NATIONAL TRANSPORTATION SAFETY BOARD
OFFICE OF HIGHWAY SAFETY
WASHINGTON, D.C.

VEHICLE FACTORS GROUP CHAIRMAN'S FACTUAL REPORT

A. CRASH INFORMATION

Location:	Northbound US Highway 83 (US-83) near milepost 553.4 in Uvalde County, 6.5 miles north of Concan, Texas
Vehicle:	2007 Dodge Ram quad-cab 3500 pickup truck
Operator:	Private owner
Vehicle:	2004 Ford E350 cutaway chassis with a 13-passenger Turtle Top Vanterra medium-size bus body
Operator:	First Baptist Church of New Braunfels
Date:	Wednesday, March 29, 2017
Time:	Approximately 12:20 p.m. CST
NTSB #:	**HWY17MH011**

B. VEHICLE FACTORS GROUP

David Pereira, Vehicle Factors Investigator, Group Chairman
NTSB Office of Highway Safety
490 L'Enfant Plaza East, S.W., Washington, DC 20594

C. CRASH SUMMARY

For a summary of the crash, refer to the *Crash Summary Report,* which can be found in the docket for this investigation.

D. DETAILS OF THE VEHICLE FACTORS INVESTIGATION

The Vehicle Factors Group On-Scene Field document is collection of factual information obtained during the detailed inspection of the involved vehicles.

The detailed inspections of the 2007 Dodge Ram pickup and of the 2004 Turtle Top VanTerra medium-size bus were conducted at Gilbert's Body Shop in Uvalde, Texas between April 1 and 6, 2017.

All major mechanical systems were examined, including the steering, braking, and suspension systems. Overall collision damage, along with any damage or anomalies within major vehicle mechanical systems were documented. Supporting photographs, vehicle specifications, maintenance records were collected and reviewed.

The Texas Department of Public Safety, Highway Patrol Division (TxDPS) conducted an inspection of the vehicles on Wednesday March 29, 2017 and were not present during the vehicle factors group chairman's inspection of the vehicles.

Vehicle 1: 2007 Dodge Ram quad-cab 3500 pickup truck

1.1. General Information

VIN:[1]	3D7MX48C77G[redacted]
Model:	3500, 4WD, Quad Cab, 8ft Box, Dual Rear Wheel
Model Year:	2007
Date of Manufacture:	October 2006
Capacity:	6 passengers
Wheelbase:	160.5 inch
Approximate Mileage:	261,680[2]
GVWR:[3]	12,200 lbs.
GAWR[4] – Front Axle:	5,200 lbs.
GAWR – Rear Axle:	9,350 lbs.
Engine:	Cummins 325 HP, 5.9 Liter Turbo Diesel
Transmission:	6-speed, manual
Brake Type:	4-wheel hydraulic antilock disc brakes

1.2. Damage Description

The Dodge pickup truck (truck) sustained collision damage to all areas, affecting all major mechanical systems. Damage specific to many of the vehicle components will be described in greater detail later in the appropriate sections of this report.

For uniform description, "left" will refer to the driver's side, and "right" will refer to the passenger side of the truck.

The truck sustained contact damage to the front end with induced damage extending down the left side and roof of truck cab, as shown in **Figure 1** and **Figure 2**. The front end was shifted aft and to the left. The driver's door was separated at the upper hinge and the door frame was collapsed. The left rear passenger door was also displaced rearward and jammed until a first

[1] Vehicle Identification Number (VIN)
[2] According to maintenance records located in the vehicle, dated 9/24/16
[3] Gross Vehicle Weight Rating (GVWR) is the total maximum weight that a vehicle is designed to carry when loaded, including the weight of the vehicle itself, plus fuel, passengers, and cargo.
[4] Gross Axle Weight Rating (GAWR) is the maximum distributed weight that a given axle is designed to support.

responder pried it open. The right front passenger door was also pried open by first responders to extract the driver.[5]

Figure 1- Front view to the 2007 Dodge Ram 3500 pickup truck showing contact and induced damage the front end

Figure 2 – Left-side view of the 2007 Dodge Ram 3500 pickup truck showing contact and induced damage to the left side of the vehicle

[5] See Vehicle Photograph 1 – A right side view of the 2007 Dodge Ram 3500 pickup truck

1.3. Weight and Measurements

The truck was weighed by the TxDPS using certified portable scales on March 29, 2017.[6] Due to the damage and weight shift as a result of the crash, these measurements may not represent the exact axle weights at the time of the collision.

