



Your Ref: D20001218MFSH
Our Ref : CS/FCI120003537/P

9th March 2020

M/s First Capital Insurance Pte. Ltd.
36 Robinson Road #16-01
City House
Singapore 068877
(Motor Claims Department)

TECHNICAL INVESTIGATION REPORT OF FIRE INCIDENT INVOLVING THE INSURED VEHICLE SHC 688E ON 25th February 2020

1. We refer to your letter dated 28th February 2020 and the instructions therein.
2. Our analysis, comments and opinions with respect to the cause of fire to the insured vehicle SHC 688E (herein referred to as "**Insured Vehicle**") are set out below.

Inspection of the Insured Vehicle

3. The Insured Vehicle was physically inspected on 28th February 2019 at the premises of ST Engineering Land Systems Ltd located at 31, Corporation Road Singapore 649825.
4. A static inspection was carried out to the Insured Vehicle where the following general information was recorded:-

Vehicle Registration No.	: SHC 688E
Make / Model	: I40 1.7L CRDI AT ABS AIRBAG 4DR
Chassis No	: KMHLB41UMEU057874
Year of Registration	: July 2014
Mileage	: N.A (wiring affected)

5. The Insured Vehicle was observed to have sustained severe fire damage. Its engine compartment was completely burnt and interior compartment had sustained heat and smoke damage. Rust had accumulated around the engine compartment of the Insured Vehicle as a result of exposure to environmental condition for a period of time. See photos 1 – 6 below.

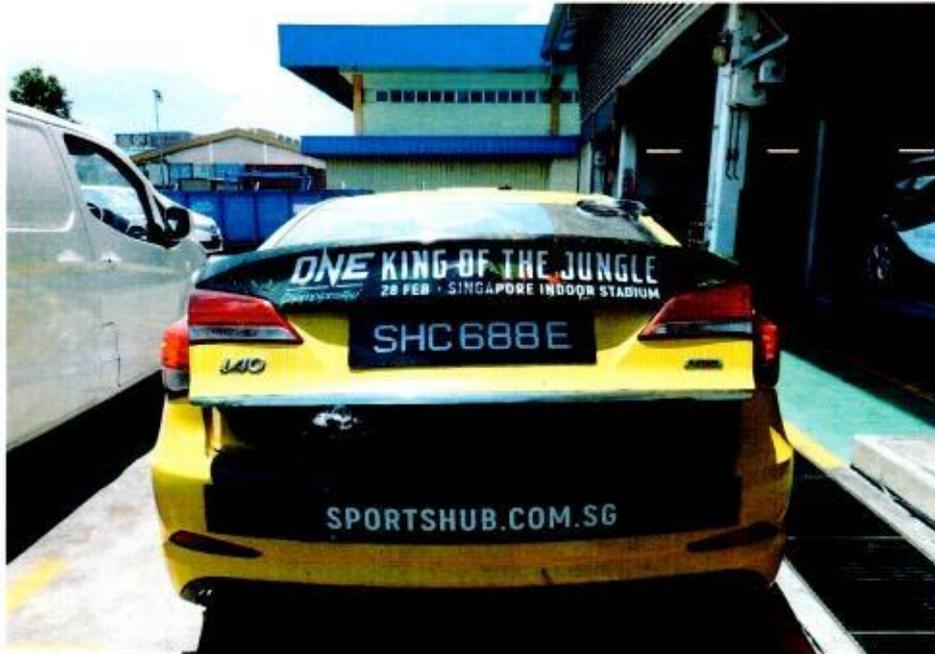


Photo 1 shows the rear portion of the Insured Vehicle, which was observed to be unaffected by the fire.



Photo 2 shows the rear right body of the Insured Vehicle, which was observed to be unaffected by the fire.



Photo 3 shows the rear left body of the Insured Vehicle, which was observed to be unaffected by the fire.



Photo 4 shows the general view of the front portion of the Insured Vehicle at the time of our inspection. The Insured Vehicle was observed to have sustained severe fire damage. Its engine compartment was completely burnt. Rust had accumulated around the engine compartment of the Insured Vehicle as a result of exposure to environmental condition for a period of time.



Photo 5 shows the engine compartment of the Insured Vehicle at the time of our 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 6 shows the interior view from the right side of the Insured Vehicle at the time of our inspection. The interior of the Insured Vehicle was observed to be affected by heat & smoke damage as the result of the fire.

6. At the time of inspection of the Insured Vehicle, we did not find any additionally fitted electronic and/or electrical component(s) on the Insured Vehicle. There also appears to be no modification(s) fitted on the Insured Vehicle.

