

Your Ref: S9M01/10
Our Ref : CS/ASM19005417/D

04 April 2019

M/s AXA Insurance Pte Ltd
8 Shenton Way #24-01
AXA Tower
Singapore 068811
(Motor Claims Department)

**TECHNICAL INVESTIGATION REPORT OF FIRE INCIDENT INVOLVING THE
INSURED VEHICLE SGG 1769P ON 25 MARCH 2019**

1. I refer to your request dated 26 March 2019.
2. My analysis, comments and opinions with respect to the cause of fire to the insured vehicle SGG 1769P (herein referred to as "**Insured Vehicle**") are set out below.

Inspection of the Insured Vehicle

3. The Insured Vehicle was physically inspected on 28 March 2019 at the premises of M/s Progressive Car Care Pte Ltd, Block 3022A Ubi Road 1 #01-45/46, Singapore 408716.
4. A static inspection was carried out to the Insured Vehicle where the following general information was first recorded: -

Vehicle Registration No.	: SGG 1769P
Make / Model	: Toyota Wish 1.8A
Chassis No	: ZNE100300406
Year of Registration	: 2006 (May)
Mileage	: N.A (wiring affected)
5. The Insured Vehicle was noted to have sustained fire damage that was confined to its engine compartment. Most of the parts and components within the engine compartment were burnt and/or melted. This had included various rubber hoses, wiper garnish, battery, air intake duct, fuse box, brake fluid reservoir, cooling fan, radiator, intake manifold and alternator amongst others. Exteriorly, the front bonnet, front left fender and front windscreen were affected.
6. There was no modification(s) and/or electronic and/or electrical component(s) additionally fitted on the Insured Vehicle at the time of my inspection. See photo 1 – 4 below.



Photo 1 shows a general view of the front right body of the Insured Vehicle at the time of my inspection. The fire damage was confined to the engine compartment of the Insured Vehicle. The interior compartment and the rear portion of the Insured Vehicle were unaffected.



Photo 2 shows a general view of the front left body of the Insured Vehicle at the time of my inspection. The fire damage was confined to the engine compartment of the Insured Vehicle. Exterioirly, only the front bonnet, front left fender and front windscreen were affected by the incident.



Photo 3 shows a general view of the Insured Vehicle's engine compartment at the time of my inspection. Most of the parts and components within the engine compartment were burnt and/or melted. This had included various rubber hoses, wiper panel, battery, air intake duct, fuse box, brake fluid reservoir, cooling fan, radiator, intake manifold and alternator amongst others.



Photo 4 shows the interior compartment of the Insured Vehicle, which was unaffected by the incident.

Circumstance of Incident

7. From the Singapore Accident Statement, which was made by Mr Tan Leong Wah (herein referred to as "**Mr Tan**"), I note that the fire to the Insured Vehicle had started at a time when he was driving the Insured Vehicle along the upslope spiral carpark driveway of Primax Building located at 22 New Industrial Road. Mr Tan noticed smoke coming from the front bonnet of the Insured Vehicle and within a few seconds fire came out from the front bonnet area. The Insured Vehicle subsequently stalled at the second floor landing with fire coming out from its engine compartment. Some members of public assisted to extinguish the fire.
8. I spoke to Mr Tan on 03 April 2019, where 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.
9. According to Mr Tan, on 25 March 2019 at about 1020hrs, he was driving the Insured Vehicle heading to one of his suppliers' office at Primax Building, 22 New Industrial Road. He had started his journey from his home at Choa Chu Kang Street and estimates the travelling time to be approximately 30mins to 45mins. During this drive, he did not encounter any abnormality to the operating behaviour of the Insured Vehicle.
10. Upon reaching Primax Building, Mr Tan drove the Insured Vehicle from the ground floor up to the second floor carpark, which was where his supplier's office was located. The Insured Vehicle was moving up the spiral upslope driveway when he first noticed smoke coming out through the gaps surrounding the front bonnet, near to the centre part of the front windscreen. As the Insured Vehicle was on the upslope driveway, Mr Tan decided to continue driving the Insured Vehicle up to the second level in order not to obstruct traffic.
11. Upon reaching the driveway in between the second level and the third level, Mr Tan saw flames coming out from the same area where he first saw smoke and almost instantly, the engine of the Insured Vehicle stalled. Mr Tan then alighted and called SCDF for assistance, by which time the fire had grown bigger. Some members of public, including the staff at his supplier's office came to assist by using fire extinguishers and fire hoses to put out the fire. They had sprayed at the front bonnet area of the Insured Vehicle and eventually manage to extinguish the fire before the arrival of SCDF officers.

