

Your Ref: S1M038J6
Our Ref : CS4/ASM21005245/P

31st May 2021

M/s AXA Insurance (Singapore) Pte. Ltd.

8 Shenton Way #26-01
Singapore 068811
(Motor Claims Department)

**TECHNICAL INVESTIGATION REPORT OF FIRE INCIDENT INVOLVING THE
INSURED VEHICLE SMG 5366X ON 2nd February 2021**

1. We refer to your letter dated 28th April 2021 and the instructions therein.
2. Our analysis, comments and opinions with respect to the cause of fire to the insured vehicle SMG 5366X (herein referred to as “**Insured Vehicle**”) are set out below.

Inspection of the Insured Vehicle

3. The Insured Vehicle was physically inspected on 29th April 2021 at the premises of Specialist Motor Pte Ltd located at 3018A Ubi Rd 1, #01-24/25/26, Singapore 408711.
4. A static inspection was carried out to the Insured Vehicle where the following general information was recorded:-

Vehicle Registration No.	: SMG 5366X
Make / Model	: BMW 335I CONVERTIBLE
Chassis No	: WBAWL72070JZ973977
Year of Registration	: APRIL 2009
Mileage	: N.A (wiring affected)
5. The Insured Vehicle was noted to have been involved in an accident before the fire started. The Insured Vehicle sustained fire damage that was confined to its front portion. The interior compartment, left, right and rear portion was observed to be unaffected by the fire.

6. The fire had resulted in the body parts at the front right portion of the Insured Vehicle to be burnt. This had included its front windscreen, right headlamp, bonnet, bumper and several parts inside the engine compartment were also observed to sustain heat damage. This includes the coolant fluid reservoir, brake fluid reservoir, ABS pump and its factory wiring harness. See photos 1 – 10 below.



Photo 1 shows the general view of the front portion of the Insured Vehicle at the time of our inspection. The fire damage to the Insured Vehicle was confined to its front portion. This had included its front windscreen, right headlamp, bonnet, bumper and several parts inside the engine compartment were also observed to sustain heat damage. This includes the coolant fluid reservoir, brake fluid reservoir, ABS pump and its factory wiring harness are amongst the body parts that were found to have been affected as a result of the fire.



Photo 2 shows the close-up interior view of the front portion of the Insured Vehicle at the time of our inspection. The fire damage to the Insured Vehicle was confined to its front portion. As observed its front windscreen (circled) had suffered heat and smoke damage as a result of the fire.



Photo 3 shows the close-up view of the front portion of the Insured Vehicle at the time of our inspection. The fire damage to the Insured Vehicle was confined to its front portion. As observed whitish burn marks (circled) on the surface are a result of exposure to prolonged heat intensity as a result of the fire.



Photo 3 shows the close-up view of the front portion of the Insured Vehicle at the time of our inspection. The fire damage to the Insured Vehicle was confined to its front portion. As observed whitish burn marks (circled) on the surface are a result of exposure to prolonged heat intensity as a result of the fire.



Photo 4 shows the general view of the engine compartment of the Insured Vehicle at the time of our inspection. The fire damage to the Insured Vehicle was confined to its front portion. This had included its right headlamp, bonnet, bumper and several parts inside the engine compartment were also observed to sustain heat damage. This includes the coolant fluid reservoir, brake fluid reservoir, ABS pump and its factory wiring harness are amongst the body parts that were found to have been affected as a result of the fire.

