

Your Ref: DF19HO00066
Our Ref : CI/EQI19017794/D

07 October 2019

EQ Insurance Company Ltd
5 Maxwell Road #17-00
Tower Block MND Complex
Singapore 069110
(Motor Claims Department)

**TECHNICAL INVESTIGATION REPORT OF FIRE INCIDENT INVOLVING THE
MOTOR CAR SJW 2052Y ON 28 AUGUST 2019**

1. I refer to your request dated 09 September 2019.
2. My analysis, comments and opinions with respect to the cause of fire to the motor car SJW 2052Y (herein referred to as "**Motor Car**") are set out below.

Inspection of the Motor Car

3. The Motor Car was physically inspected on 13 September 2019 at the roof top carpark of 2 Kaki Bukit Avenue 2, Kaki Bukit Auto Hub, Singapore 417921.
4. A static inspection was carried out to the Motor Car where the following general information was recorded: -

Vehicle Registration No.	: SJW 2052Y
Make / Model	: Proton Exora 1.6L AT M-Line
Chassis No	: PL1FZ6YRRAF028000
Year of Registration	: 2010 (March)
Mileage	: N.A (battery and wirings affected)

5. The Motor Car was noted to have sustained fire damage that was confined to its frontal portion. The engine compartment of the Motor Car had sustained moderate damage of burnt nature while the interior compartment was observed to be partially burnt and/or melted at the front area.
6. The fire had resulted in the body parts at the frontal portion of the Motor Car to be burnt. This had included its front bumper, front bonnet, front fenders, front support panel, front grille, front headlamps, front windscreen, front dashboard, plastic trims and roof upholstery amongst others. The rear portion of the Motor Car was unaffected by the fire. See photo 1 – 4 below.



Photo 1 shows a general view of the front right body of the Motor Car at the time of my inspection. The fire damage to the Motor Car was confined to its frontal portion. Its engine compartment and interior compartment had sustained damage of burnt nature whilst its rear portion was unaffected. Its front bumper, front bonnet, front grille and front right headlamp 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 body of the Motor Car at the time of my inspection. The fire damage to the Motor Car was observed to be confined to its frontal 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 Motor Car at the time of my inspection. The engine compartment of the Motor Car was observed to have sustained moderate damage of burnt nature. The battery, fuse box, air intake, various piping and hoses were amongst the parts within the engine compartment that were burnt and/or melted as a result of the fire.



Photo 4 shows the interior compartment of the Motor Car, which was observed to be partially burnt and/or melted at the front area. The front windscreen, front dashboard, plastic trims 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 Motor Car, I did not find any additionally fitted electronic and/or electrical component(s) on the Motor Car. There was also no modification(s) fitted on the Motor Car.

Circumstance of Incident

8. From the Police Report G/20190828/2058, which was made by one Mohamed Ali Bin Abidin (herein referred to as "**Mr Mohd Ali**"), I note that the fire to the Motor Car had occurred whilst the Motor Car was in the possession of Hup Soon Batteries and Auto Services (herein referred to as "**Hup Soon Batteries**"). On 28 August 2019 at about 0955hrs, Mr Mohd Ali received a telephone call from Hup Soon Batteries informing him that the Motor Car's engine caught fire and that the fire was put out by SCDF officers. When he arrived at the premise of Hup Soon Batteries, at No. 2 Kaki Bukit Avenue 2 #01-15, he discovered that the Motor Car was badly burnt. In the same Police Report, I also note that prior to the fire, Mr Mohd Ali had sent the Motor Car to Hup Soon Batteries on 27 August 2019 for repairs.
9. Since the fire to the Motor Car had occurred at the premise of Hup Soon Batteries, I had hence sought further information pertaining to the incident from one Alex Lee (herein referred to as "**Mr Alex**"), the director of Hup Soon Batteries.
10. According to Mr Alex, the Motor Car arrived at Hup Soon Batteries on 27 August 2019 for repair works due to engine starting issue. Technicians from Hup Soon Batteries checked and diagnosed the issue as starter motor malfunction. The starter motor was subsequently removed from the Motor Car and sent for repairs. Upon completion of the repair, the starter motor was re-fitted, and the Motor Car's engine was able to start. The Motor Car was then left within the premise of Hup Soon Batteries pending other work.
11. On 28 August 2019 at about 0200hrs, Mr Alex received a telephone call from Police Officers informing him that there was a motor vehicle inside the premise that had caught fire. Upon arriving at Hup Soon Batteries at about 0300hrs, he observed that the Motor Car was burnt at its frontal portion. By this time, the fire was already extinguished and SCDF fire investigator was at scene. Apart for some slight damage to the ceiling due to heat and smoke, there was no other significant damage to other motor vehicle(s) that were parked inside the premise and/or to other property/equipment inside Hup Soon Batteries at that time.

