

Your Ref: 77212 /EG
Our Ref :CS/DAI18010248/D

12 June 2018

M/s Direct Asia Insurance (Singapore) Pte Ltd

88 South Bridge Road
Singapore 058716
(Motor Claims Department)

TECHNICAL INVESTIGATION REPORT OF FIRE INCIDENT INVOLVING THE INSURED VEHICLE SJU 409B ON 03 JUNE 2018

1. I refer to your request dated 04 June 2018.
2. My analysis, comments and opinions with respect to the cause of fire to the insured vehicle SJU 409B (herein referred to as "**Insured Vehicle**") are set out below.

Inspection of the Insured Vehicle

3. The Insured Vehicle was physically inspected on 05 June 2018 at the premises of M/s Ah Lim Motor Company, 10 Ang Mo Kio Industrial Park 2A #01-09, AMK Autopoint, Singapore 568047.
4. A static inspection was carried out to the Insured Vehicle where the following general information was recorded:-

Vehicle Registration No.	: SJU 409B
Make / Model	: Alfa Romeo 159 2.2JTS Selespeed
Chassis No	: ZAR93900007257420
Year of Registration	: 2009 (November)
Mileage	: N.A (wiring affected)

5. The Insured Vehicle was noted to have sustained severe fire damage that was confined to its frontal body. Its engine compartment was observed to have been extensively burnt. The dashboard and upholstery at the front area of the interior compartment were also partially affected.
6. The parts at the frontal body of the Insured Vehicle that were observed to have been burnt and/or melted as a result of the fire had included its front bumper, front fenders, front bonnet, front headlamps, front grille and front windscreen amongst others. Parts inside the engine compartment like the radiator, intake manifold, air duct, cooling fan, hoses and pipes amongst others were all burnt and/or melted as a result of the incident. See photo 1 – 4 below.



Photo 1 shows a general view of the front right body of the Insured Vehicle at the time of inspection. The Insured Vehicle was observed to be severely burnt at its frontal body. 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 burnt as a result of the fire.



Photo 2 shows a general view of the front left body of the Insured Vehicle at the time of inspection. The Insured Vehicle was observed to be severely burnt at its frontal body. Its front bumper, front left fender, front left headlamp, front bonnet and front windscreen were amongst the body parts that were found to have been burnt as a result of the fire.



Photo 3 shows the engine compartment of the Insured Vehicle at the time of inspection. Almost all the parts inside the engine compartment were observed to be burnt and/or melted as a result of the fire. These parts had included its radiator, air condenser, cooling fan, intake manifold, fuse box, battery, air duct, hoses and pipes amongst others.



Photo 4 shows the interior compartment of the Insured Vehicle, which was affected at the front area. The dashboard and upholstery were amongst the parts in the interior compartment that were observed to be partially melted/burnt.

7. I did not find any modification(s) and/or additional electronic and/or electrical component(s) fitted on the Insured Vehicle at the time of my inspection.

Circumstance of Incident

8. From the police report G/20180604/2046, which was made by one Tan Tong Eng (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. Mr Tan had first seen smoke coming out from the front bonnet after he had stopped the Insured Vehicle at the traffic junction of Upper Serangoon Road and Lorong Low Koon due to red traffic light signal.
9. I manage to speak to Mr Tan on 06 June 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.
10. According to Mr Tan, on 03 June 2018 at about 2000hrs, he was driving the Insured Vehicle heading back to his home at Block 18 Eunos Crescent. His wife and his son were on board the Insured Vehicle and they were returning home after having dinner at Yio Chu Kang area.
11. Mr Tan brought the Insured Vehicle to a complete stop on the second lane from the extreme right at the junction of Upper Serangoon Road and Lorong Low Koon due to red traffic light signal. Upon stopping, he noticed greyish smoke coming out from the left side of the front bonnet and simultaneously the Insured Vehicle became jerky. He immediately turned off the engine of the Insured Vehicle and told his wife and son to alight from the Insured Vehicle.
12. The three of them then walked towards the back of the Insured Vehicle. By which time, Mr Tan noticed flames coming out from the frontal portion of the Insured Vehicle. However, he was not sure of the exact area where the flames were coming out from as he was standing at the back of the Insured Vehicle, a distance away. Mr Tan then called SCDF for assistance.
13. Whilst waiting for SCDF personnel to arrive, a SBS bus had stopped and the bus captain had attempted to extinguish the flames by using the fire extinguisher from the bus. According to Mr Tan, the flames was put out for a short while but subsequently came back again, engulfing the entire frontal portion of the Insured Vehicle. SCDF personnel eventually arrive and manage to completely extinguish the fire.