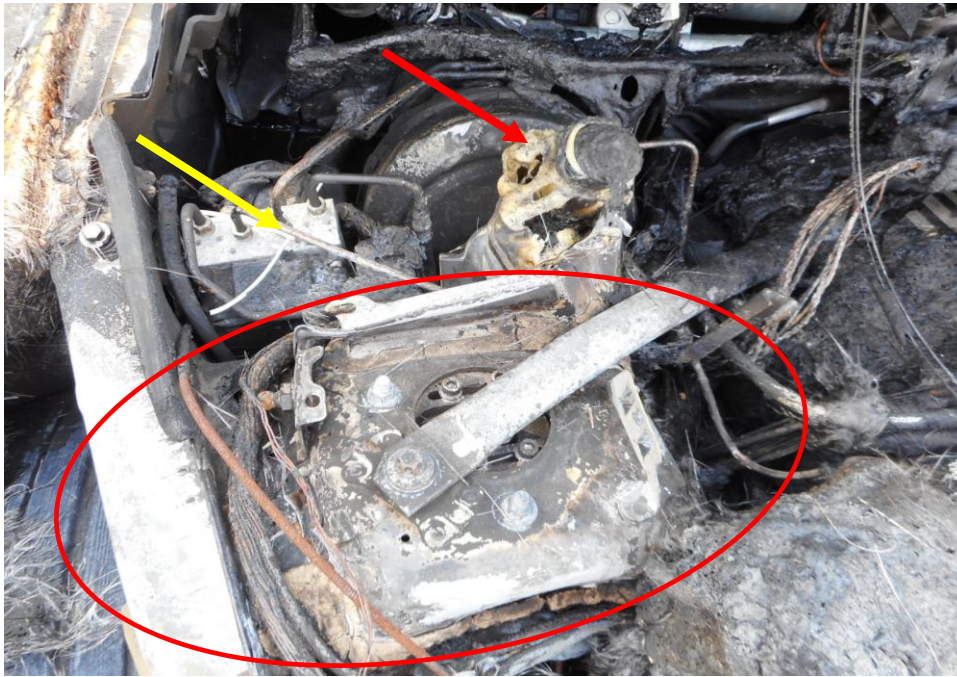


Photo 5 shows the close-up view of the front engine compartment portion of the Insured Vehicle at the time of our inspection. Its brake fluid reservoir (arrowed) and ABS pump unit was damaged as a result of the fire. As observed whitish burn marks (circled) on the surface are a result of exposure to prolonged heat intensity as a result of the fire.



Photo 6 shows the close-up view of the front engine compartment portion of the Insured Vehicle at the time of our inspection. As observed whitish burn marks (circled) on the surface are a result of exposure to prolonged heat intensity as a result of the fire.



Photo 7 shows the close-up view of the front right head lamp portion of the Insured Vehicle at the time of our inspection. The whole of the head lamp including its housing and its factory wiring harness (circled) were damaged and melted down as a result of the fire.



Photo 8 shows the right portion of the Insured Vehicle, which was observed to be unaffected by the fire.



Photo 9 shows the left portion of the Insured Vehicle, which was observed to be unaffected by the fire.



Photo 10 shows the rear portion of the Insured Vehicle, which was observed to be unaffected by the fire.

7. At the time of inspection of the Insured Vehicle, we observed a wide body kit, an aftermarket carbon fibre bonnet, set of aftermarket air filters, an additional fitted engine oil catch tank, aftermarket intercooler, aftermarket brake kit, a modified exhaust system and an additionally fitted audio amplifier on the Insured Vehicle. See photo 11-19 below.



Photo 11 shows the aftermarket wide body kit (circled) of the Insured Vehicle, which was observed to be unaffected by the fire.



Photo 12 shows the aftermarket carbon fibre bonnet (circled) of the Insured Vehicle, which was observed to be damaged by the fire.