12. Mr Alex informed me that CCTV cameras fitted inside the premise of Hup Soon Batteries had recorded the events at the material time and upon my request, the footage captured was forwarded to me for review.

Video Footage

13. The video footage provided had showed the events before the fire, the events during the fire and the events after the fire. Upon reviewing the video footage, I had observed that the Motor Car was parked inside the premise of Hup Soon Batteries with its front bonnet lifted, before the fire. There was also no one inside the premise just before the fire.
14. From the time stamp shown on the video footage, on 28 August 2019 at about 0124hrs, a flame was first seen at the rear of the Motor Car's engine compartment, slightly towards the left from the rear centre. Very quickly, the flame turned into a fire and engulfed the entire engine compartment of the Motor Car but did not spread to the immediate surroundings of the Motor Car. SCDF officers arrived and managed to extinguish the fire. See photo 5 – 9 below showing screenshots extracted from the video footage.



Photo 5 shows the premise of Hup Soon Batteries (screenshot from video footage retrieved from a CCTV camera inside the premise of Hup Soon Batteries). The Motor Car (arrowed) could be seen parked inside the premise of Hup Soon Batteries with its front bonnet lifted, before the fire. There was also no one inside the premise just before the fire. This was on 28 August 2019 at about 0123hrs.



Photo 6 shows the premise of Hup Soon Batteries (screenshot from video footage retrieved from a CCTV camera inside the premise of Hup Soon Batteries). At about 0124hrs, a flame (arrowed) was first seen at the rear of the Motor Car's engine compartment, slightly towards the left from the rear centre. At this point in time, there was no one inside the premise. This would indicate that the flame at the rear of the Motor Car's engine compartment had self-ignite.



Photo 7 shows the premise of Hup Soon Batteries (screenshot from video footage retrieved from a CCTV camera inside the premise of Hup Soon Batteries). It was observed that the flame that was first seen at the rear of the Motor Car's engine compartment had turned into a fire and engulfed the entire engine compartment of the Motor Car but did not spread to the immediate surroundings of the Motor Car.

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Photo 8 shows the premise of Hup Soon Batteries (screenshot from video footage retrieved from a CCTV camera inside the premise of Hup Soon Batteries). SCDF officers attending and putting out the fire before it could spread to the surroundings.



Photo 9 shows the premise of Hup Soon Batteries (screenshot from video footage retrieved from a CCTV camera inside the premise of Hup Soon Batteries). From the video footage, there appears to be no damage to other motor vehicle(s) that were parked inside the premise and/or to other property/equipment inside Hup Soon Batteries at that time.