Table 1: Axle Weights of 2007 Dodge Ram 3500 pickup truck

Position	Weight (lbs.)		Axle
	Right	Left	Total
Axle 1	1,850	650	2,500
Axle 2	2,800	2,450	5,250
Total			7,750 lbs.

The truck was scanned by the Technical Reconstruction Group using a FARO 3-dimensional laser scanner that will allow for the creation of a 3-D model. From this 3-D model, scaled measurements were taken as shown in **Figure 3**. Measurements shown are 7.29 ft. (87 in) left-side wheel base, 13.82 ft. (165 in) right-side wheel base with a 0.60 ft. (8in) offset and a 17.81 ft. (213 in) overall length.

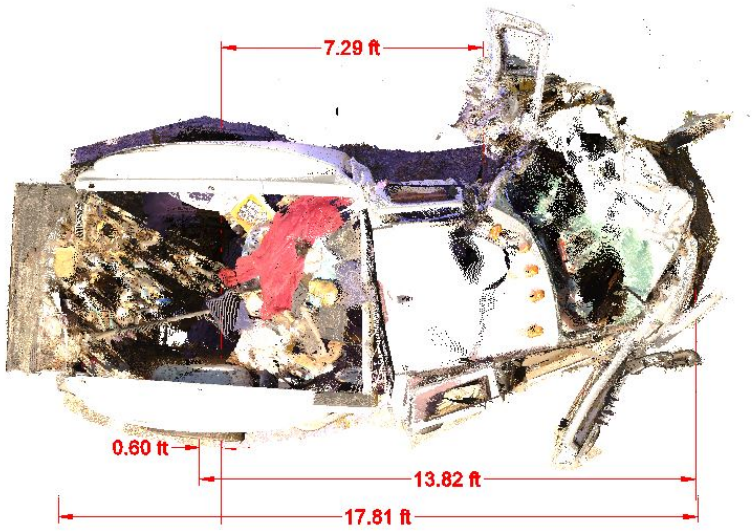

Figure 3 - 3D laser scan of the 2007 Dodge Ram 3500 pickup truck showing post collision axle deformation

1.4. Driver Controls

The driver's seat was intact in the truck. The driver's lap/shoulder seatbelt was found unbuckled, locked in stowed position, and hanging from the upper attachment point to the left of the driver's seat location. The steering wheel, instrument panel and footwell regions were

[6] See Vehicle Attachment - TxDPS vehicle weight and measurement for the 2007 Dodge Ram 3500 pickup truck

displaced into the drivers seating position. Due to inward displacement of the footwell the accelerator, brake and clutch pedals were not able to be manipulated.[7] Located immediately in front of the driver's seat was the steering wheel. The steering wheel was mounted on a steering column that was adjustable for angle. The turn signal stalk was located on the left side of the steering column, and controlled the high beam headlamps by pulling the stalk towards the driver. The turn signal stalk was found in the centered, or off position. The headlamp switch was located on the lower left instrument panel and was found in the off position. The dash in front of the driver's seat contained numerous gauges, indicator lights, and switches. The gauges included: oil pressure, engine speed (RPMs), vehicle speed (mph & km/h), coolant temperature, fuel level, and electrical system voltage.[8]

1.5. Steering

The damaged steering wheel measured 16 inches horizontally and 14 inches vertically and found turned a 90-degree angle to the right. The driver's airbag deployed from the steering wheel housing. Due to the significant damage sustained by the vehicle, a functional check of the steering system was not able to be performed.

The steering column transcended through the firewall of the truck. The steering shaft connected to the input shaft of the steering gear box through a universal joint that was broken at both upper and lower joint connections. The output shaft from the steering gear was then connected to the pitman arm. The pitman arm was connected by means of a ball joint to the drag link. The drag link was bent aft and upward but still connected to the right side of the steering axle knuckle through a steering arm using a ball joint connection. The left side of the steer axle was connected to the right side of the steer axle by means of a tie rod with ball joint connections on each end as well as aftermarket dual steering stabilizers. The front sway bar was broken at the two upper mounts and broken off at the left steering knuckle.[9]

The steering gear was removed from the truck and an external examination of the steering gear revealed no obvious contact or induced damage to the housing. An inspection of the pitman arm and sector shaft splines showed no signs of damage. When the input shaft was turned, the sector shaft also turned, indicating that the internal mechanical parts of the steering gear were still operational. The steering gear box functionality appeared normal and required minimal effort to turn from left to far right with minimal amount of lash.

