGE

Figure 6. Overhead view of the damaged guardrail and end terminal.

The front plane impact of the Ford to the end terminal extruded 11.7 m (38.5 ft) of guardrail to the field side and damaged 20.7 m (68.0 ft) of guardrail and 8 posts (**Figure 6**). The direct damage involved the full height and width [71 cm (28.0 in) and 38 cm (15.0 in)] of the face of the end terminal. The posts were constructed of steel. Posts 3 to 16 had composite offset blocks. All posts beyond post 16 had metal offset blocks. The guardrail was separated from posts 1 to 7. Post 1 was displaced from its base and remained bolted to the damaged guardrail. Post 2 was bent downstream to the ground. Post 3 to 5 and 7 were bent downstream approximately 40 degrees off vertical and twisted toward the field side. The offset block was displaced from each post and each bolt remained attached to its post. Post 6 was bent downstream approximately 60 degrees off vertical. The offset block was displaced from the post and the bolt remained attached to the post. Post 8 was bent downstream approximately 20 degrees off vertical. The guardrail and offset block remained attached to the post. The remaining posts were undamaged. The guardrail was kinked at posts 8 and 9. The width of the feeder channel was 10 cm (4.0 in) and the guide chute exit height was 51 cm (20.0 in). The connection of the feeder channel to the head was not damaged and no welds were broken. The anchor cable was present and disconnected as a result of the crash. The height of the undamaged guardrail was 58 cm (23.0 in). The FHWA guardrail form is attached to the end of this report as **Appendix A**.

2006 FORD F-150

Description

The Ford was a 4-wheel drive, 3-passenger, 2-door regular cab pickup truck with the Vehicle Identification Number 1FTRF14586Kxxxxxx manufactured in October 2005. The vehicle was equipped with a 5.4-liter, V-8 engine, 4-speed automatic transmission, 4-wheel antilock brakes (ABS), multi-stage frontal air bags, PCM EDR, and a tilt steering column that was adjusted to the center position. The specified wheelbase was 320 cm (126.0 in). The vehicle's odometer reading was 136,237 kilometers (84,656 miles). The vehicle manufacturer's recommended tire size was P275/65R18. The vehicle was equipped with Goodyear Wrangler SR-A tires of the recommended size. The manufacturer's recommended cold tire pressure for the front and rear tires was 241 kPa (35 psi). The tires were in fair condition prior to the crash. The right front tire sustained a cut in the outer sidewall during the crash. The remaining tires were undamaged.

The front row was equipped with a cloth-covered split bench seat with adjustable head restraints and integrated seat belts in the outboard seating positions. The driver's seat track was adjusted between the middle and rear-most positions and the seatback was reclined 24 degrees aft of vertical. The remaining seating positions were not occupied at the time of the crash.

Exterior Damage

Exterior Damage Event 1: The Ford sustained damage to the right-side view mirror during the impact with the delineator. The mirror was fractured and rotated inward on its swivel mount. There was no other damage to the right plane.

Damage Classification Event 1: The collision deformation classifications (CDC) was 12RPMS1 (0 degree). The severity of the damage was minor.

Exterior Damage Event 2: The impact with the end terminal occurred at the right corner of the front plane and the direct damage involved the bumper, right headlamp/turn signal assembly, and grille. The direct damage from the end terminal began 30 cm (11.8 in) right of the centerline and extended 63 cm (24.8 in) to the right. The remainder of the front bumper also sustained damage as the guardrail was deformed. A crush profile could not be obtained since the damaged bumper was pulled outward during towing operations.

Damage Classification Event 2: The CDC was CDC was 12FDEW2. The extent zone was estimated. The severity of the damage was moderate.

Event Data Recorder

The Ford's PCM EDR was imaged with version 17.6.1 of the Bosch Crash Data Retrieval software via direct connection to the PCM and reported with version 19.3.1. No pre-crash data relevant to this crash was reported since the PCM did not receive a restraint deployment signal during the crash. As a result, any pre-crash data that may have been recorded was overwritten in the circular buffer. The CSV data file was also examined and the pre-crash speed and brake data were reported as "0."

Interior Damage

The interior of the Ford sustained no damage during the crash. Evidence of occupant contact consisted of a body oil smear on the left front glazing from possible contact by the driver's head. The left and right front doors remained closed and operational. There was no damage to any of the glazing.

Manual Restraint Systems

The outboard front-row seating positions were equipped with lap and shoulder seat belts with sliding latch plates and fixed upper anchors. The center seating position was equipped with a lap belt. The outboard seat belts were equipped with retractor-mounted pretensioners. There was no evidence of pretensioner actuation.

The driver was belted at the time of the crash as evidenced by the wavy condition of the belt webbing, which suggested it was stretched during the crash by driver loading. The driver stated during the interview that he was belted.

Supplemental Restraint Systems

The Ford was equipped with multi-stage frontal air bags. Neither air bag deployed during the crash.

2006 FORD F-150 OCCUPANT

Driver Demographics

Age/sex:	58 years/male
Height:	180 cm (71 in)
Weight:	104 kg (229 lb)
Eyewear:	No
Seat type:	Split bench
Seat track position:	Mid-to-rear
Manual restraint usage:	Lap and shoulder seat belt
Usage source:	Vehicle inspection
Air bags:	Frontal, not deployed
Alcohol/drug data:	None
Egress from vehicle:	Removed by emergency responders
Transport from scene:	Ambulance to Level III trauma center
Medical treatment:	Hospitalized for 3 days

Driver Injuries

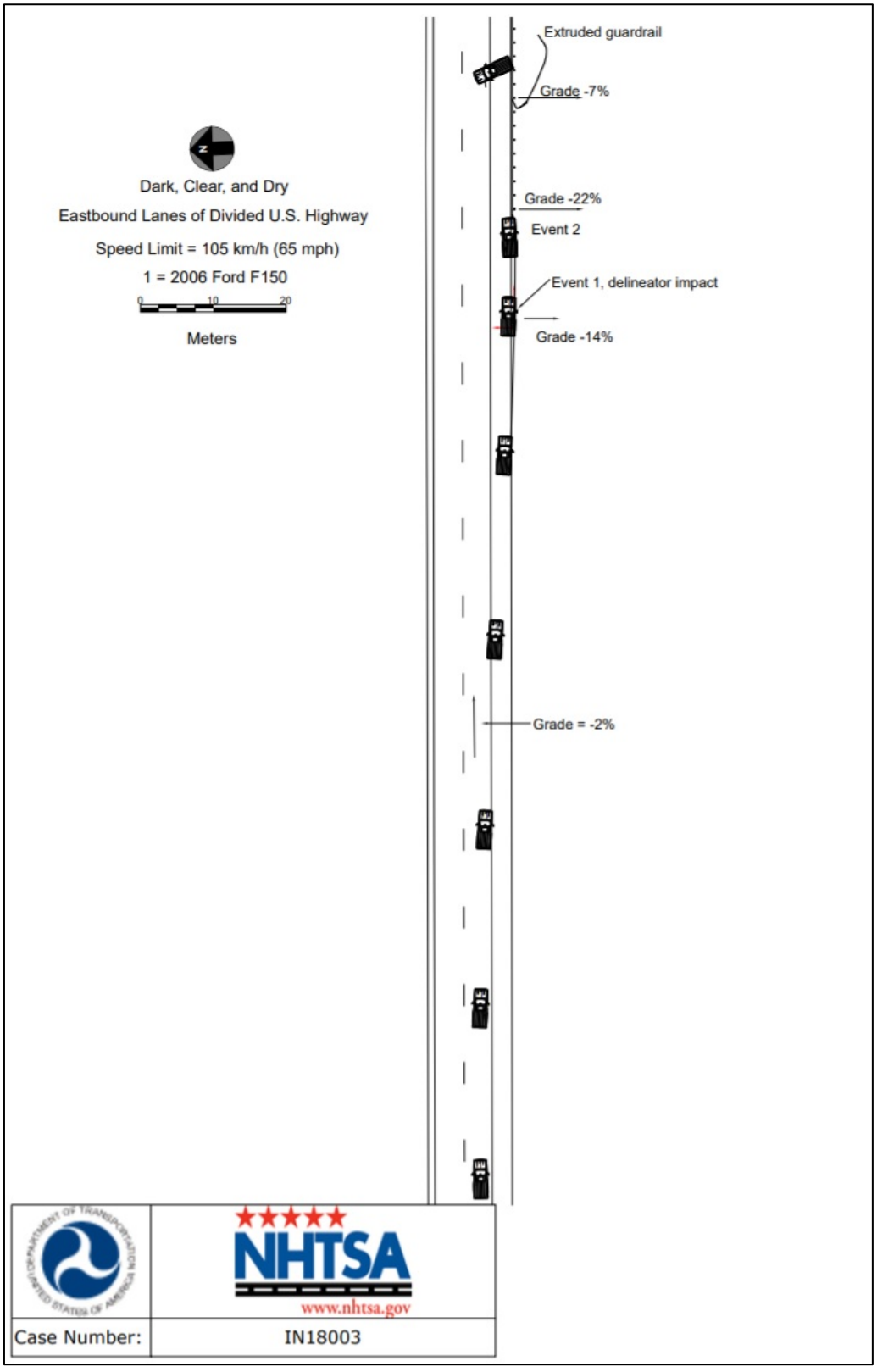
Injury No.	Injury	Injury Severity AIS 2015	Involved Physical Components (IPC)	IPC Confidence Level
1	Sprain or strain, cervical ligaments, not further specified	640284.1	Isolated Interior – Shoulder portion of belt restraint	Probable
2	Contusion to left chest	410402.1	Isolated Interior – Shoulder portion of belt restraint	Certain

