



U.S. Department  
of Transportation

**National Highway  
Traffic Safety  
Administration**

# Memorandum

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Subject: Complainant Interview, Vehicle and Site Inspection      Date: 10/10/2007  
Vehicle Owner Questionnaires (VOQs) ODI 10174732 and 10176450

From: D. Scott Yon  
Investigator, NHTSA ODI

To: Files ODI 10174732, 10176450 and EA07-010

Present: Ms. [REDACTED], complainant, 10174732, 10176450  
Ms. [REDACTED], friend of the complainant;  
Bill Collins, NHTSA, VRTC;  
Scott Yon; NHTSA, ODI

The complainant's incident is reported in the National Highway Traffic Safety Administration's (NHTSA's) complaint database under VOQs 10174732 and 10176450. I first interviewed her on 3/12/2007 in connection with an analysis of VOQs related to unwanted acceleration on model year (MY) 2007 Lexus ES350 products. The complainant leased a MY 2007 ES350, VIN JTHBJ46G372 [REDACTED], the subject vehicle (SV), in late May of 2006. On April 12, 2007, myself and Bill Collins from NHTSA's Vehicle Research and Test Center (VRTC) met with the complainant to interview her and to visit the site of the incident. That morning we also attempted to inspect the SV however upon arrival at the location where it had been stored, the backyard of a private residence located in Detroit, Michigan, a person at a home across the street advised that the vehicle had been removed by an unidentified tow truck earlier that morning. The complainant reported the missing vehicle to the local police department prior to our interview and site inspection. Fresh markings on the driveway and street where the car was removed from the home were documented, see the photo log below.

During interview the complainant confirmed that on September 2, 2006, in the late afternoon, she was traveling north in the right hand lane of I-75 in the Pontiac, Michigan area. She was wearing her seatbelt. The roadway was wet due to rain. She was approaching a large truck that was transporting a precariously secured heavy load (salvage vehicles) as she neared the interchange with Michigan route 59. She intended to exit I-75 onto westbound M59. She didn't want to travel behind the truck due to its loading and the mist it was creating from the wet road, so she accelerated and passed the truck in the lane to its left. She changed back into the right hand lane to take the exit for M59 west and applied the brake. She reported having difficulty getting the vehicle to slow down for the exit ramp, despite forcefully applying the brake multiple times. She also reported that it behaved erratically, jerking back and forth, while she was on the ramp, however she somehow managed to successfully negotiate the ramp.

When the SV entered M59 west it began to accelerate more forcefully. The complainant continued to attempt to stop the vehicle through multiple applications of the brake, sometimes

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with two feet, but was unsuccessful. She took evasive maneuvers to pass slower moving traffic on M59. However, after traveling about 1.5 miles at speeds of 75 to 85 MPH, she realized she was going to hit a vehicle in the left hand lane so she steered the vehicle into the median strip. Although she had no recollection of it, the right front of her vehicle hit the left rear of the contact vehicle (CV) she was attempting to avoid. The SV departed the left (south) side of the roadway and struck a guardrail just east of the MLK Jr. Boulevard overpass. The collision with the guardrail caused the SV to roll counter clockwise and land on the driver's side and roof area. The complainant does not recall trying to shift the vehicle from drive, or attempting to turn off the engine with the control button, stating that she was too panicked to think of these countermeasures. The CV stopped a short distance after the impact.

The complainant could not recall how she was extricated from the vehicle, just that after the crash she was at the back of an ambulance being treated by emergency personnel. She was taken to the hospital and received treatment for neck, back, and pelvic injuries. She was still suffering symptoms and walked with a noticeable limp when interviewed in April. The vehicle was a total loss. On the day of the interview, Bill and I, along with the complainant, drove the route she traveled prior to the crash and inspected the crash location also, see the photo log.

A police report was filed by the responding agency, the Pontiac police department. We obtained a copy of the report and reviewed it. The report indicates the complainant received injuries (Type C) and that the airbags deployed<sup>1</sup>. It contains a written statement advising "Driver of vehicle 1 (SV) stated she was braking but the vehicle kept going faster." A diagram in the report shows the complainant's vehicle struck the CV in the right hand lane (not the left lane as indicated by the complainant). The report also identified other parties and witnesses to the incident, two of which I was able to interview. One of the parties was an uninvolved witness who was in the right hand lane just behind and to the right of the CV. The other party was the driver of the CV. Both parties confirmed that the SV was in fact traveling in the left lane, and that the crash occurred in the left hand lane<sup>2</sup>. Both reported that the SV was traveling at a high rate of speed, a speed obviously unsafe for wet road conditions, just prior to impact.