On Thursday May 25, 2017, a detailed external and internal examination and component teardown of the steering gear was conducted at the NTSB, Office of Research and Engineering, Materials Laboratory in Washington DC, as shown in **Figure 4**.

These examinations were conducted by NTSB investigative and engineering staff. The exam found the steering gear to be mechanically functional, with no worn or defective components.

[7] See Vehicle Photograph 2 - A view of the drivers' footwell area of the 2007 Dodge Ram 3500 pickup truck
[8] See Vehicle Photograph 3 - A view of the drivers' compartment area and gauge cluster of the 2007 Dodge Ram 3500 pickup truck
[9] See Vehicle Photograph 4 - A view of front axle and sway bar of the 2007 Dodge Ram 3500 pickup truck

Figure 4 – Disassembled steering gearbox of the 2007 Dodge Ram 3500 pickup truck

Examinations concluded that the steering gear did receive an impact load, significant enough to cause indentations from recirculating ball bearings on the internal helical worm gear. As shown in **Figure 5**. The location of the recirculating ball bearing impacts, at the lower limits of the helical worm gear, correspond to the front wheels being turned to the maximum steering wheel rotation to the left, at the time the steering gear was subjected to the impact load.

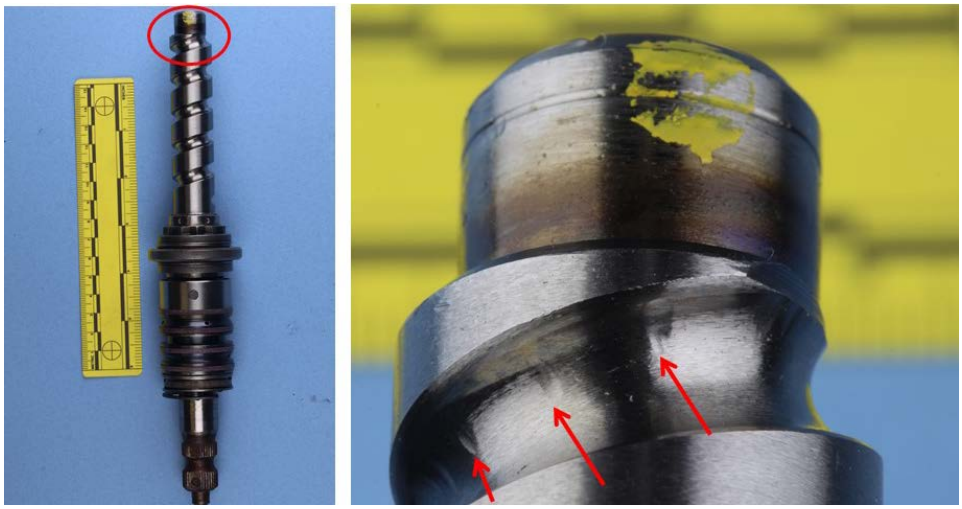

Figure 5 - The helical worm gear of the 2007 Dodge Ram 3500 pickup truck with a close-up view of the recirculating ball bearing indentations (shown by red arrows)

1.6. Suspension

The front axle was equipped with aftermarket adjustable long control arms and longer front coil springs as shown in **Figure 6**. The rear suspension was equipped with aftermarket 4-inch lift blocks installed between the axle housing and leaf spring pack as shown in **Figure 7.** These modifications altered the trucks suspension by raising the vehicle approximately 4-inches.[10]

The truck's front axle suspension consisted of coil springs and shock absorbers mounted to the axle. The right-side coil spring and shock absorber were still mounted to the front axle. The left side coil spring was torn out of its mount during the collision sequence and located in the debris pile in the bed of the truck. The coil was examined and measured 24 inches in length. The left shock absorber was broken at the upper mount. The complete front axle assembly and frame rails were displaced to the left.[11]

The truck's rear axle suspension consisted of two leaf spring packs with shock absorbers mounted to the rear axle. the left side of the axle assembly was shifted aft approximately 3- inches causing the right leaf spring pack to have several buckled leaf springs due to forward displacement of the right-side axle assembly.

