LKK Auto Consultants Pte Ltd
Company Registration No. 199607198R
51 UBI AVE 1, #01-25 PAYA UBI INDUSTRIAL PARK, SINGAPORE 408933 TEL : (065) 62563561 FAX : (065) 67414108

Your Ref: D20002401MFSH
Our Ref : CS4/FCI20006234/N

15 June 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 960T ON 8 JUNE 2020

1. We refer to your letter dated 11 June 2020 and the instructions therein.

2. Our analysis, comments and opinions with respect to the cause of fire to the insured vehicle SHC 960T (herein referred to as **"Insured Vehicle"**) are set out below.

Inspection of the Insured Vehicle

3. The Insured Vehicle was physically inspected on 12 June 2020 at the premises of ComfortDelGro Engineering Pte. Ltd. (herein referred to as **"CDGE")** located at 59 Loyang Drive, Singapore 508969.

4. A static inspection was carried out to the Insured Vehicle where the following general information was recorded:-

Vehicle Registration No.	: SHC 960T
Make / Model	: MERCEDES BENZ VIANO 2.2 CDI TREND LONG
Chassis No	: WDF63981323803007
Year of Registration	: October 2013
Mileage	: N.A. (battery melted)

5. The exterior front body of the Insured Vehicle sustained visible fire damage. This included its windscreen, front bonnet, headlights, front bumper, side panels, left front wheel rim and left front tyre.

6. The fire had resulted in extensive damage to the engine compartment of the Insured Vehicle. Most of the components inside the engine compartment were found to be severely burnt and/or melted as a result of the fire. The interior compartment was observed to have been relatively unaffected by the fire. See photos 1 – 6 below.

Photo 1 shows the rear view of the Insured Vehicle. The rear portion of the Insured Vehicle was observed to be relatively unaffected by the fire.

Photo 2 shows the general view of the right portion of the Insured Vehicle at the time of our inspection. The exterior body of the Insured Vehicle had sustained visible fire damage. This included its front windscreen, front bonnet, front bumper, and right front panel.

Photo 3 shows the general view of the left portion of the Insured Vehicle at the time of our inspection. The exterior body of the Insured Vehicle had sustained visible fire damage. This included its front windscreen, front bonnet, left headlight, front bumper, left front panel, left front wheel rim and left front tyre.

Photo 4 shows a closer view of the front windscreen of the Insured Vehicle at the time of our inspection. The front windscreen had sustained slight fire damage.

Photo 5 shows a general view of the engine compartment of the Insured Vehicle at the time of our inspection. Most of the components inside the engine compartment were found to be severely burnt and/or melted as a result of the fire.

Photo 6 shows the interior compartment of the Insured Vehicle, which was observed to be relatively unaffected by the fire.

7. 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

8. For this particular case, the fire appears to have originated within the engine compartment of the Insured Vehicle, somewhere around the left portion of the engine compartment due to the nature of the fire damage which was more extensive at the left portion. This can also be determined from the burn pattern and the high heat intensity burn marks (whitish burn marks) found on the bottom left portion of the underside bonnet of the Insured Vehicle. The whitish burn marks are a result of exposure to prolonged heat intensity. See photos 7 - 9 below.

Photo 7 shows the burn pattern which was found to be more extensive on the left portion of the front bonnet and left front fender of the Insured Vehicle (circled).

Photo 8 shows the whitish burn marks that were found on the bottom left portion of the underside of the front bonnet of the Insured Vehicle (circled). Such whitish burn marks are a result of exposure to prolonged heat intensity, which may indicate where the fire had started. Hence the fire to the Insured Vehicle can be determined to have originated towards the left portion of the engine compartment.

Photo 9 shows the burn pattern found on the left front fender of the Insured Vehicle (circled).

9. Upon closer examination of the left portion of the engine compartment, which was where the fire to the Insured Vehicle had likely started, we had found traces of greenish residue on several stretches of burnt wirings leading from the battery. 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 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 10 - 13 below.

Photo 10 shows the burnt wirings leading from the battery around the left portion of the engine compartment (circled), which is in the immediate vicinity where the fire to the Insured Vehicle had likely started.

