

Your Ref: S0M02HRQ
Our Ref : CS/ASM20003497/P

11th March 2020

M/s AXA Insurance Pte. Ltd.
8 Shenton Way #24-01
AXA Tower
Singapore 068811
(Motor Claims Department)

**TECHNICAL INVESTIGATION REPORT OF FIRE INCIDENT INVOLVING THE
INSURED VEHICLE PA 6846S ON 24th February 2020**

1. We refer to your letter dated 3rd March 2020 and the instructions therein.
2. Our analysis, comments and opinions with respect to the cause of fire to the insured vehicle PA 6846S (herein referred to as "**Insured Vehicle**") are set out below.

Inspection of the Insured Vehicle

3. The Insured Vehicle was physically inspected on 5th March 2020 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.	: PA 6846S
Make / Model	: ISUZU LT134P-7.8D (M)
Chassis No	: JALLT134P77000101
Year of Registration	: July 2007
Mileage	: N.A. (wiring affected)

5. The exterior body of the Insured Vehicle had sustained fire damage at the top portion as well as rear portion. Affected parts had included the side mirrors, roof, windows, rear panels, both windscreens and the rear roof air extractor unit. The interior compartment of the Insured Vehicle was completely burnt. 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 front portion of the Insured Vehicle was significantly affected by the fire.



Photo 2 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 top portion as well as rear portion. Affected parts had included the side mirrors, roof, windows, rear panels, both windscreens and the rear roof air extractor unit.



Photo 3 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 damage at the top portion as well as rear portion. Affected parts had included the side mirrors, roof, windows, rear panels, both windscreens and the rear roof air extractor unit



Photo 4 shows the general view of the top portion of the Insured Vehicle at the time of our inspection. The roof of the Insured Vehicle had sustained severe fire damage.



Photo 5 shows a closer view of the left rear portion of the Insured Vehicle at the time of our inspection. The fire damage was observed to be at its rear roof portion. The engine exterior compartment was observed to be unaffected by the fire.

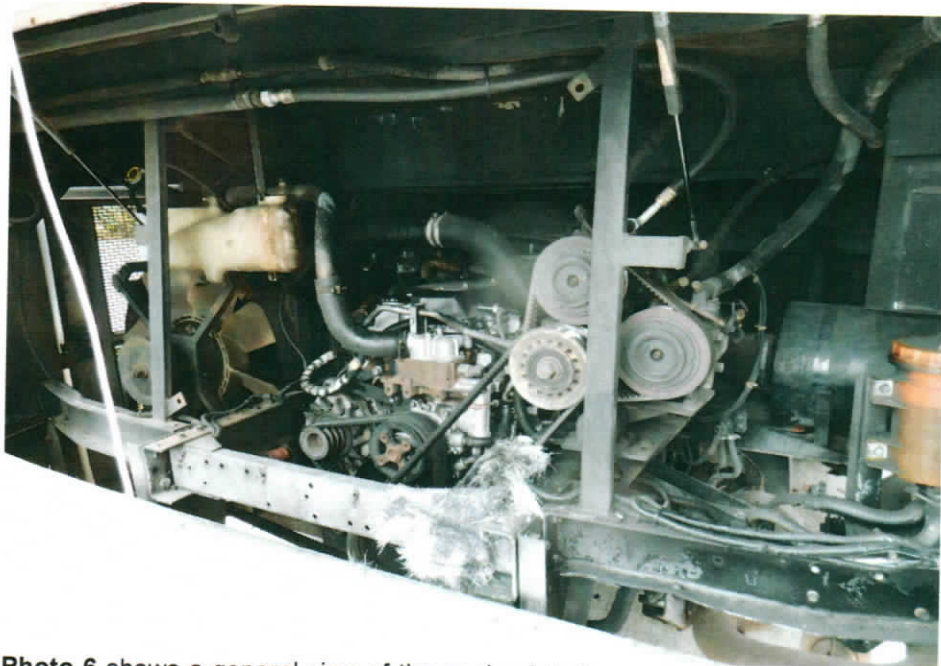


Photo 6 shows a general view of the engine interior compartment of the Insured Vehicle at the time of our inspection. The engine compartment of the Insured Vehicle was observed to be unaffected by the fire.



Photo 7 shows the interior cabin of the Insured Vehicle at the time of inspection. The interior rear cabin was completely burnt.