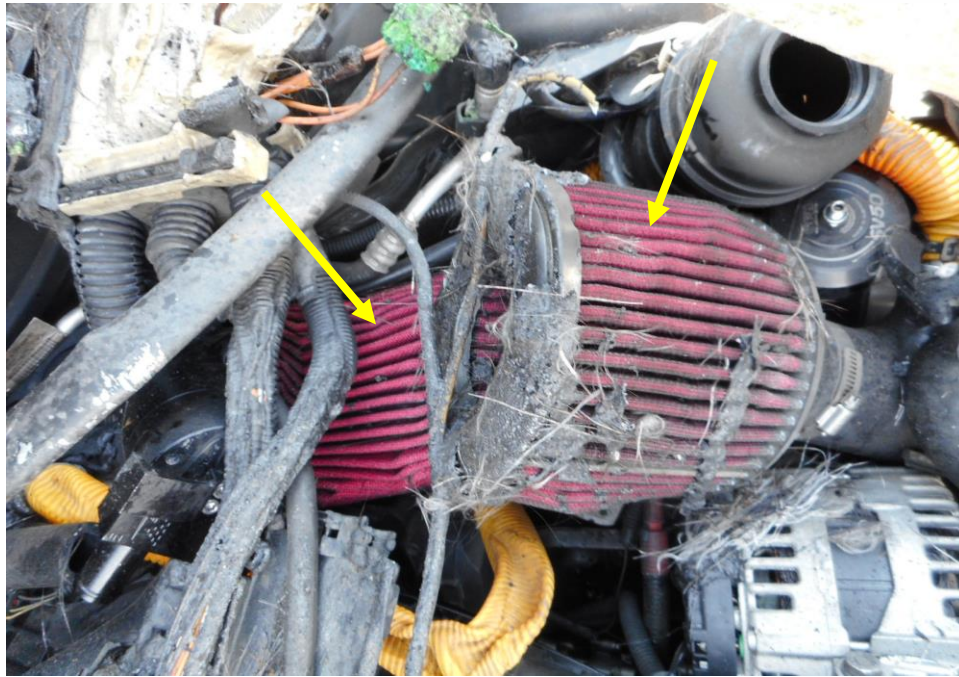


Photo 13 shows the aftermarket air filters (arrowed) of the Insured Vehicle, which was observed to be damaged by the fire.



Photo 14 shows the additional fitted engine oil catch tank (arrowed) of the Insured Vehicle, which was observed to be damaged by the accident.



Photo 15 shows an aftermarket intercooler (circled) of the Insured Vehicle, which was observed to be damaged by the accident.



Photo 16 shows an aftermarket brake kit on of the Insured Vehicle, which was observed to be unaffected by the fire.



Photo 17 shows a modified exhaust system fitted on the Insured Vehicle, which was observed to be unaffected by the fire at the time of inspection.



Photo 18 shows a general view of an additionally fitted audio amplifier system fitted at the boot of the Insured Vehicle, which was observed to be unaffected by the fire at the time of inspection.



Photo 19 shows a close up view of an additionally fitted audio amplifier system fitted at the boot of the Insured Vehicle, which was observed to be unaffected by the fire at the time of inspection.

8. I had also found the insured vehicle to be fitted with a wide body kit, which is not LTA compliant as the additional attachments protrude laterally out of the body of the Insured Vehicle. A modified exhaust system was also found, this was at the rear, the exhaust muffler of the insured vehicle. There was additional piping and welding marks joining the exhaust muffler to the tailpipes of the Insured Vehicle's exhaust system. Such exhaust system is not LTA compliant. The exhaust system fitted on the insured vehicle will enhance the overall engine performance of the insured vehicle. See photo 20 - 22 below.



Photo 20 shows the general view of the aftermarket wide body kit additional attachments (arrowed) fitted on the Insured Vehicle, which was observed to be protruding laterally out of the body of the Insured Vehicle.



Photo 21 shows the close up view of the aftermarket wide body kit additional attachments (arrowed) fitted on the Insured Vehicle, which was observed to be protruding laterally out of the body of the Insured Vehicle.

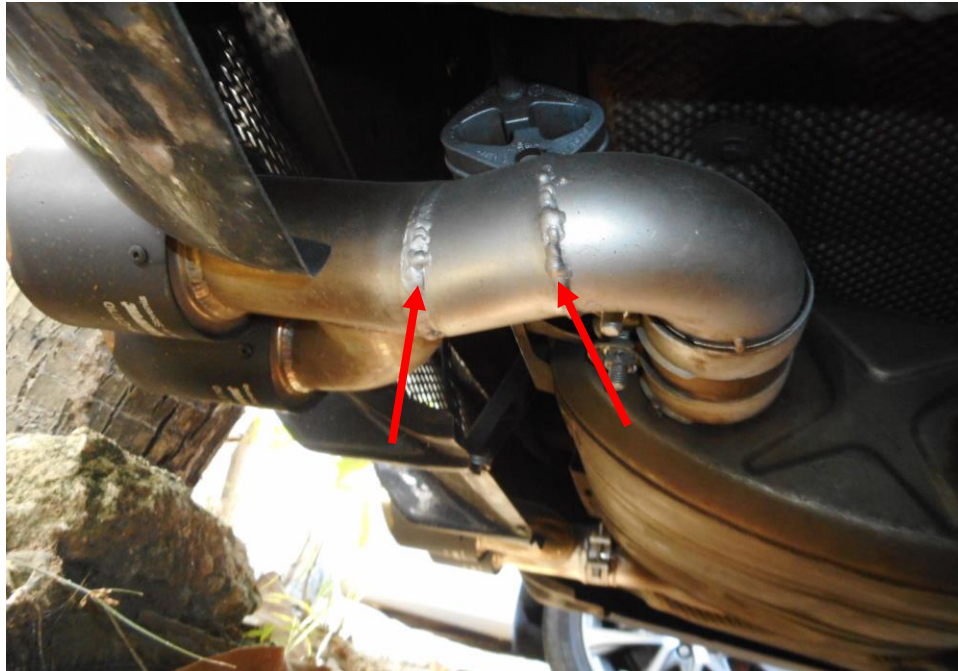


Photo 22 shows a modified exhaust system installed on the Insured Vehicle, this was at the rear, the exhaust muffer of the insured vehicle. There was additional piping and welding marks joining the exhaust muffer to the tailpipes of the Insured Vehicle's exhaust system. From my observations, the exhaust system fitted on the insured vehicle is not LTA compliant.

