



STATE OF SOUTH CAROLINA)

IN THE COURT OF COMMON PLEAS)

COUNTY OF CHARLESTON)

NINTH JUDICIAL CIRCUIT)

CASE NO.: 2019-CP-10-6567)

Lonnie Hamilton, III and Zoe'Lia)
Culbreath)

Plaintiffs,)

Affidavit of Bryan R. Durig Ph.D., P.E.)

v.)

RECEIVED

301 Auto Parts, LLC)

Sep 02 2022

Defendant.)

SC Court of Appeals

PERSONALLY APPEARED BEFORE ME, Bryan R. Durig, Ph.D., P.E., who, first being duly sworn deposes and says:

1) My name is Bryan R. Durig. I am fifty-eight (58) years old and reside in Lexington County in South Carolina. I have obtained a B.S., M.S., and Ph.D. in mechanical engineering from the University of South Carolina. I also have obtained a Masters degree in Business Administration from the University of South Carolina. A copy of my CV is attached hereto. I am a licensed engineer in the state of South Carolina as well as numerous other states.

2) I am a consulting engineer with Summit Engineering, L.L.P. in Columbia, South Carolina. I specialize in the area of engineering analysis of accidents. Over the last 30 years, I have conducted numerous fire investigations involving residential, commercial and industrial facilities including vehicle fires. I am familiar with industry fire investigation guidelines. I have been qualified as a mechanical engineering and fire investigator in numerous courts.

3) I have been retained to review the facts of this case, including the Summons and Complaint, 301 Auto Parts' Answer, Affidavits, Repair records, fire/incident reports,

and research on Kia vehicle fires and Hyundai vehicle fires. I have examined and photographed the subject Kia Optima vehicle located in Greenwood, South Carolina. The overall purpose of this investigation has been to conduct an engineering investigation of the fire with the 2013 Kia Optima vehicle to determine the origin and cause of the fire.

4) The subject vehicle has been identified as a 2013 Kia Optima with VIN 5XXGN4A72DG188737. Reportedly, 301 Auto Parts sold a replacement engine to Mr. Hamilton, III in June 2019. The first replacement engine apparently did not operate after being installed so a second replacement engine was provided to Mr. Hamilton, III by 301 Auto Parts, LLC. On September 10, 2019 (approximately a month after the second replacement engine was installed by a mechanic hired by Mr. Hamilton, III), there was a fire with the vehicle while Ms. Zoe'Lia Culbreath was driving the car in Greenwood, South Carolina.

5) The Kia VIN (5XXGN4A72DG188737) shows there are six open recalls for this vehicle. There was a recall announced on February 21, 2020 NHTSA Campaign 20V100000 which included 2013 Kia Optima's with the 2.4L gas engine for "If the fuel hose cracks, a fuel leak can occur, increasing the risk of a fire...The low pressure fuel hose may deteriorate and crack over time due to heat generated within the engine compartment." Another recall dated December 9, 2018 states "...vehicles that had their engine replaced under previous recall 17V224. The defect may cause fuel to leak increasing the risk of fire...17V224 may not have been properly performed. In some cases, the high pressure fuel pipe may have been damaged, misaligned or improperly torqued during the engine replacement procedure, allowing fuel to leak, thereby increasing the risk of fire..." Both these recalls deal with engine compartment fires due to fuel delivery systems to the engine that may leak fuel due to damage to the fuel line when an engine was replaced or long term deterioration of fuel lines. There are two recalls (August 27, 2020 and May 10, 2021) that are listed as Hydraulic Electronic Control Unit Short. These two recalls state "Brake fluid may leak inside the Hydraulic Electronic Control Unit (HECU), possible resulting in an electrical short." NHSTA Recall 17V224 in 2017 was for "Machining errors during the

engine manufacturing process may cause premature bearing wear within the engine... Bearing wear may result in the engine seizing, increasing the risk of a crash.”

6) Records from Quality Greenwood show the engine sub-assembly was replaced under warranty in November 2017. On November 29, 2018, the vehicle was towed into Quality Greenwood due to oil leaks and engine would not start. Quality Greenwood found “oil drain plug missing in vehicle. Also found one under shield missing and the other cracked and broken. Upon further inspection we found lower radiator support bent and front bumper scratched...” The last service entry indicates the vehicle was driven over an object and damaged the underside components of the 2013 Kia Optima.

