FACTUAL REPORT OF INVESTIGATION
TESLA MODEL S FIRE

West Hollywood, CA

HWY18FH014

(9 pages)

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

FACTUAL REPORT OF INVESTIGATION

A. CRASH INFORMATION

Location:	7807 Santa Monica Blvd, West Hollywood, Los Angeles County, California 90046
Vehicle #1:	2012 Tesla Model S
Date and Time:	June 15, 2018 at approximately 5:30 p.m.
Uninjured	1
NTSB #:	**HWY18FH014**

B. INVESTIGATIVE GROUP

Thomas Barth, Survival Factors Investigator, Biomechanics Engineer
NTSB Denver Regional Office, 4760 Oakland St. Suite 500Denver, CO 80239

Tim Cunnigham, Intern, Office of Highway Safety
NTSB, 490 L'Enfant Plaza, East, S.W, Washington DC, 20594

C. CRASH SUMMARY

On Friday, June 15, 2018, about 5:30 p.m., pacific daylight time, a 2012 Tesla Model S electric powered passenger car, occupied by a 44-year-old male driver, was traveling westbound on Santa Monica Boulevard, in West Hollywood, Los Angeles County, California. Motorists flagged down the Tesla driver because they saw smoke coming from the vehicle. The driver stopped the Tesla next to the north-side curb in the 7800 block of Santa Monica Boulevard and exited the vehicle. A nearby Los Angeles Sheriff's Department patrol car also stopped, and the officers directed traffic around the burning car. The Los Angeles County Fire Department responded to the vehicle fire, dispatching an engine unit from station #8, which is located at 7643 Santa Monica Boulevard. Smoke and flames were still coming from the vehicle as the fire engine arrived on the scene and firefighters, wearing self-contained breathing apparatus, responded to the fire and applied both water and foam. The flames were quickly extinguished, but smoke continued to come from the vehicle. Firefighters removed portions of the vehicle's left front fender and under-hood trim, severed the high voltage cut loop, and applied additional water and foam under the hood and behind the front wheels. The fire captain estimated that less than 300 gallons of water and foam were applied during their response to the event. The fire was extinguished, and there were no injuries. The vehicle was towed from the scene without incident.

D. DETAILS OF THE INVESTIGATION

The investigation was focused on the vehicle fire event and included the collection of information about the roadway, vehicle, driver, law enforcement, and fire/rescue.

1. Roadway Information

The incident occurred at the 7800 block of Santa Monica Blvd, West Hollywood, CA 90046. This was near the intersection of Santa Monica Blvd and North Ogden Dr. The Tesla driver started his trip at his residence located nearby and was driving westbound on Santa Monica Blvd when bystanders flagged him down due to noticing smoke emanating from the vehicle. The driver stopped the vehicle in front of Executive Car Leasing Company at 7807 Santa Monica Blvd. Figure 1 provides a Google map view of this location.