Source: hospital records (injury #1); interviewee data, same person (injury #2).

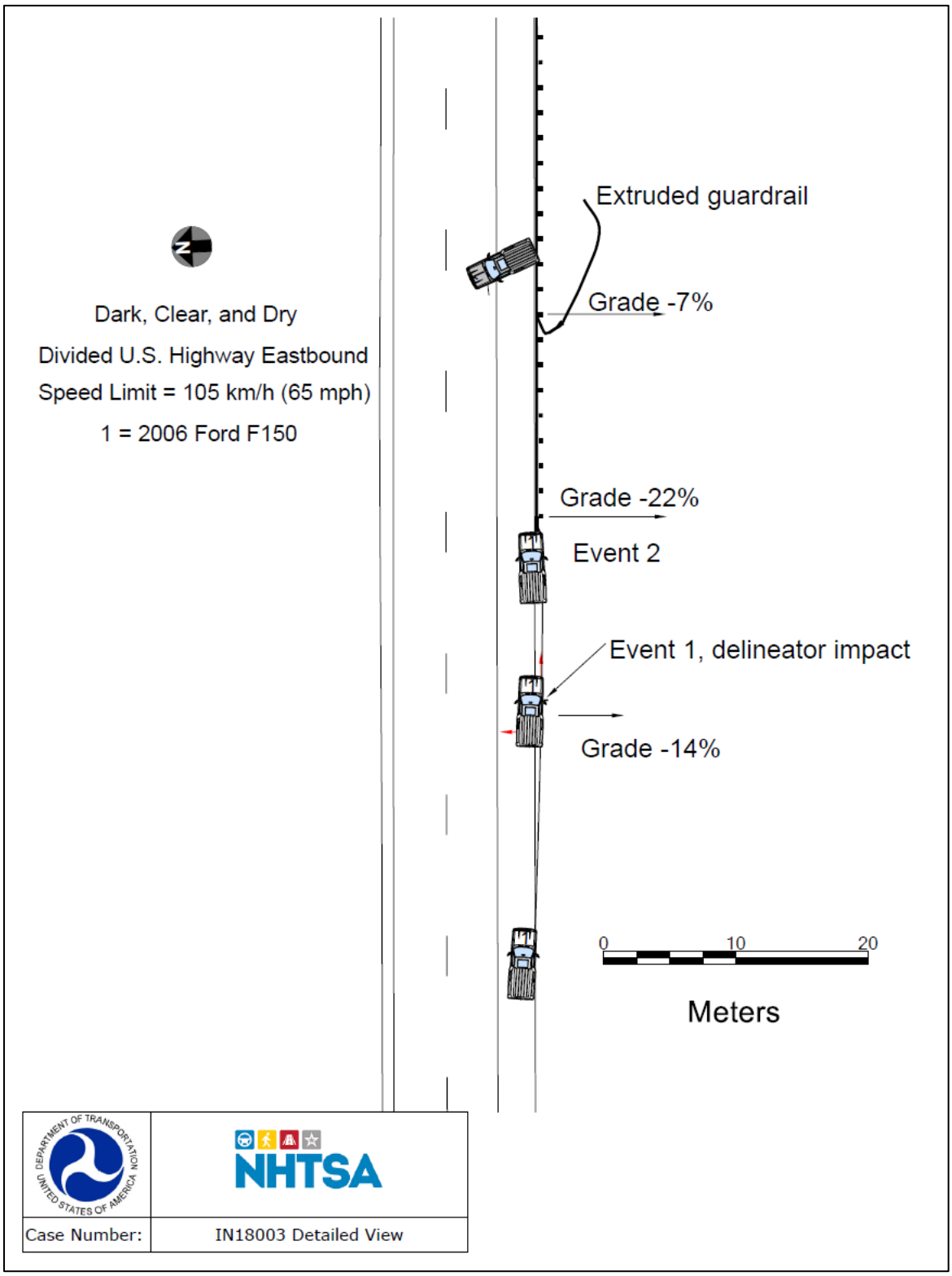
Driver Kinematics

The driver was restrained by a lap and shoulder seat belt. His seat track was adjusted between the middle and rear-most positions and the seat back was reclined 24 degrees aft of vertical. The right plane sideswipe impact to the side view mirror with the delineator probably had no effect on the driver's position. He was then displaced forward during the impact with the end terminal and loaded the seat belt resulting in a contusion to his left chest. The cervical ligament strain was probably caused by the occupant's head flexing forward while his torso was restrained by the shoulder belt. The driver then rebounded. The driver sustained police-reported "C" (possible) injuries and was transported by ambulance to a hospital. The driver, who had a history of atrial fibrillation with pacemaker and obstructive sleep apnea, was admitted to the hospital for three days for observation due to concerns relating to those health issues.

CRASH DIAGRAM



CRASH DIAGRAM: A DETAILED VIEW



APPENDIX A: FHWA Guardrail Form

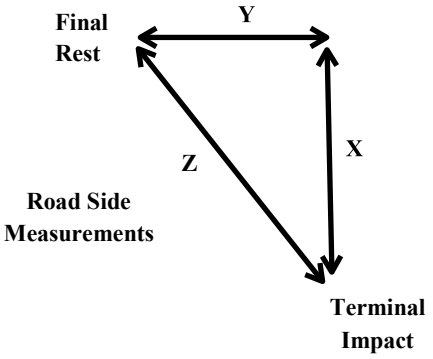
Case No.: IN18003

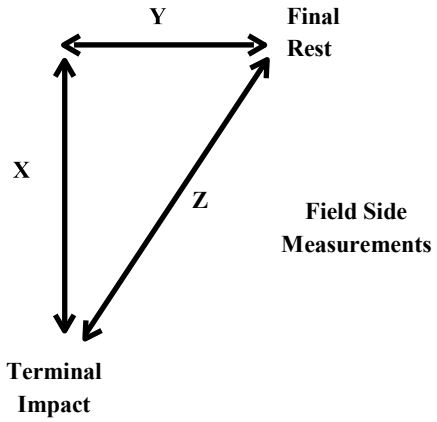
PREPOPULATED DATA (BY OTHERS)			
Date of Crash	February 2018	**TIME OF CRASH (MILITARY)**	Nighttime
Case Number	IN18003	**State**	Missouri
Traffic Route	U.S. highway	**Direction (Southbound = SB)**	EB
Ambient Conditions (at time of crash)			
Temperature (°F)	30	**Lighting**	Dark
Atmospheric	Cloudy		