12. With regard to the history of the Insured Vehicle, I was informed by Mr Tan that the Insured Vehicle was purchased about 1 to 2 years ago from a used car dealer. The COE of the Insured Vehicle was extended for 5 years prior to the purchase. The registered owner of the Insured Vehicle is his niece, but he is the main driver as his niece is a non-driver. All maintenance and servicing aspect of the Insured Vehicle are handled by him.
13. Mr Tan informed me that as far as he can recall, he has not experienced any major electrical and/or mechanical issue with the Insured Vehicle apart for the usual fair, wear and tear items like the battery and tyres. The last servicing was carried out on 14 March 2019 where the engine oil and engine oil filter were replaced. Mr Tan paid cash and did not collect any receipt hence he is unable to provide me any document(s) relating to the servicing of the Insured Vehicle.
14. During my conversation with Mr Tan, he informed that he took some photographs whilst at the incident scene. There was also a video recording taken by one of the supplier's staff before the fire was extinguish. These were duly forwarded to me for my review.

Incident Scene Photographs

15. The photographs taken by Mr Tan had showed the Insured Vehicle stopped on a sheltered driveway, a short distance before an upslope ramp, with the fire already extinguished. Generally, I note that the damage of fire nature to the Insured Vehicle, as seen from the photographs provided, was similar to what I had observed during my inspection of the Insured Vehicle.
16. My review of the video recording taken at the incident scene showed the Insured Vehicle with dense smoke covering the Insured Vehicle and its immediate surrounding. This was before the fire was extinguished. Flames could be seen at the frontal body of the Insured Vehicle, slightly towards the left from the centre.
17. In general, the observations gathered from my review of the photographs and video recording that were provided by Mr Tan at the incident scene had corresponded to the description of events that he had related to me during our conversation on 03 April 2019. See photo 5 - 7 below.



Photo 5 shows a general view of the Insured Vehicle at the incident with fire already extinguished. The Insured Vehicle could be seen stopped on a sheltered driveway, a short distance before an upslope ramp. In general, the observations gathered from my review of the photographs provided by Mr Tan at the incident scene had corresponded to the description of events that he had related to me during our conversation on 03 April 2019.