Figure 6 – Right-side aftermarket adjustable control arms (circled in red) of the 2007 Dodge Ram 3500 pickup truck

[10] The state of Texas laws contains no suspension lift limits, frame height limits, or bumper height restrictions
[11] See Vehicle Photograph 5 - A left side view of the 2007 Dodge Ram 3500 pickup truck depicting the front displacement

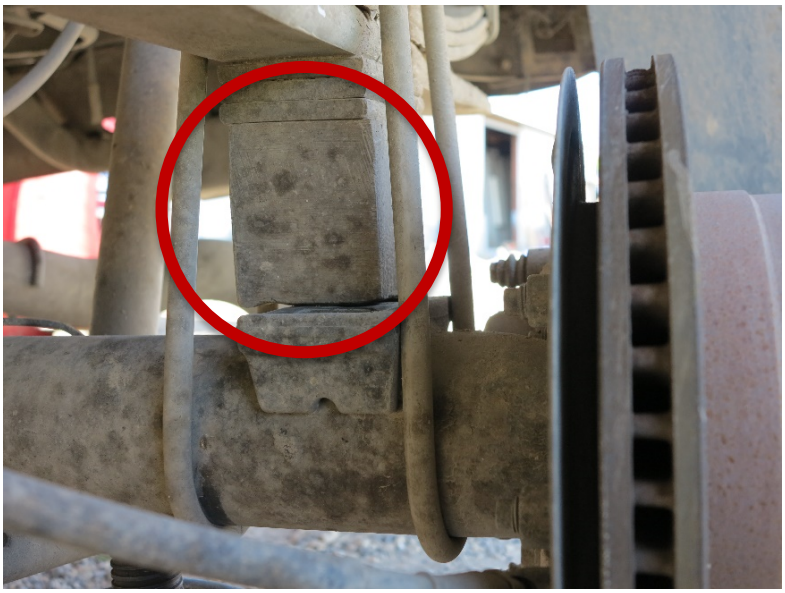

Figure 7 - Left-side aftermarket 4-Inch lift block (circled in red) on rear axle of the 2007 Dodge Ram 3500 pickup truck

1.7. Tires

The tire and weight rating placard mounted inside the driver door frame suggested that LT235/80R17 tires be mounted on 17x6 rims at all wheel positions. It also recommended that the front and rear tires be inflated to 65 pounds per square inch (psi).

General information about each of the truck's tires as they were at the time of inspection is included in **Table 2**. Tire tread depth measurements were taken in the major tread grooves of each tire. The smallest depth measured is displayed in the table, and represents a minimum tread depth value for that tire.[12] All the rims were inspected for cracks, welds, and elongated lug nut holes. No non-collision related defects were found on any of the rims. The truck was a duel rear wheel vehicle with an aftermarket 3-inch spacer between the rims increasing the stock track width.

The LT285/70R17 tires mounted on the truck were not the suggested factory size. They are 0.91 larger in diameter, 1.97 wider and .45 inches in taller in sidewall height. The speedometer difference with the larger tires are minimal with less than a 2-mph difference from speedometer reading and actual speed of the vehicle.

[12] Tire requirements for the state of Texas vehicle inspection: Tires without tread wear indicators worn so that less than 2/32 (1/16) of an inch of tread design depth remains when measured (with a tread depth gauge) at the lowest points in any two adjacent major grooves in the center or middle of the tire. Tire with tread wear indicators worn so that the tread wear indicators contact the road in any two adjacent major grooves in the center or middle of the tire.

Table 2- Tire information for the 2007 Dodge Ram 3500 pickup truck

Front Axle	Left	Right
Make	Hankook	Hankook
Model	Dynapro ATM	Dynapro ATM
Size	LT 285/70R17	LT 285/70R17
Load Rating	E[13]	E
Pressure	Deflated	60 psi
Tread Depth	4/32 inch	1/32 inch
DOT #	T7X8RFH2915	T7X8RFH2915

Rear Axle	Left		Right	
	Outside	Inside	Inside	Outside
Make	Hankook	Hankook	Hankook	Hankook
Model	Dynapro ATM	Dynapro ATM	Dynapro ATM	Dynapro ATM
Size	LT 285/70R17	LT 285/70R17	LT 285/70R17	LT 285/70R17
Load Rating	E	E	E	E
Pressure	49 psi	50 psi	50 psi	50 psi
Tread Depth	3/32 inch	4/32 inch	3/23 inch	4/32 inch
DOT #	T7X8RFH2915	T7X8RFH2915	BJX8RFH1815	BJX8RFH1815

During the tire examination, several areas of damage were noted to the rims and tires. The tire and rim damage, when possible, is referenced to a clock position with the valve stem being at 12:00. The tire and rim damage observed during the examination included the following:

- Left front tire - 9:00 “V” shape cut inner sidewall, 1:00 inner flange approximate 4-inch dent.

