



Your Ref : D18/7418/SG/FIRE
Our Ref : CI/FCI18019909/N

19 October 2018

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 SHD 8841X ON 10 OCTOBER 2018**

1. We refer to your letter dated 12 October 2018 and the instructions therein.
2. Our analysis, comments and opinions with respect to the cause of fire to the insured vehicle SHD 8841X (herein referred to as "**Insured Vehicle**") are set out below.

Inspection of the Insured Vehicle

3. The Insured Vehicle was physically inspected on 17 October 2018 at the premises of ComfortDelGro Engineering Pte. Ltd. (herein referred to as "**CDGE**") located at 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.	: SHD 8841X
Make / Model	: MERCEDES BENZ E 220 CDI BLUEEFFICIENCY
Chassis No	: WDD2120022A679822
Year of Registration	: September 2012
Mileage	: N.A. (battery melted)

4. The Insured Vehicle was observed to have sustained severe fire damage all around. Its engine compartment and interior compartment were completely burnt. Rust had accumulated all over the rear and centre portion of the Insured Vehicle as a result of exposure to environmental condition for a period of time. See photos 1 – 7 below.



Photo 1 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 extensive fire damage all around. Its engine compartment and interior compartment were completely burnt. Rust had accumulated all over the rear and centre portion of the Insured Vehicle as a result of exposure to environmental condition for a period of time.



Photo 2 shows the general view of the left body of the Insured Vehicle at the time of our inspection. The Insured Vehicle was observed to have sustained extensive fire damage all around. Rust had accumulated all over the rear and centre portion of the Insured Vehicle as a result of exposure to environmental condition for a period of time.



Photo 3 shows the general view of the right body of the Insured Vehicle at the time of our inspection. The Insured Vehicle was observed to have sustained extensive fire damage all around. Rust had accumulated all over the rear and centre portion of the Insured Vehicle as a result of exposure to environmental condition for a period of time.



Photo 4 shows the general view of the rear right body of the Insured Vehicle at the time of our inspection. The Insured Vehicle was observed to have sustained extensive fire damage all around. Rust had accumulated all over the rear and centre portion of the Insured Vehicle as a result of exposure to environmental condition for a period of time.



Photo 5 shows the general view of the rear boot compartment of the Insured Vehicle at the time of our inspection. The rear boot compartment sustained extensive fire damage. Rust had accumulated all over the rear portion of the Insured Vehicle as a result of exposure to environmental condition for a period of time.



Photo 6 shows the general view of the interior compartment of the Insured Vehicle at the time of our inspection. Its interior compartment was completely burnt as a result of the fire.



Photo 7 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.

5. At the time of inspection, we did not find any unusual skeletal remains which could have suggested that there was possible modification(s) on the Insured Vehicle.

Investigation and Technical Analysis

6. Based on the circumstances for this particular case, the fire appears to have originated within the rear boot compartment of the Insured Vehicle, somewhere around the rear right portion of the rear boot compartment. This can also be determined from the nature of fire damage which was observed to be most extensive at the rear portion of the Insured Vehicle.
7. Upon closer examination of the rear right portion of the rear boot 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 rear right portion of the rear boot compartment, leading from the battery. 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 8 - 11 below.



Photo 8 shows the original factory fitted wirings around the rear right portion of the rear boot 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 leading from the battery (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 9 shows a closer view of the greenish residue found on some of the burnt stretches of original factory fitted wirings (arrowed) leading from the battery (circled). The presence of such greenish residue suggests occurrence of an electrical short circuit.



Photo 10 shows a close up view of the greenish residue found on some of the burnt stretches of original factory fitted wirings (arrowed) leading from the battery (circled). The presence of such greenish residue suggests occurrence of an electrical short circuit.