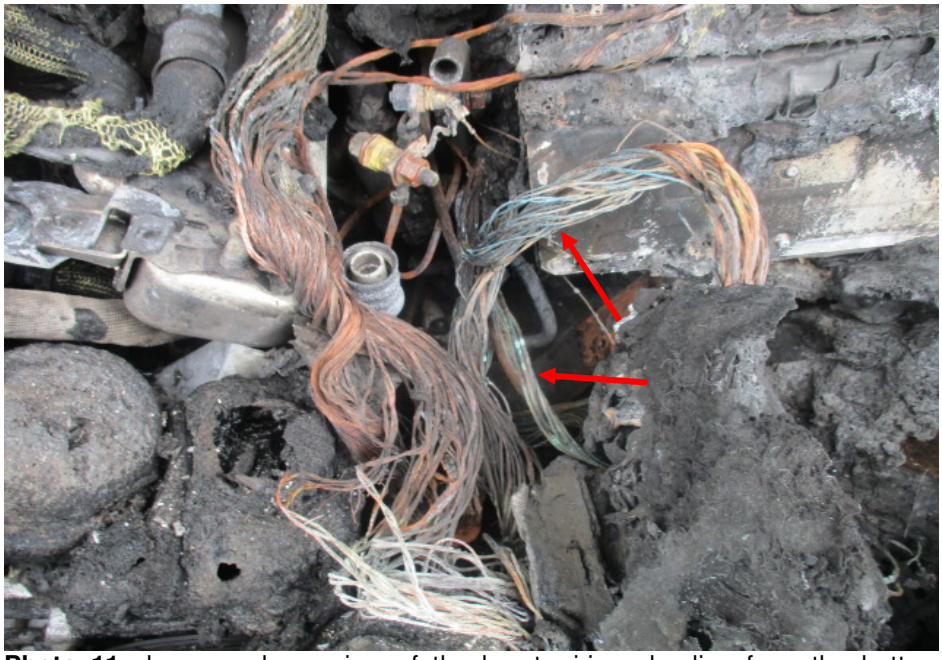


Photo 11 shows a closer view of the burnt wirings leading from the battery around the left portion of the engine compartment, which is in the immediate vicinity where the fire to the Insured Vehicle had likely started. We noticed greenish residue on several stretches of burnt wirings (arrowed). The presence 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.

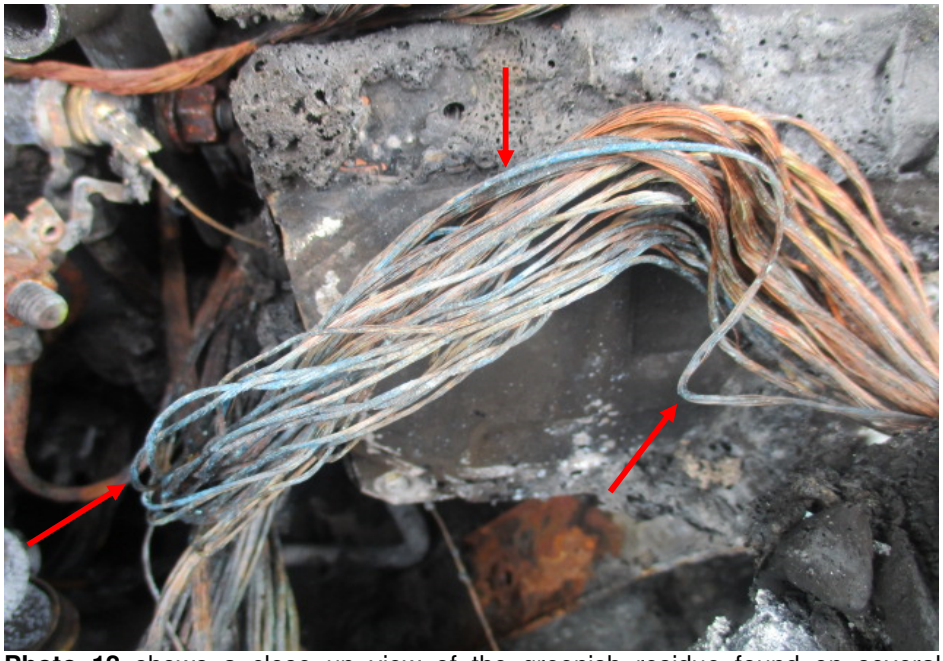


Photo 12 shows a close up view of the greenish residue found on several stretches of burnt wirings leading from the battery (red arrows). The presence of such greenish residue suggests occurrence of an electrical short circuit.

