Your Ref: BVS22/1170 18th November 2022
Our Ref : CS4/LIP22009955/P

M/s Liberty Insurance Pte. Ltd.
51 Club Street #03-00
Liberty House
Singapore 069428

TECHNICAL INVESTIGATION REPORT OF FIRE INCIDENT INVOLVING THE INSURED VEHICLE PC 21J ON 1st OCTOBER 2022

1. We refer to your letter dated 7th October 2022 and the instructions therein.

2. Our analysis, comments and opinions with respect to the cause of fire to the insured vehicle PC 21J (herein referred to as **"Insured Vehicle"**) are set out below.

Inspection of the Insured Vehicle

3. The Insured Vehicle was physically inspected on 18th October 2022 at the premises of SC Auto Industries (herein referred to as **"SC Auto"**) located at 51 Senoko Road, Singapore 628706.

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

Vehicle Registration No.	: PC 21J
Make / Model	: SCANIA KIB4X2
Chassis No	: YS2K4X20001864585
Year of Registration	: FEB 2019
Mileage	: N.A. (wiring affected)

5. The interior cabin and exterior body of the Insured Vehicle had sustained fire damages more towards the rear portion as well as its rear right wheels and tyres. The affected interior parts had included the interior seats, windows and the affected exterior parts had included the rear left and right body panels and the rear right wheel rims and tyres. See photos 1 – 9 below.

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

Photo 2 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 unaffected by the fire.

Photo 3 shows the interior cabin of the Insured Vehicle at the time of inspection. The interior rear cabin including its seats and windows was completely burnt.

Photo 4 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 fire damage at the rear portion. Affected parts had included the rear windows and rear left panels.

Photo 5 shows the close up view of the left portion of the Insured Vehicle at the time of our inspection. The exterior body of the Insured Vehicle had sustained fire damage at the rear portion. Affected parts had included the rear windows and rear left panels.

Photo 6 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 fire damages at the rear right wheel and rim area as well as its rear right body panel portion. Affected parts had included the right rear panels, rear right windows and the rear right wheel and rims.

Photo 7 shows the close up view of the rear right portion of the Insured Vehicle at the time of our inspection. The wheel rims and the tyres of the Insured Vehicle had sustained severe fire damage.

Photo 8 shows a closer view of the right rear portion of the Insured Vehicle at the time of our inspection. The fire damage was observed to be at its rear right portion. The rear right body panel was observed to be affected by the fire.

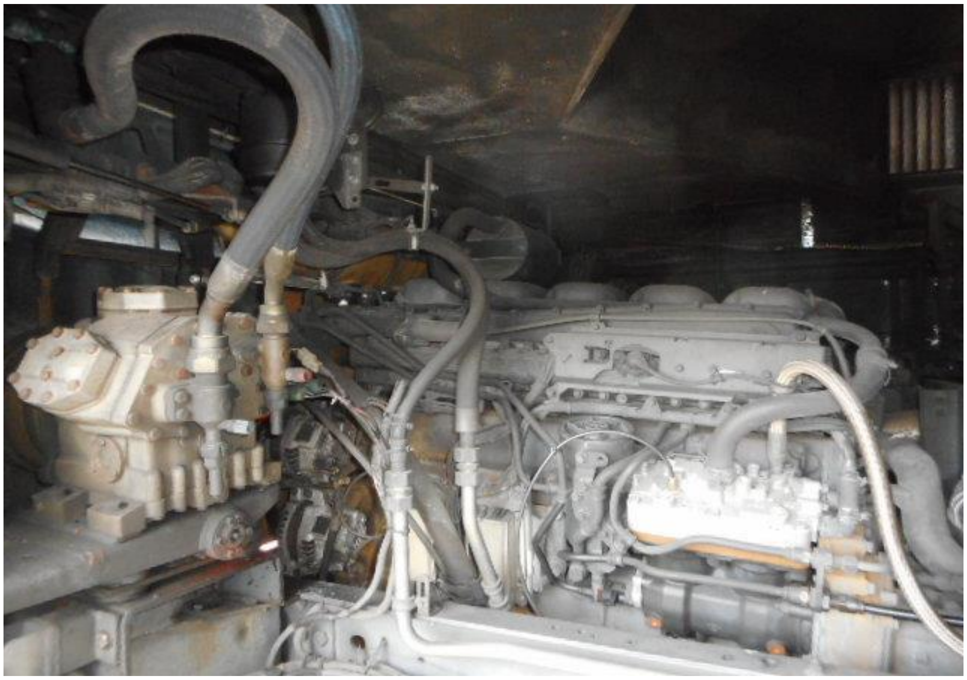

Photo 9 shows a general view of the engine compartment of the Insured Vehicle at the time of our inspection. The engine compartment of the Insured Vehicle was observed to be unaffected by the fire.

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.