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

8. From the Singapore Accident Statement, which was made by Mr Ho Kim Charn (herein referred to as "**Mr Ho**"), we note that the fire to the Insured Vehicle had started at a time when he was driving. Mr Ho was first alerted of the fire when he detected a burning smell within the interior compartment of the Insured Vehicle.
9. We managed to speak to Mr Ho where we were 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 Ho, he had picked up 4 passengers from the Singapore Changi Airport at around 1900 hours and was headed to Woodlands. He travelled along the TPE towards the SLE. It was raining and the traffic was heavy. He was approaching the Jalan Kayu exit when he detected a burning smell in the Insured Vehicle. He then saw thick white smoke emitting from the rear portion of the Insured Vehicle. Mr Ho quickly pulled over to the road shoulder and switched off the engine. He opened the rear boot and realized there was a fire at the rear right portion of the rear boot. He immediately removed the passengers' luggage from the rear boot of the Insured Vehicle. Mr Ho mentioned that the luggage that was placed at the rear right portion of the rear boot compartment sustained fire damage which was near the immediate vicinity where the fire had occurred.
11. He retrieved a fire extinguisher from the rear boot compartment and attempted to put out the fire. Mr Ho also informed us that there was traffic police officer on duty in the immediate vicinity and came to assist him in extinguishing the fire. However the fire had begun to engulf the Insured Vehicle and Mr Ho together with his passengers were instructed by the traffic police officer to keep a safe distance away from the Insured Vehicle while waiting for the SCDF to arrive. Mr Ho called CDGE to inform them regarding the incident as well as to make towing arrangements.
12. The SCDF, police and an ambulance arrive to the incident location shortly after. Mr Ho does not remember how long firefighters took to put out the fire. Mr Ho and his passengers were examined by paramedics and later assisted the SCDF in their preliminary investigations. The police also took their statements. The passengers were allowed to leave after their statements were taken.
13. The tow truck arrived around 2200 hours. The Insured Vehicle was towed to CDGE. Mr Ho went home after the Insured Vehicle was towed. He went to CDGE the next day on 11 October 2018 and made the insurance report at 1322 hours.

14. With regard to the history of the Insured Vehicle, we were able to gather from Mr Ho that he has been the hirer of the Insured Vehicle for the past 6 months. Mr Ho drives the Insured Vehicle from 1630 hours to 0430 hours. He has a relief driver who drives the Insured Vehicle from 0430 hours to 1630 hours 2 to 3 times a week. To the best of his recollection, there was no major mechanical or electrical/electronic problem with the Insured Vehicle. However he did mention that he had at times encountered a problem with starting up the Insured Vehicle and had highlighted this issue with CDGE when he sent the Insured Vehicle for periodic servicing on 24 September 2018. Mr Ho also added that approximately a week before the incident occurred the Insured Vehicle had broken down due to the same issue and had to be towed to CDGE. Mr Ho was later informed by the workshop that the fuel pressure sensor had been replaced. Since then Mr Ho did not encounter any problems of similar nature till the incident occurred.
15. Mr Ho told us that he neither noticed any warning lights nor abnormally high temperatures while he was driving the Insured Vehicle on the day of the incident.

Incident Scene Photographs

16. We were able to obtain from Mr Ho several photographs of the Insured Vehicle which were taken during the fire as well as after the fire had been extinguished. In general, the information that could be gathered from these photographs had corresponded to the events that were related to us by Mr Ho. 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 of the road shoulder of the SLE where the Insured Vehicle was positioned. See photos 12 - 17 below.



Photo 12 shows the Insured Vehicle at the road shoulder of the SLE when the fire occurred.



Photo 13 shows the front portion of the Insured Vehicle after the fire was extinguished. In general, the damages sustained to the front portion had corresponded to the events that were related to us by Mr Ho, which is the fire had not started from the front bonnet.



Photo 14 shows the rear portion of the Insured Vehicle after the fire was extinguished. In general, the extensive damages sustained to the rear portion had corresponded to the events that were related to us by Mr Ho, which is the fire started from the rear boot compartment.



Photo 15 shows the luggage that was removed from the rear boot compartment of the Insured Vehicle by Mr Ho soon after the fire broke out. Only 1 of the luggage sustained visible fire damage (arrowed).



Photo 16 shows 2 of the luggage that was removed from the rear boot compartment of the Insured Vehicle soon after the fire broke out. Only 1 of the luggage sustained visible fire damage (circled). In general, this photograph had corresponded to the events that were related to us by Mr Ho, which is the burnt luggage was placed nearest to the immediate vicinity where the fire had occurred.

