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Your Ref: G0046683
Our Ref :CS/AVI18002494/D

12 February 2018

Aviva Ltd
4 Shenton Way #01-01
SGX Centre 2
Singapore 068807
(Motor Claims Department)

TECHNICAL INVESTIGATION REPORT OF FIRE INCIDENT INVOLVING THE INSURED VEHICLE SGG 2789A ON 02 FEBRUARY 2018

1. I refer to your request dated 07 February 2018.

2. My analysis, comments and opinions with respect to the cause of fire to the insured vehicle SGG 2789A (herein referred to as "**Insured Vehicle**") are set out below.

Inspection of the Insured Vehicle

3. The Insured Vehicle was physically inspected on 07 February 2018 at the premises of ComfortDelgro Engineering Pte Ltd, 320 Ubi Road 3, Singapore 408649.

4. A static inspection was carried out to the Insured Vehicle where the following general information was recorded:-

Vehicle Registration No.	: SGG 2789A
Make / Model	: Nissan Sunny 1.6EXM
Chassis No	: JN1CFAN16Z0101135
Year of Registration	: 2006 (May)
Mileage	: N.A (battery melted)

5. The Insured Vehicle was noted to have sustained fire damage that was confined to its frontal portion. The entire engine compartment of the Insured Vehicle was observed to be severely burnt while the interior compartment was observed to be partially burnt and/or melted.

6. The fire had resulted in the body parts at the frontal portion of the Insured Vehicle to be burnt. This had included its front bumper, front bonnet, front fenders, front support panel, front grille, front headlamps, front windscreen, front dashboard and roof upholstery amongst others. See photo 1 – 4 below.

Photo 1 shows a general view of the front right portion of the Insured Vehicle at the time of my inspection. The fire damage to the Insured Vehicle was confined to its frontal portion. Its front bumper, front bonnet, front grille, front right headlamp and front right fender were amongst the body parts that were found to have been affected as a result of the fire.

Photo 2 shows a general view of the front left portion of the Insured Vehicle at the time of my inspection. The fire damage to the Insured Vehicle was confined to its front portion. Its front bumper, front bonnet, front left headlamp and front left fender were amongst the body parts that were found to have been affected as a result of the fire.

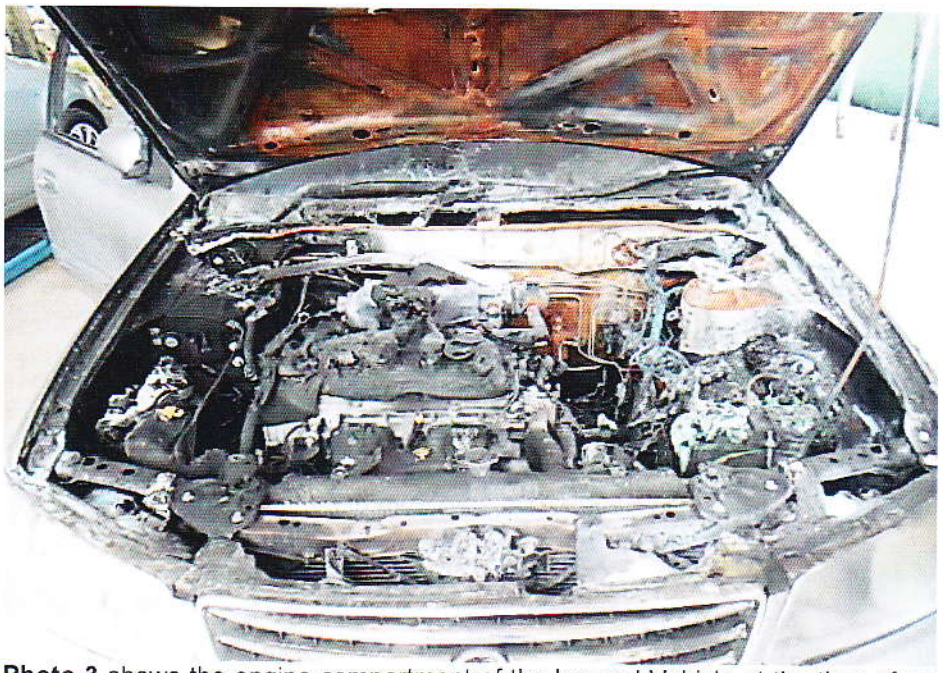

Photo 3 shows the engine compartment of the Insured Vehicle at the time of my inspection. The entire engine compartment of the Insured Vehicle was observed to be severely burnt. Most of the parts inside the engine compartment were found to be burnt and/or melted as a result of the fire.