Investigation and Technical Analysis

7. For this particular case, the fire appears to have originated from the left portion of the engine compartment of the Insured Vehicle. This can be determined from the burn pattern of the various components in the engine compartment, which were observed to have been partly melted and burn 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 parts.
8. 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 photos 7 & 8 below.



Photo 7 shows the top of the front bonnet cover of the Insured Vehicle at the time of our inspection. The high heat intensity burn marks (whitish burn marks) and rust that had development found on the exterior surface of the bonnet indicates that the fire had originated from the engine compartment of the Insured Vehicle.



Photo 8 shows the underside of the front bonnet cover of the Insured Vehicle at the time of our inspection. The High heat intensity burn marks (whitish burn marks) and rust that had development found on the exterior surface of the bonnet indicates that the fire had originated from the engine compartment of the Insured Vehicle.

9. Upon closer examination of the engine compartment of the Insured Vehicle which was where the fire had started, we had found traces of greenish residue on the wirings leading from the battery terminal harnesses to the electrical components. The wirings were original wirings fitting from manufacturer. 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 the 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 9 - 11 below.



Photo 9 shows the close up view of the front engine compartment portion of the Insured Vehicle at the time of our inspection. The fire damage to the Insured Vehicle was confined to its engine compartment portion and. Its engine valve cover (circled), turbocharger (red arrow) abs pump (yellow arrow) and original wiring harnesses was amongst the parts in the compartment that were found to have been affected as a result of the fire.



Photo 10 shows a general view of the original wiring harness in the engine compartment. The battery terminal harness (yellow arrow) and the original wiring harness (red arrow) were observed with greenish residue on the surface. 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.

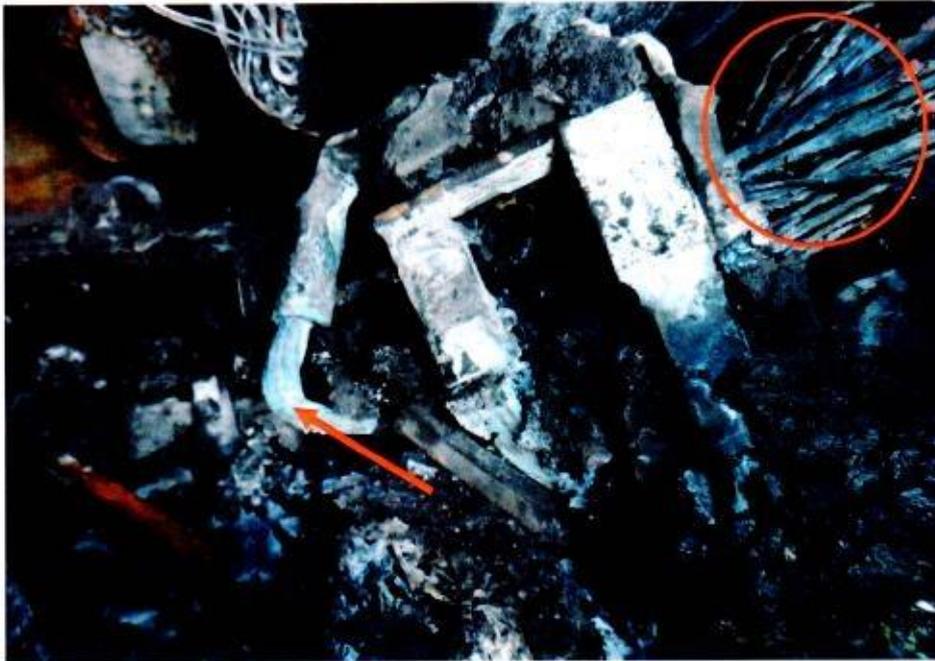


Photo 11 shows a close up view of the original wiring harness in the engine compartment. The battery terminal harness (arrowed) and original wiring harness (circled) was observed with greenish residue on the surface. The presence of greenish residue indicates internal heating of copper wires, a sign 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.

10. From the Singapore Accident Statement, which was made by Mr Wong Heng Chin (herein referred to as **“Mr Wong”**), we note that the fire to the Insured Vehicle had started at a time when it was driving along Changi North Road. Mr Wong was first alerted of the fire when he detected rubber burning smell in the cabin of the Insured Vehicle.
11. We managed to speak to Mr Wong on 4th March 2020 where we were able to gather further information pertaining to the incident as well as information pertaining to the history of the Insured Vehicle.
12. According to Mr Wong, on 25th February 2020, at about 2045 hours he was travelling from white sands shopping centre (Pasir Ris) towards Changi North Road. While driving along Changi North Road, he smelled the burning of rubber smell inside the Insured Vehicle. Mr Wong immediately drove the Insured Vehicle into the bus stop up ahead, he mentioned that upon driving the Insured Vehicle into the bus stop he tried to bring the Insured Vehicle to a stop using the footbrake, however it did not stop but continued surging forward until Mr Wong managed to activate the handbrakes to bring it to a stop.