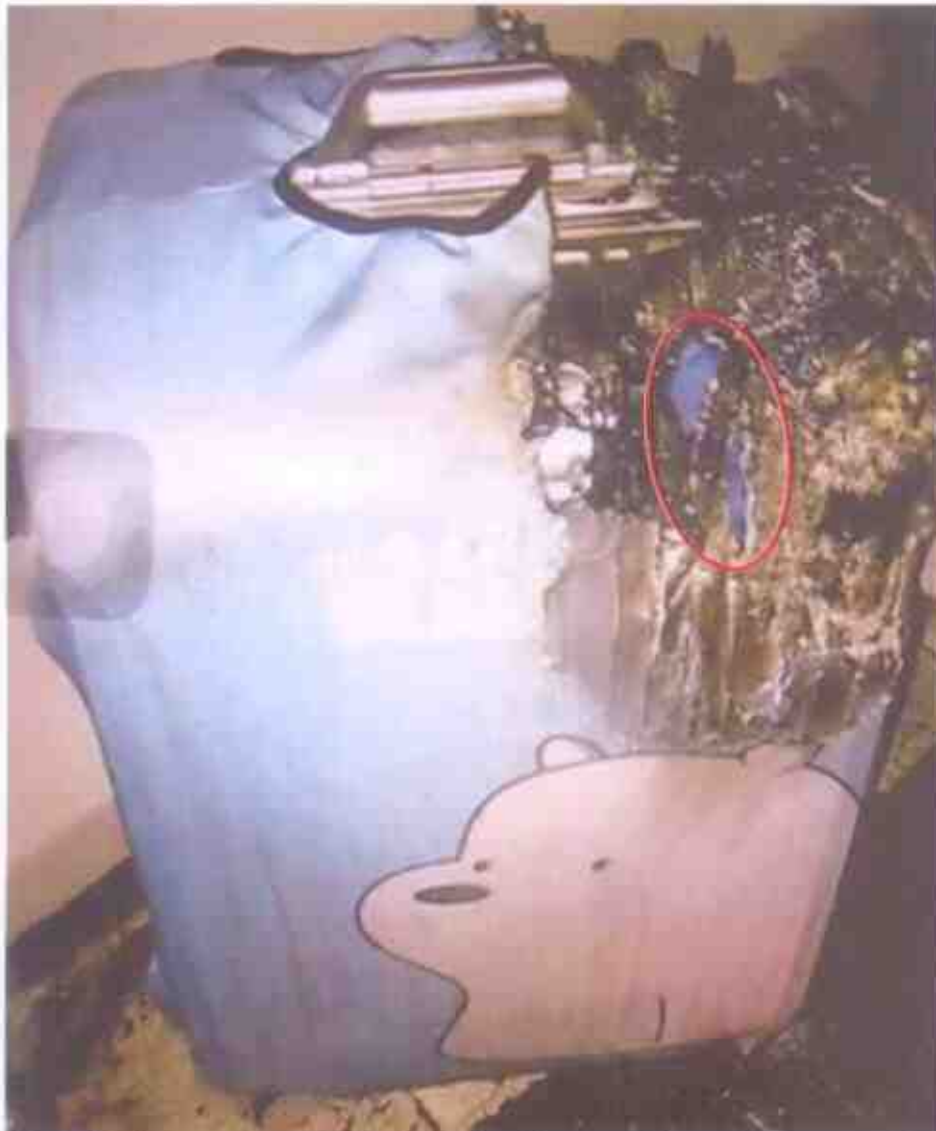


Photo 17 shows a close up view of the burnt luggage. Upon closer examination, we observed that the contents of the luggage were unaffected by the fire (circled). In general, the damages sustained to the exterior portion of the luggage had corresponded to the events that were related to us by Mr Ho, which is the fire had started from the rear boot compartment of the Insured Vehicle and not from the luggage.

17. Pertaining to the maintenance aspect, the Insured Vehicle is serviced at a ComfortDelGro workshop located in Sin Ming.

18. During the course of our investigations, we were also able to obtain from Mr Lim Tien Song, who is a service advisor at CDGE, documents relating to the servicing of the Insured Vehicle for the past 3 months. We noted that the Insured Vehicle was brought in for periodic servicing and repair works on 29 August 2018, as an issue with the brakes and gearbox was reported. The servicing package had included the changing of engine oil, oil filter and auto transmission fluid (ATF). The brake sensor and rear brake pads were replaced. See Invoice 1 below.

