



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

**VEHICLE FACTORS GROUP CHAIRMAN'S
FACTUAL REPORT**

NORTH LAS VEGAS, NEVADA – HWY22FH004

A. CRASH INFORMATION

Refer to the *Crash Information and Crash Summary Report* in the docket for this investigation.

B. VEHICLE FACTORS GROUP

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C. DETAILS OF THE VEHICLE FACTORS INVESTIGATION

The Vehicle Factors Group Factual Report is a collection of factual information obtained during the detailed inspection of the collision involved vehicles. The vehicles were inspected between January 31 – February 3, 2022, at Ewing Brothers Towing, 2201 North Commerce Street, North Las Vegas, NV. All major mechanical systems on the Dodge Challenger were examined, including the steering and braking systems. Overall accident damage, along with any damage or anomalies within major vehicle mechanical systems were documented. Some areas of the vehicle could not be reliably documented due to extensive collision damage. Supporting photographs, vehicle specifications, and any available maintenance records were reviewed.

Inspections of an additional four involved passenger vehicles entailed photographs and overall damage documentation. The Event Data Recorders (EDR's) of four vehicles, including the Challenger, were imaged using Bosch Crash Data Retrieval software. The Hyundai Tucson EDR was imaged using the GIT Hyundai EDR Tool Kit. One involved vehicle was driven from the scene and not available for inspection.

1. Vehicle Inspections

1.1. Vehicle #1: 2018 Dodge Challenger



1.1.1. General Information

VIN¹ : 2C3CDZAG6JH*****
Manufacturer: Dodge
Model: Challenger SXT
Manufactured: 09/2017
GVWR² : 4,950lbs
GAWR³ #1: 2,810lbs
GAWR⁴ #2: 2,810lbs
Engine: 6 Cylinder Gasoline
Transmission: Automatic

¹ Vehicle Identification Number (VIN) used by the automotive industry to identify individual motor vehicles

² Gross Vehicle Weight Rating (GVWR).

³ Gross Axle Weight Rating (GAWR).

⁴ For consistency in describing the axles of the passenger vehicles, the front (steer) axle will be referred to as Axle #1, the rear axle as Axle #2.

Brake System: Hydraulic Disc w/4-Channel Anti-lock Braking System (ABS)

1.1.2. Damage Description

The front bumper was displaced up, rearward, and was flush with the radiator. The engine block was also displaced rearward into the driver's seating area. The hood was folded and torn in multiple locations. The bumper horns on the front of the frame rails were shifted right and were flush with the engine. The bumper fascia was missing and located in pieces near the Challenger. The windshield was shattered but remained in the frame. The hood was displaced rearward into the windshield.

The driver's door was missing from the Challenger but was located in the impound yard and had been cut off during emergency extrication. The sheet metal of the door had been displaced to the right approximately 13-inches at the midpoint of the door. There were 10-inch and 7-inch tears in the sheet metal in the lower left corner of the door. The door latch was fractured, and the driver's mirror was missing. The inner door lining was detached from the outer door panel. The top of the left A-pillar was folded rearward into an approximate 90-degree angle and was partially torn at the top of the engine compartment.^{5 6} The left frame rail was displaced to the right approximately 13-inches and was folded at the B-pillar. The middle support beam of the unibody frame under the vehicle had detached from the left frame rail and had torn through the sheet metal just aft of the driver's door and B-pillar. The sheet metal on the roof was folded and separated from the driver's door frame sheet metal exposing the roof insulation. The left rear fender was folded and displaced to the right, just behind the B-pillar. There was a fold in the fender located near the fuel cap.

The rear bumper fascia was missing and located under the Malibu. The trunk lid was shifted left and folded forward. The top of the rear bumper had an approximately 31-inch portion of the metal torn from the body of the bumper. The entire bumper was shifted left approximately 12-inches. The right muffler was folded and displaced forward.