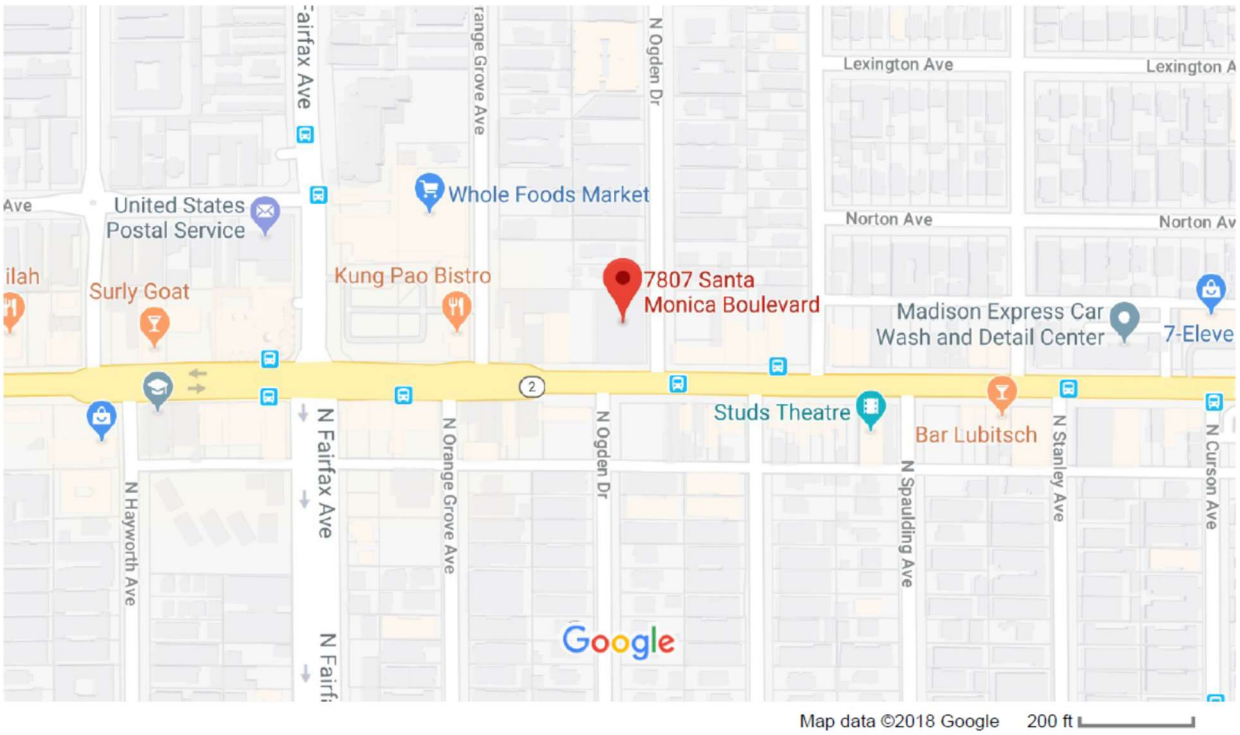

Figure 1: Google map view of Santa Monica Blvd in the vicinity of the vehicle fire incident.

Santa Monica Blvd at this location ran East and West with two travel lanes in each direction divided by a double yellow line. The eastbound lanes had parallel parking next to the curb. The westbound lanes also had parallel parking, but not in front of the Executive Car Leasing Company, which occupied the northwest corner of Santa Monica Blvd and North Ogden Drive. The curb in front of this business extended into the area of the parking lane on either side. North Ogden Drive intersected Santa Monica Blvd in a staggered fashion from North to South. There were white stripped pedestrian crossings across Ogden Drive and across Santa Monica Blvd. Because of the offset, the pedestrian crossing across Santa Monica Blvd extended from a parking lot at the Southeast corner of North Ogden Drive to the mid-block entrance of Executive Car Leasing Company.

The driver stopped the Tesla and exited the vehicle. A LAPD unit that was traveling a few cars behind the Tesla and also stopped. The Los Angeles County Fire Department responded to the vehicle fire, dispatching an engine unit from Station #8 located at 7643 Santa Monica Blvd, located 2 blocks to the East of North Ogden Drive, at North Stanley Avenue. Figure 2 is a Google street view with the approximate location of the Tesla, LAPD unit, and LAFD Engine X during the fire incident illustrated.