14. After relating the earlier events to the SCDF personnel and the police officers who had attended to the incident scene, Mr Tan was advised to tow the Insured Vehicle away. Arrangement was subsequently made to tow the Insured Vehicle to Ah Lim Motor Company at Ang Mo Kio.
15. With regard to the history of the Insured Vehicle, I was able to gather from Mr Tan that he is the registered owner and main driver of the Insured Vehicle. He purchased the Insured Vehicle second hand about 7 years ago, in 2011. Initially, the Insured Vehicle was maintained and serviced at the local agent distributor as he had bought an extended warranty package. Upon expiry of the package, the Insured Vehicle was maintained and serviced at several other workshops. The last servicing was on February 2018 at a workshop in Kaki Bukit area. Mr Tan was not able to produce any documents relating to the servicing aspect as he does not keep any receipts after making payment for the servicing.
16. Mr Tan informed me that there is no modification and/or electrical components fitted on the Insured Vehicle and as far as he can recall, he has not experienced any major mechanical and/or electrical problem with the Insured Vehicle apart for the usual wear and tear problems that a vehicle would experience.
17. According to Mr Tan, on the day of the incident, the Insured Vehicle was not utilized and parked at the carpark of his home till about 1800hrs or thereabouts when he drove the Insured Vehicle to Yio Chu Kang area for dinner. Mr Tan estimates that the Insured Vehicle was parked at Yio Chu Kang for about 45 minutes before he started driving the Insured Vehicle home. He further estimates the time driving from Yio Chu Kang area to the incident location to be about 10 minutes. Mr Tan had taken some photographs and videos during his time at the incident location and these were forwarded to me for review.

Investigation and Technical Analysis

18. The photographs and videos provided to me had showed the Insured Vehicle stopped just before a traffic light junction with smoke coming out from its frontal portion. Flames were subsequently seen also at its frontal portion. Upon further examination of the photographs and videos, I had noted that there was no unusual foreign material(s) and/or object(s) on the ground in the immediate area of where the Insured Vehicle had stopped. The damage of burnt nature to the Insured Vehicle immediately after the fire was put out had corresponded to the damages as seen by me during my inspection of the Insured Vehicle.

19. In general, the observations gathered from my review of the photographs and videos that were taken by Mr Tan at the incident scene had corresponded to his description of the events when I spoke to him on 06 June 2018. See photo 5 – 7 below.



Photo 5 shows the Insured Vehicle at the incident location with smoke emitting out from its frontal portion. There was no unusual foreign material(s) and/or object(s) on the ground in the immediate area of where the Insured Vehicle had stopped.



Photo 6 shows the Insured Vehicle at the incident location with flames coming out from its frontal portion. In general, the observations gathered from my review of the incident scene photographs and videos had corresponded to the information gathered from Mr Tan when I spoke to him.



Photo 7 shows the Insured Vehicle at the incident location after the fire was extinguished by SCDF personnel. The damage of burnt nature to the Insured Vehicle had corresponded to the damages as seen by me during my inspection of the Insured Vehicle.

20. 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.
21. Fire due to an overheated engine was unlikely as the Insured Vehicle was still able to be operated after smoke was first seen. The engine of the Insured Vehicle did not stall and Mr Tan himself had turned the engine off before alighting from the Insured Vehicle. 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 by itself. Mr Tan would have likely experienced engine stalling shortly after seeing the smoke.