Photo 4 shows the interior compartment of the Insured Vehicle, which was observed to be partially burnt and/or melted. The front dashboard and roof upholstery were amongst the parts that were found to have been burnt and/or melted as a result of the fire.

7. At the time of my inspection of the Insured Vehicle, I did not find any additionally fitted electronic and/or electrical component(s) on the Insured Vehicle. There was also no modification(s) fitted on the Insured Vehicle.

Investigation and Technical Analysis

8. For this particular case, the fire appears to have originated within the engine compartment of the Insured Vehicle, somewhere around the left and towards the rear of the engine compartment. This can be determined from the burn pattern and the rust that had developed on the front bonnet of the Insured Vehicle, at both its top and under side.

9. The presence of rust on a steel/metal material body panel of a vehicle that was involved in a fire incident is a consequence of that body panel being exposed to natural environmental condition after the layers of paint and its related compounds were melted due to prolong exposure of that particular body panel to high heat intensity. Such physical evidence can hence be used to determine the origin of the fire. See photo 5 - 7 below.

Photo 5 shows the rust (circled) that was found on the top side of the front bonnet of the Insured Vehicle. The presence of rust on a steel/metal material body panel of a vehicle that was involved in a fire incident is a consequence of that body panel being exposed to natural environmental condition after the layers of paint and its related compounds were melted due to prolong exposure of high heat intensity to that body panel. Such physical evidence can normally indicate where the fire of a vehicle had originated.

Photo 6 shows the rust (circled) that was found on the underside of the front bonnet of the Insured Vehicle, directly under the area of the top side of the front bonnet, where rust had also developed.

Photo 7 shows a general view of where the fire to the Insured Vehicle had originated, which was somewhere around the left and towards the rear of the engine compartment (circled). This was established given the localized area on the Insured Vehicle where rust had developed.

10. Upon closer examination of the area around the left rear of the engine compartment, which was where the fire to the Insured Vehicle had likely started, I had found greenish residue on several stretches of original factory fitted wirings leading towards the Engine Control Module (ECM) of the Insured Vehicle. The presence of greenish residue indicates internal heating of copper wires, a sign of an electrical short circuit occurring. The greenish residue is normally left behind from oxidation as a result of chemical reaction involving the copper wires. This physical evidence would then appear to suggest that the cause of fire to the Insured Vehicle could have possibly been due to electrical in nature. See photo 8 – 11 below