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 roof portion of the Insured Vehicle, around the rear roof portion of the rear air extractor unit. This can be determined from the nature of the fire damage which was more extensive at the top 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 roof portion of the Insured Vehicle.

8. Upon closer examination of the rear portion of the roof of the Insured Vehicle as well as around the immediate vicinity to where the fire had likely started, we had found greenish residue on several burnt stretches of original air extractor fans and factory fitted wirings around the rear top portion of the rear air extractor unit. 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 a general view of the rear roof portion of the air extractor unit of the Insured Vehicle. Upon closer examination, we had found greenish residue on several burnt stretches of original extractor fan and factory fitted wirings around the rear roof portion of where the air extractor unit is located with (circled).



Photo 9 shows a close up view of the greenish residue found on several burnt stretches of original factory fitted wirings, around the rear roof portion of the air extractor unit (circled) of the Insured Vehicle. 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 general view of the interior portion. Observed the fan of the air extractor unit from the Insured Vehicle had fallen into the interior portion. Upon closer examination, we had found greenish residue on several burnt stretches of original extractor fan and factory fitted (circled).



Photo 11 shows a closer view of the fallen original extractor fan from the air extractor unit, greenish residue was found on factory fitted wirings of the air extractor fan (arrowed) of the Insured Vehicle. This seems to suggest the occurrence of an electrical short circuit.

9. We managed to speak to Mr Wong 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. From the Singapore Accident Statement and Singapore Police Report No. D/20200224/0050 which was made by Mr Wong Kok Fei (herein referred to as "**Mr Wong**"), 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 Wong was first alerted of the fire when he smelled smoke in the cabin of the Insured Vehicle.
11. According to Mr Wong, on 24 February 2020 at about 0545hrs he drove the Insured Vehicle to office to fill up the fuel tank for the start of the shift and filling up he proceed to start up the Insured Vehicle and he saw black smoke coming out from the exhaust pipe, subsequently he informed his company about it but he was only told to return the Insured Vehicle to office at 0630hrs, however Mr Wong stated that he was already on the road with passengers on it and could not return to office and continued his driving.

12. While in the midst of picking and dropping office workers along 1 Portsdown road at about 0925 hours Mr Wong smelled smoke emitting from the cabin of the Insured Vehicle and he immediately stopped the Insured Vehicle, switched off the engine and evacuated the remaining passengers off the Insured Vehicle.
13. Mr Wong had informed us that he had inhaled smoke and had difficulty breathing and he had only partial recollection of the event upon evacuating from the Insured Vehicle.
14. He informed us that members of public activated SCDF and also came to assist attending to him and attempted to put out the fire but the fire was too strong. The SCDF and police arrived in within 10 minutes and shortly after managed to extinguish the fire. Police officers then took down Mr Wong's statement. Mr Wong was then bought up the ambulance for checks.
15. Mr Wong company staff from Tong Tar Transport Pte Ltd had already arrived on the scene to access the situation and also made towing arrangements. The tow truck arrived in less than an hour. The Insured Vehicle was towed back to SC Auto Industries. After declaring fit from the paramedics, Mr Wong went to see a doctor by his own and had gotten a 7 days MC.
16. Mr Wong lodged a police report at the Choa Chu kang Neighbourhood Police Centre 2 days later, on 26 February 2020 at 1401 hours. An insurance report was made at SC Auto Industries by his company staff on 02 March 2020 at 1015 hours.
17. To the best of his recollection, Mr Wong mentioned he had not experienced any mechanical or electrical problems with the Insured Vehicle till the day of the incident. 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. He only notices intermittent black smoke emitting out from the exhaust piping happening for 3 days prior to the fire.
18. During the course of our investigations, we were able to obtain from the staff at Tong Tar Transport Pte Ltd, the latest servicing records of the Insured Vehicle before the incident occurred.
19. With regards to the history of the Insured Vehicle, we were able to gather from the staff at Tong Tar that the Insured Vehicle was purchased new in 2007. Mr Wong is the only driver to the Insured Vehicle.

20. 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.