Investigation and Technical Analysis

15. Given the circumstance of incident as seen from the video footage, the fire had occurred while the Motor Car was parked, not utilized/driven. Common causes of fire arising from a vehicle that was parked with its engine switched off are fire due to external factor (arson etc) or fire due to electrical in nature.
16. For this case, the video footage had showed that there was no one in the premise of Hup Soon Batteries just before the Motor Car caught fire. Generally, there was no abnormal event seen ie no one walked by or walked near to the Motor Car etc. The Motor Car was basically untouched before the fire. Hence it can be established that external factor was not the cause of fire to the Motor Car.
17. Since external factor was not the cause of fire, then fire due to electrical in nature would be the primary cause. In fact, the information gathered during the course of my investigations and also the condition of the wirings as seen during my inspection of the Motor Car supports the fire to the Motor Car being due to electrical in nature. The following paragraphs 18 to 20 discusses this aspect.
18. Firstly, the fire was observed to have self-ignited from within the engine compartment of the Motor Car. This was determined from the first sight of flame on the Motor Car that was seen from the video footage. Refer to photograph 6 above.
19. Upon my examination of the rear of the Motor Car's engine compartment, , which was where the flame was first seen, I had found greenish residue on several stretches of original factory fitted wirings. 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 indicates that the cause of fire to the Motor Car was due to electrical in nature. See photo 10 – 12 below.

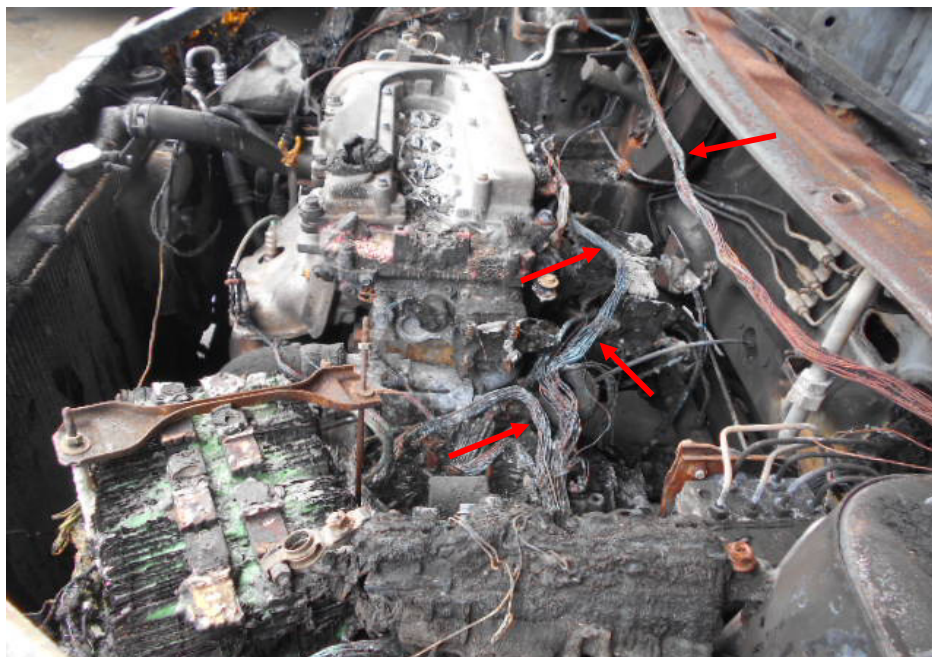


Photo 10 shows the wirings inside the engine compartment of the Motor Car. Upon my examination of the rear of the engine compartment, which was where the flame was first seen, I had observed greenish residue on several stretches of wirings (arrowed). These wirings were originally fitted wirings. The presence of such greenish residue suggests occurrence of an electrical short circuit.



Photo 11 shows a closer view of the stretch of wirings with greenish residue (arrowed). The wirings were originally fitted wirings located at the rear of the Motor Car's engine compartment. The 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.