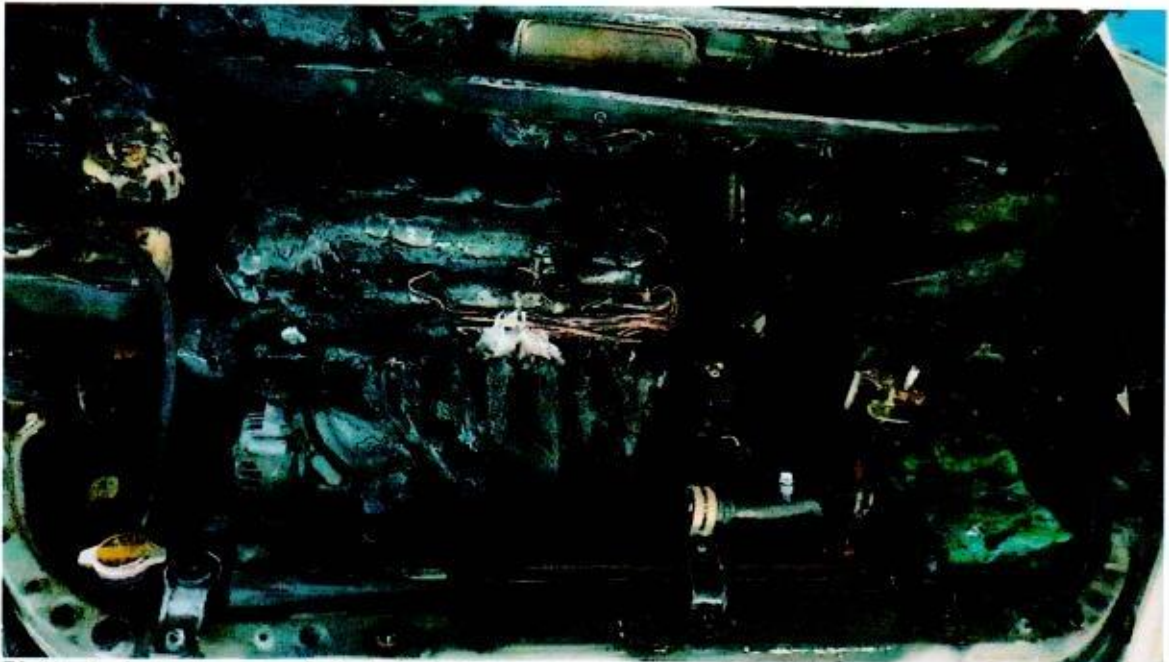


Photo 6 shows a general view of the Insured Vehicle's engine compartment. The damage of fire nature to the Insured Vehicle, as seen from the photographs provided, was similar to what I had observed during my inspection of the Insured Vehicle.



Photo 7 shows a screenshot from the video recording that was provided to me by Mr Tan. My review of the video recording taken at the incident scene showed the Insured Vehicle with dense smoke covering the Insured Vehicle and its immediate surrounding. Flames could be seen at the frontal body of the Insured Vehicle, slightly towards the left from the centre.

Investigation And Technical Analysis

18. Given the circumstance of incident described by Mr Tan, the fire had occurred while the Insured Vehicle was being driven/engine in operation. Common causes of fire arising from a vehicle that is being driven and/or with its engine in operation include engine overheating, leakage of fluid onto hot surfaces or electrical nature. For this case, the physical condition of the wrings as seen during my inspection of the Insured Vehicle indicates that the cause of fire was due to electrical in nature. The following paragraphs 19 to 22 discusses the physical evidence relating to this, and a brief explanation of the occurrence.
19. Firstly, the fire can be established to have originated within the engine compartment of the Insured Vehicle, given the single area of fire damage that the Insured Vehicle had sustained (interior compartment and rear portion unaffected). The burn mark found at a single area at the top side of its front bonnet further indicates that the fire had originated somewhere around the rear centre of the engine compartment.

20. Following the characteristic of heat rising upwards, high heat intensity burn marks (whitish burn marks) were correspondingly found on the underside of the Insured Vehicle's front bonnet, directly below the area where the burn mark was formed on the top side of the front bonnet. These whitish burn marks are a result of exposure to prolong 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. See photo 8 & 9 below.