9. Having carried out a detailed inspection of the insured vehicle, the table below co-relates the various modifications and additionally fitted non-standard parts found on the insured vehicle with the modification guidelines stipulated by Land Transport Authority (LTA), and the effects these modifications and additionally fitted non-standard parts have with respect to the general performance of the insured vehicle.

Modification/additionally fitted non-standard part	LTA's guideline	Effect(s) on insured vehicle
Wide Body Kit	Not compliant	Additional attachments protrude laterally out of the body of the vehicle
Carbon fibre bonnet	Compliant	Cosmetic type of modification
Aftermarket air filters	Compliant	Provides improved air flow for the engine

Engine oil catch tank	Compliant	Acts as a filter for the engine oil
Aftermarket intercooler	Compliant	Improves the cooling efficiency of air entering the engine
Modified exhaust system	Not compliant. Owner does not have any approval from LTA	Overall engine performance enhanced
Audio amplifier unit	Compliant	Part of the in-car-entertainment system

Investigation and Technical Analysis

10. For this particular case, the fire appears to have been of electrical nature originated from the front right portion of the Insured Vehicle and the fire was likely caused by the impact of the accident that had damaged the headlamp and as wirings and causing them to short circuit as where the headlamp assembly with the light bulbs are located as the nature of fire damage was most severe to these particular areas. This can be determined from the burn pattern of the front right headlamp assembly components which were observed to have been partly melted from the high heat intensity and the high heat intensity burn marks (whitish burn marks) found on the metal parts around the Insured Vehicle. Rust had also developed on these metal brackets.
11. The whitish burn marks are a result of exposure to prolonged heat intensity. Rust would normally start to develop around these areas soon after a fire as prolonged exposure to high heat intensity usually causes steel/metal material body parts to be exposed to natural environmental condition. The rust that had developed on the metal brackets is an indication that the front right position of the Insured Vehicle had sustained exposure to prolonged high heat intensity. See photo 23 and 24 below.

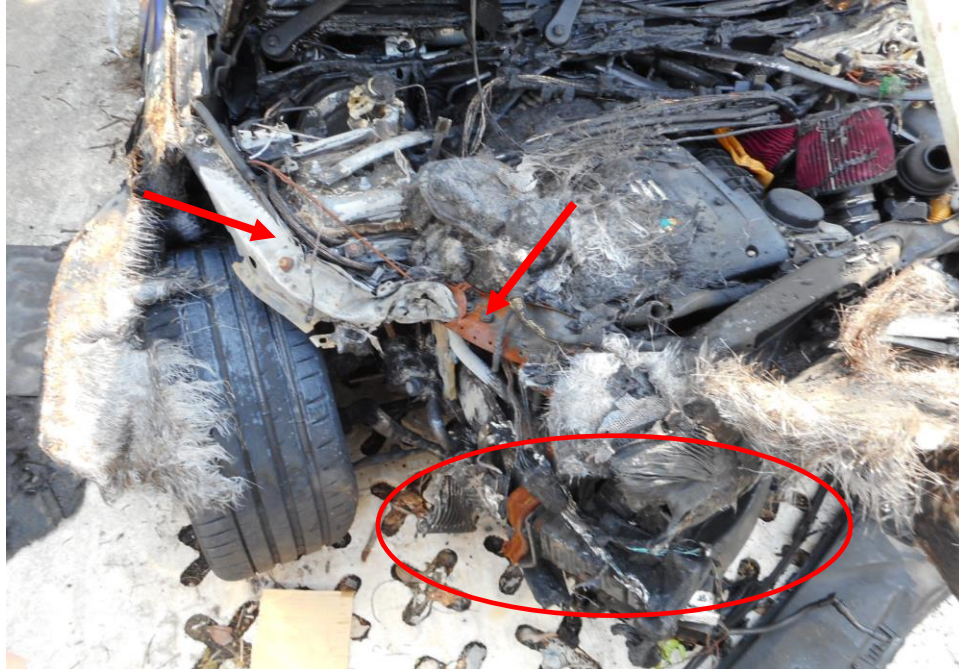


Photo 23 shows a general view of the front right headlamp assembly (circled) and the various surrounding components. The headlamp assembly and various components was observed to be melted from the high heat intensity. Rust and high intensity burn marks (whitish burn marks) development was also observed on the metal brackets (arrowed) of the Insured Vehicle.



