

Your Ref: SNM22D206049
Our Ref : CS4/CTI22008420/N

12 September 2022

M/s China Taiping Insurance (Singapore) Pte Ltd

3 Anson Road #16-00
Springleaf Tower
Singapore 079909
(Motor Claims Department)

TECHNICAL INVESTIGATION REPORT OF FIRE INCIDENT INVOLVING THE INSURED VEHICLE SKL 3618E ON 25 AUGUST 2022

1. We refer to your request dated 30 August 2022.
2. Our analysis, comments and opinions with respect to the cause of fire to the insured vehicle SKL 3618E (herein referred to as “**Insured Vehicle**”) are set out below.

Inspection of the Insured Vehicle

3. The Insured Vehicle was physically inspected on 6 September 2022 at the premises of Auto Insure Pte. Ltd. (herein referred to as “**Auto Insure**”) located at 6 Marsiling Lane, Singapore 739145.
4. A static inspection was carried out to the Insured Vehicle where the following general information was recorded: -

Vehicle Registration No.	: SKL 3618E
Make / Model	: Jaguar XF 2.2 I4D AUTO ABS D/AB 2WD 4DR HID TC
Chassis No	: SAJAC0565DDU00869
Year of Registration	: October 2013
Mileage	: N.A (wiring affected)

5. The Insured Vehicle was noted to have sustained fire damage that was confined to its undercarriage. The interior compartment, engine compartment and the exterior of the Insured Vehicle were observed to have been relatively unaffected by the fire.
6. The fire had resulted in several components in the undercarriage to be slightly burnt and/or damaged. This had included its diesel particulate filter (DPF), DPF heat shield and engine oil pan cover, amongst others. See photos 1 – 6 below.



Photo 1 shows the general view of the frontal portion of the Insured Vehicle at the time of our inspection. The fire damage was confined to its undercarriage. The exterior portion of the Insured Vehicle was observed to be relatively unaffected by the fire.



Photo 2 shows the general view of the engine compartment of the Insured Vehicle at the time of our inspection. The fire damage was confined to its undercarriage. The engine compartment of the Insured Vehicle was observed to be relatively unaffected by the fire.



Photo 3 shows the general view of the rear portion of the Insured Vehicle at the time of our inspection. The fire damage was confined to its undercarriage. The exterior portion of the Insured Vehicle was observed to be relatively unaffected by the fire.



Photo 4 shows the interior compartment of the Insured Vehicle, which was observed to be relatively unaffected by the fire.



Photo 5 shows the Insured Vehicle hoisted for us to have a thorough look of the undercarriage. For this particular case, the fire appears to have originated from the undercarriage of the Insured Vehicle. This can be determined from fire extinguisher residue found on the engine oil pan cover, partially burnt and/or melted parts of the engine oil pan cover, DPF and DPF heat shield as well as burnt wirings (arrowed).