SCENE INFORMATION	
Type of area where crash occurred	❒Urban ☒Rural ❒Suburban
Terminal on a horizontal curve?	☒No ❒Curve/LT ❒Curve/RT
Estimated or Reconstructed Speed at Impact (MPH)	Unknown
Est. distance (straight line) from terminal impact to COM final rest position (ft.)	Z = 67 ft
Est. distance (longitudinal) along guardrail from terminal impact to COM final resting location (ft.)	X =. 69 ft
Est. distance (normal) from either 1. the white paint line; or 2. roadway/shoulder/pavement edge to COM rest position (ft.)	Y =. 4 ft
Super elevation	❒+2% ❒-2% ☒ NONE or FLAT
Curve Radius (ft.)	N/A

KEY:

- COM - Center of Mass of Vehicle
- Distance Measurements





Case No.: IN18003

ON-SCENE INFORMATION		
End Treatment Type	☒Extruder	❒ET2000 ☒ET-PLUS 4in ❒ET-PLUS 5in ❒SKT ❒FLEAT ❒SOFT STOP
	❒Telescope	❒X-LITE ❒X-TENSION
Curb?	☒No ❒Yes	❒AASHTO Type A ❒AASHTO Type B ❒AASHTO Type C ❒AASHTO Type D ❒AASHTO Type E ❒AASHTO Type F ❒AASHTO Type G ❒AASHTO Type H
Curb Height:		

GUARDRAIL INSTALLATION									
Post No.	Post		Offset Block		Pre-Existing Damage		Offset to Post or Post Hole (ft.)		Spacing to Next Post (ft. -in.)
	Type	Dim.	Type	Dim.	Yes No Unknown	Describe	Travel Way	Curb	
	Steel Wood Other	D x W (in.) or Dia. (in.)	Steel Wood Composite	D x W (in.)					
0	N/A	N/A	N/A	N/A	N/A		N/A	N/A	N/A
1	Steel	6 x 4	None	N/A	Unk		10.3	N/A	6’4”
2	Steel	6 x 4	None	N/A	Unk		10.3	N/A	6’ 9”

Case No.: IN18003

Post No.	Post		Offset Block		Pre-Existing Damage		Offset to Post or Post Hole (ft.)		Spacing to Next Post (ft. -in.)
	Type	Dim.	Type	Dim.	Yes No Unknown	Describe	Travel Way	Curb	
	Steel Wood Other	D x W (in.) or Dia. (in.)	Steel Wood Composite	D x W (in.)					
3	Steel	6 x 4	Composite	7 x 4	Unk		10.9	N/A	6’ 7”
4	Steel	6 x 4	Composite	7 x 4	Unk		10.8	N/A	6’ 8”
5	Steel	6 x 4	Composite	7 x 4	Unk		10.8	N/A	6’ 5”
6	Steel	6 x 4	Composite	7 x 4	Unk		10.8	N/A	6’ 5”
7	Steel	6 x 4	Composite	7 x 4	Unk		10.8	N/A	6’ 5”
8	Steel	6 x 4	Composite	7 x 4	Unk		10.8	N/A	6’ 5”

Case No.: IN18003

Post No.	Post		Offset Block		Pre-Existing Damage		Offset to Post or Post Hole (ft.)		Spacing to Next Post (ft. -in.)
	Type	Dim.	Type	Dim.	Yes No Unknown	Describe	Travel Way	Curb	
	Steel Wood Other	D x W (in.) or Dia. (in.)	Steel Wood Composite	D x W (in.)					
9	Steel	6 x 4	Composite	7 x 4	No		10.4	N/A	3’ 6”
10	Steel	6 x 4	Composite	7 x 4	No		10.3	N/A	3’ 1”
11	Steel	6 x 4	Composite	7 x 4	No		10.3	N/A	2’ 11”
12	Steel	6 x 4	Composite	7 x 4	No		10.2	N/A	2’ 11”

Additional Comments

Case No.: IN18003

EXTRUDER			
Feeder Channel Width at impact head	☒4inches ☐5 inches ☐Other _____		
Guide Chute Exit Height (in.)	20 in		
Connection of feeder channels to head damaged?	☒No ☐Yes	Are Welds Broken?	☒No ☐Yes
Anchor Cable Present?	☐No ☒Yes	Connected?	☒No ☐Yes
Rail Extrusion?	☐No ☒Yes	Length (ft. in.)	38 ft 6 in
Rail Extrusion Direction	☐Traffic Side ☒Field Side		
Total Length of Rail Damaged (ft.) [total length would include extruded rail plus damaged rail downstream from head.]	68 ft		

TELESCOPE				
Rail Displacement	☐No	☐Yes; Length:	No of Panels Displaced	☐1 ☐2 ☐3 ☐4 ☐5 ☐6

ALL-SYSTEM PERFORMANCE			
Railkinks Downstream of Head?	☐No	☒Yes ;	No. of Kinks in Rail: 2
Was there intrusion into the Occupant Compartment by foreign object (guardrail)?	☒No ☐Yes		
Did vehicle impact other objects after impact with terminal?	☒No ☐Yes		
Object Contacted			

ALL-SYSTEM PERFORMANCE ENVIRONMENT			
SIDESLOPE	**50 ft in Advance of Post 1**	**At Post 1**	**50 ft Past Post 1**
Percent - %	-14%	-7%	-22%
Adjacent Lane Width (ft)	12.7 ft		
Lane Type (NAS EDS Variable: Sur. Type)	Bituminous		
Shoulder Type	Bituminous		

Shoulder Width (ft)	8.9 ft
Guardrail Height (in)	23 in

VEHICLE INFORMATION		
Vehicle Type (NHTSA Input)	Large Pickup Truck	
Vehicle Identification Number (VIN)	1FTRF14586Kxxxxxx	
Vehicle Mass (NASS var.: veh.wgt)		
Vehicle orientation upon impact	☒Case Type 1 ❒ Case Type 2 ❒ Case Type 3 ❒ Case Type 4 ❒ Case Type 5 ❒ Case Type 6 ❒ Case Type 7 ❒ Case Type 8 ❒ Other	
If "Other," describe		
Collision Deformation Classification	12FDEW2	
Delta-V	Unknown, Estimated range: 6 – 15 mph	
Occupant Compartment Penetration of rail	☒No	❒Yes; Describe:
Quarter Turns (NASS EDS variable: Rollover)	❒1 ❒2 ❒3 ❒4 ❒5 ❒6 ❒7 ❒8 ❒9 ❒10 ❒11 ❒12 ❒13 ❒14 ❒15 ❒16 ❒17+	
Object Precipitating Rollover, (NASS EDS variable: Rollobj)	N/A	
Rollover Type, Terhune Scale, (NASS EDS variable: rolintyp)	N/A	

APPENDIX B: 2006 Ford F-150 Power Train Control Module (PCM) Report[2]

[2] The PCM report contained in this technical report was imaged using the current version of the Bosch CDR software at the time of the vehicle inspection. The CDR report contained in the associated Crash Viewer application may differ relative to this report.

IMPORTANT NOTICE: Robert Bosch LLC and the manufacturers whose vehicles are accessible using the CDR System urge end users to use the latest production release of the Crash Data Retrieval system software when viewing, printing or exporting any retrieved data from within the CDR program. Using the latest version of the CDR software is the best way to ensure that retrieved data has been translated using the most current information provided by the manufacturers of the vehicles supported by this product.

CDR File Information

User Entered VIN	1FTRF14586K******
User	
Case Number	
EDR Data Imaging Date	
Crash Date	
Filename	IN18003_V1_PCM.CDRX
Saved on	
Imaged with CDR version	Crash Data Retrieval Tool 17.6.1
Imaged with Software Licensed to (Company Name)	NHTSA
Reported with CDR version	Crash Data Retrieval Tool 19.3.1
Reported with Software Licensed to (Company Name)	NHTSA
EDR Device Type	Powertrain Control Module
Restraint Deployment Signal Received	No. Analyst evaluation of PCM EDR data is needed. Refer to CSV export of PCM EDR data to perform further analysis.

Comments

No comments entered.

The retrieval of this data has been authorized by the vehicle's owner, or other legal authority such as a court order or search warrant, as indicated by the CDR tool user on .

Data Limitations

FORD POWERTRAIN CONTROL MODULE EVENT DATA INTERPRETATION GUIDE

1. This document is intended to assist you in reading the data that has been retrieved from a Powertrain Control Module ("PCM") contained in a Ford vehicle. This document is further intended to provide general guidelines and is not intended to provide information regarding the interpretation of a specific read-out.