The right rear fender was missing. The roof sheet metal was separated at the seam on the right side at the seam with the passenger door frame. The passenger door was removed during the extrication process and found nearby. The glass in the door was still intact. This glass, and the small window behind the passenger door was the only intact glass on the Challenger. The passenger side mirror was still in place. The right-side A-pillar was displaced down and was folded near the top of the engine compartment.

1.1.3. Driver's Controls

The driver's seating area was damaged, with the seat shifted and distorted to the right. The dash was detached from its mounts and folded downward at approximately the center point. Most driver's controls were either missing or damaged, therefore, detailed documentation of individual

⁵ Pillars are the vertical or near vertical supports of a car's window area —designated respectively as the A, B, C or (in larger cars) D-pillar, moving from front to rear, in profile view.

⁶ For uniform description, "left" will refer to the driver's side, and "right" will refer to the passenger side of the vehicle

control status was unable to be performed. The steering wheel was in place but shifted right and distorted. The deployed airbag remained attached to the center.

1.1.4. Steering

All steering components were damaged in the crash. The steering wheel was not able to be rotated to check for front axle movement due to damage.

1.1.5. Tires and Wheels

The manufacturer’s label for the Challenger was located on the driver’s door frame. The label contained information specific to this vehicle, which included suggested tire and wheel information. The label suggested the vehicle be equipped with 235/55R18 tires for both axles. The tires were specified to be inflated to 32 psi for both axles. All rims were aluminum alloy.

The tires mounted on the Challenger were not the size specified by the manufacturer. All tires were size 245/45ZR20. General information about each of the tires as they were at the time of the inspection is included in **Table 1**. All the wheels were inspected for cracks, welds, and elongated lug nut holes. No non-crash related defects were discovered on any of the wheels. Tire pressure measurements were taken using a commercial grade tire pressure gauge. Tread depth measurements were taken in 2 locations within the major tread grooves of a given tire, the lowest of which is entered in Table 1 and represents the minimum tread depth. All tread depths measured were within the minimum tread depth regulations, which is 2/32 of an inch.

Table 1: Tire Information

Axle 1	Left	Right
Tire Make	Prin Hirace HZ2	Prin Hirace HZ2
Tire Size	245/45ZR20	245/45ZR20
Pressure	Flat	Flat
Tread Depth	8/32	8/32
DOT #	04NCPUHPC4420	04NCPUHPC4420
Load Rating	875lbs	875lbs
Axle 2	Left	Right
Tire Make	Prin Hirace HZ2	Prin Hirace HZ2
Tire Size	245/45ZR20	245/45ZR20
Pressure	40psi	34psi
Tread Depth	5/32	5/32
DOT #	04NCPUHPC4920	04NCPUHPC4420
Load Rating	875lbs	875lbs

During the tire examination, several areas of damage were noted to many of 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 inspection included the following:

- Axle 1 Left –
 - Wheel detached from axle.
 - 11:00 – 1:00 - Inside flange fractured.
 - 4:00 – 6:30 - Inside flange fractured.
- Axle 1 Right –
 - 12:00 – 2:00 – Outside flange damaged and deformed.
 - 7:00 – 8:00 – 6-inch x 2 ½-inch tear in sidewall.

1.1.6. Brakes

The brake system on the Challenger was hydraulic, with disc brakes on all four wheels. Due to damage sustained in the collision, the system was unable to be checked. The front hydraulic lines were torn away, and the brake pedal was inaccessible.

All rotors and brake pads were within minimum specifications, however there was an 8-inch section of the left front brake rotor missing.

1.1.7. Event Data

The event data recorder of the Challenger was successfully imaged by the North Las Vegas Police Department on January 30, 2022.⁷ See the Technical Reconstruction Group Chairman's Factual Report for additional information.

1.1.8. Documented Recalls

A search of the safety recall database maintained by NHTSA on February 3, 2022, indicated there were four recalls affecting the 2018 Dodge Challenger.⁸

- May 1, 2018 – Incorrect transmission park rods installed
- May 17, 2018 – Cruise control cannot be cancelled. Recalled to address a defect that could prevent the cruise control system from disengaging
- July 12, 2018 – Cruise control cannot be cancelled. Recalled to address a defect that could prevent the cruise control system from disengaging.
- August 9, 2018 – Voltage regulator may fail and cause a stall or a no start condition.

