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02 April 2018

Tokio Marine Insurance Singapore Ltd
20 McCallum Street #09-01
Tokio Marine Centre
Singapore 069046
(Motor Claims Department)

5001 ✓

**TECHNICAL INVESTIGATION REPORT OF FIRE INCIDENT INVOLVING THE
INSURED VEHICLE XD 1815D ON 02 MARCH 2018**

1. I refer to your request dated 06 March 2018 and the instructions therein.
2. My analysis, comments and opinions with respect to the cause of fire to the insured vehicle XD 1815D (herein referred to as "**Insured Vehicle**") are set out below.

Inspection of the Insured Vehicle

3. The Insured Vehicle was physically inspected on 07 March 2018 at the premises of M/s Lee Kuan Hwa Motor Service, 24 Sungei Kadut Street 4, Singapore 729050.
4. The Insured Vehicle was observed to have sustained extensive fire damage at its frontal portion. The body panels at the frontal portion and the undercarriage components at the front underside were found to have been burnt to char. Parts inside the interior compartment were also observed to be completely burnt, leaving charred skeletal remains. The engine and transmission of the Insured Vehicle were also affected.
5. At the time of inspection, I did not find any unusual skeletal remains which could have suggested that there was possible modification(s) and/or additionally fitted electronic and/or electrical component(s) on the Insured Vehicle. See photo 1 – 6 below.



Photo 1 shows a general view of the front right body of the Insured Vehicle at the time of inspection. The Insured Vehicle was observed to have sustained extensive fire damage at its frontal portion. The body panels at the frontal portion and the undercarriage components at the front underside were found to have been burnt to char.



Photo 1 shows a general view of the front left body of the Insured Vehicle at the time of inspection. The Insured Vehicle was observed to have sustained extensive fire damage at its frontal portion. The body panels at the frontal portion were found to have been burnt to char.



Photo 3 shows the interior compartment of the Insured Vehicle. All the parts inside the interior compartment were found to be burnt and/or melted. Its front seats, rear seats, roof upholstery, carpet and various trims were all burnt and/or melted as a result of the fire.



Photo 4 shows the underside of the Insured Vehicle, at its front left area. The various undercarriage components at the front underside of the Insured Vehicle was observed to be affected. This had included components of the braking system and steering system.



Photo 5 shows the engine compartment, which was located at the back of the Insured Vehicle's front cabin. The various parts and components within the engine compartment of the Insured Vehicle were all affected by the fire. This had included the engine of the Insured Vehicle.

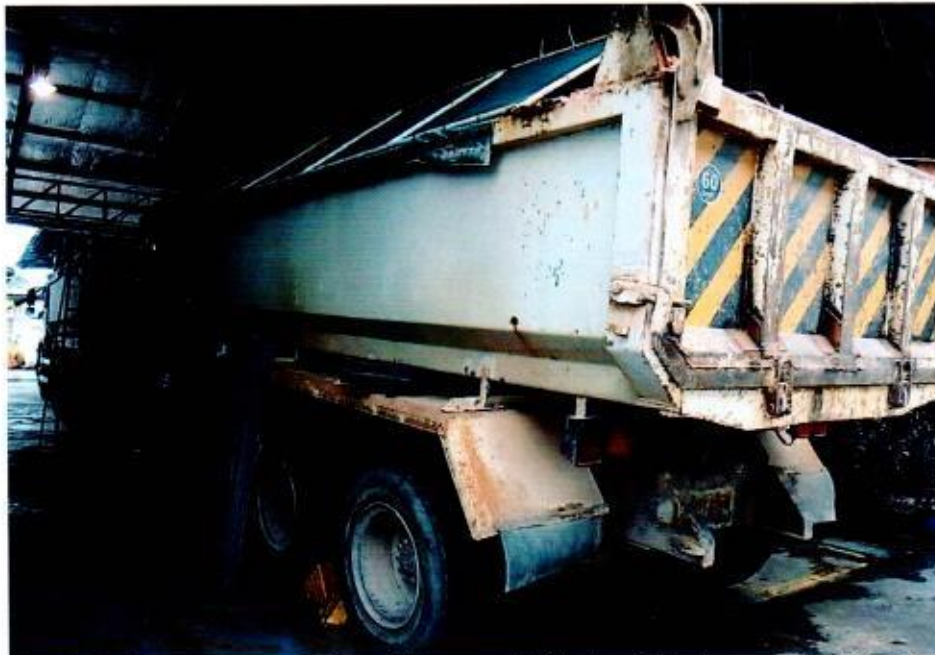


Photo 6 shows a general view of the rear left body of the Insured Vehicle. The rear portion was observed to be relatively unaffected by the fire.