- Right front tire - 9:00 approximate 4-inch cut to outer sidewall.

1.8. Brakes

The truck was equipped with anti-lock hydraulic disc brakes all four wheels. The wheels were removed from each axle end, and an examination of the brake system components was conducted. Measurements taken of the brake systems can be found in **Table 3**. The left front brake rotor had a circumferential outer lip with the inner friction surface worn further then the outer surface. Remaining brake rotors were found to be smooth of any major groves, all calipers were free of any leaks. Functional checks of the vehicle’s brakes were not able to be performed due to the damage to the system leading to the axles. ABS wheel speed sensors were in place on all four of the wheels.

[13] Load rating E: ply rating of 10, maximum load pressure 80 psi

Table 3 – 2007 Dodge Ram 3500 pickup truck brake information

Location	Brake Lining Thickness[14] (inches)
Left Front	8/32
Right Front	16/32
Location	Brake Lining Thickness (inches)
Left Rear	12/32
Right Rear	12/32

1.9. Electrical

The vehicle's electrical system was damaged from the collision sequence. The right headlight, rear turn signals and stop lamps bulbs were visually examined. No apparent signs of filament stretch (hot shock) were observed.[15]

1.10. Event Data Recorders

The truck was equipped with supplemental restraint system (SRS) or "airbags" which deployed as a result of the impact. An airbag control module (ACM), that had event data recording capabilities, was removed by TxDPS, and imaged using the Bosch Crash Data Retrieval (CDR) system. The ACM was also sent to the NTSB recorders laboratory in Washington, DC for further evaluation. No event data as able to be retrieved from the ACM. See the *Recorders Specialist's Factual Report*.

1.11. Maintenance and Inspection History

Two maintenance receipts from previous mechanical repairs were in vehicle's glovebox. On September 21, 2016, a fuel filter and two batteries were replaced. On December 15, 2016, the transfer case shifter bushings were replaced, the steering stabilizer bolts were tightened, 4 wheel-drive axles were installed on the front differential, and the brake caliper, bracket, brake pads and rotor on the right front axle were replaced.[16]

A review of the State of Texas vehicle inspection program shows the truck was inspected October 6, 2016 and was valid at the time of the collision expiring on October 31, 2017.[17]

[14] The manufacturer recommends brake pads to be replaced at 2/32nd
[15] Hot shock is caused when a lamp is illuminated, its filament is hot and ductile, the force of a strong impact will distort the filament
[16] See Vehicle Attachment – Maintenance receipts for the 2007 Dodge Ram 3500 pickup truck
[17] See Vehicle Attachment – Texas vehicle inspection for the 2007 Dodge Ram 3500 pickup truck

Documented Recalls and Warranty Claims

A search of the safety recall database maintained by the National Highway Traffic Safety Administration (NHTSA) revealed four open recalls relating to the truck.[18]

1. *Manufacturer Recall Number H46 - NHTSA Recall Number 09E-001*

Summary: During a prior service appointment, a Mopar service parts steering linkage was installed. also, the steering damper bracket at the tie rod tube may loosen.

2. *Manufacturer Recall Number N62 - NHTSA Recall Number 13V-528*

Summary: A Mopar service parts steering linkage may have been installed during a prior service appointment. the left tie rod ball stud on the Mopar service parts steering linkage may fracture under certain driving conditions.

3. *Manufacturer Recall Number R25 - NHTSA Recall Number 15V-313*

Summary: The driver airbag inflator housing may rupture, due to excessive internal pressure, during normal airbag deployment events. this condition is more likely to occur if the vehicle has been exposed to high levels of absolute humidity for extended periods of time.

4. *Manufacturer Recall Number S43 - NHTSA Recall Number 16V-352*

Summary**:** The front passenger airbag inflator may rupture, due to excessive internal pressure, during normal airbag deployment events. this condition is more likely to occur if your vehicle has been exposed to high levels of absolute humidity for extended periods of time.