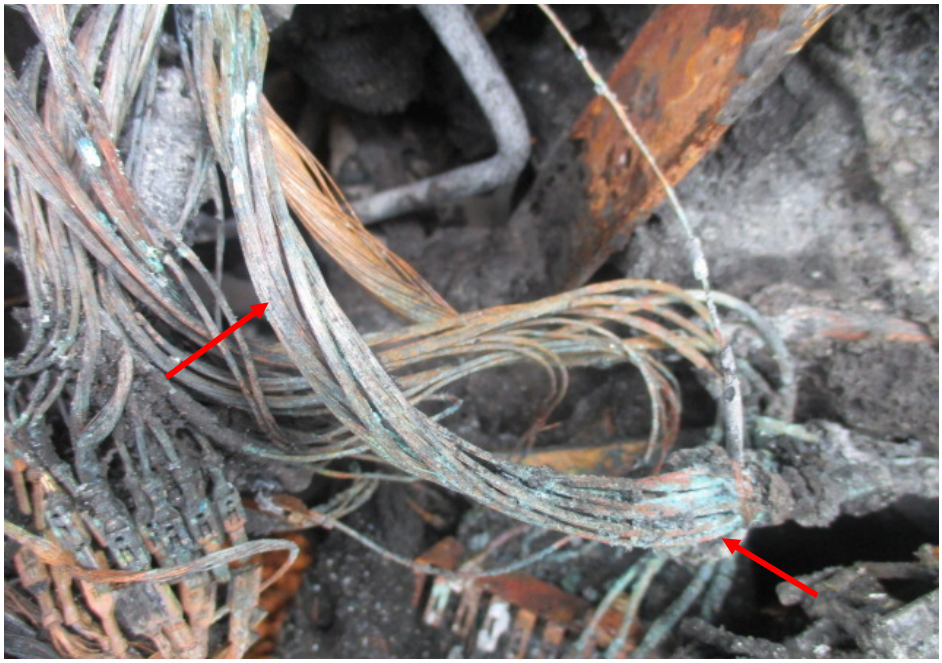


Photo 13 shows a close up view of the greenish residue found on several stretches of burnt wirings leading from the batery (red arrows). The presence of such greenish residue suggests occurrence of an electrical short circuit.

10. From the Singapore Accident Statement, which was made by Mr Seow Leng Teck (herein referred to as **"Mr Seow"**), who is a senior technical executive of CDGE based in Sin Ming, we note that the fire to the Insured Vehicle had started at a time while it was at the holding bay. He was alerted of the fire when a colleague saw smoke emitting from the engine compartment.

11. We managed to speak to Mr Seow where we were able to gather further information pertaining to the incident.

12. According to Mr Seow, the Insured Vehicle had been returned to CDGE's Sin Ming compound about 2 months ago by the previous hirer. Since then, the only time the Insured Vehicle was driven around the carpark to make way for other vehicles. At about 1000 hours on 8 June 2020, the Insured Vehicle was scheduled to be used for delivery of items. However, Mr Seow mentioned that the Insured Vehicle had a flat battery. Hence he had a colleague jumpstart the battery and drove it to the holding bay with the engine running. Shortly after, he noticed white smoke emitting from the front bonnet. Mr Seow was informed by his colleague, which was when he saw flames emitting from the left portion of the front bonnet.

13. Mr Seow immediately switched off the engine and grabbed a fire extinguisher but the fire was too big. By then, somebody had called for the SCDF. Firefighters arrived about 10 minutes later and the fire was put out shortly after.

14. The SCDF fire investigator spoke to the assistant vice president of CDGE who was present at the incident scene. Towing arrangements were made. The tow truck arrived by 1500 hours and the Insured Vehicle was towed to CDGE. Mr Seow made the insurance report at CDGE only 2 days later, on 10 June 2020 at 1405 hours. When asked why the insurance report was made only 2 days after the incident, Mr Seow mentioned that he was asked to make a report only for reference purposes.

15. To the best of Mr Seow's recollection, there has not been any major mechanical problem and/or electrical problem with the Insured Vehicle.

16. Pertaining to the maintenance aspect, the Insured Vehicle is sent for periodic servicing at a CDGE workshop located at Sin Ming.