22. Leakage of fluid within the engine compartment may cause a fire to be ignited when the leaked fluid comes into contact with hot surfaces, like an exhaust pipe. The leaked fluid could possibly reach temperature sufficient for it to self-ignite. However, given that the Insured Vehicle was parked for 45 minutes and driven for about 10 minutes before smoke was first seen, the temperature within the engine compartment would have unlikely been able to reach temperature that could result in leaked fluid to self-ignite. Heat generated from engine operation would have also been able to dissipate out whilst the Insured Vehicle was moving, unlike in a situation where the traffic is of start stop condition. Furthermore, the incident had occurred during night hours where the environmental temperature would have been lower as compared to day hours. Fire due to self-igniting fluid leakage would then seem unlikely for this case.
23. Since engine overheating and leakage of fluid were both unlikely the cause of fire, the most probable cause would then be electrical in nature to the wirings of the Insured Vehicle. The physical condition of the wirings as seen during my inspection of the Insured Vehicle also supports the cause of fire being due to electrical in nature. The following paragraphs discusses the physical evidence relating to this.
24. Firstly, high heat intensity burn marks (whitish burn marks) were found on the firewall panel, towards the rear of the engine compartment. 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. Given this burn pattern, the origin of fire can then be determined to be at the rear centre area of the engine compartment. See photo 8 below.
25. My examination of the rear centre area of the engine compartment, during my inspection of the Insured Vehicle, revealed wirings that were completely burned 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. The same wirings were also noted to be bright reddish in colour immediately after the fire was extinguished as seen from the incident scene photographs taken by Mr Tan. Hence the physical condition of the wirings at the area where the fire had originated indicates that the cause of fire to the Insured Vehicle was due to electrical in nature. See photo 9 & 10 below.



Photo 8 shows the whitish burn marks (circled) that were found on the firewall panel, towards the rear of the Insured Vehicle's engine compartment. Such whitish burn marks are a result of exposure to prolong heat intensity. The fire to the Insured Vehicle can then be established to have originated around the rear centre of the engine compartment.

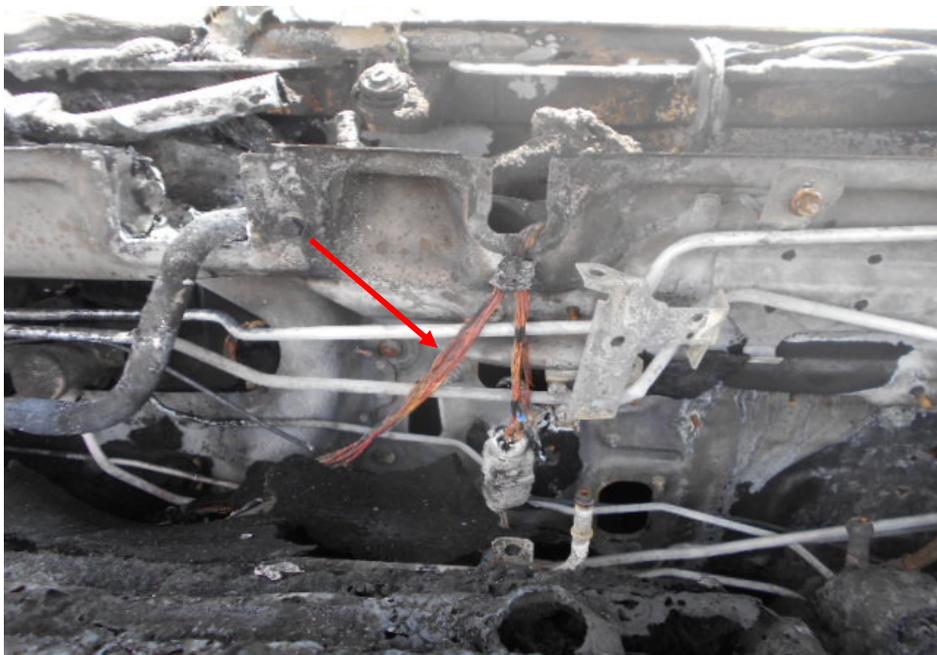


Photo 9 shows the wirings at the rear centre area of the Insured Vehicle's engine compartment. The wirings (arrowed) were found to be completely burned to its bare copper state. The bright reddish colour of the copper wires suggest that the wirings were exposed to high heat. Such condition normally indicates internal heating of copper wires which is a sign of an electrical short circuit occurring.