2. The data points in the ³PCM EDR Data´ tables shown in this report are recorded in the PCM approximately every 0.2 seconds. Where a time element is shown in the report under the heading ³Relative Time (calc.),´ that is a value calculated by the CDR Tool software based on the indication of the receipt of a "Restraint Deployment Signal" or "RDS" which is a function of communication between the RCM and PCM. While the recording time interval shown is based on the function of the PCM, the ³Relative Time (calc.)´ is not a data element which is retrieved from the PCM.

3. In the event that one of the vehicle's restraint devices (e.g., an airbag or belt pretensioner) have been commanded for deployment by the Restraint Control Module (RCM), it is designed to indicate that deployment as a function of a Restraints Deployment Signal (RDS). If the PCM "receives" an RDS, the PCM will lock data internally in the PCM. The RCM and PCM both require power for some period of time after the collision and after a deployment in order for that signal or flag to reach the PCM.

4. If no RDS flag has been received from the RCM and there is still power to the PCM, the PCM data will not lock and the circular buffer will continuously overwrite itself when the vehicle¶ ignition is in the run position. In this event, data contained in the PCM that was relevant to the collision may be lost. However, if power was lost as a result of the collision, or the ignition key was turned off shortly after the event, there may still be data relating to the collision in the PCM.

5. Finding the data closest to impact:

a.) Where a Restraint Deployment Signal is received by the PCM, the data is displayed based on the ³Relative Time (calc.)´ parameter beginning with the oldest recorded frame of data displayed first in the data table. When an RDS has been received by the PCM, the indication will be associated with a frame of data reported as "RDS = Received" which would follow a series of data elements showing "RDS=NOT RECEIVED." To calculate relative time, the CDR program adopts a "time zero" (for the time element shown in in the column ³Relative Time (calc.)") associated with the sample where the RDS was received. The CDR Tool software then assigns "negative time" relative to that point moving "back in time" to the oldest sample in the loop of data and "positive time" going forward from that assigned time zero.

b.) Where a Restraint Deployment Signal is NOT received at any point in the data set, the data is displayed in order of the ³Buffer Address´ parameter data beginning with the lowest address value. The PCM buffer is circular and the data point of the first address listed in the PCM EDR Data tables does not necessarily signify the beginning of the PCM recording loop. The start and stop time of the PCM recording could be in the middle of the table. An indication that there has been an impact will often correlate with a discontinuity of the data listed in the table. If a single, significant discontinuity in the data is found, the data point immediately preceding the

discontinuity is likely to be the last data point recorded. If there is no single significant discontinuity, the data must be examined in detail to determine the largest discontinuity in the largest number of data elements. If no single largest discontinuity can be determined, it may not be possible to determine whether or not this data is associated with an impact.

c.) The Restraint Deployment Signal may not be recorded on the PCM immediately at impact. Time lags within the system may result in the Restraint Deployment Signal being recorded a few data samples after impact has occurred. The Restraint Deployment Signal is a guide, but the analyst must examine all of the data to determine when impact has occurred.

6. The PCM Data Tables further show a column labeled as the ³Key on Timer - 63.75 Max (sec)' or PUTMR. The PUTMR shows the length of time that the PCM was functioning for the most recent key cycle. The timer ascends to a maximum value of 63.75 seconds. If the data was not locked by an RDS flag and the ignition key was turned off and on again, the PCM will begin to write new data starting at the beginning of the data table. While it is not common, there are instances where the first portion of the data table has subsequent-key-on, post-crash data; while the latter portion of the data table has data from the key cycle in which the crash occurred. In other rare cases, an event has occurred in less than 25 seconds after key on and older data from prior key cycles has been left in the latter part of the buffer. Review the Key on Timer - 63.75 Max (sec) (PUTMR) data for discontinuities to determine if this has occurred.

7. Data displayed in the Key on Timer - 63.75 Max (sec) column has a resolution of 0.25 seconds and rounds actual data to the nearest 0.25 seconds. The data points occur every 0.2 seconds.

Actual time	Key on Timer display
0.0	0.0
0.2	0.25
0.4	0.50
0.6	0.50
0.8	0.75
1.0	1.00

8. Recorded Vehicle Speed is proportional to transmission output shaft speed and accuracy can be affected if the vehicle has had the tire size or inflation pressure or the final drive axle ratio changed from the factory build specifications.

9. ABS_EVENT=1 occurs when the ABS is active. This can occur with or without the brake pedal being applied. The ABS module may or may not be taking an action. (For Example, if the brake pedal is not depressed, the ABS cannot modulate brake pressure if it detects wheel slippage)

PCM Data Source:
?All PCM recorded data is fed directly from sensors to the PCM where raw signals are processed, and stored internally, except for the following parameters which are transmitted via the vehicle¶ communication network:

- Stability Control (if equipped)
- Traction Control (if equipped)
- ABS
- Restraint Deployment Signal

02005_PCM-1-2_r002

BOSCH

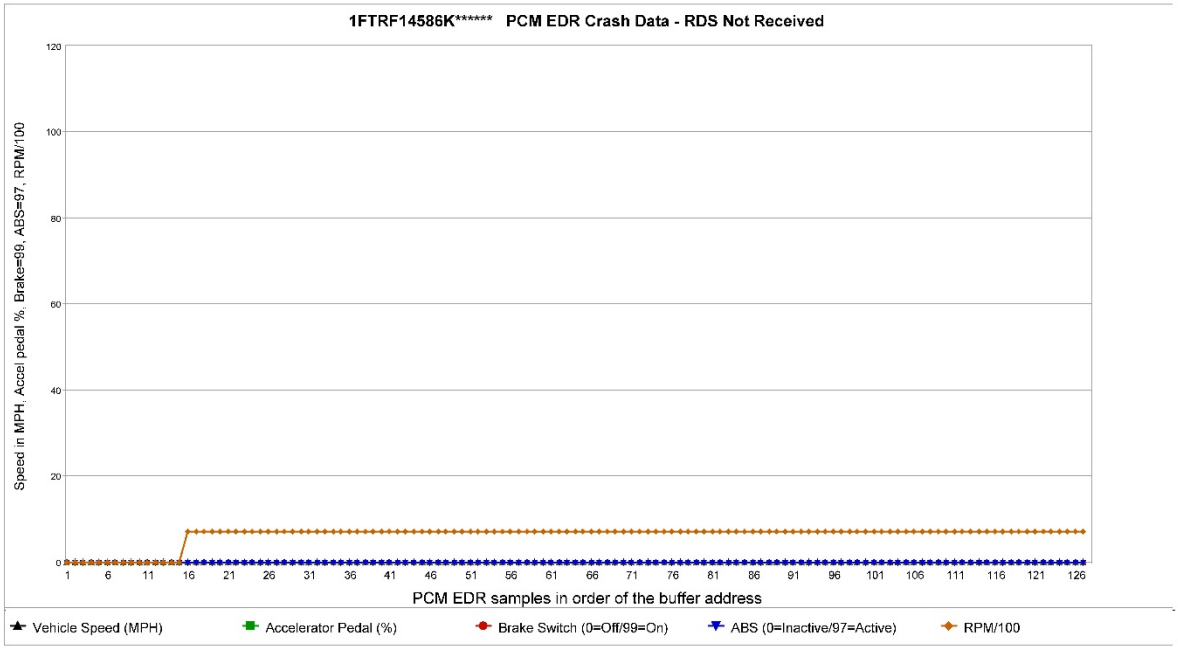
CDR CRASH DATA RETRIEVAL

PCM Module Information

Vehicle Identification Number (from PCM)	1FTRF14586K******
PCM File Name (calibration level)	TEJF1P5.HEX*
PCM Part Number	6L3A-12A650-BPA

BOSCH

CDR CRASH DATA RETRIEVAL



PCM EDR Data (1)