NHTSA records indicate that all four recall repairs have been completed on the Challenger.

⁷ See *Vehicle Attachment – 2018 Dodge Challenger – Event data recorder image*

⁸ The safety recall database was accessed via the NHTSA safety recall website. <http://www-odi.nhtsa.dot.gov/recalls/recallsearch.cfm>

1.2. 2013 Toyota Sienna Minivan



1.2.1. General Information

VIN: 5TDXK3DC4DS*****
Manufacturer: Toyota
Model: Sienna
Manufactured: 07/2013
GVWR: 5,995lbs
GAWR #1: 3,100lbs
GAWR #2: 3,100lbs
Engine: 6 Cylinder Gasoline
Transmission: Automatic
Brake System: Hydraulic

1.2.2. Damage Description

The front bumper fascia of the Sienna was torn away from the top mount and was hanging from the bottom mounts. The right side of the bumper was displaced aft into the radiator and shifted upward. The hood was folded in half and the windshield was dislodged from the frame and laying on the hood. All other glass in the Sienna was missing.

There were striations in the paint and sheet metal beginning at the front of the left fender extending rearward to where the B-pillar would be. The left doors were missing due to extrication but were located nearby. The B-pillar had been cut at the top and bottom and removed during extrication. The front of the left fender was deformed and folded aft and to the right. The left mirror was missing. The bottom frame rail trim was missing. The portion of the van from the B-pillar to the left rear was displaced down and to the right. The left rear fender was displaced forward and to the right. All lights in the van were missing or severely damaged.

The rear of the roof was displaced down onto the top of the third-row seats. The roof sheet metal was separating from the top of the door frames at the seams on both the right and left sides. The rear hatch was deformed and shifted right. The rear bumper fascia was missing, exposing the energy absorbing foam underneath. The right side of the rear bumper was displaced forward to the D-pillar.

The right doors were still on in place on the van but had been shifted up and left approximately 41-inches at the B-pillar. The right B-pillar was displaced to nearly the centerline of the van. There was a tire transfer mark in the right rear door panel.

1.2.3. Event Data

The event data recorder of the Sienna was successfully imaged by the North Las Vegas Police Department on January 30, 2022.⁹ See the Technical Reconstruction Group Chairman's Factual Report for additional information.

1.3. 2016 Hyundai Tucson Crossover SUV



⁹ See *Vehicle Attachment – 2013 Toyota Sienna – Event data recorder image*

1.3.1. General Information

VIN: KM8J33A44GU*****
Manufacturer: Hyundai
Model: Tucson
Engine: 4 Cylinder Gasoline
Transmission: Automatic
Brake System: Hydraulic

1.3.2. Damage Description

There was no damage to the front portion of the Hyundai. The driver's mirror was missing, and the left front fender was displaced to the right beginning at the front axle. The fender trim around the left front and left rear wheel well was either detached or missing. The driver's door was also displaced to the right approximately 4-inches and the door handle was missing. The left front and rear door glass were missing. The left side of the windshield was shattered, but in place in the frame. There were striations in the paint and sheet metal beginning at the front axle extending to the left rear corner of the Hyundai. The fuel filler cover was missing. There were striations on the roof rail and the last 12-inches was missing. The left rear turn signal lens was broken.

1.4. 2005 Chevrolet Malibu LS, 4-Door Sedan



1.4.1. General Information

VIN: 1G1ZT54845F*****
Manufacturer: Chevrolet
Model: Malibu LS
Engine: 6 Cylinder Gasoline
Transmission: Automatic
Brake System: Hydraulic

1.4.2. Damage Description

The front bumper fascia was displaced from the front of the vehicle but was laying under the bumper. The front bumper frame was displaced rearward approximately 12-inches on the right side into the radiator and right front tire. The right-side bumper horn was displaced right. The right headlight was missing. The right front portion of the hood was deformed aft and folded at the midpoint.