The occupants of the CV stopped to assist with the crash and helped extricate the complainant via the right rear window. The driver of the CV also reported speaking with other motorist, who had been traveling behind her on westbound M59, which stopped at the crash scene also. They reported they had witnessed the SV traveling at a high speed and passing their vehicles. The driver of the struck vehicle received minor injury and did not seek treatment. There were no other injuries reported. The CV suffered damage in the left rear and was towed from the scene.

The complainant subsequently reported the crash to her insurer and informed them that she believed a mechanical failure of the vehicle was the cause. The insurer hired a mechanical investigator to make an assessment of the vehicle on their behalf<sup>3</sup>. The investigator produced a report dated October 24, 2006, a copy of which was provided to NHTSA by the complainant. The report describes the investigative process in detail; stating that the vehicle was inspected on October 19, 2006 at a tow facility; that it had significant body damage; that the mileage was

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<sup>1</sup> The police report indicates the complainant was cited however she advised the charge was dismissed at trial due to her allegation and testimony that a problem with the vehicle caused the accident.

<sup>2</sup> The witness who was driving the CV advised that she thought the SV was already partially out of the left hand lane (on the median to the south side) when it struck her vehicle.

<sup>3</sup> A representative from Toyota was also present at the inspection according to statements in the investigator's report.

4,369; that the right side airbag had deployed; that the right front tire was flat; and that the right rear wheel had been broken off at the axle. It also notes that an all weather floor mat was found unsecured on the driver's floorboard. At ODI's request, the investigative agency provided copies of the digital photos taken during the inspection. The investigative report and the photos have been reviewed extensively by both Bill and I.

The investigator states that he also reviewed an interview statement of the complainant<sup>4</sup> and the police accident report as part of his assessment. The investigator concluded that: 1) there is no evidence that a brake system defect caused a brake loss or an inability to slow the vehicle, and 2) there is no evidence of a defect that would have caused the accelerator to stick and continue accelerating. The investigator supports his conclusions by noting that by the driver's own statement, "she was accelerating on I-75 when the vehicle started to accelerate yet she was still able to control the vehicle and got off a straight road to navigate around a curve while her vehicle was accelerating out of control." The investigator further notes that it was raining at the time of the incident suggesting that this makes the scenario even more improbable.

We noted from the pictures taken by the investigator that the retaining hooks for the driver's floor mat, while not engaged in the all weather mat, were properly engaged in the flooring material and that one of them was oriented 180 degrees from the proper position (see photo log). We asked the complainant about the driver floor mat and her recollection of how it had been installed in the vehicle. She advised that on the morning of the incident she had taken the carpet mat out of the driver floor and replaced it with the all weather mat because it was raining and she didn't want to ruin her carpet mat. She had previously experienced difficulty engaging the mat on the retaining hooks and, given that it was raining at the time, she did not secure the mat<sup>5</sup>. She also advised she was unaware the all weather mat had the potential to interfere with, or entrap, the throttle pedal, or that it represented any hazard when unsecured.

Throttle entrapment due to an unsecured all weather floor mat was studied in defect investigations Preliminary Evaluation (PE) 07-016 and Engineering Analysis (EA) 07-010, and was the subject of Toyota Safety Recall 07E-082<sup>6</sup>. The photographs supplied by the investigator show the all weather floor mat in an unsecured state on the driver's floor, a condition where it could entrap the throttle when depressed (see photo log); we believe this a plausible explanation for the unwanted acceleration alleged by the complainant. Additionally, her description of the onset of the incident, that it occurred after she had applied the throttle pedal (to pass another vehicle), is consistent with other reports of unwanted acceleration ODI concluded were caused by unsecured all weather floor mats.

When the throttle is held open and the vehicle is driven for a sufficient distance with the brakes forcefully applied, the brake pads become overheated and display surface glazing and other damage due to high temperatures<sup>7</sup>. This damage has been found on other vehicles that

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<sup>4</sup> The description of the interview statement in the investigator's report describes the incident in the same manner as the complainant explained to NHTSA, although it is not clear how the statement was obtained (perhaps from the insurer).

<sup>5</sup> The complainant indicated she normally would have taken the time to secure the mat, it was on this occasion with these circumstances that she elected not to.