13. Upon bringing the Insured Vehicle to a stop, subsequently he switched off the engine and alighted to check. Upon alighting he saw white smoke emitting out from the front engine compartment area of the insured vehicle and shortly after flames started engulfing the engine front compartment of the Insured Vehicle, Mr Wong then went a safe side of the road and requested for SCDF assistance. Upon waiting, bystanders came to assistance with 4 fire extinguishers, however the fire was too strong to be put out.
14. SCDF arrived shortly and the fire was extinguished within 10 mins. Mr Wong was given a case number after his statement was taken by the police and scdf.
15. Mr Wong subsequently contacted his company and made towing arrangements on the same day with his insurance company. The tow truck arrived within 30mins and the Insured Vehicle was towed to ST Engineering Land Systems Ltd. Mr Wong made an insurance report the next day at 1227 hours.
16. Mr Wong 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 and when driven, prior to the fire.
17. With regards to the history of the Insured Vehicle, we were able to gather from City Cab that the Insured Vehicle was purchased brand new. Mr Wong is the registered driver of the Insured Vehicle. Mr Wong informed us that he is the relief driver of the Insured vehicle.



18. Pertaining to the maintenance aspect, Mr Wong informed us that his hirer sends the Insured Vehicle for periodical servicing. The renting company has provided servicing records and inspection certification and there was no major overhaul done or modifications done to the Insured Vehicle.

Taxi Maintenance History

No	Vehicle No	Model	Registered Date	Job Card No	Type	Mileage	Date In	Time In	Date Out	Time Out
1	SHC0688E	H0	2/7/2014	TC00371131	CM REPAIR	594.195	20/2/2020	1:59	20/2/2020	2:50

Problem Reported

VEHICLE VIBRATION- CHECK MOUNTING

Service Code	Description	Qty	UOM
LE001	REPLACE ENGINE RUBBER MOUNTING		
LGT017	REPLACE GEARBOX MOUNTING		
		0.00	

No	Vehicle No	Model	Registered Date	Job Card No	Type	Mileage	Date In	Time In	Date Out	Time Out
2	SHC0688E	H0	2/7/2014	TC00370809	A	591.538	14/2/2020	10:29	14/2/2020	2:37

Problem Reported

ENGINE VIBRATE,
A/CON NOT COLD,
WIPER BLADES

Service Code	Description	Qty	UOM
LAC003	REPLACE EXPANSION VALVE		
LB008	REPLACE FRT DISC PAD		
LBD011	REPLACE WIPER BLADE		
LE005	REPLACE AIR FILTER		
LE031	RENEW INJECTOR WASHER AND OIL SEAL		
LEH011	CARRY OUT DEGENERATE EXHAUST SYSTEM		
LGT013	CHANGE AUTO TRANS FLUID		
SVCA	A SERVICE		
E009	OIL FILTER	1.00	
E010	ENGINE OIL	5.00	LITRE



TEST CERTIFICATE

REV. 3

UNREGISTERED

No. DUPLICATE COPY



THE ROAD TRAFFIC ACT (CHAPTER 276)

SHG089E

This is to certify that the motor vehicle with registration no: _____ was examined under section 90 of the Road Traffic Act and that at the date of the examination the prescribed statutory requirements were complied with in relation to the vehicle.

28/11/2010

Date of issue



Authorised signatory

KEEP THIS CERTIFICATE SAFELY

CHECK carefully that the particulars specified above are correct. A test certificate showing any alteration should not be issued or accepted as this may delay the renewal of a vehicle licence.

For the purpose of renewing road tax, this Certificate must be presented within **3 MONTHS** from the date of issue.

A test certificate should not be accepted as evidence of the satisfactory mechanical condition of a vehicle offered for sale.



JIC INSPECTION SERVICES PTE LTD

Registration No. 199607198R

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Incident Scene Photographs

19. During the course of our investigations, we were able to obtain coloured photographs showing the Insured Vehicle at the incident location before, during and after the fire was extinguished by SCDF personnel. These were provided to us by Mr Wong.
20. Our examination of these photographs revealed that the fire had started from the front of the engine compartment of the Insured Vehicle. The photographs had also showed the Insured Vehicle on fire and similar extent of damage and burn pattern to the Insured Vehicle as per what we had observed during our physical inspection of the Insured Vehicle. Apart from the aforesaid, there was no further notable information that could be gathered from these photographs. See photos 12 - 14 below which were provided to us by Mr Wong.



Photo 12 shows the smoke and flames emitting from the front and undercarriage of the Insured Vehicle before the arrival of the SCDF. In general, the information that could be gathered from this photograph had corresponded to the events that were related to us by Mr Wong, location when the fire broke out.