The right front fender was displaced aft and downward. The left rear corner of the bumper had tire transfer marks. The left rear tail lens was broken.

1.4.3. Event Data

The event data recorder of the Malibu was successfully imaged by the North Las Vegas Police Department on February 1, 2022.¹⁰ See the Technical Reconstruction Group Chairman's Factual Report for additional information.

¹⁰ See *Vehicle Attachment – 2005 Chevrolet Malibu – Event data recorder image*

1.5. 2016 Ford Fusion SE Hybrid, 4-Door Sedan



1.5.1. General Information

VIN: 3FA6P0PU2GR*****
Manufacturer: Ford
Model: Fusion
Manufactured: 09/2015
GVWR: 4,910lbs
GAWR #1: 2,435lbs
GAWR #2: 2,485lbs
Engine: 4 Cylinder PHEV Plug-in Hybrid
Transmission: Automatic
Brake System: Hydraulic Disc

1.5.2. Damage Description

The front bumper fascia was missing, and the bumper was detached from the frame horns and shifted up approximately 16-inches. The left front bumper horn was displaced to the left and the right horn was displaced aft and to the left, flush with the engine block. The radiator was displaced aft into the engine block. The hood frame top was displaced aft. The hood was folded

and torn on the right side and shifted left approximately 32-inches. The windshield was shattered but in place in its frame.

The right front fender was detached and missing. The right front wheel was also detached and found next to the Fusion. The passenger side mirror was folded flush with the door and the fascia was missing. The right front door panel was displaced left approximately 3-inches and aft approximately 1-inch. The door handle was fractured. There was a tire transfer mark in the center of the right front door. The right rear door was deformed at the leading edge, and the glass was missing.

The rear bumper fascia was loose and detached from its mounts on the right side. The fascia was torn away entirely at the midpoint left with red paint transfer visible. There was contact damage to the bottom of the trunk frame at the midpoint, and the trunk lid also showed contact damage at the midpoint.

1.5.3. Event Data

The event data recorder of the Fusion was successfully imaged by the North Las Vegas Police Department on February 1, 2022.¹¹ See the Technical Reconstruction Group Chairman's Factual Report for additional information.

1.6. 2021 Mercedes Benz GLE-350, Crossover SUV



¹¹ See *Vehicle Attachment – 2016 Ford Fusion – Event data recorder image*

1.6.1. General Information

VIN: 4JGFB4KB1MA*****
Manufacturer: Mercedes
Model: GLE 350
GVWR: 6,000 to 7,000lbs
Engine: 4 Cylinder Gasoline
Transmission: Automatic
Brake System: Hydraulic Disc

1.6.2. Damage Description

This vehicle was not available for NTSB investigators to inspect. Photos taken at the scene indicate damage to the left front fender. There was minor damage to the driver's door. The left rear door and fender sustained more severe damage and the left sidelight window was missing.

D. DOCKET MATERIAL

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

LIST OF ATTACHMENTS

Vehicle Attachment – 2018 Dodge Challenger – Event data recorder image

Vehicle Attachment – 2013 Toyota Sienna – Event data recorder image

Vehicle Attachment – 2016 Hyundai Tucson – Event data recorder image

Vehicle Attachment – 2005 Chevrolet Malibu – Event data recorder image

Vehicle Attachment – 2016 Ford Fusion – Event data recorder image

LIST OF PHOTOGRAPHS

Vehicle Photo 1 – 2018 Dodge Challenger - Damage viewed from the left front corner

Vehicle Photo 2 - 2013 Toyota Sienna - Damage viewed from the right side

Vehicle Photo 3 – 2016 Hyundai Tucson - Damage viewed from left side

Vehicle Photo 4 - 2005 Chevrolet Malibu - Damage viewed from the right front corner

Vehicle Photo 5 -2016 Ford Fusion – Damage viewed from the right front corner

Vehicle Photo 6 -2021 Mercedes GLE 350 – Damage viewed from the left side

END OF REPORT

Brian Bragonier

Vehicle Factors Group Chairman