TONG TAR TRANSPORT SERVICE PTE LTD

8 Soon Lee Road, Singapore 628073 Tel: 6261 5537 Fax: 6268 6620
GST Registration No. M2-0029363-X

Bus No : PA 6846 S

Maintenance Record 维护记录 - 2020

Type : 49 SEATER

Description	Date	Service by	Date	Service by	Date	Service by	Remarks
Change Engine Oil (3 month) 更换机油	20/2/2020	Ah Tiong					
Change Oil filter 更换机油过滤器	20/2/2020	Ah Tiong					
Change Air filter 变化的空气过滤器	20/2/2020	Ah Tiong					
Change Diesel fuel filter 更改柴油过滤器	20/2/2020	Ah Tiong					
Check Brake Oil 检查刹车油							
Check Gear box Oil 检查变速箱油							
Check Tires air (Reading on Tires) 检查轮胎空气	20/2/2020	Ah Tiong					
Check Battery 检查电池	20/2/2020	Ah Tiong					
Check Radiator Coolant water 检查散热器冷却液的水	20/2/2020	Ah Tiong					
Check fan belt 检查风扇皮带	20/2/2020	Ah Tiong					
Check Pump grease pulley nipple 检查润滑油泵皮带轮嘴	20/2/2020	Ah Tiong					
Check Power Steering oil 检查动力转向油	20/2/2020	Ah Tiong					
Check Tires tread / Grooving 检查轮胎胎面/开槽	20/2/2020	Ah Tiong					
Additional Repair							
Replace Clutch plate	20/2/2020	Ah Tiong					

51 UBI AVE 1, #01-25 PAYA UBI INDUSTRIAL PARK, SINGAPORE 408933 TEL : (065) 62563561 FAX : (065) 67414108

21. 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.
22. From our understand, the Insured Vehicle is used daily as a shuttle bus to ferry passengers to work thus the black smoke produced from the exhaust pipe is due to the high usage and old age of the engine. And rectified or not, it did not cause or contributed to the fire as the origin of fire was at the roof of the Insured Vehicle.

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 fire had started from the rear roof portion and not from the engine compartment 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. Apart from the aforesaid, there was no further notable information that could be gathered from these photographs. See photos 12- 13 below.



Photo 12 shows the fire had started from the rear roof portion (circled) 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.



Photo 13 shows the fire had started from the rear roof portion of the Insured Vehicle and spread to the rest of Insured Vehicle (red circle); however the engine portion was not affected (yellow circle) 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 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, as Mr Wong was still able to bring the Insured Vehicle to a stop and switch off the running engine.
26. 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.

26. 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 original air extractor unit and the factory fitted wirings to the electrical components on the Insured Vehicle, which was earlier discussed in paragraph 8 above.
27. Our checks with both local and international bodies and associations had revealed that at the time of writing this report, there was a manufacturer recall on 26th September 2011 for the fuel common rail and it was rectified 12th December 2011. Given that the cause of fire was due to electrical short circuit of air extractor unit, the manufacturer recall on 26th September 2011 whether rectified or not, it did not cause or contributed to the fire See search result from LTA below.

1

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Vehicle Recall Details

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

Owner ID Type Company	Owner ID 458K
Vehicle No. PA6846S	Make/Model ISUZU/ LT134P

Engine No.:
6HK1452683

Chassis No.:
JALLT134P77000101

Recall Details

Recall No.: R2011100058

<p>Manufacturer Recall Date: 26 Sep 2011 ←</p> <p>Brief Description (As Provided by Motor Dealer): SURFACE OF FUEL COMMON RAIL GET ROUGH CONDITION DUE TO MACHINE FAILURE IN PRODUCTION LINE OF VENDOR. AS A RESULT, DURABILTY OF HEAT LOAD IS NOT ENOUGH.</p> <p>Hotline Information: ANG KHOON ENG at 68614800</p> <p>For more details, contact TRIANGLE AUTO PTE LTD</p>	<p>Estimated Completion Year of Recall: 2012</p> <p>Date Rectified: 12 Dec 2011 ←</p>
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Conclusion

29. 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 factory fitted wirings of original air extractor unit in the rear roof portion of the Insured Vehicle.
30. Although informed that there was black smoke emitting from the exhaust pipe of the Insured Vehicle a few days before prior to the fire, 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 or due to the black smoke from the exhaust pipe
31. Our investigations had also revealed that at the time of writing this report, the manufacturer recall campaign 26th September 2011 which had involved the Insured Vehicle but did not possess a fire risk to the Insured Vehicle.

31. 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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