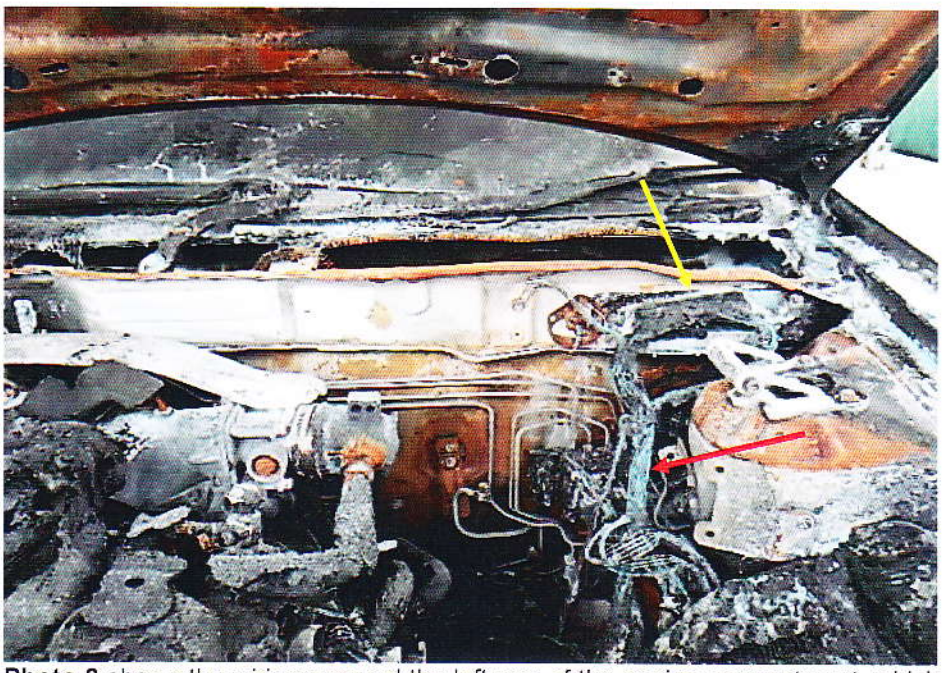

Photo 8 shows the wirings around the left rear of the engine compartment, which is in the immediate vicinity where the fire to the Insured Vehicle had likely started. Greenish residue was found on the wirings (red arrow) leading to the Engine Control Module (ECM) (yellow arrow). The presence of such greenish residue suggests occurrence of an electrical short circuit.

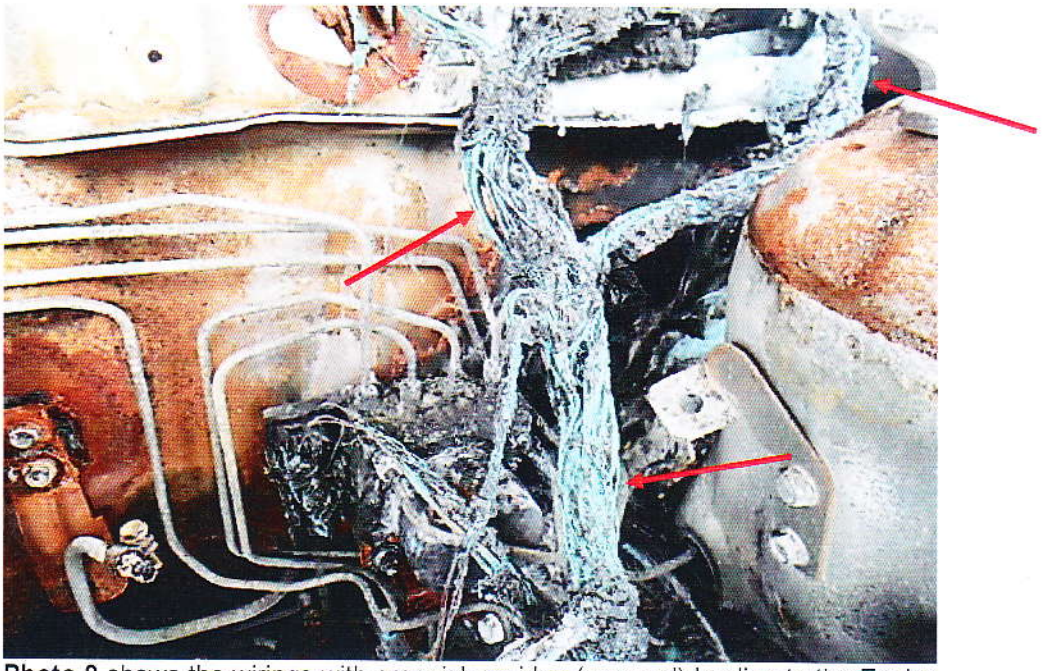

Photo 9 shows the wirings with greenish residue (arrowed) leading to the Engine Control Module (ECM). The presence of such greenish residue suggests occurrence of an electrical short circuit.