Buffer Address (Hex)	Relative Time (calc.) (Seconds)	Restraint Deployment Signal (Received / Not Received)	Speed, Vehicle Indicated (MPH [km/h])	Accelerator Pedal % Full (%)	Engine Throttle % Full (%)	Brake Switch (On / Off)	Brake SC De-ac (On / Off)	ABS (Active / Inactive)	Transmission - Neutral (Neutral / Not Neutral)
EA000010	N/A	Not Received	0 [0]	0	9	OFF	OFF	Not Active	Not Neutral
EA000020	N/A	Not Received	0 [0]	0	9	OFF	OFF	Not Active	Not Neutral
EA000030	N/A	Not Received	0 [0]	0	9.5	OFF	OFF	Not Active	Not Neutral
EA000040	N/A	Not Received	0 [0]	0	9.5	OFF	OFF	Not Active	Not Neutral
EA000050	N/A	Not Received	0 [0]	0	9.5	OFF	OFF	Not Active	Not Neutral
EA000060	N/A	Not Received	0 [0]	0	9.5	OFF	OFF	Not Active	Not Neutral
EA000070	N/A	Not Received	0 [0]	0	9.5	OFF	OFF	Not Active	Not Neutral
EA000080	N/A	Not Received	0 [0]	0	9.5	OFF	OFF	Not Active	Not Neutral
EA000090	N/A	Not Received	0 [0]	0	9.5	OFF	OFF	Not Active	Not Neutral
EA0000A0	N/A	Not Received	0 [0]	0	9.5	OFF	OFF	Not Active	Not Neutral
EA0000B0	N/A	Not Received	0 [0]	0	9.5	OFF	OFF	Not Active	Not Neutral
EA0000C0	N/A	Not Received	0 [0]	0	9.5	OFF	OFF	Not Active	Not Neutral
EA0000D0	N/A	Not Received	0 [0]	0	9.5	OFF	OFF	Not Active	Not Neutral
EA0000E0	N/A	Not Received	0 [0]	0	9.5	OFF	OFF	Not Active	Not Neutral
EA0000F0	N/A	Not Received	0 [0]	0	9.5	OFF	ON	Not Active	Not Neutral
EA000100	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000110	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000120	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000130	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000140	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000150	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000160	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000170	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000180	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000190	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0001A0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0001B0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0001C0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0001D0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0001E0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0001F0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000200	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000210	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000220	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000230	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000240	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000250	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000260	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000270	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000280	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000290	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0002A0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0002B0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0002C0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0002D0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0002E0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0002F0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000300	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000310	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000320	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000330	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000340	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000350	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000360	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000370	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000380	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000390	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0003A0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0003B0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0003C0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0003D0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0003E0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0003F0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral

Buffer Address (Hex)	Relative Time (calc.) (Seconds)	Restraint Deployment Signal (Received / Not Received)	Speed, Vehicle Indicated (MPH [km/h])	Accelerator Pedal % Full (%)	Engine Throttle % Full (%)	Brake Switch (On / Off)	Brake SC De-ac (On / Off)	ABS (Active / Inactive)	Transmission - Neutral (Neutral / Not Neutral)
EA000400	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000410	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000420	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000430	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000440	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000450	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000460	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000470	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000480	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000490	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0004A0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0004B0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0004C0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0004D0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0004E0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0004F0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000500	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000510	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000520	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000530	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000540	N/A	Not Received	0 [0]	0	3.5	OFF	ON	Not Active	Neutral
EA000550	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000560	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000570	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000580	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000590	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0005A0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0005B0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0005C0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0005D0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0005E0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0005F0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000600	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000610	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000620	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000630	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000640	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000650	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000660	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000670	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000680	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000690	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0006A0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0006B0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0006C0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0006D0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0006E0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0006F0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000700	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000710	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000720	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000730	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000740	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000750	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000760	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000770	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000780	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA000790	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0007A0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0007B0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0007C0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0007D0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0007E0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral
EA0007F0	N/A	Not Received	0 [0]	0	3.5	OFF	OFF	Not Active	Neutral

PCM EDR Data (2)

Buffer Address (Hex)	Relative Time (calc.) (Seconds)	Transmission - Reverse (Reverse / Not Reverse)	Speed Control (On / Off)	Engine RPM (RPM)	Engine Output Torque Calculated (N-m)	Driveline Output Torque Calculated (N-m)	Traction Control (Active / Inactive)	Stability Control (Active / Inactive)	Key On Timer 63.75 Max (sec) (Seconds)
EA000010	N/A	Reverse	OFF	0	426	1608	Not Active	Not Active	.25
EA000020	N/A	Reverse	OFF	0	426	1608	Not Active	Not Active	.5
EA000030	N/A	Reverse	OFF	0	426	1608	Not Active	Not Active	.5
EA000040	N/A	Reverse	OFF	0	426	1608	Not Active	Not Active	.75
EA000050	N/A	Reverse	OFF	0	426	1608	Not Active	Not Active	1
EA000060	N/A	Reverse	OFF	0	426	1608	Not Active	Not Active	1.25
EA000070	N/A	Reverse	OFF	0	426	1608	Not Active	Not Active	1.5
EA000080	N/A	Reverse	OFF	0	426	1608	Not Active	Not Active	1.5
EA000090	N/A	Reverse	OFF	0	426	1607	Not Active	Not Active	1.75
EA0000A0	N/A	Reverse	OFF	0	426	1606	Not Active	Not Active	2
EA0000B0	N/A	Reverse	OFF	0	426	1597	Not Active	Not Active	2.25
EA0000C0	N/A	Reverse	OFF	0	426	1594	Not Active	Not Active	2.5
EA0000D0	N/A	Reverse	OFF	0	426	1594	Not Active	Not Active	2.5
EA0000E0	N/A	Reverse	OFF	0	426	1594	Not Active	Not Active	2.75
EA0000F0	N/A	Reverse	OFF	0	426	1594	Not Active	Not Active	3
EA000100	N/A	Not Reverse	OFF	702	-11	-56	Not Active	Not Active	63.75
EA000110	N/A	Not Reverse	OFF	704	-13	-57	Not Active	Not Active	63.75
EA000120	N/A	Not Reverse	OFF	704	-12	-58	Not Active	Not Active	63.75
EA000130	N/A	Not Reverse	OFF	702	-12	-54	Not Active	Not Active	63.75
EA000140	N/A	Not Reverse	OFF	695	-8	-51	Not Active	Not Active	63.75
EA000150	N/A	Not Reverse	OFF	699	-8	-46	Not Active	Not Active	63.75
EA000160	N/A	Not Reverse	OFF	698	-7	-48	Not Active	Not Active	63.75
EA000170	N/A	Not Reverse	OFF	704	-12	-51	Not Active	Not Active	63.75
EA000180	N/A	Not Reverse	OFF	705	-11	-55	Not Active	Not Active	63.75
EA000190	N/A	Not Reverse	OFF	706	-13	-56	Not Active	Not Active	63.75
EA0001A0	N/A	Not Reverse	OFF	698	-11	-57	Not Active	Not Active	63.75
EA0001B0	N/A	Not Reverse	OFF	699	-9	-51	Not Active	Not Active	63.75
EA0001C0	N/A	Not Reverse	OFF	703	-13	-57	Not Active	Not Active	63.75
EA0001D0	N/A	Not Reverse	OFF	702	-8	-46	Not Active	Not Active	63.75
EA0001E0	N/A	Not Reverse	OFF	702	-11	-55	Not Active	Not Active	63.75
EA0001F0	N/A	Not Reverse	OFF	705	-11	-50	Not Active	Not Active	63.75
EA000200	N/A	Not Reverse	OFF	702	-7	-44	Not Active	Not Active	63.75
EA000210	N/A	Not Reverse	OFF	702	-8	-51	Not Active	Not Active	63.75
EA000220	N/A	Not Reverse	OFF	707	-13	-54	Not Active	Not Active	63.75
EA000230	N/A	Not Reverse	OFF	706	-13	-58	Not Active	Not Active	63.75
EA000240	N/A	Not Reverse	OFF	701	-11	-55	Not Active	Not Active	63.75
EA000250	N/A	Not Reverse	OFF	698	-10	-52	Not Active	Not Active	63.75
EA000260	N/A	Not Reverse	OFF	700	-8	-49	Not Active	Not Active	63.75
EA000270	N/A	Not Reverse	OFF	700	-9	-52	Not Active	Not Active	63.75
EA000280	N/A	Not Reverse	OFF	706	-11	-49	Not Active	Not Active	63.75
EA000290	N/A	Not Reverse	OFF	706	-12	-53	Not Active	Not Active	63.75
EA0002A0	N/A	Not Reverse	OFF	709	-14	-57	Not Active	Not Active	63.75
EA0002B0	N/A	Not Reverse	OFF	705	-12	-58	Not Active	Not Active	63.75
EA0002C0	N/A	Not Reverse	OFF	701	-8	-51	Not Active	Not Active	63.75
EA0002D0	N/A	Not Reverse	OFF	704	-10	-52	Not Active	Not Active	63.75
EA0002E0	N/A	Not Reverse	OFF	703	-10	-51	Not Active	Not Active	63.75
EA0002F0	N/A	Not Reverse	OFF	701	-10	-52	Not Active	Not Active	63.75
EA000300	N/A	Not Reverse	OFF	702	-10	-50	Not Active	Not Active	63.75
EA000310	N/A	Not Reverse	OFF	695	-6	-46	Not Active	Not Active	63.75
EA000320	N/A	Not Reverse	OFF	695	-5	-45	Not Active	Not Active	63.75
EA000330	N/A	Not Reverse	OFF	700	-5	-41	Not Active	Not Active	63.75
EA000340	N/A	Not Reverse	OFF	703	-8	-44	Not Active	Not Active	63.75
EA000350	N/A	Not Reverse	OFF	706	-10	-49	Not Active	Not Active	63.75
EA000360	N/A	Not Reverse	OFF	706	-13	-56	Not Active	Not Active	63.75
EA000370	N/A	Not Reverse	OFF	703	-11	-56	Not Active	Not Active	63.75
EA000380	N/A	Not Reverse	OFF	701	-10	-54	Not Active	Not Active	63.75
EA000390	N/A	Not Reverse	OFF	701	-8	-50	Not Active	Not Active	63.75
EA0003A0	N/A	Not Reverse	OFF	697	-8	-46	Not Active	Not Active	63.75
EA0003B0	N/A	Not Reverse	OFF	691	-3	-35	Not Active	Not Active	63.75
EA0003C0	N/A	Not Reverse	OFF	694	-6	-39	Not Active	Not Active	63.75
EA0003D0	N/A	Not Reverse	OFF	688	-1	-33	Not Active	Not Active	63.75
EA0003E0	N/A	Not Reverse	OFF	694	-5	-40	Not Active	Not Active	63.75
EA0003F0	N/A	Not Reverse	OFF	688	-4	-43	Not Active	Not Active	63.75

