

Your Ref : D20003185MFSH  
Our Ref : CS4/FCI20008373/N

14 August 2020

**M/s First Capital Insurance Limited**  
36 Robinson Road #16-01  
City House  
Singapore 068877

**TECHNICAL INVESTIGATION REPORT OF FIRE INCIDENT INVOLVING THE  
INSURED VEHICLE SHC 3097R ON 10 AUGUST 2020**

1. We refer to your letter dated 12 August 2020 and the instructions therein.
2. Our analysis, comments and opinions with respect to the cause of fire to the insured vehicle SHC 3097R (herein referred to as “**Insured Vehicle**”) are set out below.

**Inspection of the Insured Vehicle**

3. The Insured Vehicle was physically inspected on 13 August 2020 at the premises of ComfortDelGro Engineering Pte. Ltd. (herein referred to as “**CDGE**”) located 59 Loyang Drive, Singapore 508969. A static inspection was carried out to the Insured Vehicle where the following general information was recorded:-

Vehicle Registration No.	: SHC 3097R
Make / Model	: HYUNDAI I40 1.7L CRDI AT ABS AIRBAG 4DR
Chassis No	: KMHLB41UMEU052943
Year of Registration	: March 2014
Mileage	: N.A. (battery melted)

4. The Insured Vehicle was noted to have sustained fire damage that was confined to its frontal portion and right body. The entire engine compartment of the Insured Vehicle was observed to be severely burnt while the interior compartment was observed to be severely affected by the fire.
5. The fire had resulted in the body parts at the frontal portion and right body of the Insured Vehicle to be burnt. This had included its front bumper, front bonnet, front support panel, front grille, front headlamps, front windscreen, right rims, right body and right tyres amongst others. See photos 1 – 6 below.



**Photo 1** shows the general view of the rear portion of the Insured Vehicle at the time of our inspection. The rear portion of the Insured Vehicle was relatively unaffected by the fire.



**Photo 2** shows the general view of the frontal portion of the Insured Vehicle at the time of our inspection. The fire damage to the Insured Vehicle was confined to its frontal portion and right body. The entire engine compartment of the Insured Vehicle was observed to be severely burnt while the interior compartment was observed to be severely affected by the fire.



**Photo 3** shows the closer view of the right front body of the Insured Vehicle at the time of our inspection. The fire damage to the Insured Vehicle was confined to its frontal portion and right body. Its front bumper, front bonnet, front support panel, front grille, front headlamps, front windscreen, right rims, right body and right tyres were amongst the body parts that were found to have been affected by the fire.



**Photo 4** shows the general view of the front windscreen of the Insured Vehicle at the time of our inspection. The fire damage to the windscreen was extensive.





**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 compartment of the Insured Vehicle, which was severely affected by 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 within the engine compartment of the Insured Vehicle, somewhere around the right portion of the engine compartment. This can be determined due to the nature of the fire damage which was more extensive at the right portion, the burn pattern and the high heat intensity burn marks (whitish burn marks) found on the right portion of the front bonnet of the Insured Vehicle and also the rust that had developed on the underside of the front bonnet, at the right portion.
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 underside of the front bonnet, around the right portion, is an indication that the right portion of the engine compartment had sustained exposure to prolonged high heat intensity. See photos 7 & 8 below.



**Photo 7** shows the burn pattern and whitish burn marks that were found on the right portion of the front bonnet of the Insured Vehicle (arrowed). Such whitish burn marks are a result of exposure to prolonged heat intensity, which may indicate where the fire had started. Rust would also begin to develop on these areas soon after the fire.



**Photo 8** shows the rust that had developed on the underside of the front bonnet, around the right portion (circled). The development of rust is an indication that this area was subjected to prolonged exposure to high heat intensity, which had caused the steel/metal material of the front bonnet to be exposed to natural environmental condition. Hence the fire to the Insured Vehicle can be determined to have originated towards the right portion of the engine compartment.



9. Upon closer examination of the right portion of the engine compartment, which was where the fire to the Insured Vehicle had likely started, we had found greenish residue on several burnt stretches of original factory fitted wirings around the centre right portion of the engine compartment. The presence of such 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 9 - 12 below.



**Photo 9** shows the original factory fitted wirings around the right portion of the engine compartment, which is in the immediate vicinity where the fire to the Insured Vehicle had likely started. We had found greenish residue on several burnt stretches of these wirings (circled). The presence of such 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 10** shows a closer view of the greenish residue found on some of the burnt stretches of original factory fitted wirings (arrowed). The presence of such greenish residue suggests occurrence of an electrical short circuit.