<sup>6</sup> Visit <http://www-odi.nhtsa.dot.gov> to view further information on these investigations and the recall action.

<sup>7</sup> When the throttle is open and the brake is depressed multiple times the vacuum reservoir for the power assist will deplete. Stopping the vehicle when the throttle is fully open (engine making maximum power) and the brake power assist is fully depleted requires significant brake pedal effort for an extended period of time.

experienced unwanted acceleration due to floor mat entrapment of the accelerator<sup>8</sup> and has been duplicated in vehicle assessments VRTC conducted during PE07-016 and EA07-010. The investigator took photographs of the right rear brake assembly and hardware, including a photo of the brake pads (see photo log). The brake pads shown in the photo display the glazing and damage due to overheating that is consistent with the throttle being stuck open and the brakes being forcefully applied for the vehicle speeds and distances the complainant says occurred in her incident. This evidence supports the complainant's contention that she had her foot on the brake attempting to stop the vehicle during the incident, and that the throttle was open<sup>9</sup>. This also supports the investigator's conclusion that the brake system did not 'fail.'

We also considered the investigator's observation that the complainant was able to negotiate the M59 entrance ramp with the vehicle accelerating out of control. The SV is equipped with an electronic stability control (ESC) system. ESC has the capability to intervene on the driver's behalf when it senses that an unstable vehicle condition or loss of vehicle control is occurring. Typically the systems have two ways of intervening, either by mitigating/reducing the throttle opening<sup>10</sup>, and or (and possibly simultaneously) actuating the brakes, to reduce or eliminate the loss of control. We asked the complainant if she knew what ESC was, how it worked, or that her vehicle was equipped with this system; she answered no to these questions<sup>11</sup>.

We estimated that the westbound M59 ramp has a radius of about 225' based on publicly available satellite imagery. Using a MY 2007 ES350, VRTC conducted an assessment of the vehicle's ESC system while attempting to maintain a radius with the throttle pedal entrapped fully open by the all weather floor mat, both with and without brake application. In either state of braking, we determined that the ESC system does mitigate the throttle to allow the vehicle to maintain a 225' radius turn. When the brakes are applied, the mitigation of the throttle produces accelerations and decelerations in the vehicle; these could be described as a 'jerking' of the vehicle, as the complainant had alleged she experienced. We also noted that when the vehicle exits the radius and follows a straight path, the ESC stops intervening and vehicle acceleration goes back to a maximum state; this is also consistent with the complainant's statements.

In preparing this memo, we decided to run a CarFax vehicle history report using the SV VIN and noted that a salvage title had been issued for the vehicle in July, 2007, and that the vehicle had been sold at salvage auction in August, 2007. We reported these findings to the complainant, who was unaware of this, for her to pursue with the local authorities she had previously reported the missing vehicle to.

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<sup>8</sup> Visit <http://www-odi.nhtsa.dot.gov> to review memos regarding vehicle inspections and view photos of the damaged brake pads for VOQs 10182245 and 10189655 under PE-07016 and EA07-010 respectively.

<sup>9</sup> The throttle had to be open to keep the vehicle in motion long enough to damage the brakes in this fashion, otherwise the vehicle simply would have come to a stop and the brakes would be unharmed.

<sup>10</sup> The SV utilizes an electronically controlled (by wire) throttle that allows the ESC system to close the throttle even if the throttle pedal is depressed or entrapped in the mat.

<sup>11</sup> We did not discuss ESC with the investigator, however it appears based on his report, that he was unaware the SV was equipped with ESC and or of what ESC is capable of doing.