Buffer Address (Hex)	Relative Time (calc.) (Seconds)	Transmission - Reverse (Reverse / Not Reverse)	Speed Control (On / Off)	Engine RPM (RPM)	Engine Output Torque Calculated (N-m)	Driveline Output Torque Calculated (N-m)	Traction Control (Active / Inactive)	Stability Control (Active / Inactive)	Key On Timer 63.75 Max (sec) (Seconds)
EA000400	N/A	Not Reverse	OFF	693	-6	-42	Not Active	Not Active	63.75
EA000410	N/A	Not Reverse	OFF	693	-3	-34	Not Active	Not Active	63.75
EA000420	N/A	Not Reverse	OFF	697	-5	-39	Not Active	Not Active	63.75
EA000430	N/A	Not Reverse	OFF	698	-9	-48	Not Active	Not Active	63.75
EA000440	N/A	Not Reverse	OFF	695	-5	-43	Not Active	Not Active	63.75
EA000450	N/A	Not Reverse	OFF	701	-8	-49	Not Active	Not Active	63.75
EA000460	N/A	Not Reverse	OFF	700	-9	-50	Not Active	Not Active	63.75
EA000470	N/A	Not Reverse	OFF	700	-7	-44	Not Active	Not Active	63.75
EA000480	N/A	Not Reverse	OFF	696	-8	-48	Not Active	Not Active	63.75
EA000490	N/A	Not Reverse	OFF	696	-5	-39	Not Active	Not Active	63.75
EA0004A0	N/A	Not Reverse	OFF	694	-6	-44	Not Active	Not Active	63.75
EA0004B0	N/A	Not Reverse	OFF	711	-11	-48	Not Active	Not Active	63.75
EA0004C0	N/A	Not Reverse	OFF	709	-15	-65	Not Active	Not Active	63.75
EA0004D0	N/A	Not Reverse	OFF	710	-15	-62	Not Active	Not Active	63.75
EA0004E0	N/A	Not Reverse	OFF	706	-13	-59	Not Active	Not Active	63.75
EA0004F0	N/A	Not Reverse	OFF	702	-12	-56	Not Active	Not Active	63.75
EA000500	N/A	Not Reverse	OFF	701	-10	-56	Not Active	Not Active	63.75
EA000510	N/A	Not Reverse	OFF	701	-8	-48	Not Active	Not Active	63.75
EA000520	N/A	Not Reverse	OFF	704	-11	-51	Not Active	Not Active	63.75
EA000530	N/A	Not Reverse	OFF	704	-10	-52	Not Active	Not Active	63.75
EA000540	N/A	Not Reverse	OFF	704	-12	-55	Not Active	Not Active	63.75
EA000550	N/A	Not Reverse	OFF	698	-11	-55	Not Active	Not Active	63.75
EA000560	N/A	Not Reverse	OFF	700	-12	-57	Not Active	Not Active	63.75
EA000570	N/A	Not Reverse	OFF	696	-12	-56	Not Active	Not Active	63.75
EA000580	N/A	Not Reverse	OFF	696	-10	-51	Not Active	Not Active	63.75
EA000590	N/A	Not Reverse	OFF	696	-8	-51	Not Active	Not Active	63.75
EA0005A0	N/A	Not Reverse	OFF	699	-11	-51	Not Active	Not Active	63.75
EA0005B0	N/A	Not Reverse	OFF	700	-11	-50	Not Active	Not Active	63.75
EA0005C0	N/A	Not Reverse	OFF	702	-12	-56	Not Active	Not Active	63.75
EA0005D0	N/A	Not Reverse	OFF	698	-12	-57	Not Active	Not Active	63.75
EA0005E0	N/A	Not Reverse	OFF	701	-12	-58	Not Active	Not Active	63.75
EA0005F0	N/A	Not Reverse	OFF	702	-10	-54	Not Active	Not Active	63.75
EA000600	N/A	Not Reverse	OFF	698	-9	-51	Not Active	Not Active	63.75
EA000610	N/A	Not Reverse	OFF	700	-12	-53	Not Active	Not Active	63.75
EA000620	N/A	Not Reverse	OFF	699	-9	-48	Not Active	Not Active	63.75
EA000630	N/A	Not Reverse	OFF	697	-10	-53	Not Active	Not Active	63.75
EA000640	N/A	Not Reverse	OFF	700	-10	-52	Not Active	Not Active	63.75
EA000650	N/A	Not Reverse	OFF	702	-9	-50	Not Active	Not Active	63.75
EA000660	N/A	Not Reverse	OFF	703	-12	-56	Not Active	Not Active	63.75
EA000670	N/A	Not Reverse	OFF	699	-11	-53	Not Active	Not Active	63.75
EA000680	N/A	Not Reverse	OFF	697	-9	-51	Not Active	Not Active	63.75
EA000690	N/A	Not Reverse	OFF	696	-9	-48	Not Active	Not Active	63.75
EA0006A0	N/A	Not Reverse	OFF	693	-4	-43	Not Active	Not Active	63.75
EA0006B0	N/A	Not Reverse	OFF	696	-8	-51	Not Active	Not Active	63.75
EA0006C0	N/A	Not Reverse	OFF	698	-10	-50	Not Active	Not Active	63.75
EA0006D0	N/A	Not Reverse	OFF	702	-11	-51	Not Active	Not Active	63.75
EA0006E0	N/A	Not Reverse	OFF	702	-12	-56	Not Active	Not Active	63.75
EA0006F0	N/A	Not Reverse	OFF	700	-13	-56	Not Active	Not Active	63.75
EA000700	N/A	Not Reverse	OFF	696	-11	-56	Not Active	Not Active	63.75
EA000710	N/A	Not Reverse	OFF	704	-10	-51	Not Active	Not Active	63.75
EA000720	N/A	Not Reverse	OFF	706	-12	-55	Not Active	Not Active	63.75
EA000730	N/A	Not Reverse	OFF	700	-11	-55	Not Active	Not Active	63.75
EA000740	N/A	Not Reverse	OFF	702	-10	-50	Not Active	Not Active	63.75
EA000750	N/A	Not Reverse	OFF	701	-10	-50	Not Active	Not Active	63.75
EA000760	N/A	Not Reverse	OFF	701	-9	-51	Not Active	Not Active	63.75
EA000770	N/A	Not Reverse	OFF	700	-7	-48	Not Active	Not Active	63.75
EA000780	N/A	Not Reverse	OFF	700	-8	-47	Not Active	Not Active	63.75
EA000790	N/A	Not Reverse	OFF	700	-10	-50	Not Active	Not Active	63.75
EA0007A0	N/A	Not Reverse	OFF	696	-7	-45	Not Active	Not Active	63.75
EA0007B0	N/A	Not Reverse	OFF	698	-9	-46	Not Active	Not Active	63.75
EA0007C0	N/A	Not Reverse	OFF	700	-7	-44	Not Active	Not Active	63.75
EA0007D0	N/A	Not Reverse	OFF	702	-10	-54	Not Active	Not Active	63.75
EA0007E0	N/A	Not Reverse	OFF	703	-11	-53	Not Active	Not Active	63.75
EA0007F0	N/A	Not Reverse	OFF	700	-11	-52	Not Active	Not Active	63.75