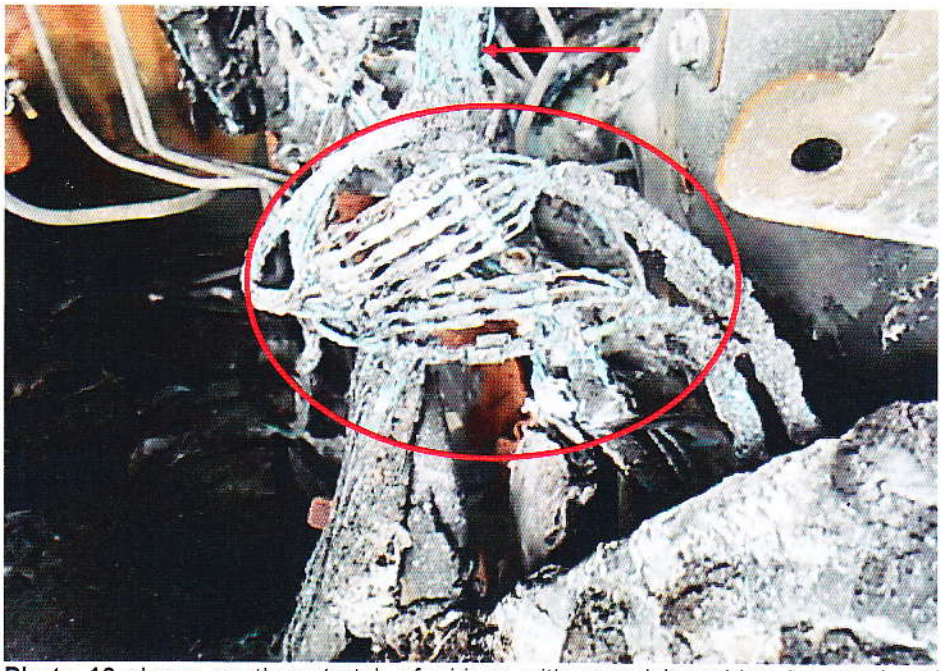

Photo 10 shows another stretch of wirings with greenish residue (arrowed and circled) at the rear left area of the Insured Vehicle's engine compartment. The presence of such greenish residue suggests occurrence of an electrical short circuit.

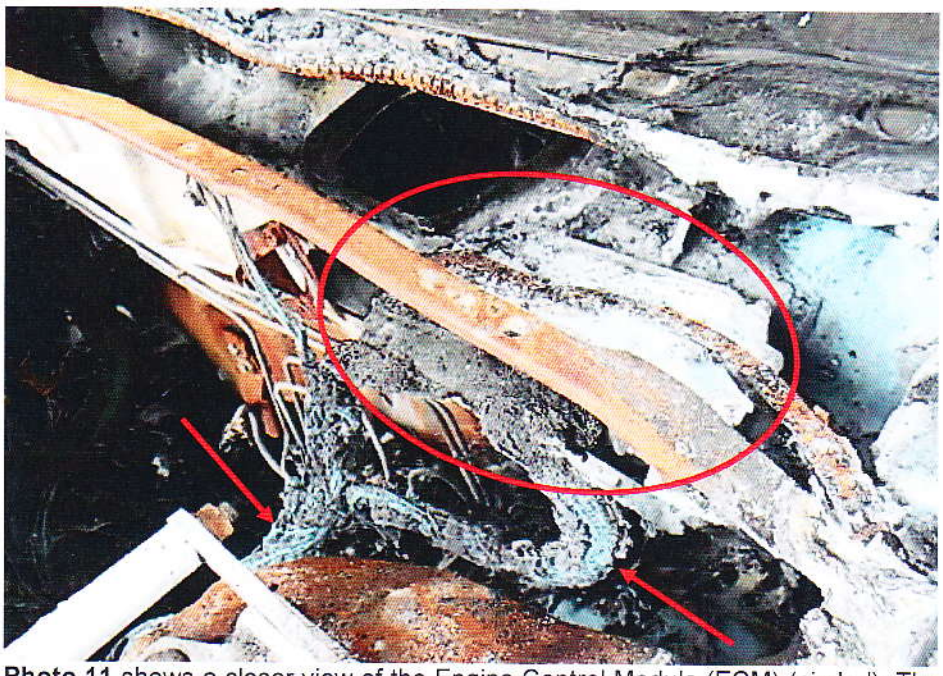

Photo 11 shows a closer view of the Engine Control Module (ECM) (circled). The wirings leading to this Engine Control Module (ECM) was found with greenish residue (arrowed) suggesting occurrence of an electrical short circuit.

11. From the Police report G/20180202/2139, which was made by one Leo Choa Hoo (herein referred to as "**Mr Leo**"), who is the registered owner of the Insured Vehicle, I note that the fire to the Insured Vehicle had started at a time when it was parked. The Insured Vehicle was driven by him and he had parked it at the carpark of Pasir Ris West Plaza (Pasir Ris Street 72) before going for lunch at the nearby coffeeshop. About an hour after he had parked the Insured Vehicle, he noticed commotion at the carpark and went to check. It was at this time that he discovered the Insured Vehicle had caught fire.