7) 301 Auto Parts sold Mr. Hamilton a replacement engine in June 2019, six months after the engine was found to be inoperable in November 2018. I have not seen any service records between November 2018 and June 2019 when someone replaced the old engine with a replacement engine purchased from 301 Auto Parts. The first engine from 301 Auto Parts installed in the subject Kia Optima did not operate for some unknown reason. A second engine from 301 Auto Parts (shipped July 15, 2019) was provided and installed in the subject 2013 Kia Optima. The vehicle reportedly was operated for about a month before the engine stopped and a fire erupted in the engine compartment.

8) The fire damaged 2013 Kia Optima was examined in Greenwood, South Carolina on November 24, 2020. The fire damage was primarily contained to the engine compartment. The engine compartment was visually examined. It was noted that there were numerous parts missing and evidence other parts had been removed prior to my inspection (the ignition coils had been removed and laying on top of the engine). Other components were found on the ground in front of the vehicle and in the rear of the vehicle. The fire damage shows most of the fire damage was high on the engine. The radiator at the front of the engine compartment was not significantly damaged. The description that the vehicle stopped operating and smoke was observed coming out of the engine compartment prior to seeing flames may be consistent with a fuel leak in the engine compartment.

9) The fire damage indicates the fire originated in the engine compartment. However, the exact cause of the fire could not be determined as many components/parts in the engine compartment had been removed by someone and not retained by Mr. Hamilton, III or his representative for a later inspection. There are known defects with the fuel system for this model 2013 Kia Optima (multiple recalls by Kia after the engine has been replaced) as well as HECU units shorting out. The fuel system could have been damaged during one of the engine replacement operations (one by Quality Greenwood in November 2017 and two by someone in Charleston in June/July 2019) or the low pressure fuel line failure that Kia had a recall resulting from long term deterioration. Another possible cause is brake fluid could have leaked into the HECU and caused a fire. Because there are numerous parts missing from the engine compartment and no photographs available at this time of the post-fire condition of the engine compartment before numerous parts were removed, the cause of this fire is "Undetermined".

10) The Greenwood City FD fire report states "FD was dispatched to a vehicle fire. Upon arrival the engine compartment was fully involved. FD extinguished fire and investigated. Fire appears to be electrical in nature and not suspicious." An Incident Report states "On the above date and time I (Capt. Anderson) responded to Sumter St. in reference to a vehicle fire. Upon arrival I observed a 2015 beige Kia bearing SC registration KIY 194 to be on fire. The engine compartment was completely engulfed in flames. I then spoke with Zoella Culbreath who advised me she was driving North on Sumter St. when her vehicle just cut off and began to smoke. She advised she and her sister exited the vehicle and then noticed it was on fire so they called 911." There is nothing noted in either of these reports about Ms. Culbreath hearing anything from the engine compartment or the engine "knocking" prior to the vehicle stopping then smoking and catching on fire. In fact, the Greenwood City FD investigated the fire before any items were removed from the vehicle and determined the "fire appears to be electrical in nature".

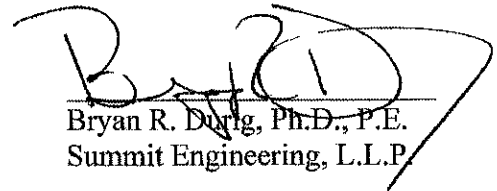
11) Photographs of the engine were reviewed to evaluate if there was evidence of the fire being caused by an internal failure of the engine itself. There is a damaged area

on the engine block where someone has removed the starter and damaged the engine block. This appears to be post fire damage and not related to the cause of the fire. There was nothing observed at this time to indicate the fire was caused by an internal engine failure related to the engine sold by 301 Auto Parts, LLC.

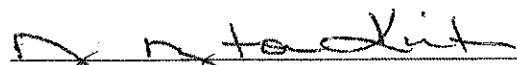
12) Based on a review of the above described material, it is my opinion to a reasonable degree of engineering certainty, there has been nothing reviewed to date to show the engine compartment fire was caused by the engine sold by 301 Auto Parts, LLC to Mr. Hamilton, III in July 2019.

13) Based on a review of the above described material, it is my opinion to a reasonable degree of engineering certainty by applying the Scientific Method as outlined in NFPA 921, the cause of the fire is "Undetermined".

FURTHER AFFIANT SAITH NOT


Bryan R. Durig, Ph.D., P.E.
Summit Engineering, L.L.P.

SWORN TO BEFORE ME THIS
11 day of February, 2022


Notary Public for South Carolina
My Commission Expires: 4.8.25