<u>Investigation and Technical Analysis</u>

7. For this particular case, the fire appears to have originated from rear right portion of the Insured Vehicle, around the rear right wheel rims and tyres portion of the Insured Vehicle. This can be determined from the nature of the fire damage which was more extensive at the rear right portion. Basing on the circumstances of the fires' origin at the material time of incident as well as examining the area where the extent of fire damage was most severe, we can determine that the fire had likely started from the rear right wheel rims and tyres portion of the Insured Vehicle.

8. Upon closer examination of the rear right portion of the wheel rims and its tyres of the Insured Vehicle as well as around the immediate vicinity to where the fire had likely started, we had observed that the outer wheel rim had sustained the highest heat intensity burn marks (whitish burn marks) that were found on the surface of it and it was also dented and cracked.

9. In our opinion, the dent and cracked damages observed on the rear right outer wheel rim was likely not the result of the fire. In support to this claim we have investigated further; we focus on our findings to the wheel rim and tyres area and identify that the moving components in the area are the drum brakes system and the wheel drum itself.

10. Firstly, we have removed the right wheel rims of the Insured Vehicle to inspect their drum brakes and brake pads and we did not notice any signs of brakes lock up or burn to either the exterior or interior surface of the rear right brake drums and top or bottom of the brake pads on the Insured Vehicle.

11. Secondly, we have examined the outer rear right wheel rim and notice that the dent and cracked wheel rim was caused by an impact that had caused the deformed damage to it. See photos 10 - 16 below.

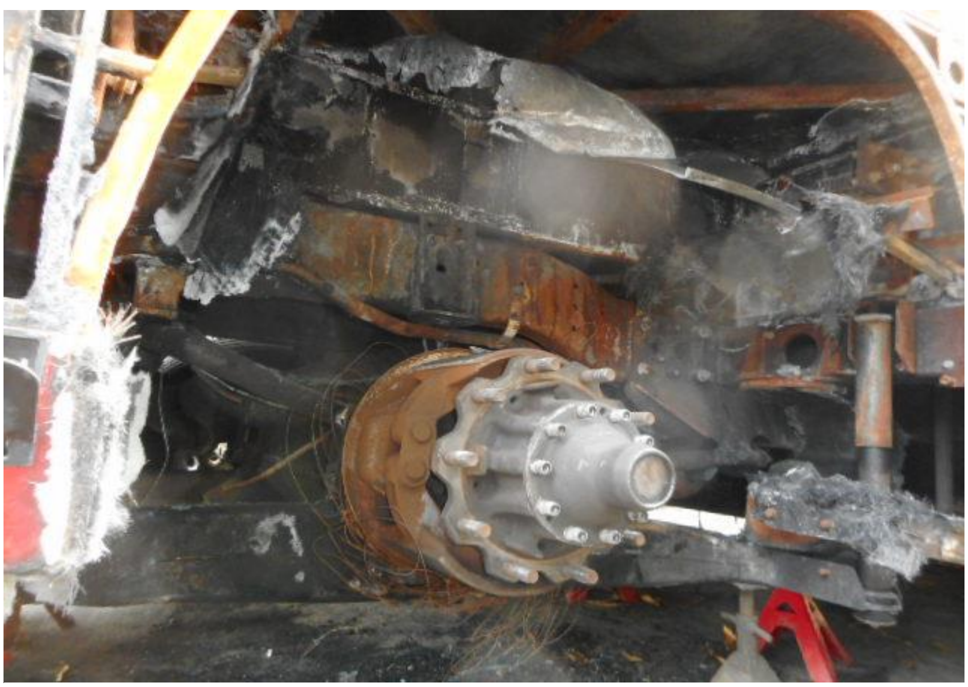

Photo 10 shows a general view of the rear right brake drum and brake pad of the Insured Vehicle after the wheel rim was removed. Upon closer examination, we did not observe any damages to the brake drum or the brake pad.

Photo 11 shows a close up view of the rear left top brake drum pad of the Insured Vehicle. Upon closer examination, we did not observed any damages to the brake drum pad.

