

NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorder Division
Washington, DC 20594

June 22, 2020

Onboard Image Recorder

Group Chairman's Factual Report By Sean Payne

1. EVENT

Location: Boise, Idaho
Date: July 16, 2018
Vehicle: 2017 Volvo Truck
Operator: Krujex Freight Transport
NTSB Number: HWY18FH015

For a summary of the accident, refer to the Crash Summary Report, which is available in the docket for this investigation.

2. GROUP

A group was convened on September 13, 2018. The group consisted of the following members:

Chairman: Charles Cates
Mechanical Engineer
National Transportation Safety Board (NTSB)

Member: Shawn Currie
Investigator-In-Charge
NTSB

Member: David Rayburn
Investigator
NTSB

Member: Jason Brinkman
Managing Engineer
Idaho Department of Transportation

Member: Tom Duncan
Risk Management Supervisor
Krujex Freight Transport

Member: Matt Wiersma
President/CEO
Diamond Drilling

Member: Glenn Hinderliter
Engineer
Volvo Trucks

3. DETAILS OF INVESTIGATION

On August 6, 2018, the National Transportation Safety Board (NTSB) Vehicle Recorder Division received the following file via an electronic file transfer from an onboard image recorder:

Recorder Manufacturer/Model: **Garmin Dash Cam**
Recorder Serial Number: **N/A - Electronic File**

3.1. Recorder Description

The video recorder was manufactured by Garmin. The particular model number was not recorded. In general, Garmin video recorders marketed for vehicle applications can record video at resolutions of up to 1920 x 1080 pixels and include an audio track. This particular unit had an internal GPS unit which recorded the camera's position using the GNSS system. The device internally derived a groundspeed estimation based on the unit's location in space compared to time and calculated a groundspeed in miles per hour which was displayed, along with the time, at the bottom of the image recording's frame.

3.2. Video Files

The device recorded a series of video files in .mp4 format. The video files were each 1 minute in length and captured, in series, a video recording of the accident trip. The files were 1920 x 1080 pixels in resolution and included an embedded external audio track captured at 48kHz. The video was captured at a framerate of approximately 30 frames per second (fps).

3.3. Timing and Correlation

The times used in this report are expressed as Local Time of the accident (MDT). Timing is expressed as HHMM:SS, where HH stands for hours, MM for minutes and SS for seconds in MDT. Times are given in bold for each corresponding video event. The GPS time of the device was assumed to be accurate.

3.4. Summary of Recording Contents

In agreement with the Investigator-In-Charge, a video group was convened, and a transcript of key video events was prepared.

The video review began at **2150:00**. The truck was traveling eastbound on I84.

2152:12 The truck took exit 376A in Ontario, Oregon, from Eastbound I84.

2152:25 The truck turned right, slowing to about 3 mph but not stopping at a red light at the end of the exit ramp.

2153:20 The truck stopped at a fuel island at a Pilot Truck Stop.

2157:35 The truck departed the fuel island.

2200:00 The truck was parked and the driver exited the cab. The seat and seat belt were visible in a reflection from the windshield of the truck. The seat belt was buckled with the lap belt across the seat and the shoulder belt draped across the upper portion of the seat.

For the next 38 minutes, the truck's cab was unoccupied.

2238:04 The driver reentered the cab of the truck. Due to the lighting conditions, the driver was visible in a reflection of the cab's windshield. The driver was wearing a headset and holding a cell phone and fuel card and a bottle under his arm. The bottle's label was consistent with a brand of root beer that is sold at the rest area.

The driver was later visible at various points in the remainder of the recording when lighting conditions were conducive to produce a reflection on the cab's windshield. These times are noted in the transcript when the reflection of the driver showed a driver action that was pertinent to the accident investigation.

2239:26 The truck began to back from its parking place. A talk radio type broadcast was audible in the truck.

2242:05 The truck turned left at a stop sign, slowing without completely stopping.

2243:20 The truck turned right on to the entrance ramp of I84 eastbound.

2243:58 The driver stopped the talk radio program. There was no other music or talk radio audible in the cab for the remainder of the recording.

2244:55 The truck entered a lane closure area and navigated through a crossover at roughly Idaho Mile Post (MP) 0.

2245:09 The driver initiated a phone call while navigating through the crossover. The phone call was in Ukrainian. Only the driver's side of the conversation was audible. The phone call ended around **2252:00**.

2245:17 The truck crossed the Idaho state line on I84 eastbound.

2246:00 The truck traveled through the two-way two-lane area between 57-62 MPH. The temporary construction speed limit was 65 MPH in the zone.

Between **2246:23** and **2249:44**, three minutes of video was initially missing from the provided recorded files. The group did not transcribe video events during this time. Prior to publishing the report, this area of video and audio was located. During this time, the driver hit the rumble strip on the right side of the roadway once. The speed during this portion of the recording averaged about 60 mph.

2252:00 The phone call that began at **2245:09** ended.

2252:10 The truck flashed its high beams at an oncoming vehicle two times.

Between **2253:44** and **2256:44**, three minutes of video was initially missing from the provided recorded files. The group did not transcribe video events during this time. Prior to publishing the report, this area of video and audio was located. During this time, the driver hit the rumble strip once. The speed during this portion of the recording was between 60 and 64 mph.

2257:40 The truck entered the reverse crossover at the end of the work zone and traversed back to the right side of the interstate. The speed limit for trucks was 70 mph and for cars was 80 mph in this area. The truck traveled between 57-65 mph until the next crossover area.

2301:05 The truck changed to the left lane with a left turn signal in preparation for a crossover to a two-lane two-way travel section.