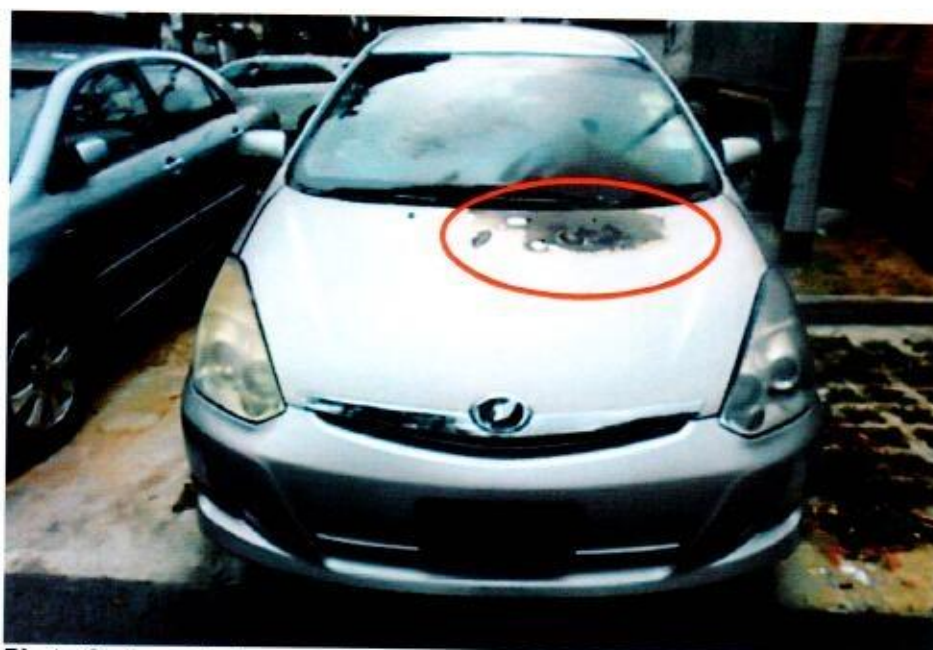


Photo 8 shows the burn mark (circled) that was formed at a single area on the top side of the Insured Vehicle's front bonnet. Given this single burn mark on the front bonnet and the physical evidence that only the parts and components within the engine compartment were burnt and/or melted, the fire can be established to have originated within the engine compartment of the Insured Vehicle, somewhere around the rear centre of the engine compartment.

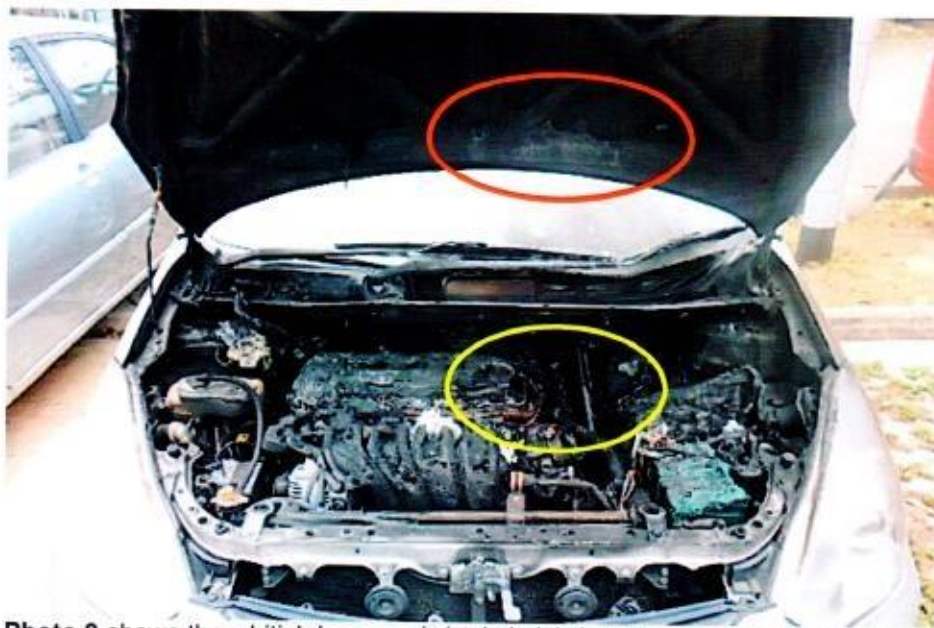


Photo 9 shows the whitish burn mark (red circle) that was found on the underside of the Insured Vehicle's front bonnet, directly under the area where the single burn mark was formed on the top side of the front bonnet. Such whitish burn marks are a result of exposure to prolonged heat intensity. Following the characteristic of heat rising upwards, the fire to the Insured Vehicle can be established to have originated around the rear centre of the engine compartment (yellow circle).