Though the truck had open safety recalls, the steering linkage and tie rod ends were examined and none were found to be fractured and non-were found to contributory to the collision. The airbags deployed normally without rupture.

2. Vehicle 2: 2004 Ford E350 cutaway chassis with a 13-passenger Turtle Top Vanterra medium-size bus body

2.1. General Information

This vehicle was manufactured in two stages. The first stage build of the Ford cab and chassis, known in the industry as an incomplete vehicle, or commercial cutaway, was completed in October 2003. The final stage build consisted of configuring the vehicle with a midsize bus body and associated equipment, which was completed in May 2004, by Turtle Top, Inc of New Paris, Indiana.

[18] A search of the safety recall database on April 4, 2017 that is maintained by the National Highway Traffic Safety Administration (NHTSA) http://www-odi.nhtsa.dot.gov/recalls/recallsearch.cfm

Ford Cab and Chassis:

VIN:	1FDWE35S64H[redacted]
Make:	Ford
Model:	E-350 138" wheel base, dual rear wheel (DRW) Originally Manufactured as a Cutaway Chassis
Model Year:	2004
Manufactured:	October 2003
Mileage:	60803 miles[19]
GVWR:	10700 lbs.
GAWR – Front Axle:	4,600 lbs.
GAWR – Rear Axle:	7,800 lbs.
Engine:	Ford, 6.8-liter V10
Transmission:	4-speed, Automatic
Brake Type:	4-wheel hydraulic antilock disc brakes

Turtle Top:

Sales order Number:	392009
Make:	Turtle Top
Model:	VanTerra XL– DRW extended, 14 passenger (including driver)

Additional equipment and specifications are included in Turtle Top Bus Build Order[20]

2.2. Damage Description

The Turtle Top Vanterra medium-size bus (bus) sustained collision damage to all areas, affecting all major mechanical systems. Damage specific to many of the vehicle components will be described in greater detail later in the appropriate sections of this report.

For uniform description, "left" will refer to the driver's side, and "right" will refer to the loading door, or passenger, side of the bus.

The bus sustained extensive front end damage that extended down the left side resulting in extensive intrusion as shown in **Figure 8**. The entire driver's compartment collapsed such that the A-pillar on the driver's side was aligned with the B-pillar on the passenger side of the bus. Similarly, the B-pillar on the driver's side was displaced rearward such that it was aligned with the rear window bow of the first window on the right side of the bus. The rear right bumper corner, made of fiberglass, had a 5-inch x 11-inch section torn away with the underlying structure also being displaced.

The windshield was destroyed by impact forces and similarly, the driver's side window and the first two passenger windows on the driver's side were destroyed by impact forces.[21] On

[19] See Vehicle Attachment – 2004 Turtle Top bus driver's vehicle log dated March 27, 2017
[20] See Vehicle Attachment – 2004 Turtle Top bus build order
[21] See Vehicle Photograph 6 – A view of the front end of the 2004 Turtle Top bus, showing extensive front end damage

the left side of the bus, the front passenger window was broken during the impact. The loading door, located on the right side of the bus behind the right front passenger door, was intact and was open upon examination. The first and third windows on the right side of the bus were intact. The second window on the passenger side of the bus, which was also the emergency exit window, was removed by emergency responders.[22]

Figure 8 - Left side view of the 2004 Turtle Top bus showing the front and left side contact and induced damage

2.3. Measurements

The bus was weighed by the TxDPS using certified portable scales on March 29, 2017. [23] Due to the damage and weight shift as a result of the crash, these measurements may not represent the exact axle weights at the time of the collision.

Table 4: Axle Weights of the 2004 Turtle Top bus

Position	Weight (lbs.)		Axle
	Right	Left	Total
Axle 1	2,400	1,950	4,350
Axle 2	1,650	1,650	3,300
Total			7,650 lbs.

[22] See Vehicle Photograph 8 - A right side view of the 2004 Turtle Top bus, showing the loading door and emergency exit windows
[23] See Vehicle Attachment - TxDPS vehicle weight and measurement for the 2004 Turtle Top bus

The bus was scanned by the Technical Reconstruction Group using a FARO 3-dimensional laser scanner that will allow for the creation of a 3-D model. From this 3-D model, scaled measurements were taken as shown in **Figure 9.** Measurements shown are 8.23 ft. (99 in.) left-side wheel base and 12.28 ft. (147 in.) right side wheel base.