Date: 11.10.2018 TAXI SERVICE HISTORY Time: 08:00:30
YTSS11F Page: 1

Taxi Nos: 5H08841X ← Model: E220CDI(E5 Reg Date: 12.09.2012 ← Workshop: SM

Serviced on: → 29.08.2018 / 08:31:00 Time Out: 29.08.2018 / 12:10:20
Remarks: (Next PM-25/09/2018 time-13:30 (05KM))
Job Card Nos: 602836264 Type: 3P Odometer Reading: 2,180

PM/PROBLEM REPORTED

MG3 MERCEDES E220 WDD212 DOCKING 3
4.1 Brake Noisy(To Do Brake Test)
14.1 Tyre Bald/Uneven Wear
17.8 Others [CHECK GEAR NOISY]
H000 Mechanic Team Repair - Tan Boun Kwei
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
S023 Check diesel / engine oil leakage
S030 Illegal fittings, modifications & fusebox
S031 All seat belts & camera
S051 Check battery terminal secured
S065 Check harness rubbing Air Filter Cover
S011 All coolant, fluid, water
S021 Service A/C filter and Radiator
S022 Clear A/C drain pipe

Date: 11.10.2018 TAXI SERVICE HISTORY Time: 08:00:30
YTSS11F Page: 29

QC QC TEST BY LAT - Tan Cheon Chooi

MATERIAL CHANGED

SN	DESCRIPTION	QTY
1	212VC FUCHS TITAN C11 PROFLUX SW30	6.000 L
2	212/639VA OIL FILTER ELEMENT	1.000 EAC
3	(212/211B) BRAKE SENSOR RR	1.000 EAC
4	212VC/211B REAR BRAKE DISC PAD	1.000 EAC
5	(ALL) UNIVERSAL CLEANER(600ML)CL. 2 D.G	1.000 EAC
6	(212) ATF, FULLY SYN 736.15	5.000 L

REMARKS

SN	DESCRIPTION
1	MG3 - 60,000 KM

Invoice 1 shows the periodic servicing and repair works done on 29 August 2018 (arrowed). An issue with the brakes and gearbox was reported. The servicing package had included the changing of engine oil, oil filter and auto transmission fluid (ATF). The brake sensor and rear brake pads were replaced.



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

19. The Insured Vehicle was brought in for periodic servicing and repair works on 24 September 2018 as Mr Ho had reported having problems starting up the Insured Vehicle as well as a noisy undercarriage. The servicing package had included the changing of engine oil and oil filter. The front left and front right torsion bar rods, brake sensor, front brake pads and 2 tyres were also replaced. See Invoice 2 below.

Serviced on: → 24.09.2018 / 00:20:00 Time Out: 24.09.2018 / 16:14:27
Remarks: (Next PM-22/10/2018 time-10:30 (15KM)(1))
Job Card Nos: 602857886 Type: JP Odometer Reading: 16,120

PM/PROBLEM REPORTED

MG4 MERCEDES E220 WDD212 DOCKING 4
11.3 Starting Problem when Cold [SOMETIME CANNOT START]
15.5 Undercarriage Noisy - Front Suspension
15.6 Undercarriage Noisy - Rear Suspension
H000 Mechanic Team Repair - Chan Kah Chuen
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
S023 Check diesel / engine oil leakage
S030 Illegal fittings, modifications & fusebox
S031 All seat belts & camera
S051 Check battery terminal secured
S065 Check harness rubbing Air Filter Cover
S011 All coolant, fluid, water
S021 Service A/C filter and Radiator
S022 Clear A/C drain pipe
QC QC TEST BY LAT - Tan Choon Choo

MATERIAL CHANGED

SN	DESCRIPTION	QTY
1	212VC FUCHS TITAN GTI PROFLEX 5W30	6.000 L
2	212/639VA OIL FILTER ELEMENT	1.000 EAC
3	(212)TORSION BAR ROD FRT/LH	1.000 EAC
4	(212)TORSION BAR ROD FRT/RH	1.000 EAC
5	(212/211B) BRAKE SENSOR IRR	1.000 EAC
6	212VC FRONT BRAKE DISC PAD	1.000 EAC
7	(ALL) UNIVERSAL CLEANER(600ML)CL.2 D.G	1.000 EAC
8	(140/E220)WESTLAKE TYRE 205/60R16 RP26	2.000 PC