Photo 24 shows a close up view of the front right headlamp assembly (circled) and the various surrounding components. The headlamp assembly and various components were observed to be melted from the high heat intensity. Rust and high intensity burn marks (whitish burn marks) development was also observed on the metal brackets (arrowed) of the Insured Vehicle.

12. Upon closer examination of the front right portion of the Insured Vehicle which was where the fire had likely started, we had found traces of greenish residue on the wirings leading from the fuse box to the headlamp assembly. Both the fuse box and headlamp assembly were factory fitted. 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 photos 25 - 29 below.



Photo 25 shows general view of the wirings leading from the fuse box to the headlamp assembly (circled). Both the fuse box to the headlamp assembly were factory fitted. 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.

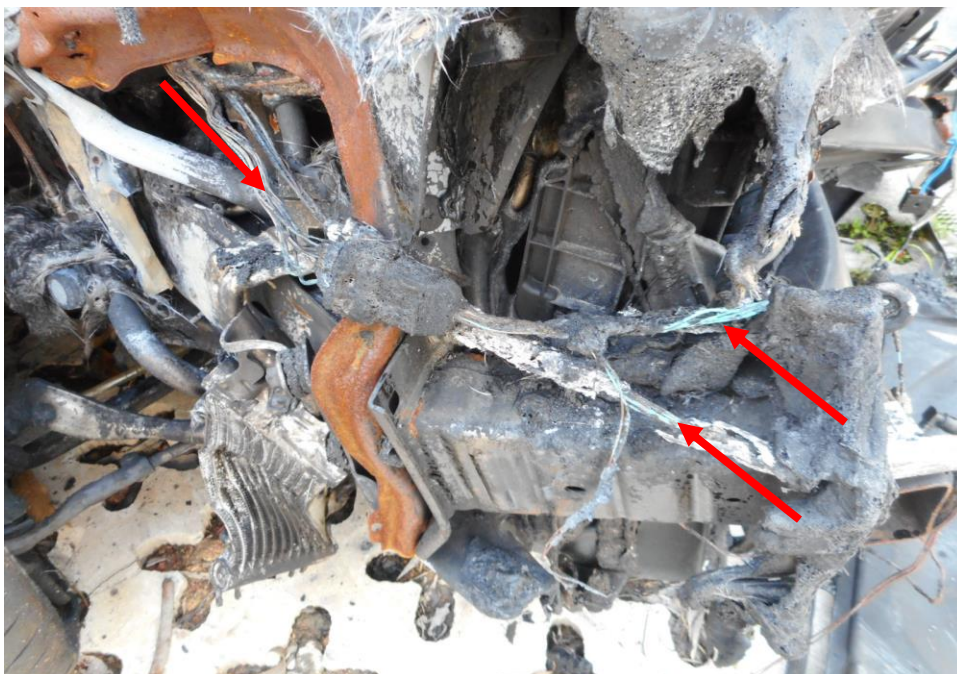


Photo 26 shows the close-up view of the headlamp assembly. Observed was greenish residue on the wiring harness leading (arrowed) from the fuse box to the headlamp assembly (arrowed). Observed was greenish residue on the wiring harness. The presence of greenish residue indicates internal heating of copper 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.



Photo 27 shows the close-up view of the headlamp assembly. Observed was greenish residue on the wiring harness leading (arrowed) from the fuse box to the headlamp assembly (arrowed). Observed was greenish residue on the wiring harness. 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.