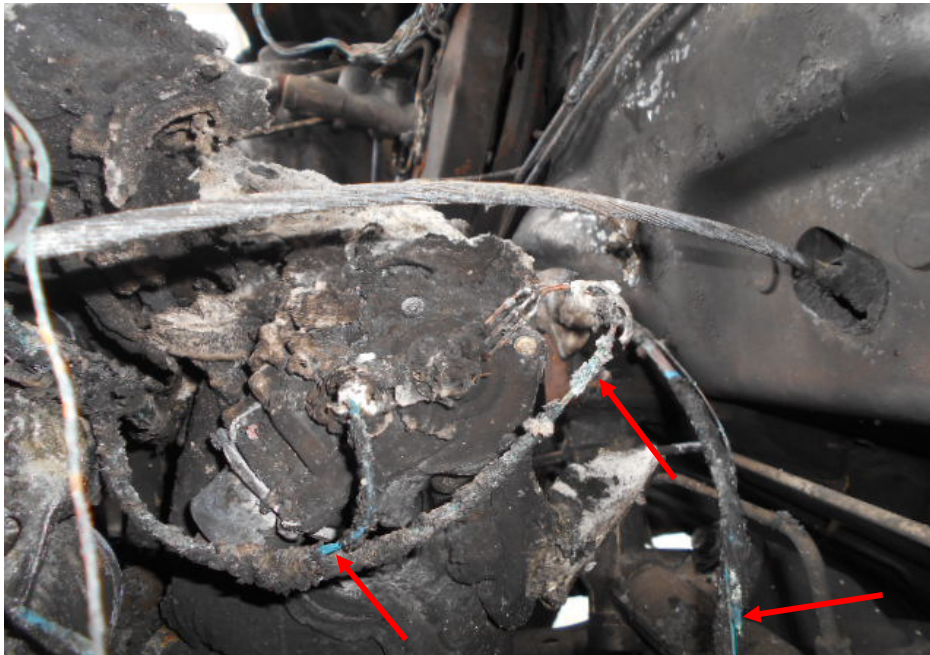


Photo 12 shows a closer view of another stretch of wirings with greenish residue (arrowed). The wirings were originally fitted wirings. The presence of such greenish residue suggests occurrence of an electrical short circuit.

20. For a brief technical explanation, although the engine of the Motor Car was switched off at the material time of incident, some electrical current would still be flowing within the electrical system as several electrical and/or electronic components on the Motor Car would require current to remain in operation and/or in standby mode. These components may include the alarm system, clock, radio and cabin light amongst others. In other words, even if the engine of a vehicle is switched off, it may still be possible for an electrical short circuit to occur.
21. From the information gathered during the course of my investigations, the Motor Car was initially sent to Hup Soon Batteries for repair due to engine starting issue. Technicians from Hup Soon Batteries checked and diagnosed the issue as starter motor malfunction. The starter motor was subsequently removed, repaired and re-fitted on the Motor Car. The starter motor was located at the rear of the engine compartment, in the vicinity of where the flame was first seen on the Motor Car (refer to photograph 13 below). Factoring these into consideration, together with my technical analysis of the fire being of electrical in nature, it would appear that the fire could have possibly arisen from an electrical malfunction of the Motor Car's starter motor.



Photo 13 shows a general view of where the starter motor of the Motor Car is located. This was at the rear of the engine compartment (arrowed), in the vicinity of where the flame was first seen on the Motor Car.

22. 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 Motor Car. 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:	260D
Vehicle Details	
Vehicle Registration number:	SJW2052Y ←
Make:	PROTON
Vehicle Model:	EXORA 1.6L AT (M-LINE) ABS D/AB 2WD 5DR
Engine No.:	S4PHQG9484
Chassis No.:	PL1FZ6YRRAF028000
Recall Details	
No Recall Detail records ←	

Screenshot 1 shows the LTA search result regarding the manufacturer recall campaign involving the Motor Car. There was no recall campaign involving the Motor Car.

Conclusion

23. Having investigated and technically analysed the damages of burnt nature to the Motor Car, I am of the view that the cause of fire to the Motor Car was of electrical in nature. For this particular case, the fire had originated along the wirings around the rear of the engine compartment. The wirings were original factory fitted wirings and could have possibly arose from an electrical malfunction of the Motor Car's starter motor.
24. There was no modification(s) or additional electronic and/or electrical component(s) fitted on the Motor Car at the time of my inspection.
25. 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 Motor Car.

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