17. During the course of our investigations, we were also able to obtain from Mr Lim Kwok Eng who is a service advisor at CDGE, documents relating to the latest servicing records of the Insured Vehicle. The Insured Vehicle was last serviced on 25 February 2020, 4 months before the incident occurred. We noted in particular during this servicing, there was an issue with the brakes as reported by the previous hirer. The brake wear sensor, front brake pads, rear brake pads and rear brake disc were changed during this servicing. Since then there were no issues of similar nature recorded by the previous hirer.

18. The servicing package had included the changing of engine oil, oil filter and automatic transmission fluid (ATF). The battery terminal was also checked to ensure that it was secured. Refer to Invoice 1 below.

Date: 16.06.2020 TAXI SERVICE HISTORY Time: 12:52:40
YTSS11F Page: 1

Taxi Nos: SHC 960T Model: VIANO CDI Reg Date: 11.10.2013 Workshop: SM

Serviced on: 25.02.2020 / 09:19:00 Time Out: 25.02.2020 / 14:14:17
Remarks: (Next PM-03/04/2020 time-10:30 (999KM)(5))
Job Card Nos: 603103586 Type: JP Odometer Reading: 999,999

PM/PROBLEM REPORTED

INSP	PRE-VICOM INSPECTION
MF5	MERCEDES VIANO CDI 2.2L DOCKING 5
4.1	Brake Noisy(To Do Brake Test) [REAR]
6.4	Engine Check Light ON [REGENARATION]
15.4	Undercarriage Noisy - Wheel Bearing [CHECK REAR]
H000	Mechanic Team Repair - Low Jian Cheung
S010	AllBelts (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
S023	Check diesel / engine oil leakage
S025	Check vehicle boot hinges
S030	llegal fittings, modifications & fusebox
S031	All seat belts & camera
S051	Check battery terminal secured
S011	All coolant, fluid, water
S021	Service A/C filter and Radiator
S022	Clear A/C drain pipe
QC	QC TEST BY LAT - Chai Chang Kiat
S010	Fire Extinguisher

MATERIAL CHANGED

SN	DESCRIPTION	QTY	
1	212VC/639VA OIL FILTER ELEMENT	1.000	EAC
2	212VC/639VA FUEL FILTER ELEMENT	1.000	EAC
3	GLXXMOBIL-SUPER-3000-XE-5W30 (DRUM)	8.500	L
4	639VA BRAKE PAD FRONT 005 420 5220	1.000	EAC
5	639VA BRAKE WEAR SENSOR	3.000	EAC
6	FUCHS FULLY SYN ATF MB 236.12	4.000	L
7	639VA BRAKE PAD REAR 006 420 4420	1.000	EAC

Date: 16.06.2020 TAXI SERVICE HISTORY Time: 12:52:40
YTSS11F Page: 4

8	639VA BRAKE DISC REAR	2.000	EAC

REMARKS

SN	DESCRIPTION
2	MF5 - 100,000 KM

Invoice 1 shows the servicing done on the Insured Vehicle at the CDGE workshop at Sin Ming on 25 Ferfuary 2020 (red arrows). We noted in particular during this servicing, there was an issue with the brakes as reported by the previous hirer (black arrow). The brake wear sensor, front brake pads, rear brake pads and rear brake disc were changed during this servicing. Since then there were no issues of similar nature recorded by previous hirer. The servicing package had included the changing of engine oil, oil filter and automatic transmission fluid (ATF). The battery terminal was also checked to ensure that it was secured (circled).

19. Mr Seow mentioned that there were neither warning lights displayed nor was there an abnormal rise in temperature of the Insured Vehicle when the Insured Vehicle was driven on the day of the incident.

20. Mr Seow mentioned that there was not any modification(s) and/or additionally fitted any electrical or electronic component(s) to the Insured Vehicle.

Incident Scene Photographs

21. We were able to obtain from Mr Seow, photos of the Insured Vehicle which he had taken after the fire was put out. In general, the information that could be gathered from these photographs had corresponded to the events that were related to us by Mr Seow. Our close examination of these photographs also showed no unusual foreign material(s) and/or object(s) found on the ground in the immediate area where the Insured Vehicle was positioned. See photo 14 below.