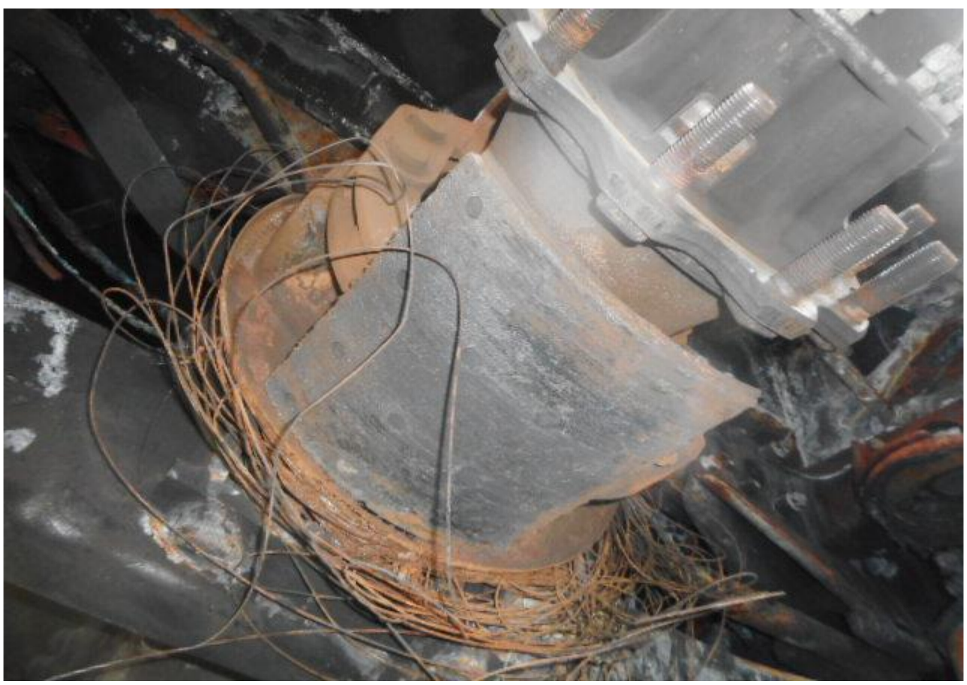

Photo 12 shows a general view of the rear left bottom brake drum pad of the Insured Vehicle. Upon closer examination, we did not observed any damages to the brake drum pad.

Photo 13 shows a general view of the rear left brake drum of the Insured Vehicle. Upon closer examination, we did not observe any damages to the exterior surface of the brake drum.

Photo 14 shows a general view of the rear left brake drum of the Insured Vehicle. Upon closer examination, we did not observe any damages to the interior surface of the brake drum.

Photo 15 shows a general view of the rear right outer wheel rim of the Insured Vehicle. Upon closer examination, we observed that the dent and cracked wheel rim (circled) was caused by an impact that had caused the deformed damage to it.

Photo 16 shows a close up view of the rear right outer wheel rim of the Insured Vehicle. Upon closer examination, we observed that the dent and cracked wheel rim (circled) was caused by an impact that had caused the deformed damage to it.

12. We managed to speak to Mr Sun where we were able to gather further information pertaining to the incident as well as information pertaining to the history of the Insured Vehicle.

13. From the Singapore Accident Statement which was made by Mr Sun YuanYong (herein referred to as **"Mr Sun"**), who is the driver of the Insured Vehicle; we note that the fire to the Insured Vehicle had started at a time while he was driving the Insured Vehicle. Mr Sun was first alerted of the fire when he saw smoke emitting from rear right wheel of the Insured Vehicle.

14. According to Mr Sun, on 1st October 2022 at about 0630hrs he drove the Insured Vehicle from his office at Woodlands for the start of the shift to Chua Chu Kang to pick workers up and then dropped him off at Raffles Place, during the journey from Chua Chu Kang to Raffles Place when the Insured Vehicle was travelling on the expressway of AYE, Mr Sun look at the right side rear view mirror and saw smoke coming from the rear right wheel of the Insured Vehicle, subsequently he drove the Insured Vehicle to the left shoulder lane and switched off the engine and evacuated the remaining passengers off the Insured Vehicle.

15. He informed us that he had activated SCDF assistance and also tried to put off the fire with a fire extinguisher in the Insured however, the fire but the fire was too strong. The SCDF and police arrived in within 15 minutes and shortly after managed to extinguish the fire. The SCDF officers then took down Mr Sun's statement.

16. Mr Sun mentioned that EMAS had towed the Insured Vehicle off the expressway and his company had made towing arrangements. The tow truck arrived in less than an hour. The Insured Vehicle was towed back to SC Auto Industries.

17. Mr Sun lodged an insurance report was made at SC Auto Industries on 3rd October 2022 at 1708 hours.

18. To the best of his recollection, Mr Sun mentioned he had not experienced any mechanical or electrical problems with the Insured Vehicle. He mentioned that there were neither warning lights displayed nor was there an abnormal rise in temperature of the Insured Vehicle when he was driving the Insured Vehicle on the day of the incident.

19. During the course of our investigations, we were able to obtain, the latest servicing records of the Insured Vehicle before the incident occurred.

20. With regards to the history of the Insured Vehicle, we were able to gather that the Insured Vehicle was purchased pre-owned since Nov 2019. Mr Sun is the only driver to the Insured Vehicle and it is daily driven.

21. Pertaining to the maintenance aspect, servicing record provided by the company for the Insured Vehicle, shows that its latest servicing was done 4 days prior to the fire incident. Refer to servicing record below.