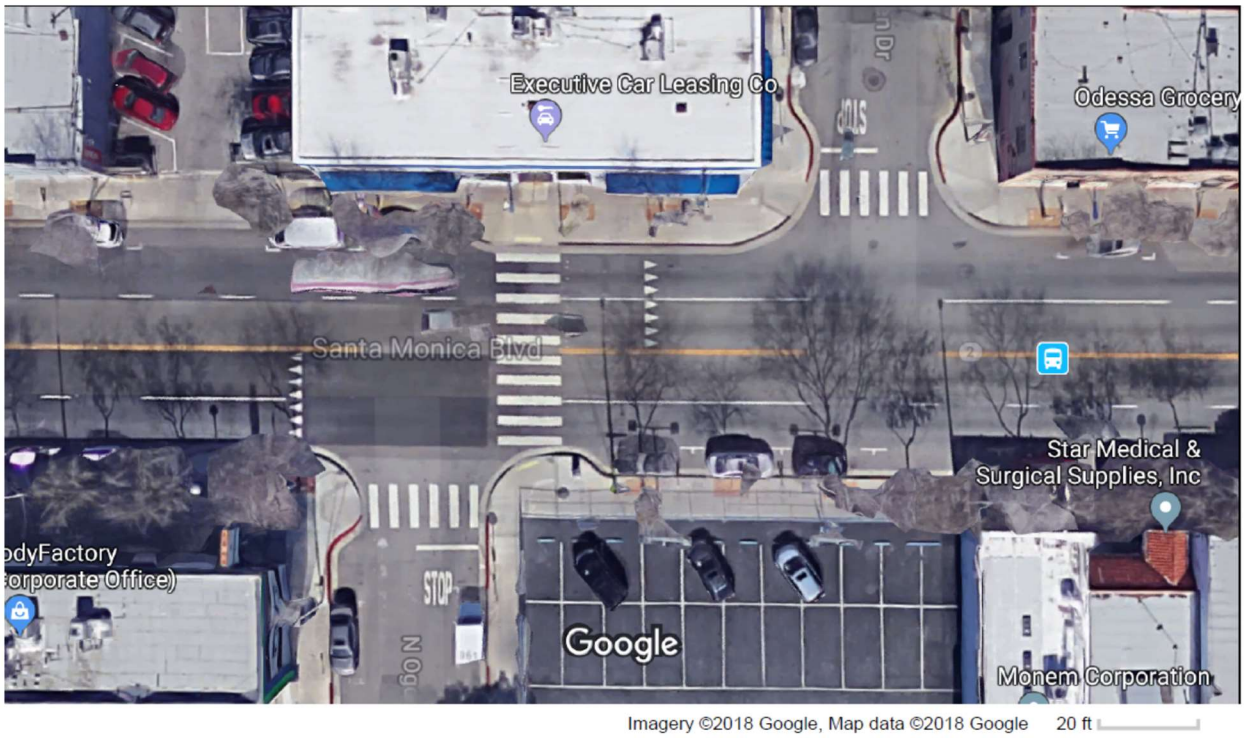

Figure 2: Google street view of Santa Monica Blvd at North Ogden Drive.

2. Vehicle Information

The fire incident involved a 2012 Tesla Model S, VIN 57JSA1DP9CFPXXXXX.[1] The local service representative from Tesla Motors spoke to the owner and obtained permission to take possession of the vehicle

2.1. Tesla Vehicle Inspections

On Sunday June 17, 2018 Tesla spoke to NTSB investigators and provided some preliminary information based on information obtained by the local service center and a preliminary inquiry of the data obtained from the vehicle. The following items were noted as initial information:

- The car was starting to report anomalous battery values at 5:32pm, the driver unlatched his seatbelt and opened his door at 5:33pm

[1] Last 5 digits of VIN replaced with X.

- There was no indication that the owner had done any obviously incorrect charging behavior or other actions that might have initiated the fire.
- There was no indication of an impact or other external factor involved.
- There was no evidence of over-charging or other anomalous signals from the charging cycle prior to the incident.
- Driver has a super-charger at his residence, but it was unknown what type of charger was used for the last charge prior to the incident.
- The last charge prior to the incident lasted between 20 and 40 min, exact time not yet known.
- Telemetric data did not show any anomalies until the battery warning at 5:32 p.m. Note that complete data was not yet available.
- The last data appears to have been transmitted when the driver got out of the car, went around the other side and opened the passenger door, at which time the data then stopped uploading.
- In the 7 hours leading up to event in which data was available, there were no signs of impact or crash.
- Tesla had not been able to have techs talk to driver, but Tesla did talk to some fire fighters.
- A few photos were obtained by the service center. They show that the interior does not appear badly damaged, and the exterior photos did not show any obvious signs of impacts or damage.
- Tesla spoke to the LAPD and were told that there were no plans for a report, as it involved no injuries or a collision.
- Tesla was in the process of obtaining FD contacts and other information.
- Tesla conducted a cursory review of service records and did not find any obvious issues.
- The Tesla representative said these types of events are exceedingly rare, with only about 3 total known, and he said 2 of those were attributed to cooling system failures.
- They had some data from the last charging, with module thermal data and voltages, and no obvious anomalies were noted.
- Tesla reported that the wire cut loop at the front of the car was cut. The representative noted that there have been reports from FF that the rear cut loop is deep, requiring responders to cut far into the left rear wheel well area. The model 3 has been designed with a more shallow and higher rear cut loop.