2302:00 The truck entered the crossover area for the two-lane two-way work zone section. The work zone spanned from approximately MP 17-26.

2304:23 The truck rode on the rumble strips cut in the right side of the two-lane two way section as it passed oncoming traffic.

Between **2307:45** and **2310:45**, three minutes of video was initially missing from the provided recorded files. The group did not transcribe video events during this time. Prior to publishing the report, this area of video and audio was located. During this time, the driver hit the rumble strip three times. The driver was heard clearing his throat at one moment. At another time, the driver burped.

2310:58 The truck rode on the rumble strips three times over the next 15 seconds.

2311:40 The truck entered the crossover area at the end of the two-lane two-way work zone. The speed limit following the work zone was 65 mph.

2312:05 The truck drove through sprinklers which were spraying the road surface. The windshield wipers were used to clear the windshield.

2312:45 A white truck passed in the left lane. Figure 1 is a screen capture at this time.

2312:53 After the white truck passed and was clear, the subject truck flashed its high beams.

2313:30 The truck drifted out of the right-hand lane onto the right-hand shoulder. The truck had increased speed to about 64 mph.

2313:45 The truck turned on its left turn signal for three flashes but did not change lanes.

2313:56 The truck drifted to the left and straddled the two lanes.

2314:00 The truck completed a change into the left lane. The trucks speed was briefly 65 mph.

2314:22 The truck turned on its right turn signal and changed to the right lane. The truck drifted across the right lane marking on to the shoulder and corrected back into the lane. The speed of the truck was about 60 mph.

2315:00 Following the lane change the truck slowed to 53 mph while drifting from the shoulder to the right lane. The truck's speed accelerated back to around 60 mph. Over the next two and a half minutes the truck drifted on to the shoulder and corrected back in to the lane approximately 10 times.

2317:35 The truck failed to move to the left for a truck stopped on the right shoulder of the roadway.

2317:40 The truck continued to drift from the right lane to the shoulder and back traveling 60-65 mph. Over the next minute and a half, the truck drifted on to the shoulder approximately 5 additional times.

2319:36 An Old Dominion truck with triple trailers passed in the left lane and honked its horn one time as it passed. The subject truck honked twice in return. The subject truck was traveling around 57 mph and it flashed its high beams when the trailers were clear. After the truck passed, the subject truck accelerated to around 65 mph.

2321:00 A three lane section began. Three lanes of travel were available in each direction plus an auxiliary on/off lane.

2323:06 The truck reached a speed of 69 mph, which was the highest recorded speed for this portion of the trip. A four-lane section began. Four permanent lanes of travel were available in each direction.

2323:49 The truck was traveling in the second lane from the right and began to drift to the rightmost lane. While straddling the two lanes, the right turn signal flashed three times. The truck passed a vehicle on the right.

2324:56 Over the next minute and a half the truck made three deviations on to the right shoulder.

2325:50 A window was opened in the truck.

2326:00 The truck drifted to the left and completed a lane change in to the second lane from the right.

2326:20 The window was closed.

2326:30 The truck changed lanes into the right lane with a turn signal.

2326:50 The truck drifted from the right lane on to the shoulder and back.

2327:07 The truck turned on its left turn signal and changed lanes in to lane three (the second lane from the right).

2327:47 The truck drifted to the left and straddled lanes two and three and returned to lane three. The right turn signal was activated as the truck returned to lane three.

2329:12 The truck drifted to the right and straddled lanes three and four before returning to lane three.

2330:00 A sound similar to a plastic bag rustling was audible in the cab.

2330:03 The driver's reflection was momentarily visible in the windshield. His right hand was visible reaching down to the right in to a plastic bag. A sound similar to a plastic bag rustling was audible in the cab for the next few moments.

2330:16 A Portable Changeable Message Sign (PCMS) is visible with alternating messages "NIGHT WORK THRU" and "JUNE CHECK 511". The sign was located adjacent to the Eagle Road Onramp, interchange 46. The truck was traveling 61 mph.

2330:25 Road Work Ahead signs were visible on the left and right shoulders of the road.

2330:37 Signs were visible that read “Increased fines for work zone speed violations” on both the right-hand roadside and left-hand shoulder of the road. Highway safety lighting was present at these signs.

2330:23 The driver’s reflection was momentarily visible in the windshield. His right hand was visible on the steering wheel and holding a plastic bag.

2330:50 Signs were visible indicating that the speed limit was decreasing to 55 mph ahead. The truck was traveling 57 mph.

2331:01 The truck passed the work zone speed limit 55 signs. The truck was traveling 63 mph in lane three.

2331:04 With the striking truck approximately 350 feet away, a white pickup truck ahead of the subject vehicle signaled and moved from the number three to number four lane. Brake lights were visible in all four lanes including reflections from guard rails on the left and right sides of the roadway.

2331:07 The white pickup truck completed its lane change when the striking truck was about 150 feet from the impact area. The white pickup truck was clear of lane three. A Jeep was visible ahead in lane three and a truck was visible ahead of the Jeep. The vehicle in lane two had its left turn signal on and was beginning to change to lane one. Reflections continued to be visible from left and right guard rails approaching the impact area.

2331:08 The Jeep brake lights activated. Figure 2 is a screen capture at this time. The occupants of the Jeep have been redacted.

2331:09 The truck impacted the Jeep at an indicated GPS speed of 62 mph.



Figure 1. A screen capture at 2312:45.



Figure 2. A screen capture at 2331:08. The occupants of the Jeep have been redacted.