Photo 14 shows the Insured Vehicle at the incident scene after the fire was extinguished. In general, the information that could be gathered from this photograph had corresponded to the events that were related to us by Mr Seow, which is the fire had started in the engine compartment (circled).

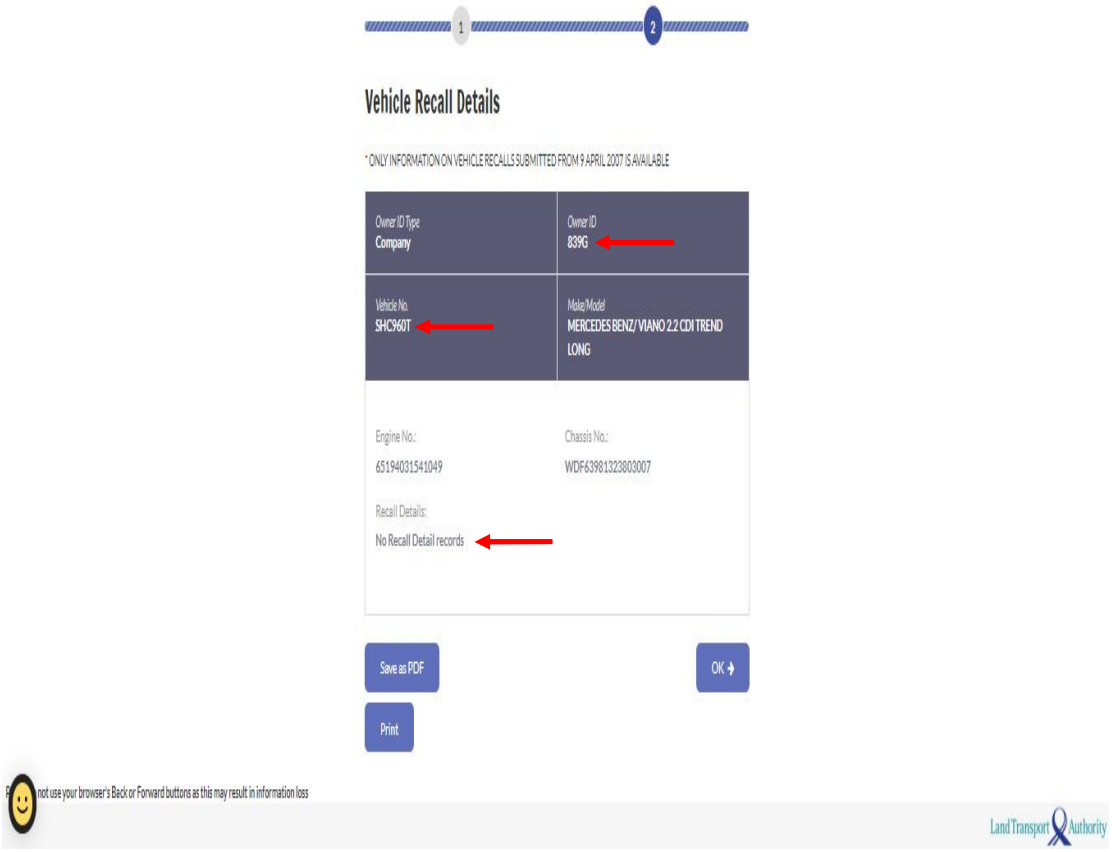
22. Based on the vehicle service record invoice provided, we are of the opinion that it is unlikely that the fire could have been caused by poor maintenance of the Insured Vehicle.

23. Given the circumstances of 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 Seow had mentioned to us there were no indications of abnormally high temperatures on the Insured Vehicle when he was driving on that day. Moreover, an overheated engine would have caused the Insured Vehicle to stall. However in this case, Mr Seow was the one who noticed smoke emitting from the front bonnet while the Insured Vehicle was at the holding bay and turned the engine off. 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 given that our examination of the available incident scene photograph did not reveal any unusual material(s)/object(s) found on the ground where the Insured Vehicle was positioned. The location of where the Insured Vehicle was positioned was also 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.



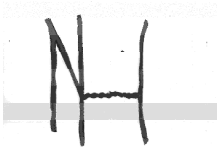
Conclusion

27. Having investigated and technically analysed the damages 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 wirings inside the engine compartment, leading from the battery. The wirings were original factory wirings of the Insured Vehicle.

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)