**Photo 11** shows a closer view of the greenish residue found on some of the burnt stretches of original factory fitted wirings (arrowed). The presence of such greenish residue suggests occurrence of an electrical short circuit.





**Photo 12** shows a close up view of the greenish residue found on some of the burnt stretches of original factory fitted wirings (arrowed). The presence of such greenish residue suggests occurrence of an electrical short circuit.

10. From the Singapore Police Report No. T/20200811/2058 and Accident Statement which was made by Mr Lim Chong Beng Vincent (herein referred to as “**Mr Lim**”), we note that the fire to the Insured Vehicle had started at a time when it was parked. Mr Lim was first alerted of the fire when he saw a commotion around the Insured Vehicle.
11. 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 Lim, he had taken over the Insured Vehicle from the hirer at around 1630 hours on 9 August 2020. At around midnight on 10 August 2020, he had just dropped off a passenger at Ang Mo Kio Street 24. He decided to have supper after that. He proceeded to Block 704 Ang Mo Kio Central and parked the Insured Vehicle at an open carpark before heading to the nearby coffeeshop. When he walked back to the Insured Vehicle, he was surprised to see the Insured Vehicle on fire. Firefighters were already there attempting to put out the fire. Police were also at the scene.

13. Mr Lim mentioned that the SCDF took approximately 15 minutes to extinguish the fire. The police took Mr Lim's statement. Mr Lim also assisted the SCDF in their preliminary investigations. Mr Lim had called the hirer of the Insured Vehicle when he saw the Insured Vehicle on fire. The hirer arrived at the incident location from Choa Chu Kang shortly after and had also made towing arrangements.
14. The tow truck had arrived around 0200 hours. The Insured Vehicle was towed to CDGE. Mr Lim filed an insurance report the following day, on 11 August 2020 at 1208 hours at CDGE. He then lodged a police report at the Thomson Neighbourhood Police Post later that day at 1400 hours.
15. With regard to the history of the Insured Vehicle, we were able to gather from Mr Lim that he is the relief driver of the Insured Vehicle. He mentioned that he had no issues whilst driving the Insured Vehicle. There was no loss of power to the Insured Vehicle.
16. Mr Lim also informed us that ever since he drove the Insured Vehicle, he has not done any modification(s) and/or additionally fitted any electrical or electronic component(s) to the Insured Vehicle.
17. Mr Lim told us that he neither noticed any warning lights nor abnormally high temperatures whilst driving the Insured Vehicle. According to Mr Lim, the SCDF had not informed him how the fire to the Insured Vehicle had started.

### **Incident Scene Photographs**

18. We were able to obtain photographs of the Insured Vehicle which were taken after the fire had been extinguished. In general, the information that could be gathered from this photograph had corresponded to the events that were related to us by Mr Lim. Our close examination of this photograph also showed no unusual foreign material(s) and/or object(s) found on the ground in the immediate area of the parking lot where the Insured Vehicle was parked. It was also observed that a motor van parked on the right side of the Insured Vehicle had sustained damage of heat nature at its left side. See photos 13 & 14 below.





**Photo 13** shows the Insured Vehicle after the fire was extinguished by the SCDF.



**Photo 14** shows Insured Vehicle after the fire was extinguished. A motor van parked on the right side of the Insured Vehicle had sustained damage of heat nature at its left side (arrowed).

19. Pertaining to the maintenance aspect, the Insured Vehicle is serviced at a ComfortDelGro workshop located in Loyang.
20. During the course of our investigations, we were also able to obtain from Mr Jumani bin Masudin, who is a service advisor at CDGE, documents relating to the servicing of the Insured Vehicle. The Insured Vehicle was last serviced on 28 July 2020, 2 weeks before the incident occurred. We noted in particular during this servicing, there was an issue with the brakes as reported by Mr Lim.
21. The servicing package had included the changing of engine oil, oil filter and battery. The driver side rubber floor mat was also replaced. Refer to Invoice 1 below.