2.1.1. Tesla Inspection at Burbank Service Center

The vehicle was transported to the Tesla Service Center located at 811 S San Fernando Blvd, Burbank, CA 91502. The incident vehicle was inspected on June 17, 2018. NTSB investigators were not present at this inspection. Tesla provided a complete set of photos taken during this inspection and provided notes summarized below.

- The purpose of the inspection at this facility was to render the vehicle safe and make initial observations.

- The battery pack was removed from the vehicle and the cover of the battery compartment was removed so that all battery modules could be accessed directly in order to drain any residual charge.

- There was some evidence (a hole in the case) that happened to be in the one spot that would be perfect for tampering with the pack, but it was also the most logical place for vent gases to create such a hole. Someone would have had to remove some parts and put them back on, including recreating the paint pen assembly marks to successfully tamper with it. It appeared very improbable that it was tampered with.

Battery module 14 was the only module to have had thermal runaway. All other modules were completely intact apart from some discoloration of the packaging. They were all drained of power before the car was transported from Burbank. Refer to the factual report attachment "Burbank Inspection Photographs" for photographic documentation of the inspection.

2.1.2. Tesla Inspection at Sunnyvale Research Center

The incident vehicle was transported by Tesla to the Tesla Sunnyvale Research Center in Sunnyvale, CA on June 18, 2018. Tesla initiated an inspection of the vehicle on June 18, 2018 and continued on June 19, 2018. The NTSB investigator attended the vehicle inspection on June 19, 2018. The battery case was removed from the vehicle a full tear down inspection was performed.

The vehicle was inspected and apart from the damage caused by fire fighters attempting to access the battery, a small amount of damage to the motor and adjacent frame rail was found. Refer to the factual report attachment "Sunnyvale Inspection Photographs. The photographs also show the damage to battery modules and battery case.

3. Driver Information

The driver was a 44 year-old male, and was not injured in the incident. The local Tesla service representative contacted the driver immediately following the incident. The driver granted permission for Tesla to take possession of the vehicle and conduct an inspection. Later Tesla reported that they purchased the vehicle from the driver. Tesla reported that the driver had told the service representative that he was driving the vehicle, noticed smoke coming out from under the vehicle, stopped, and the fire department extinguished the fire.

Tesla also reported that they attempted to contact the driver to conduct an interview, but were unsuccessful. NTSB investigators contacted the driver by telephone and be commented that

the video he provided was an accurate account of what occurred and that it was the best representation of his experience with the incident.

Based on the Tesla reported vehicle information, the first indication of vehicle issues occurred at 5:32 p.m., and according to the driver and his recorded video, he had time to exit the vehicle and start filming. The first indication of flame occurs about 32 seconds after the recording begins. The smoke and fire was emanated away from the interior of the Tesla throughout the event.

The fire department report indicated that they arrived at 5:40 p.m., and the fire fighters are first indicated about 8 minutes into the driver video. This indicated that the driver started filming very quickly upon exiting the vehicle.

4. Law Enforcement Information

The Los Angeles Sheriff's Department (LASD) had a unit respond from the West Hollywood station, located at 780 N. San Vicente Blvd, West Hollywood, CA 90069. The LASD incident history report first entry occurs at 5:51 p.m. and has a note that the incident started at 5:40 p.m.[2] It indicated that they assisted with a vehicle fire, and the code 10/98 (finished with last traffic) was logged at 7:25 p.m. The event log was closed at 7:58 p.m.

5. Fire/Rescue Information

The Los Angeles County Fire Department (LAFD) Station #8 located at 7643 Santa Monica Blvd responded to the vehicle fire. Incident response report 2018-0178432-000 was obtained.[3] The report indicated that the alarm time was 5:38 p.m., the arrival time was 5:40 p.m. and the cleared time was 6:28 p.m. The report indicated that it was a passenger vehicle fire and that the actions taken were to extinguish the fire. The report listed one unit, Engine 8 (E8) with a crew of 4 that responded.