Investigation and Technical Analysis

6. From the Police report J/20180305/2094, which was made by Mr Goh Chin Chye (herein referred to as "**Mr Goh**"), I note that the fire to the Insured Vehicle had started at a time when he was driving the Insured Vehicle. Mr Goh had first seen smoke coming out from the back of the Insured Vehicle after being alerted by other motorists. The smoke turned into a fire after he stopped the Insured Vehicle along the side of a road.
7. I spoke to Mr Goh on 19 March 2018, where through telephone conversation, I was able to gather further information pertaining to the incident as well as information pertaining to the history of the Insured Vehicle.
8. According to Mr Goh, on 02 March 2018 at about 1pm plus, he was driving the Insured Vehicle heading to a job site at Tanah Merah. Mr Goh was delivering soil from Admiralty to Tanah Merah. His assignment for that day was mainly to transport soil from Admiralty to Tanah Merah. Mr Goh had completed 2 deliveries to Tanah Merah and was making his third delivery when the incident occurred.
9. Whilst travelling along TPE towards Changi Airport, somewhere after the Loyang Avenue exit and before the Changi North Industrial exit, he heard honking sounds from other motorists and when he looked at the left wing mirror of the Insured Vehicle, he noticed smoke coming out from the front left wheel area of the Insured Vehicle. Mr Goh then drove the Insured Vehicle slowly and exited at Changi North Crescent before stopping the Insured Vehicle along the side of the road to check.
10. Upon alighting, he saw flames around the front left wheel area of the Insured Vehicle. Mr Goh then immediately called SCDF for assistance. The frontal portion of the Insured Vehicle was already engulfed in flames by the time SCDF officers had arrived. The fire was subsequently extinguished by SCDF officers. The Insured Vehicle was eventually arranged to be towed to Sungei Kadut area after clearance was obtained from the attending SCDF officers and Police officers.

11. With regard to the history of the Insured Vehicle, I was informed by Mr Goh that he is presently employed by Colossus Trading Pte Ltd, who is also the registered owner of the Insured Vehicle. He was assigned the Insured Vehicle when he joined the company about 2 years ago. He has been the main driver of the Insured Vehicle ever since. As far as he can recall, there has not been any mechanical or electrical problem(s) with the Insured Vehicle. It was sent for servicing and maintenance regularly with all documents kept by his company.
12. During my conversation with Mr Goh, I was informed that he had taken some photographs and a video recording whilst at the incident scene. These were duly forwarded to me for my review.
13. The photographs taken by Mr Goh had showed the Insured Vehicle parked along the side of a roadway with flames engulfing its frontal portion. SCDF officers were also seen spraying water onto the front underside of the Insured Vehicle, directly beneath the front cabin of the Insured Vehicle.
14. Upon further examination of the photographs and video, I had also noted that there was no unusual foreign material(s) and/or object(s) on the ground in the immediate area of where the Insured Vehicle had stopped. Burnt residual remains were however observed on the road surface. A patch of grass on the left side of the Insured Vehicle was also observed to be burnt as a result of the fire. See photo 7 – 10 below.



Photo 7 shows a general view of the Insured Vehicle with its frontal portion engulfed in flames. The Insured vehicle could be seen parked along the side of a roadway, in the vicinity of Changi North Crescent. Generally, the information that could be gathered from the incident scene photographs provided by Mr Goh had corresponded to the events that he had related to me.



Photo 8 shows a general view of the Insured Vehicle with its frontal portion engulfed in flames. The Insured vehicle could be seen parked along the side of a roadway. The information that could be gathered from the incident scene photographs had corresponded to the events that Mr Goh had related to me



Photo 9 shows a general view of the front left body of the Insured Vehicle at the incident scene. SCDF officers could be seen spraying water onto the front underside of the Insured Vehicle, directly beneath the front cabin of the Insured Vehicle.