Photographic Log: Photos from NHTSA and other sources

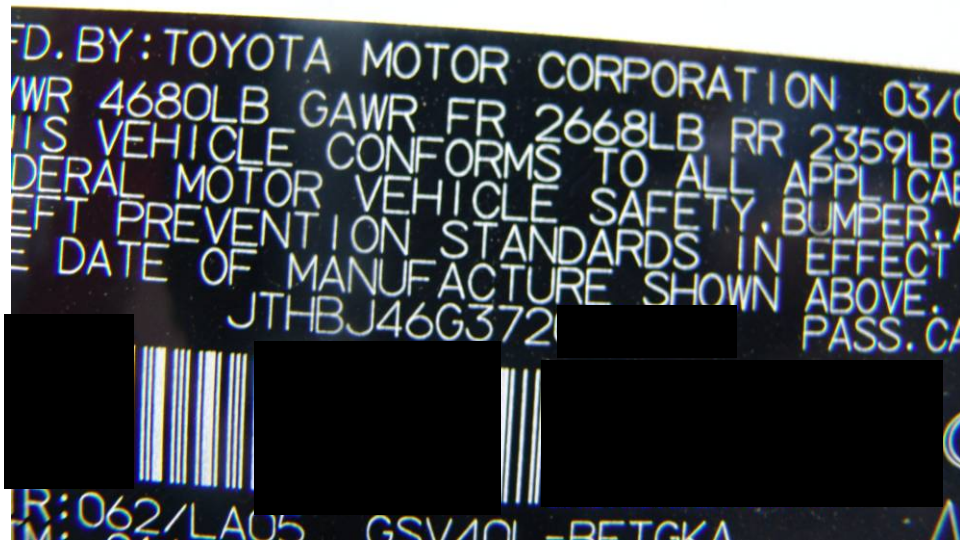


Photo 1: Certification label, driver side door jam

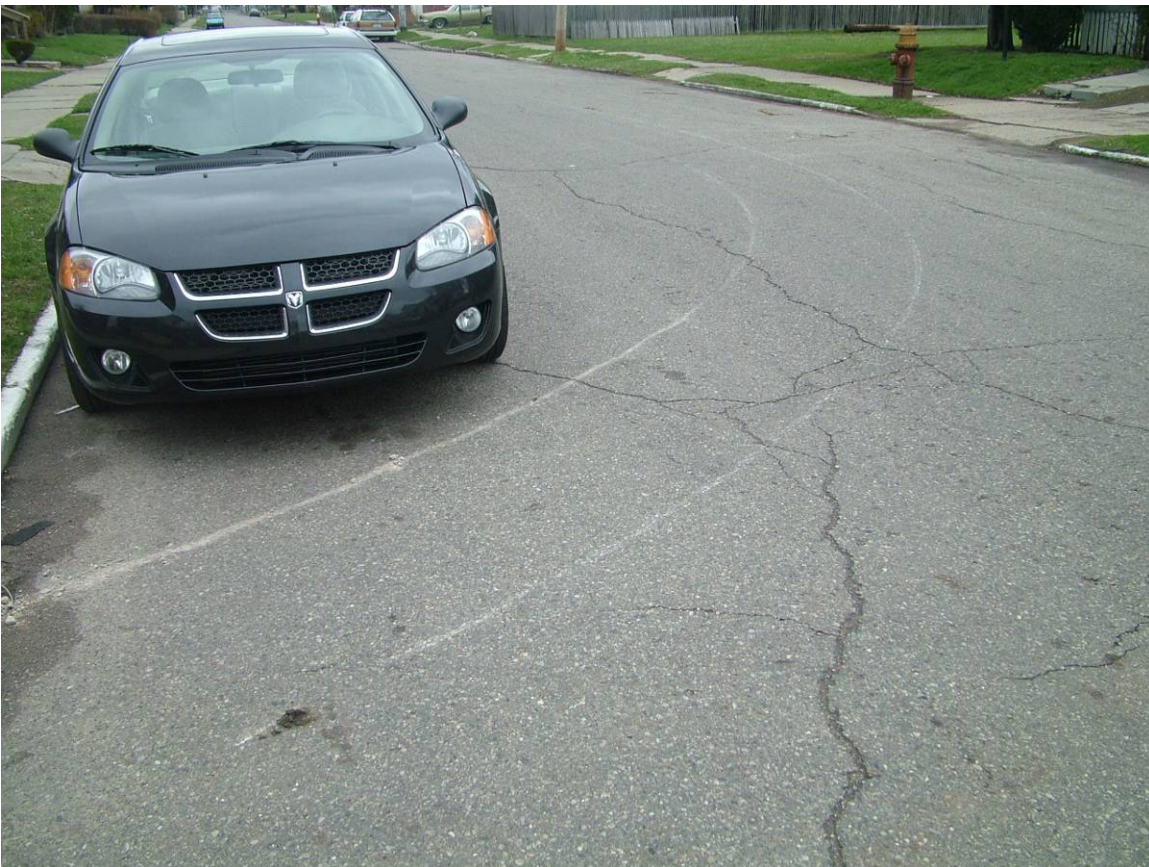


Photo 2: Drag marks on pavement from location where SV was stored and removed from.