12. I manage to speak to Mr Leo on 08 February 2018 and through telephone conversation, I was able to gather further information pertaining to the incident as well as information pertaining to the history of the Insured Vehicle.

13. According to Mr Leo, on 02 February 2018 at about 1225hrs, he had parked the Insured Vehicle at deck D parking lot number 43. This was at the multi storey carpark of Pasir Ris West Plaza, Pasir Ris Street 72. After securing the Insured Vehicle with everything intact, he had gone to a coffeeshop at Pasir Ris West Plaza for his lunch. About an hour later, he noticed that there was a commotion and observed smoke coming out from the multi story carpark. He then went to take a look since he had finished his lunch and was leaving the place.

14. Upon reaching the parking lot where the Insured Vehicle was parked, he discovered that the Insured Vehicle had caught fire. By this time, the fire had already been extinguished by SCDF officers. He also noticed that police officers were at scene. Mr Leo then approached the SCDF and police officers and identified himself as the owner of the Insured Vehicle.

15. After relating the earlier events to the SCDF and police officers, Mr Leo was advised to tow the Insured Vehicle away. Arrangement was subsequently made to tow the Insured Vehicle to ComfortDelgro Engineering Pte Ltd at Ubi Road 3.

16. With regard to the history of the Insured Vehicle, I was able to gather from Mr Leo that the Insured Vehicle was purchased brand new from the local distributer more than 10 years ago, in 2006. The Insured Vehicle is registered to his name and he is the main driver. The COE of the Insured Vehicle was renewed for 5 years in 2016 with the current COE expiring in May 2021. According to Mr Leo, to the best of his recollection, there has not been any major mechanical and/or electrical problem with the Insured Vehicle apart from the usual wear and tear that a vehicle would experience.

17. Regarding the maintenance aspect, Mr Leo informed me that the last servicing carried out on the Insured Vehicle was on 22 January 2018 at his regular workshop, UE Motor located at Block 3006 Ubi Road 1 #01-334. During the last servicing the engine oil and engine oil filter were replaced. Mr Leo also informed me that there was no modification(s) and/or additional electronic or electrical component(s) fitted on the Insured Vehicle.

18. I visited the incident location on 08 February 2018, taking the police report made by Mr Leo and the further information that I was able to gather from him during our telephone conversation, as references.

19. Upon arrival, I note that the fire had occurred at the multi-storey carpark of Pasir Ris West Plaza, Block 734 Pasir Ris Street 72. Parking lot 43, which was where the Insured Vehicle was parked at the material time, was located at deck D. It was directly facing the upslope ramp from deck C to deck D. The left side of the parking lot was a pillar while the right side was 2 other parking lots. The lift lobby for deck D was also noted to be opposite and towards the right of the parking lot.

20. Slight burnt marks and burnt residual remains were found within parking lot 43. This was towards the front centre of the parking lot. The ceiling directly above the parking lot was also observed to be slightly blackened. There were however no burnt marks found on the pillar that was on the left side of the parking lot.

21. At the time of my visit, I did not observe any CCTV camera(s) around the vicinity of parking lot 43. Generally, it was noted that the Insured Vehicle was not parked at a secluded location. See photo 12 – 18 below.

Photo 12 shows the location where the Insured Vehicle had caught fire. This was at Block 734 multi storey carpark of Pasir Ris West Plaza.

Photo 13 shows a general view of parking lot 43 (arrowed). The parking lot was observed to be directly facing the upslope ramp from deck C to deck D. The left side of the parking lot was a pillar while the right side was 2 other parking lots.

Photo 14 shows a general view of parking lot 43 (arrowed). The parking lot was observed to be directly facing the upslope ramp from deck C to deck D. The left side of the parking lot was a pillar while the right side was 2 other parking lots.

Photo 15 shows a general view of parking lot 43 (yellow arrow). The parking lot was observed to be directly facing the upslope ramp from deck C to deck D. The lift lobby for deck D was also noted to be opposite and towards the right (red arrow) of the parking lot.