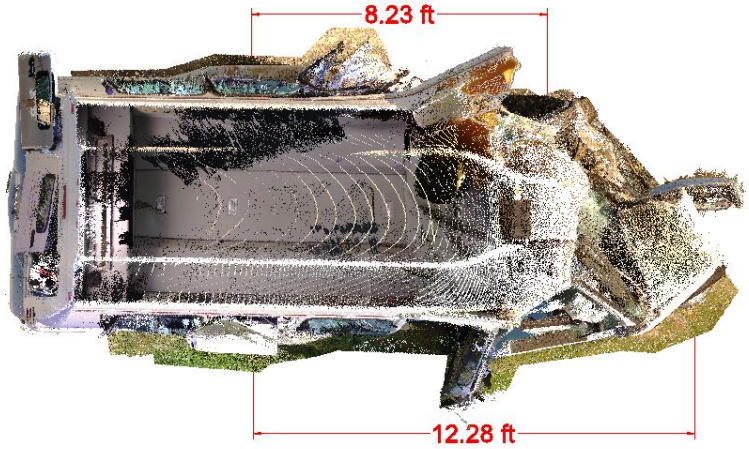

Figure 9 – 3D laser Scan of the 2004 Turtle Top bus showing post collision axle deformation

2.4. Driver Controls

Due to collision damage to the bus, driver controls were unable to be documented. The driver's seat was displaced rearward and inboard located in the middle of the aisle adjacent to the boarding door. Due to inward displacement of the footwell, the accelerator and brake pedals were not able to be manipulated.[24]

2.5. Steering

The steering column was displaced inboard to the center of the bus. The damaged steering wheel was deformed and cut by first responders. The driver's airbag was deployed and located in proximity to the left front wheel. Due to the significant damage sustained by the vehicle, a functional check of the steering system was not able to be performed.

The intermediate shaft and u-joints connecting the steering column to the power steering gear box were displaced, Due to the damage sustained by the vehicle, a functional check of the steering system was not able to be performed.

2.6. Suspension System

The front axle was equipped with suspension components including coil springs and shock absorbers. The coil springs on the left and right side of the front axle remained in their mountings at both the top and bottom. The left tie rod was broken at the outer adjusting sleeve due to collision,

[24] See Vehicle Photograph 9 – A view of the driver's controls of the 2004 Turtle Top bus

both ends of the right front shock absorber were securely mounted to the vehicle. The rear axle leaf springs and shock absorbers remained securely mounted and undamaged.

2.7. Tires and Wheels

The tire and weight rating placard mounted inside the door frame suggested that LT255/75R16 tires be mounted on 16x6 rims at all wheel positions. It also recommended that the front tires be inflated to 65 pounds per square inch (psi) and the rear tires be inflated to 60 psi.

General information about each of the truck's tires as they were at the time of inspection is included in **Table 5**. Tire tread depth measurements were taken in the major tread grooves of each tire. The smallest depth measured is displayed in the table, and represents a minimum tread depth value for that tire. All the rims were inspected for cracks, welds, and elongated lug nut holes. No non-collision related defects were found on any of the rims.

Table 5 - Tire Information for the 2004 Turtle Top bus

Front Axle	Left	Right
Make	Goodyear	Goodyear
Model	Wrangler HT	Wrangler HT
Size	LT 225/75R16	LT 225/75R16
Load Rating	E	E
Pressure	Deflated	50 psi
Tread Depth	13/32 inch	13/32 inch
DOT #	MDL MMJU5214	MDL MMJU5214

Rear Axle	Left		Right	
	Outside	Inside	Inside	Outside
Make	Goodyear	Goodyear	Goodyear	Goodyear
Model	Wrangler HT	Wrangler HT	Wrangler HT	Wrangler HT
Size	LT 225/75R16	LT 225/75R16	LT 225/75R16	LT 225/75R16
Load Rating	E	E	E	E
Pressure	49 psi	50 psi	50 psi	50 psi
Tread Depth	14/32 inch	14/32 inch	14/23 inch	14/32 inch
DOT #	MDL MMJU5214	MDL MMJU5214	MDL MMJU5214	MDL MMJU5214

During the tire examination, damage was noted to the rims and tires. The tire and rim damage, when possible, is referenced to a clock position with the valve stem being at 12:00. The tire and rim damage observed during the examination included the following:

- Front left axle – Deflated due to intrusion by front bumper into tire tread, outer flange approximate 5-inch dent.