Date: 11.10.2018 TAXI SERVICE HISTORY
YT5511F

Time: 08:00:30
Page: 30

REMARKS

SN	DESCRIPTION
2	MG4 - 80,000 KM

Invoice 2 shows the servicing and repairs done to the Insured Vehicle on 24 September 2018 (arrowed) as Mr Ho had reported having problems starting up the Insured Vehicle as well as a noisy undercarriage. The front left and front right torsion bar rods, brake sensor, front brake pads and 2 tyres were also replaced (circled).

20. The Insured Vehicle was towed to CDGE for repair works on 2 October 2018, approximately 1 week before the incident occurred. Mr Ho had reported an issue of similar nature pertaining to being unable to start the Insured Vehicle. The air filter, radiator hose clamp and fuel pressure sensor were replaced. Refer to Invoice 3 below.

Serviced on: 02.10.2018 / 18:01:00 Time Out: 04.10.2018 / 15:01:25
Remarks: (ENGINE CHECK LIGHT ON (O/N)
Job Card Nos: 602887656 Type: JC Odometer Reading: 20,276

PM/PROBLEM REPORTED

BRKD	BREAKDOWN
6.4	Engine Check Light ON [ENGINE LIGHT ON]
17.0	Mechanical Team Repair - Liu Zhiliang
17.8	Others [CAR NO POWER , TEST DRIVE]
QC	QC TEST BY LAT - Tan Boon Tree

MATERIAL CHANGED

SN	DESCRIPTION	QTY
1	212VA AIR FILTER ELEMENT	1.000 EAC
2	MERCS HOSE CLAMP 13-14.5MM	2.000 EAC
3	212VA CABLE TIE 11.5MM	2.000 EAC
4	212/639VA FUEL PRESSURE SENSOR	1.000 EAC

REMARKS

SN	DESCRIPTION
3	

Invoice 3 shows the repair works done on 2 October 2018, approximately 1 week before the incident occurred. Mr Ho had reported an issue of similar nature pertaining to being unable to start the Insured Vehicle. The air filter, radiator hose clamp and fuel pressure sensor were replaced.

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

22. 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 Ho 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, Mr Ho was the one who noticed thick smoke emitting from the rear boot compartment while he was driving the Insured Vehicle and proceeded to stop along the road shoulder and switch off the engine of the Insured Vehicle. Furthermore, the smoke was emitting from the rear portion of the Insured Vehicle and not from the engine compartment.

23. 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 Ho was driving the Insured Vehicle. The location where the Insured Vehicle caught fire was also observed to be not at a secluded location. Moreover, the damages of burnt nature sustained by the passenger's luggage were mainly on the exterior body. The contents of the luggage were relatively unaffected by the fire.
24. The possibility of the fire being due to internal factors (passengers' luggage amongst others) would also seem unlikely as the damages of burnt nature sustained by the passenger's luggage were mainly on the exterior body. The contents of the luggage were relatively unaffected by the fire.
25. The possibility of the fire being due to electrical in nature would then seem more likely given that engine overheating, external and internal factors would seem unlikely. The fire being due to electrical nature is also supported by the condition of the wirings that were found in the rear boot compartment of the Insured Vehicle, which was earlier discussed in paragraph 7 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.

Enquiry on Vehicle Recall - Vehicle Specific

SELECT INFORMATION ON VEHICLE RECALLS BY MAKE, MODEL AND YEAR

Vehicle Owner Particulars	
Owner ID No.	00000000
Owner ID	00000000

Vehicle Details	
Vehicle Registration Number	3BEB4000
Make	MAZDA
Vehicle Model	2.0 SPORTS
Engine No.	000000000000
Chassis No.	000000000000

Recall Details	
Make	MAZDA

Please click on your browser's back button to return to the previous page.

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 somewhere around the rear right portion of the rear boot compartment, leading to the battery.
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

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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