SC AUTO

SC Auto Industries (S) Pte Ltd
51, Senoko Road, Singapore 758133
Tel: 67582222 Fax: 62576931
Email: sales@scauto.com.sg
Website: www.scauto.com.sg
Co.Reg.No.: 199800107D
GST Reg No.: 199800107D

TAX INVOICE

Bill To: 2SU001S

SIN U LIAN TRAVEL PTE LTD
61 WOODLANDS INDUSTRIAL PARK
#07-06
SINGAPORE 757047
Attn:NG KEE YAN

MEMBER TYPE: SIRIUS

Invoice No.	: RP22090007	Currency	: SGD
Invoice Date	: 2/9/2022	Pay Terms	: COD
DO No.	: SRO2300006	Advisor	: SOPHIA SONG
Delivery Date	: 02/09/2022	Driver Name	: LILI
Quotation No	: Q230006-00	Contact	: 98893555

Veh No	Reg Date	Make	Model	Chassis No	Body Type	Collected On	Time Out
PC21J				OVH00833		02/09/2022	16:11:10

S/N	Item No	Description	Qty	UOM	Unit Price	Dis(%)	Net Price
1	GSS0005	GAS SPRING STB 800N 094927	2.00	PC	20.12	20	32.19
2	M46	SUPPLY LABOUR AND MATERIAL TO CHECK CHASSIS MECHANICAL FUNCTION, AIRLEAK, BRAKE AND REPLACE FOLLOWING NEW PARTS: MATERIAL 1.BRKE CHAMBER (DIAPHRAGM) 1 PC $18.00 2. AIR BELOW 2 PCS $453.60 3. FRONT PUMP $240.50 4. REAR CLUTCH PUMP 1 PC $398.25 5. EXPANSION TANK LEVEL TANK LEVEL CAP 1 PC $27.00 6. BRAKE FLUID BOT4 2 LT $40 LABOUR $390.00 NOTE: ANY ADDITIONAL CHARGES MAY APPLY FOR PARTS OR LABOUR NOT LISTED IN THIS QUOTATION.					1,567.35

Charges Summary

Parts & Materials	:	32.19	Reward Discount	(1.61)
Labour	:	1,567.35	Special Discount	0.00
Others	:		Total Amount	1,597.93
Total	:	1,599.54	GST 7%	111.86
			Amount Payable	1,709.79

22. Upon investigating the list of items in the servicing record provided, we did not find any major overhaul done to the Insured Vehicle and the items replaced in the servicing would not post a risk to the fire.

Incident Scene Photographs

23. We were able to obtain photographs taken of the incident location. The photographs were taken during the fire to the Insured Vehicle.

24. Our examination of the photograph revealed that the Insured Vehicle was observed to be tilted down to right side and the fire at the material time of incident. 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 photo17 below.

Photo 17 shows that the Insured Vehicle was observed to be tilted down to the right side (arrowed) of the Insured Vehicle at the material time of incident. 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.

25. 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 Sun 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, as Mr Sun was still able to bring the Insured Vehicle to a stop and switch of the running engine.

26. The possibility of the fire being due to electrical in nature would be unlikely as the electrical systems of the Insured Vehicle was still working and the Insured Vehicle was still able to be operated, as Mr Sun was still able to bring the Insured Vehicle to a stop and switch off the running engine.

27. 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 likely as in our opinion, the fire was cause due to the rear right outer wheel rim contacting the road surfaces where it was travelling on, where metal material of the wheel rim rubbing on the road surfaces causing sparks that had ignited the combustible materials in the vicinity like the rubber tyres, wirings and spreading into the cabin of the Insured Vehicle.

28. Although we are unable to inspect the rear right outer tyre as it was burnt by the fire. We are in view that the rear right outer tyre had suffered a puncture causing the rear right outer wheel rim to contact the road surfaces resulting in the fire. As we observed that the dent and cracked damages on the rear right outer wheel rim was due to an impact resulting in the damages. The puncture to the rear right outer tyre had caused the bus to tilt down slightly to the right result in the rear right outer wheel rim to contact the road surfaces and causing the damages as well.

29. Our checks with both local and international bodies and associations had revealed that at the time of writing this report, there was no manufacturer recall to the Insured vehicle.

1 2

Vehicle Recall Details

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

Owner ID Type	Owner ID
Company	406R
Vehicle No.	Make/Model
PC21J	SCANIA/ KIB4X2

Engine No.:
6419650

Chassis No.:
YS2K4X20001864585

Recall Details:
No Recall Detail records

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OK

Print

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

Conclusion

30. 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 external factor. For this particular case, the fire had originated from the rear right wheel rim that had spread into the interior cabin of the Insured Vehicle.

31. 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.

32. 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
Senior Technical Investigator
Technical Investigation & Reconstructionist (SAE-A)

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