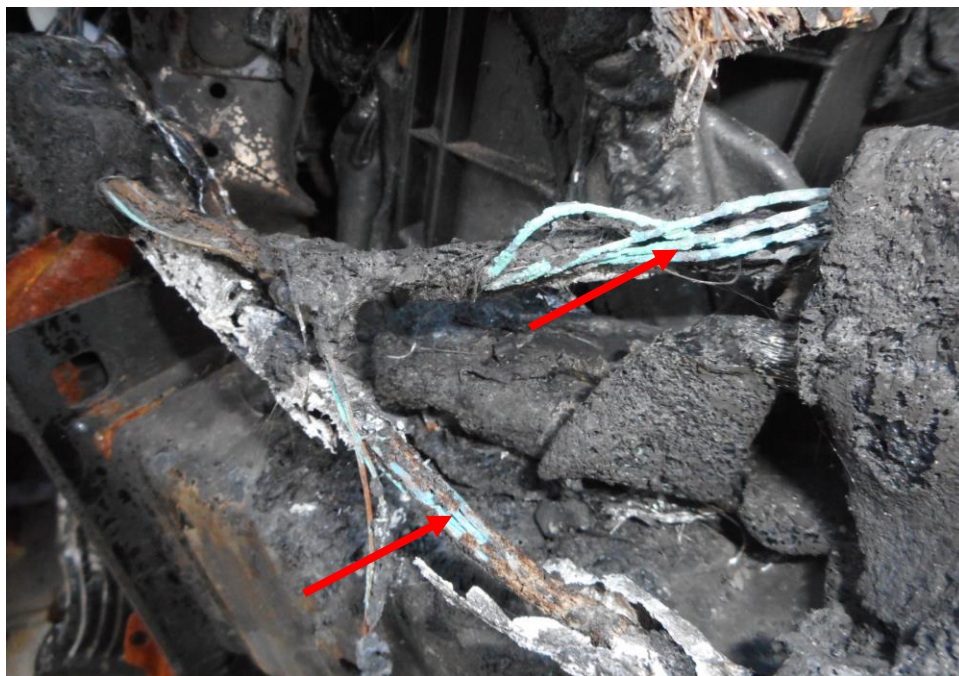


Photo 28 shows the close-up view of the headlamp assembly. Observed was greenish residue on the wiring harness leading (arrowed) from the fuse box to the headlamp assembly (arrowed). Observed was greenish residue on the wiring harness. The presence of greenish residue indicates internal heating of copper 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.

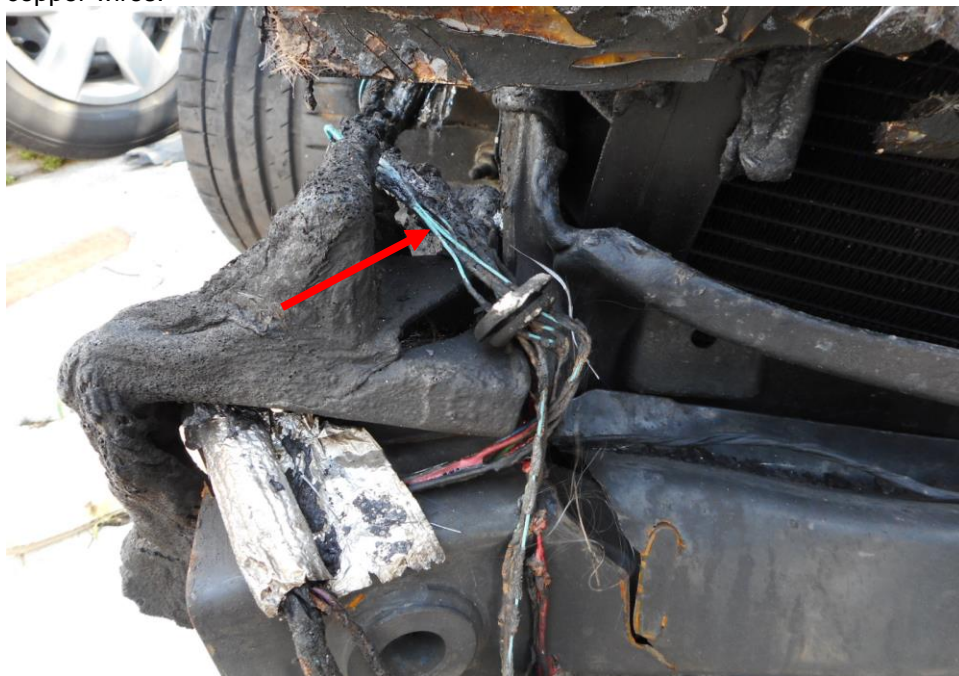


Photo 29 shows the close-up view of the headlamp assembly. Observed was greenish residue on the wiring harness leading (arrowed) from the fuse box to the headlamp assembly (arrowed). Observed was greenish residue on the wiring harness. The presence of greenish residue indicates internal heating of copper 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.