**Photo 3: Location where SV was stored showing drag marks from removal.**



**Photo 4: Vehicle damage, right front and side**



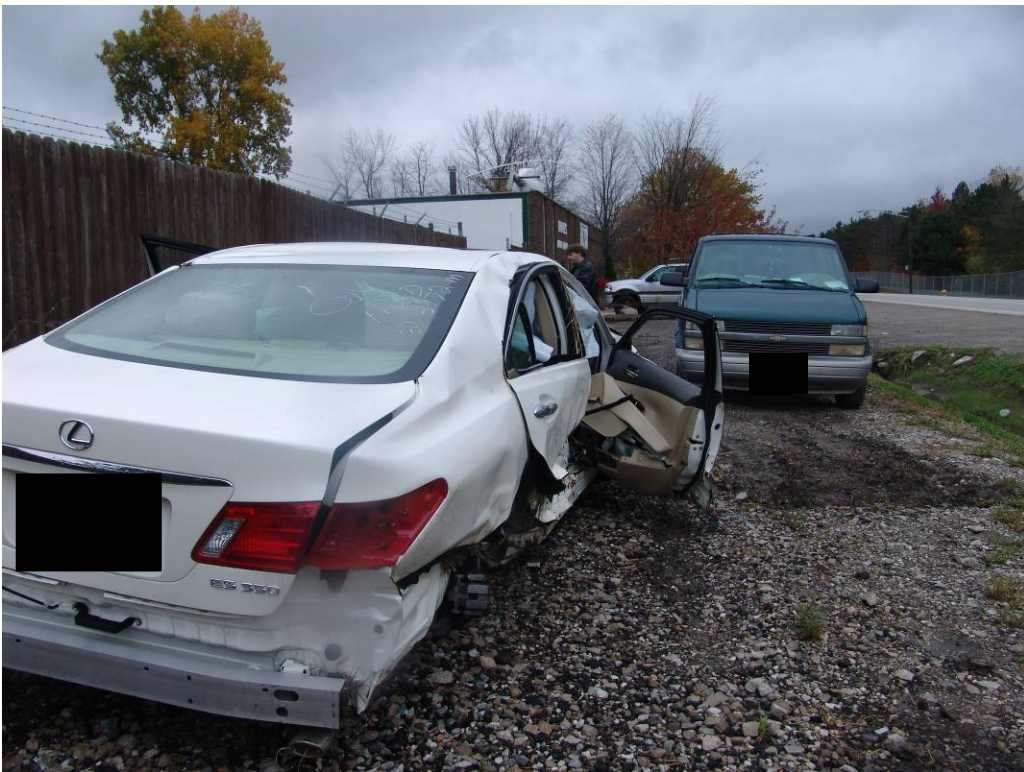


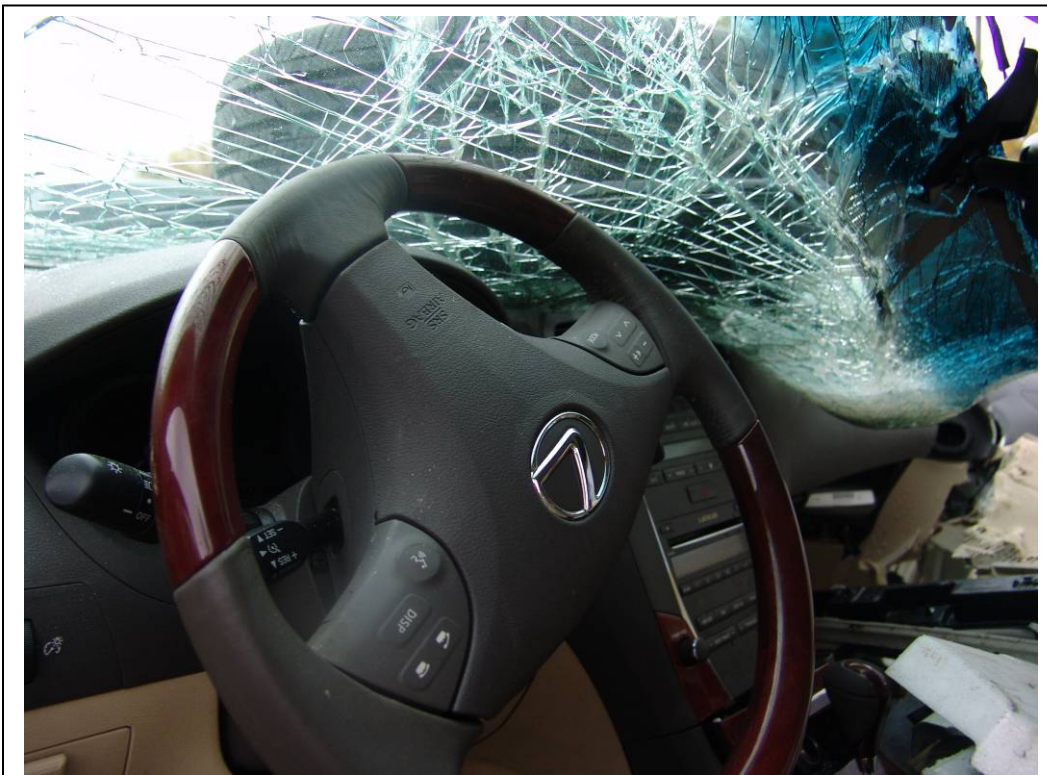
Photo 5: Vehicle damage, right rear and side, note side airbag deployment