Date: 17.08.2020 YTSS11F	TAXI SERVICE HISTORY	Time: 15:44:06 Page: 1
Taxi Nos: SHC3097R ← Model: I-40 [MEU] Reg Date: 27.03.2014		Workshop: LY ←
Serviced on: 28.07.2020 / 08:31:00 ← Time Out: 28.07.2020 / 10:54:55 Remarks: ( Next PM-14/09/2020 Time-14:00 [INSP] ) Job Card Nos: 603162686 Type: JP Odometer Reading: 767,883		
PM/PROBLEM REPORTED ----- HI5 HYUNDAI I-40 DOCKING 5 INSP PRE-VICOM INSPECTION 4.1 Brake Noisy (To Do Brake Test) ← 4.5 Brake Low/Adjust Brake (To Do Brake Test) 10.1 Lighting - External 14.1 Tyre Bald/Uneven Wear 17.1 Wiper Blade/Washer 17.5 Floor Mat [ FR 1 PC ] 17.7 Seat Torn - FR / FL / R [ FR SEAT TORN ] H000 Mechanic Team Repair - Tey Wei Chun S010 All Belts (except T/Belt) S011 Engine/Transmission Service S020 All Hoses & Clips (Check/Adjust/Replace) S010 Brake System S011 Tyres (Pressure Check) S012 Tyre Rotation S011 Undercarriage, Steering linkage & joints S010 All Lightings S021 All harness & connectors S022 (i40) Check top hose bracket S023 Check diesel / engine oil leakage S025 Check vehicle boot hinges S030 Illegal fittings, modifications & fusebox S031 All seat belts & camera		




S051	Check battery terminal secured		
S058	Check Fan Motor relay		
S059	Check CDI Wiring		
S060	Check Alt and Starter Harness		
S011	All coolant, fluid, water		
S021	Service A/C filter and Radiator		
S022	Clear A/C drain pipe		
QC	QC TEST BY LAT	- Chuah Shau Hoow	
Date: 17.08.2020	TAXI SERVICE HISTORY	Time: 15:44:06	
YTSS11F		Page: 3	
S010	Fire Extinguisher		
MATERIAL CHANGED			
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SN	DESCRIPTION		QTY
1	I40VC OIL FILTER	1.000	EAC
2	I40VC DRIVER SIDE RUBBER FLOOR MAT	1.000	EAC
3	BATTERY 110D26LBH 12V80AH AMARON	1.000	EAC
4	GLXXMOBIL-SUPER-3000-XE-SW30 (TOTE)	5.160	L
REMARKS			
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SN	DESCRIPTION		
3	HIS = 100,000 KM		

**Invoice 1** shows the servicing done on the Insured Vehicle at the CDGE workshop at Loyang on 28 July 2020 (red arrows). We noted in particular during this servicing, there was an issue with the brakes as reported by Mr Lim (black arrow). The servicing package had included the changing of engine oil, oil filter and battery. The driver side rubber floor mat was also replaced (circled).

22. Based on the vehicle service record invoice provided, we are of the opinion that it is unlikely that the fire could have been caused by poor maintenance of the Insured Vehicle.
23. Given the circumstances of incident as reported, the possibility of the cause of fire to the Insured Vehicle being due to engine overheating would seem unlikely as Mr Lim 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, an overheated engine would have caused the Insured Vehicle to stall. However in this case, the Insured Vehicle was parked at the time of the incident. Therefore, we are of the opinion that the fire was not caused by an overheated engine.
24. 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 location where the Insured Vehicle caught fire was observed to be not at a secluded location.

25. 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 in the engine compartment of the Insured Vehicle, which was earlier discussed in paragraph 9 above.
26. Our checks with both local and international bodies and associations had revealed that at the time of writing this report, there is no manufacturer recall of electrical nature to similar make and model vehicle as the Insured Vehicle that may possibly be related to this incident. See search result from LTA below.



### Vehicle Recall Details

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

Owner ID Type <b>Company</b>	Owner ID <b>821R</b>
Vehicle No. <b>SHC3097R</b>	Make/Model <b>HYUNDAI/ I40 1.7L CRDI AT ABS AIRBAG 4DR</b>
Engine No.: <b>D4FDEU409358</b>	Chassis No.: <b>KMHLB41UMEU052943</b>
Recall Details: <b>No Recall Detail records</b>	

### Conclusion

27. 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 in nature. For this particular case, the fire had originated along the original factory fitted wirings inside the engine compartment, somewhere around the right portion of the engine compartment.
28. 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.



29. There were 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.
30. Our investigations had also revealed that at the time of writing this report, there is no manufacturer recall of electrical nature to similar make and model vehicle as the Insured Vehicle that may possibly be related to this incident.

**Muhd Nazril***Senior 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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