2.8. Braking

The bus was equipped with anti-lock hydraulic disc brakes on all four wheels. All the visible brake components on front and rear axles appeared to be free of excessive wear. No visible pre-crash leaks were found in any of the brake system components, lines, or connections. Functional checks of the vehicle's brakes were not able to be performed due to the damage to the system leading to that axles. ABS wheel speed sensors were in place on all four of the wheels.

2.9. Electrical

The vehicle's electrical system was damaged from the collision sequence. The rear turn signals, stop lamps and right headlamp bulbs were visually examined. No apparent signs of filament stretch (hot shock) were observed.

2.10. Event Data Recorders

The bus airbag control module (ACM) was removed by TxDPS, and a download attempt was made using the Bosch Crash Data Retrieval (CDR) system. However, the bus ACM was not supported by the system due to the make and model year of the vehicle. The ACM was then sent to the manufacturer, Continental Automotive Systems, Inc., by the NTSB Recorders Specialist. See the *Recorders Specialist's Factual Report*.

2.11. Maintenance and Inspection History

Maintenance and service records were obtained for the owner of the bus, First Baptist Church of New Braunfels. The vehicle was regularly serviced at a New Braunfels, Texas Ford Dealership. In the most recent work order was dated January 30, 2017, it was recorded the vehicle had 60,446 miles and the following repairs were completed: front and rear shock absorbers were replaced, and a driver window regulator was replaced, and a safety inspection checked the tires, brakes and battery condition and no defects were found.[25]

A review of the State of Texas vehicle inspection program shows the bus was inspected April 18, 2016 and was valid at the time of the collision expiring on April 30, 2017.[26]

2.12. Documented Recalls and Warranty Claims

A search of the safety recall database maintained by the National Highway Traffic Safety Administration (NHTSA) revealed no recalls relating to the bus.

E. DOCKET MATERIAL

The following attachments and photographs are included in the docket for this investigation:

[25] See Vehicle Attachment - January 2016 maintenance Invoice for the 2004 Turtle Top bus
[26] See Vehicle Attachment - Texas Vehicle Inspection for the 2004 Turtle Top bus

LIST OF ATTACHMENTS

Vehicle Attachment - TxDPS vehicle weight and measurement for the 2005 Dodge Ram 3500 pickup truck

Vehicle Attachment - Maintenance receipts for the 2005 Dodge Ram 3500 pickup truck

Vehicle Attachment - Texas vehicle inspection - 2005 Dodge Ram 3500 pickup truck

Vehicle Attachment - 2004 Turtle Top bus driver's vehicle log dated March 27, 2017

Vehicle Attachment - 2004 Turtle Top bus build order

Vehicle Attachment - TxDPS vehicle weight and measurement for the 2004 Turtle Top bus

Vehicle Attachment - January 2016 maintenance invoice for the 2004 Turtle Top bus

Vehicle Attachment - Texas vehicle inspection – 2004 Turtle Top bus

LIST OF PHOTOGRAPHS

Vehicle Photograph 1 - A right-side view of the 2007 Dodge Ram 3500 pickup truck

Vehicle Photograph 2 - A view of the drivers' footwell area of the 2007 Dodge Ram 3500 pickup truck

Vehicle Photograph 3 - A view of the drivers' compartment area of the 2007 Dodge Ram 3500 pickup truck

Vehicle Photograph 4 - A view of front suspension of the 2007 Dodge Ram 3500 pickup truck

Vehicle Photograph 5 - A Left Side View of the 2007 Dodge Ram 3500 showing the front displacement

Vehicle Photograph 6 - A view of the front end of the 2004 Turtle Top bus showing front end damage

Vehicle Photograph 7 - A rear view of the 2004 Turtle Top bus, showing emergency rear exit door

Vehicle Photograph 8 - A right side view of the 2004 Turtle bus, showing the front-loading door and emergency exit windows

Vehicle Photograph 9 - A view of the driver's control and instrument cluster of the 2004 Turtle Top bus

END OF INFORMATION

David Pereira
Vehicle Factors Investigator