Hexadecimal Data

Data that the vehicle manufacturer has specified for data retrieval is shown in the hexadecimal data section of the CDR report. The hexadecimal data section of the CDR report may contain data that is not translated by the CDR program. The control module contains additional data that is not retrievable by the CDR system.

```
0000100C0:  31 46 54 52 46 31 34 35 38 36 4B 2A 2A 2A 2A 2A
0000100D0:  2A FF FF FF

000010046:  54 45 4A 46 31 50 35 2E 48 45 58 2A

000010054:  36 4C 33 41 42 50 41 2A

0EA000000:  FF 00 00 01 00 00 00 00 00 00 00 00 00 00 00 00
0EA000010:  00 0C 12 00 00 03 AA 00 00 08 48 00 F8 01 00 EC
0EA000020:  00 0C 12 00 00 03 AA 00 00 08 48 00 F8 02 00 EB
0EA000030:  00 0C 13 00 00 03 AA 00 00 08 48 00 F8 02 00 EA
0EA000040:  00 0C 13 00 00 03 AA 00 00 08 48 00 F8 03 00 E9
0EA000050:  00 0C 13 00 00 03 AA 00 00 08 48 00 F8 04 00 E8
0EA000060:  00 0C 13 00 00 03 AA 00 00 08 48 00 F8 05 00 E7
0EA000070:  00 0C 13 00 00 03 AA 00 00 08 48 00 F8 06 00 E6
0EA000080:  00 0C 13 00 00 03 AA 00 00 08 48 00 F8 06 00 E6
0EA000090:  00 0C 13 00 00 03 AA 00 00 08 47 00 F8 07 00 E6
0EA0000A0:  00 0C 13 00 00 03 AA 00 00 08 46 00 F8 08 00 E6
0EA0000B0:  00 0C 13 00 00 03 AA 00 00 08 3D 00 F8 09 00 EE
0EA0000C0:  00 0C 13 00 00 03 AA 00 00 08 3A 00 F8 0A 00 F0
0EA0000D0:  00 0C 13 00 00 03 AA 00 00 08 3A 00 F8 0A 00 F0
0EA0000E0:  00 0C 13 00 00 03 AA 00 00 08 3A 00 F8 0B 00 EF
0EA0000F0:  00 0E 13 00 00 03 AA 00 00 08 3A 00 F8 0C 00 EC
0EA000100:  00 00 07 0A FA 01 F5 00 00 01 C8 00 F8 FF 00 3F
0EA000110:  00 00 07 0B 01 01 F3 00 00 01 C7 00 F8 FF 00 3A
0EA000120:  00 00 07 0B 00 01 F4 00 00 01 C6 00 F8 FF 00 3B
0EA000130:  00 00 07 0A F8 01 F4 00 00 01 CA 00 F8 FF 00 40
0EA000140:  00 00 07 0A DB 01 F8 00 00 01 CD 00 F8 FF 00 56
0EA000150:  00 00 07 0A EB 01 F8 00 00 01 D2 00 F8 FF 00 41
0EA000160:  00 00 07 0A E7 01 F9 00 00 01 D0 00 F8 FF 00 46
0EA000170:  00 00 07 0B 02 01 F4 00 00 01 CD 00 F8 FF 00 32
0EA000180:  00 00 07 0B 05 01 F5 00 00 01 C9 00 F8 FF 00 32
0EA000190:  00 00 07 0B 08 01 F3 00 00 01 C8 00 F8 FF 00 32
0EA0001A0:  00 00 07 0A EA 01 F5 00 00 01 C7 00 F8 FF 00 50
0EA0001B0:  00 00 07 0A ED 01 F7 00 00 01 CD 00 F8 FF 00 45
0EA0001C0:  00 00 07 0A FD 01 F3 00 00 01 C7 00 F8 FF 00 3F
0EA0001D0:  00 00 07 0A FA 01 F8 00 00 01 D2 00 F8 FF 00 32
0EA0001E0:  00 00 07 0A F6 01 F5 00 00 01 C9 00 F8 FF 00 42
0EA0001F0:  00 00 07 0B 03 01 F5 00 00 01 CE 00 F8 FF 00 2F
0EA000200:  00 00 07 0A F7 01 F9 00 00 01 D4 00 F8 FF 00 32
0EA000210:  00 00 07 0A F8 01 F8 00 00 01 CD 00 F8 FF 00 39
0EA000220:  00 00 07 0B 0D 01 F3 00 00 01 CA 00 F8 FF 00 2B
0EA000230:  00 00 07 0B 06 01 F3 00 00 01 C6 00 F8 FF 00 36
0EA000240:  00 00 07 0A F4 01 F5 00 00 01 C9 00 F8 FF 00 44
0EA000250:  00 00 07 0A E8 01 F6 00 00 01 CC 00 F8 FF 00 4C
0EA000260:  00 00 07 0A EE 01 F8 00 00 01 CF 00 F8 FF 00 41
0EA000270:  00 00 07 0A F0 01 F7 00 00 01 CC 00 F8 FF 00 43
0EA000280:  00 00 07 0B 0A 01 F5 00 00 01 CF 00 F8 FF 00 27
0EA000290:  00 00 07 0B 08 01 F4 00 00 01 CB 00 F8 FF 00 2E
0EA0002A0:  00 00 07 0B 14 01 F2 00 00 01 C7 00 F8 FF 00 28
0EA0002B0:  00 00 07 0B 03 01 F4 00 00 01 C6 00 F8 FF 00 38
0EA0002C0:  00 00 07 0A F5 01 F8 00 00 01 CD 00 F8 FF 00 3C
0EA0002D0:  00 00 07 0A FE 01 F6 00 00 01 CC 00 F8 FF 00 36
0EA0002E0:  00 00 07 0A FD 01 F6 00 00 01 CD 00 F8 FF 00 36
0EA0002F0:  00 00 07 0A F4 01 F6 00 00 01 CC 00 F8 FF 00 40
0EA000300:  00 00 07 0A F8 01 F6 00 00 01 CE 00 F8 FF 00 3A
0EA000310:  00 00 07 0A DB 01 FA 00 00 01 D2 00 F8 FF 00 4F
0EA000320:  00 00 07 0A DB 01 FB 00 00 01 D3 00 F8 FF 00 4D
0EA000330:  00 00 07 0A F0 01 FB 00 00 01 D7 00 F8 FF 00 34
0EA000340:  00 00 07 0A FD 01 F8 00 00 01 D4 00 F8 FF 00 2D
0EA000350:  00 00 07 0B 08 01 F6 00 00 01 CF 00 F8 FF 00 28
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0EA000360:  00 00 07 0B 07 01 F3 00 00 01 C8 00 F8 FF 00 33
0EA000370:  00 00 07 0A FB 01 F5 00 00 01 C8 00 F8 FF 00 3E
0EA000380:  00 00 07 0A F4 01 F6 00 00 01 CA 00 F8 FF 00 42
0EA000390:  00 00 07 0A F4 01 F8 00 00 01 CE 00 F8 FF 00 3C
0EA0003A0:  00 00 07 0A E3 01 F8 00 00 01 D2 00 F8 FF 00 49
0EA0003B0:  00 00 07 0A CC 01 FD 00 00 01 DD 00 F8 FF 00 50
0EA0003C0:  00 00 07 0A DA 01 FA 00 00 01 D9 00 F8 FF 00 49