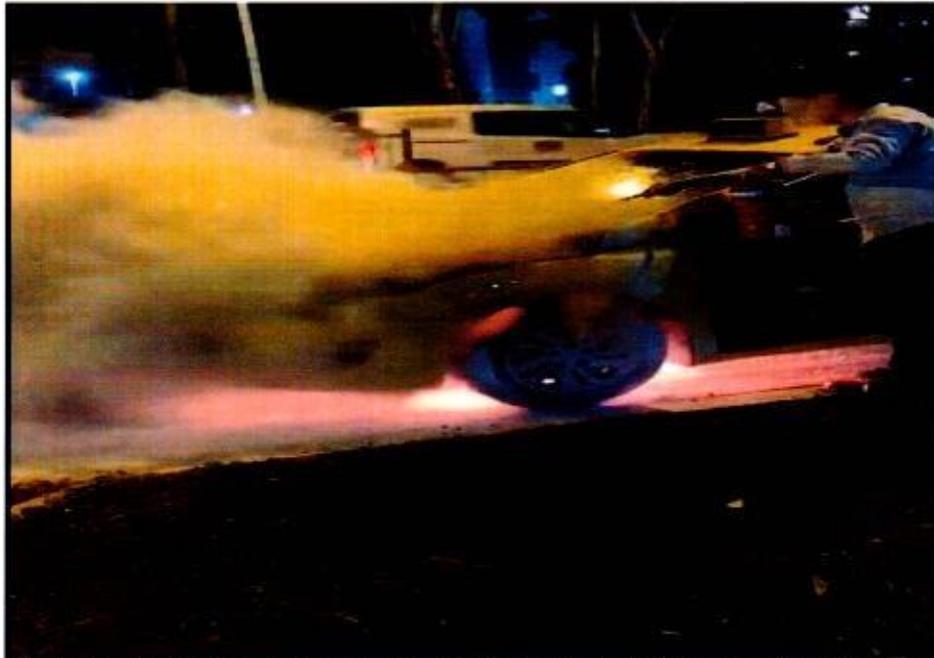


Photo 13 shows members of public in attempt to put of the fire at the front and undercarriage of the Insured Vehicle before the arrival of the SCDF. In general, the information that could be gathered from this photograph had corresponded to the events that were related to us by Mr Wong, location when the fire broke out.



Photo 14 shows the Insured Vehicle at the incident location as the fire was extinguished by SCDF personnel. In general, the information that could be gathered from this photograph had corresponded to the events that were related to us by Mr Wong, location when the fire broke out.

21. Given the circumstances of the incident as reported, the possibility of the cause of fire to the Insured Vehicle being due to engine overheating would seem unlikely as Mr Wong had mentioned to us there were no indications of abnormally high temperatures when he was driving the Insured Vehicle on the day of the incident. Moreover, Fire due to an overheated engine was unlikely as the Insured Vehicle was still able to be operated after smoke were seen emitting from the front of the Insured Vehicle. Mr Wong was still able to drive the Insured Vehicle.
22. 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 Wong was driving the Insured Vehicle. The location where the Insured Vehicle caught fire was also observed to be not at a secluded location.
23. 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 battery terminal harness to the electrical components on the Insured Vehicle, which was earlier discussed in paragraph 9 above.
24. Our checks with both local and international bodies and associations had 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 that may possibly be related to fire being originated from the engine compartment of the Insured Vehicle. See search result from LTA below.

Vehicle Recall Details

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

Owner ID Type Company	Owner ID 839G
Vehicle No. SHC688E ←	Make/Model HYUNDAI/ I40 1.7L CRDI AT ABS AIRBAG 4DR

Engine No.:
D4FDEU440376

Chassis No.:
KMHLB41UMEU057874

Recall Details:
No Recall Detail records ←

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Conclusion

25. 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 of electrical nature. For this particular case, the fire had originated along the wirings leading to the original manufacturer battery terminal harnesses of the Insured Vehicle.
26. 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.

27. There was no modification(s) or additional electronic and/or electrical component(s) fitted on the Insured Vehicle at the time of our inspection of the Insured Vehicle.
28. Our investigations had also revealed that at the time of writing this report, there is no manufacturer recall to similar make and model vehicle as the Insured Vehicle that may possibly be related to this incident.
29. SCDF was activated to attend to the fire incident and a fire report pertaining to their findings will likely be forth coming. We have applied for this fire report and will forward a copy of the report once it is made available to us.



Sherwin Beh
Technical Investigator



Ang Bryan Tani
AMSOE, AMIRTE, AFF SAE, M.MATAI, AFF.Inst.AEA
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