21. My examination of the rear centre area of the engine compartment during my inspection of the Insured Vehicle revealed several stretches of wirings that were completely burned to its bare copper state. These wirings were original wire harnesses of the Insured Vehicle and were all located at/or around the immediate vicinity of the rear centre area. The bright reddish colour of the copper wires suggest that the wirings were exposed to high heat. Such condition normally indicates internal heating of copper wires which is a sign of an electrical short circuit occurring. This would then appear to suggest that the cause of fire to the Insured Vehicle was due to electrical in nature. See photo 10 – 12 below.
22. To further explain briefly, heat from engine operation could cause the rubber insulation of the wires and/or wiring harness within the engine compartment to lose its flexibility and become hardened after a prolonged period of time. The hardened rubber insulation may then become brittle and break off bits by bits, exposing live wires that may come into contact with each other and/or the metal body of the vehicle, creating sparks that could ignite a fire. Unlike countries with different seasons, the hot local climate increases the heat within the engine compartment of locally used vehicles, and this could accelerate the hardening of rubber insulations, and any other rubber material parts within the engine compartment.



Photo 10 shows the centre area of the Insured Vehicle's engine compartment. Several stretches of wirings (arrowed) at/or around the immediate vicinity of the rear centre area were found to be burnt to its bare copper state. The bright reddish colour of the copper wires suggest that the wirings were exposed to high heat. Such condition normally indicates internal heating of copper wires which is a sign of an electrical short circuit occurring.



Photo 11 shows the wirings at the rear centre area of the Insured Vehicle's engine compartment. Several stretches of wirings (arrowed) at/or around the immediate vicinity of the rear centre area were found to be burnt to its bare copper state. Such condition normally indicates internal heating of copper wires which is a sign of an electrical short circuit occurring. These wirings were all original wiring harnesses of the Insured Vehicle.



Photo 12 shows the wirings at the rear centre area of the Insured Vehicle's engine compartment, which was where the fire to the Insured Vehicle had originated. Several stretches of wirings at/or around the immediate vicinity of the rear centre area were found to be burnt to its bare copper state, an indication of an electrical short circuit occurring. These wirings were all original wiring harnesses of the Insured Vehicle.

23. My checks with both local and international bodies and associations revealed that at the time of writing this report, there was no manufacturer recall of similar make and model vehicle as the Insured Vehicle. See search result below obtained from LTA.

Enquiry on Vehicle Recall - Vehicle Specific

* ONLY INFORMATION ON VEHICLE RECALLS SUBMITTED FROM 9 APRIL 2007 IS AVAILABLE

Vehicle Owner Particulars	
Owner ID Type:	Singapore NRIC
Owner ID:	4620Z
Vehicle Details	
Vehicle Registration number:	SGG1769P ←
Make:	TOYOTA
Vehicle Model:	WISH 1.8 A
Engine No.:	1ZZ2537935
Chassis No.:	ZNE100300406
Recall Details	
No Recall Detail records	←

Conclusion

24. Having investigated and technically analysed the damages of burnt nature to the Insured Vehicle, I am of the view that the cause of fire to the Insured Vehicle was of electrical in nature. For this particular case, the fire had originated along the wirings inside the engine compartment, at/or around the immediate vicinity of the rear centre of the engine compartment. The wirings were all original factory fitted wirings.
25. I 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. There were no modification(s) or additional electronic and/or electrical component(s) fitted on the Insured Vehicle at the time of my inspection of the Insured Vehicle.
27. My investigations also revealed that at the time of writing this report, there is no manufacturer recall of similar make and model vehicle as the Insured Vehicle.


Ang Bryan Tani

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