The narrative report indicated that upon arrival, a vehicle was found with smoke and fire coming out from under the wheel wells and front hood area. The fire was extinguished and the power was cut to the batteries. It also indicated that the owner was driving when he noticed smoke coming from under the vehicle, and that he stated that he has not had any recent mechanical problems or repairs.

The Captain of Engine 8 that responded to the incident was interviewed by phone on July 19, 2018. He was asked to describe the response. He indicated that for a vehicle fire, one engine is typically dispatched, and that was the case here. The fire station is just a couple of blocks away and they approached the vehicle and saw smoke and flame shooting out from the left front corner of the vehicle. He described it as a grey smoke, not black as typical with a vehicle fire, and that it was pressurized and shooting horizontally out from the wheel well area. He said that the engine holds 500 gallons and they did not hook up to a hydrant. They used a 1.75 inch line and a class A foam at about 1%, which seemed to help the water get into and wet the area needed. He said that the fire fighter started out about 15 feet from the vehicle, but later approached right up to the car to get the water in by the wheel well. He had the engineer open the hood and look for the cut loop, which was found and cut. They did this because the smoke persisted event after the flames were

[2] Factual Attachment: Los Angeles County Sheriff Department Incident Report
[3] Factual Attachment: Los Angeles County Fire Department Incident Report

down, and they had expected it to be out. He was a bit surprised that it continued to smoke, and so he instructed the FF to just keep applying water until it stopped.

He estimated that they used a maximum of about 300 gallons. He could not really say the flow rate, and said that the line is capable of 150 gpm, but that of course they throttle it back. He thought maybe they were running around 70 gpm. He described it as not a high flow rate, but that they applied the water for a relatively long time given the scale of the fire. He said that there was another task force coming off another job, and so he asked them to stop at the scene so he could ask that Captain for his thoughts. He was surprised that after cutting the loop under the hood, that the dash lights and computer screen in the vehicle remained on. As it was still smoking, he wanted all power out.

The other unit that stopped by has the call sign Light Force 8, which is actually comprised of 2 pieces of apparatus, a ladder truck (Truck 8), and an engine (E208). Around this time the owner was on the phone with someone from Tesla, and so the captain asked if he could talk to the Tesla person. The Tesla person informed him that there was the 12 Volt battery that was separate from the main car battery, and that it should not have anything to do with the fire. Even so, the Captain instructed the engineer to find and cut the 12 Volt battery. At one point another call came in from Tesla, and that person told him that once the main cut loop is severed, the 12 Volt battery will go out in about 10 to 15 min. He was also told that that there is nothing you can do besides just apply water to cool the battery until it stops smoking. The Tesla person also told him not to tow the vehicle, and that there was a risk that it could reignite. But the Captain told him that he has to tow it, and that if it does reignite, then the tow truck will just need to have the FD respond.

After the vehicle was out, he allowed the owner to approach the vehicle, but he does not recall details. He was also asked about a video that shows someone else approach the rear trunk of the vehicle, but was unaware of it. He was asked about the how they knew about the cut loop, or if they saw markings on the vehicle. He said they are trained in electric vehicles, and knew to find the cut loop. He also said that they were aware of the risks of high voltage. He was asked about the exact location that the vehicle stopped, and did not recall. He was asked about law enforcement and if he know about reports that there was a law enforcement unit a few cars behind the Tesla when it occurred. He did not know about that, but said that there was one West Hollywood Sheriff unit on scene, and he asked that officer to help with crowd control, because he concerned with pedestrians entering the scene, as well as exposure to toxic fumes. He did not recall the unit number of the Sheriff vehicle, and provided a phone number. He noted that 911 calls come into the Sheriffs office, and then the call gets forwarded to the LA Co FD, which has their own dispatch. He mentioned that there was a Tesla fire from a severe collision in West Hollywood a couple of years ago, where there were reports of portions of the battery shooting off the vehicle.

E. DOCKET MATERIAL

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

LIST OF ATTACHMENTS

Factual Attachment: Los Angeles County Sheriff Department Incident Report
Factual Attachment: Los Angeles County Fire Department Incident Report
Factual Attachment: Burbank Inspection Photographs
Factual Attachment: Sunnyvale Inspection Photographs

END OF REPORT