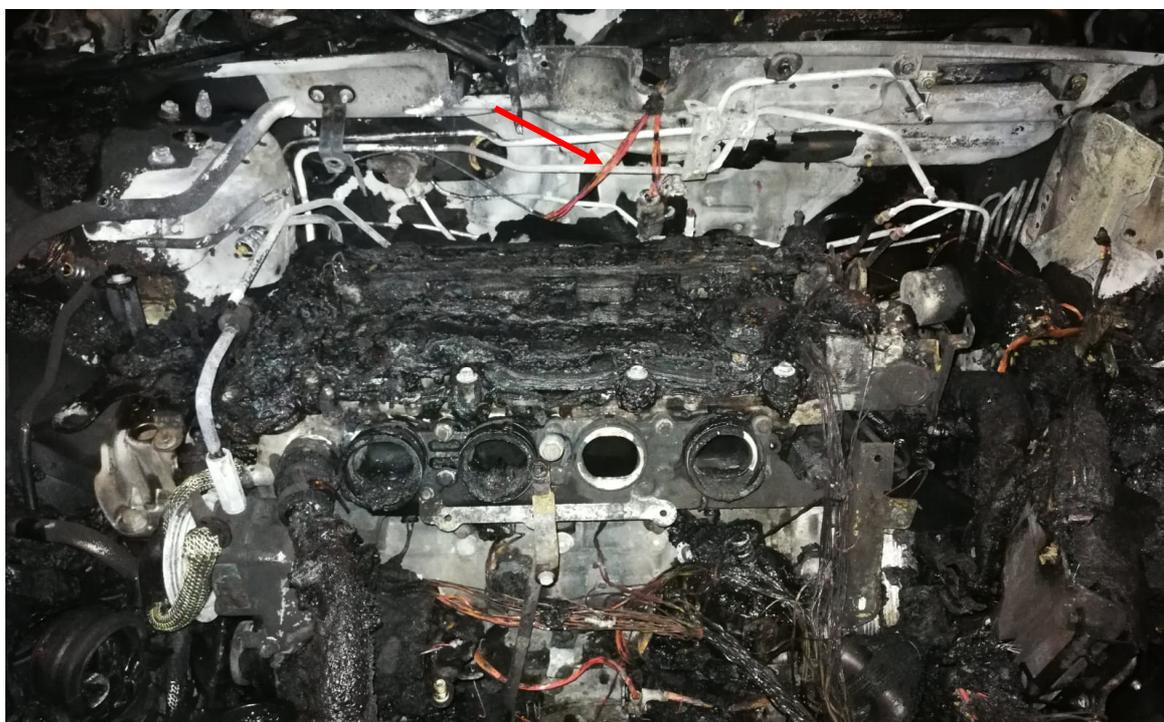


Photo 10 shows the engine compartment of the Insured Vehicle immediately after the fire was extinguished. This was from photographs taken by Mr Tan at the incident location. The same wirings (arrowed) as photograph 9 were noted to be bright reddish in colour immediately after the fire. Such condition suggest that the wirings were exposed to high heat, indicating internal heating of copper wires. This is a sign of an electrical short circuit occurring.

26. My subsequent checks with both local and international bodies and associations had 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:	3035G
Vehicle Details	
Vehicle Registration number:	SJU409B ←
Make:	ALFA ROMEO
Vehicle Model:	ALFA 159 2.2JTS.SELESPEED
Engine No.:	939A50001764154
Chassis No.:	ZAR93900007257420
Recall Details	
No Recall Detail records ←	

Screenshot shows the LTA search result regarding manufacturer recall involving the Insured Vehicle. Results gathered from my search revealed that the Insured Vehicle was not involved in any manufacturer recall campaign.

Conclusion

27. 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 wiring inside the engine compartment, at the rear centre area of the engine compartment. The wiring was an original factory wiring harness.
28. 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.
29. There was no modification(s) and/or additional electronic and/or electrical component(s) fitted on the Insured Vehicle at the time of my inspection of the Insured Vehicle.
30. 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.

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