Photo 6: Repaired guardrail at incident site, note SV debris in left background



**Photo 7: Unsecured all weather floor mat photo from investigator, note missing retainer**



**Photo 8: View of interior damage**





Photo 11: Investigator's photo of odometer



Photo 12: Photo showing inboard retaining hook is oriented 180 degrees from normal



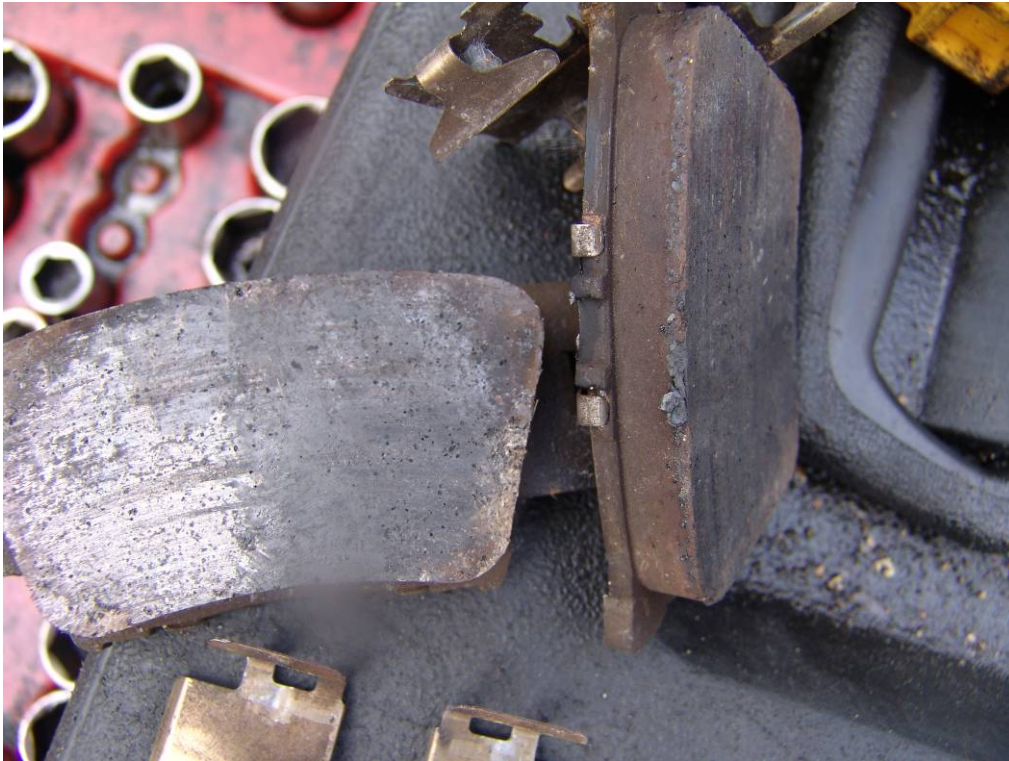


**Photo 9: View of the axle fracture of the right rear wheel assembly**



**Photo 10: Right rear brake components and broken axle shaft**





**Photo 13: View of right rear brake pads, note glazing and heat damage (debris)**



**Photo 14: Close up of right rear brake pad damage due to overheating**