13. We managed to speak to Mr Phua on 6th May 2021 where we were able to gather further information pertaining to the incident as well as information pertaining to the history of the Insured Vehicle.
14. From the Singapore Accident Statement, which was made by Mr Phua Qing Hong, Bryan (herein referred to as **"Mr Phua"**), we note that the Insured Vehicle was involved in an accident and Mr Phua was knocked unconscious right after the accident and only woke up in the hospital. He do not recall anything that had happened after the accident.
15. According to Mr Phua, at about 0530hrs on 2nd February 2021, he was travelling home to Yishun from Joo Chiat after having supper with his friends where the Insured Vehicle was driving was involved in an accident in between and he was knocked unconscious after the impact.
16. Mr Phua mentioned that when he woke up, he was informed that the Insured Vehicle had been towed to Traffic Police Vehicle Pound by the Traffic Police during the period he was in hospital.
17. Mr Phua was informed that the Insured Vehicle was towed out from Traffic Police Vehicle Pound to Specialist Motor Pte. Ltd. He made an insurance report on 20th April 2021 at 1645 hours.
18. Mr Phua mentioned that he had not experienced any mechanical or electrical/electronic problems with the Insured Vehicle till the day of the incident. He also mentioned that there were neither warning lights displayed nor was there an abnormal rise in temperature throughout the period the Insured Vehicle prior to the fire.
19. With regards to the history of the Insured Vehicle, we were able to gather from Mr Phua that the Insured Vehicle was purchased pre-owned about 2 years back and his father Mr Phua Chee Cheong is the registered owner of the Insured Vehicle. Mr Phua informed us that he is the only driver of the Insured vehicle. Informed us that they did not keep any servicing and LTA inspection records and informed that there was no major overhaul done to the Insured Vehicle.

20. Fire due to an overheated engine was unlikely as the Insured Vehicle was driven from Joo Chiat to the accident point without any abnormalities and bring it to a complete stop. In the event if the Insured Vehicle's engine had overheated, the mechanical parts inside the engine would first seize causing the engine to stall. Mr Phua would have likely experienced engine stalling shortly rendering the Insured Vehicle undriveable.
21. The possibility of the fire being due to external factors (foreign material(s) stuck on hot surfaces, arson and sabotage amongst others) would also seem unlikely as the fire occurred as Mr Phua was driving the Insured Vehicle. The location where the Insured Vehicle caught fire was also observed to be not at a secluded location.
22. The possibility of the fire being due to electrical in nature would then seem more likely given that engine overheating and external factors would both seem unlikely. The fire being due to electrical nature is also supported by the condition of the wirings that were found leading from the fuse box to the headlamp assembly on the Insured Vehicle, which was earlier discussed in paragraph 10 above.

Others

23. We have also checked with the Traffic Police Investigation Officer and was informed that the Insured Driver had gone through a blood test by the Traffic Police and was cleared for intoxication.

Conclusion

24. Having investigated and technically analysed the damages of burnt nature to the Insured Vehicle, we are of the view that the cause of fire to the Insured Vehicle was likely caused by the accident which had damaged the electrical wirings and caused a short circuit to the wirings leading from the fuse box to the headlamp assembly that caused the fire. For this particular case, the fire had originated from the front right headlight of the Insured Vehicle.

25. We did not find any evidence which had suggested that the cause of fire to the Insured Vehicle was due to poor maintenance and/or recurring electrical problem.
26. Upon investigation, the additional wide body kit, the aftermarket carbon fibre bonnet, set of aftermarket air filters, an additional fitted engine oil catch tank, aftermarket intercooler, aftermarket brake kit, a modified exhaust system and an additional fitted audio amplifier unit on the Insured Vehicle did not have the capacity to cause a fire for this particular incident.
27. In our investigation to the list of modified items on the Insured Vehicle, we have found that the wide-body kit and modified exhaust system to be of non-LTA compliant and both falls under the not allowed category.

**Sherwin Beh***Technical Investigator***Ang Bryan Tani***AMSOE, AMIRTE, AFF SAE, M.MATAI, AFF.Inst.AEA**Senior Technical Investigator**Technical Investigation & Reconstructionist (SAE-A)*

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