0EA0003D0:  00 00 07 0A C1 01 FF 00 00 01 DF 00 F8 FF 00 57
0EA0003E0:  00 00 07 0A D8 01 FB 00 00 01 D8 00 F8 FF 00 4B
0EA0003F0:  00 00 07 0A C1 01 FC 00 00 01 D5 00 F8 FF 00 64
0EA000400:  00 00 07 0A D5 01 FA 00 00 01 D6 00 F8 FF 00 51
0EA000410:  00 00 07 0A D5 01 FD 00 00 01 DE 00 F8 FF 00 46
0EA000420:  00 00 07 0A E3 01 FB 00 00 01 D9 00 F8 FF 00 3F
0EA000430:  00 00 07 0A E8 01 F7 00 00 01 D0 00 F8 FF 00 47
0EA000440:  00 00 07 0A DC 01 FB 00 00 01 D5 00 F8 FF 00 4A
0EA000450:  00 00 07 0A F4 01 F8 00 00 01 CF 00 F8 FF 00 3B
0EA000460:  00 00 07 0A F0 01 F7 00 00 01 CE 00 F8 FF 00 41
0EA000470:  00 00 07 0A EE 01 F9 00 00 01 D4 00 F8 FF 00 3B
0EA000480:  00 00 07 0A DF 01 F8 00 00 01 D0 00 F8 FF 00 4F
0EA000490:  00 00 07 0A E2 01 FB 00 00 01 D9 00 F8 FF 00 40
0EA0004A0:  00 00 07 0A D9 01 FA 00 00 01 D4 00 F8 FF 00 4F
0EA0004B0:  00 00 07 0B 1B 01 F5 00 00 01 D0 00 F8 FF 00 15
0EA0004C0:  00 00 07 0B 15 01 F1 00 00 01 BF 00 F8 FF 00 30
0EA0004D0:  00 00 07 0B 18 01 F1 00 00 01 C2 00 F8 FF 00 2A
0EA0004E0:  00 00 07 0B 08 01 F3 00 00 01 C5 00 F8 FF 00 35
0EA0004F0:  00 00 07 0A F8 01 F4 00 00 01 C8 00 F8 FF 00 42
0EA000500:  00 00 07 0A F3 01 F6 00 00 01 C8 00 F8 FF 00 45
0EA000510:  00 00 07 0A F5 01 F8 00 00 01 D0 00 F8 FF 00 39
0EA000520:  00 00 07 0A FE 01 F5 00 00 01 CD 00 F8 FF 00 36
0EA000530:  00 00 07 0A FF 01 F6 00 00 01 CC 00 F8 FF 00 35
0EA000540:  00 02 07 0B 02 01 F4 00 00 01 C9 00 F8 FF 00 34
0EA000550:  00 00 07 0A E8 01 F5 00 00 01 C9 00 F8 FF 00 50
0EA000560:  00 00 07 0A F0 01 F4 00 00 01 C7 00 F8 FF 00 4B
0EA000570:  00 00 07 0A E1 01 F4 00 00 01 C8 00 F8 FF 00 59
0EA000580:  00 00 07 0A E2 01 F6 00 00 01 CD 00 F8 FF 00 51
0EA000590:  00 00 07 0A E0 01 F8 00 00 01 CD 00 F8 FF 00 51
0EA0005A0:  00 00 07 0A EC 01 F5 00 00 01 CD 00 F8 FF 00 48
0EA0005B0:  00 00 07 0A EF 01 F5 00 00 01 CE 00 F8 FF 00 44
0EA0005C0:  00 00 07 0A F6 01 F4 00 00 01 C8 00 F8 FF 00 44
0EA0005D0:  00 00 07 0A E9 01 F4 00 00 01 C7 00 F8 FF 00 52
0EA0005E0:  00 00 07 0A F4 01 F4 00 00 01 C6 00 F8 FF 00 48
0EA0005F0:  00 00 07 0A F8 01 F6 00 00 01 CA 00 F8 FF 00 3E
0EA000600:  00 00 07 0A E6 01 F7 00 00 01 CD 00 F8 FF 00 4C
0EA000610:  00 00 07 0A F1 01 F4 00 00 01 CB 00 F8 FF 00 46
0EA000620:  00 00 07 0A EC 01 F7 00 00 01 D0 00 F8 FF 00 43
0EA000630:  00 00 07 0A E3 01 F6 00 00 01 CB 00 F8 FF 00 52
0EA000640:  00 00 07 0A F0 01 F6 00 00 01 CC 00 F8 FF 00 44
0EA000650:  00 00 07 0A F7 01 F7 00 00 01 CE 00 F8 FF 00 3A
0EA000660:  00 00 07 0A FB 01 F4 00 00 01 C8 00 F8 FF 00 3F
0EA000670:  00 00 07 0A ED 01 F5 00 00 01 CB 00 F8 FF 00 49
0EA000680:  00 00 07 0A E5 01 F7 00 00 01 CD 00 F8 FF 00 4D
0EA000690:  00 00 07 0A E2 01 F7 00 00 01 D0 00 F8 FF 00 4D
0EA0006A0:  00 00 07 0A D3 01 FC 00 00 01 D5 00 F8 FF 00 52
0EA0006B0:  00 00 07 0A DF 01 F8 00 00 01 CD 00 F8 FF 00 52
0EA0006C0:  00 00 07 0A E8 01 F6 00 00 01 CE 00 F8 FF 00 4A
0EA0006D0:  00 00 07 0A F9 01 F5 00 00 01 CD 00 F8 FF 00 3B
0EA0006E0:  00 00 07 0A F8 01 F4 00 00 01 C8 00 F8 FF 00 42
0EA0006F0:  00 00 07 0A F1 01 F3 00 00 01 C8 00 F8 FF 00 4A
0EA000700:  00 00 07 0A DF 01 F5 00 00 01 C8 00 F8 FF 00 5A
0EA000710:  00 00 07 0A FE 01 F6 00 00 01 CD 00 F8 FF 00 35
0EA000720:  00 00 07 0B 08 01 F4 00 00 01 C9 00 F8 FF 00 30
0EA000730:  00 00 07 0A EE 01 F5 00 00 01 C9 00 F8 FF 00 4A
0EA000740:  00 00 07 0A F9 01 F6 00 00 01 CE 00 F8 FF 00 39
0EA000750:  00 00 07 0A F4 01 F6 00 00 01 CE 00 F8 FF 00 3E
0EA000760:  00 00 07 0A F3 01 F7 00 00 01 CD 00 F8 FF 00 3F
0EA000770:  00 00 07 0A EE 01 F9 00 00 01 D0 00 F8 FF 00 3F
0EA000780:  00 00 07 0A F2 01 F8 00 00 01 D1 00 F8 FF 00 3B
0EA000790:  00 00 07 0A F2 01 F6 00 00 01 CE 00 F8 FF 00 40
0EA0007A0:  00 00 07 0A E2 01 F9 00 00 01 D3 00 F8 FF 00 48
0EA0007B0:  00 00 07 0A E9 01 F7 00 00 01 D2 00 F8 FF 00 44
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0EA0007C0:  00 00 07 0A F1 01 F9 00 00 01 D4 00 F8 FF 00 38
0EA0007D0:  00 00 07 0A FA 01 F6 00 00 01 CA 00 F8 FF 00 3C
0EA0007E0:  00 00 07 0A FD 01 F5 00 00 01 CB 00 F8 FF 00 39
0EA0007F0:  00 00 07 0A F1 01 F5 00 00 01 CC 00 F8 FF 00 44
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U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**

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