Photo 10 shows a general view of the Insured Vehicle at the incident scene. SCDF officers could be seen spraying water onto the front underside of the Insured Vehicle, directly beneath the front cabin of the Insured Vehicle. Burnt residual remains were observed on the road surface. A patch of grass on the left side of the Insured Vehicle was also observed to be burnt as a result of the fire.

15. During the course of my investigations, I managed to obtain from the registered owner of the Insured Vehicle, M/s Colossus Trading Pte Ltd, several documents relating to the servicing and maintenance aspect of the Insured Vehicle. The documents provided had covered a period from September 2017 to February 2018.
16. Upon reviewing these documents, I note that the Insured Vehicle was last serviced on 26 February 2018, approximately 4 days before the fire. Generally, there seems to be no inherent and/or recurring mechanical and/or electrical issue(s) to the Insured Vehicle. Most of the work carried out to the Insured Vehicle during this period involved tyre servicing and tyre replacement. Its brake system was also checked during a servicing on 02 February 2018.
17. Given the circumstance of incident described by Mr Goh, the fire had occurred while the Insured Vehicle was being driven/engine in operation. Common causes of fire arising from a vehicle that is being driven and/or with its engine in operation include engine overheating, leakage of fluid onto hot surfaces or electrical nature.
18. Fire due to an overheated engine was unlikely as the Insured Vehicle was still able to be operated after smoke was first seen. Mr Goh was still able to drive the Insured Vehicle, bring it to a complete stop along the side of a roadway before alighting to check. In the event if the Insured Vehicle's engine had overheated, the mechanical parts inside the engine would first seize causing the engine to stall. Mr Goh would have likely experienced engine stalling shortly after seeing the smoke, rendering the Insured Vehicle undriveable.
19. Furthermore, the engine was located at the back of the Insured Vehicle's front cabin (refer to photograph 5 below). As seen from the photographs, the area was not a covered area. Heat generated from engine operation would have been easily dissipated out whilst the Insured Vehicle was moving, hence fire resulting from an engine overheat is also unlikely.
20. Leakage of fluid within the engine compartment may cause a fire to be ignited when the leaked fluid comes into contact with hot surfaces, like an exhaust pipe. The leaked fluid could possibly reach temperature sufficient for it to self-ignite. However as discussed in the aforesaid paragraph, the temperature within the engine compartment would have unlikely been able to reach temperature that could result in leaked fluid to self-ignite. Fire due to self-igniting fluid leakage would then seem unlikely for this case.

21. Since engine overheating and leakage of fluid were both unlikely the cause of fire, the most probable cause would then be electrical in nature to the wirings of the Insured Vehicle. The rubber insulation of the wires and/or wiring harness may lose its flexibility and become hardened after a prolong period of time. The hardened rubber insulation may then become brittle and break off bits by bits, exposing live wires that may come into contact with each other and/or the metal body of the vehicle, creating sparks that could ignite a fire. Unlike countries with different seasons, the hot local climate enhances the deterioration of any rubber material parts or components of a motor vehicle, in particular for those contained within its engine compartment.
22. My checks with both local and international bodies and associations revealed that at the time of writing this report, there is no manufacturer recall of similar make and model vehicle as the Insured Vehicle. See screenshot below showing the search result from LTA.

Enquiry on Vehicle Recall - Vehicle Specific

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

Vehicle Owner Particulars

Owner ID Type: Company
Owner ID: 2860E

Vehicle Details

Vehicle Registration number: XD1815D
Make: ISUZU
Vehicle Model: CYZ52L
Engine No.: 6WG1407148
Chassis No.: JALCYZ52L77000113

Recall Details

No Recall Detail records

Conclusion

23. For this case, I am of the view that the fire had originated around the left front body area of the Insured Vehicle. The cause of fire was likely to be of electrical in nature.
24. The information and documents gathered during the course of my investigation did not suggest that the cause of fire was due to poor maintenance and/or recurring electrical issue(s).



25. My investigations had also revealed that at the time of writing this report, there was no manufacturer recall of similar make and model vehicle as the Insured Vehicle that may possibly pose a fire risk.

Ang Bryan Tani

AMSOE, AMIRTE, AFF SAE, M.MATAI, AFF.Inst.AEA
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