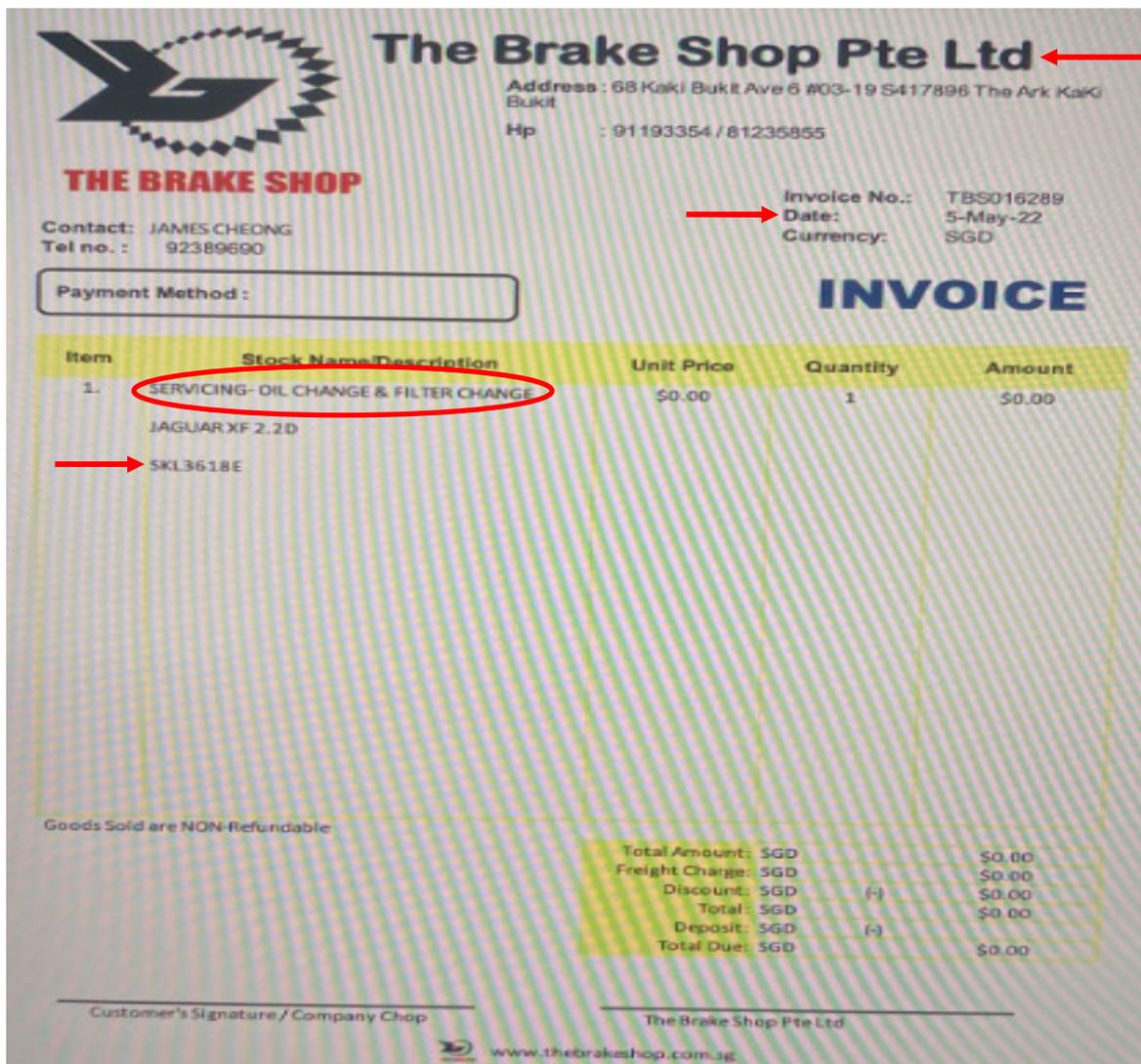


Photo 6 shows a closer view of the partially burnt and/or melted parts of the DPF (circled) and DPF heat shield (arrowed).

Circumstance of Incident

7. From the Singapore Accident Statement, which was made by one Cheong Chee Leong (herein referred to as “**Mr Cheong**”), we note that the fire to the Insured Vehicle had started at a time when he was driving home to Bukit Batok. Mr Cheong was first alerted of the fire when he saw smoke coming from the centre portion of the front bonnet of the Insured Vehicle.
8. We managed to speak to Mr Cheong where we were able to gather further information pertaining to the incident as well as information pertaining to the history of the Insured Vehicle.
9. According to Mr Cheong, at about 2000hrs on 25 August 2022, Mr Cheong was driving home from Orchard Road after visiting a friend. He travelled along PIE (Tuas). He was driving along the centre lane when he saw white smoke emitting from the centre portion of the front bonnet of the Insured Vehicle. Mr Cheong immediately stopped along the road shoulder. By then the undercarriage of the Insured Vehicle was on fire. Mr Cheong mentioned that 2 other cars stopped in front of the Insured Vehicle. One of the drivers told Mr Cheong that he had a fire extinguisher. The driver switched off the engine to the Insured Vehicle and proceeded to put out the fire. The fire was extinguished in less than 5 minutes. Mr Cheong managed to take a photo and video of the incident. Neither SCDF nor the police responded to the incident.
10. Mr Cheong called the Automobile Association and made towing arrangements. The tow truck arrived within 30 minutes. The Insured Vehicle was towed to The Brake Shop Pte. Ltd. that same day. The following day, Mr Cheong called Auto Insure. The Insured Vehicle was then towed to Auto Insure. No police report was made. Mr Cheong made an insurance report at Auto Insure on 26 August 2022 at 1408 hrs.
11. With regard to the history of the Insured Vehicle, Mr Cheong informed us that it was purchased new 9 years ago in 2013 directly from Jaguar Singapore. The Insured Vehicle is registered to his daughter, Ms Cheong Shi Ya Sheena. The main driver of the Insured Vehicle is Mr Cheong. As far as he can recall, there was no major mechanical or electrical issue(s) with the Insured Vehicle.
12. Pertaining to the maintenance aspect, Mr Cheong sends the Insured Vehicle for periodic servicing.

13. During the course of our investigations, we were also able to obtain from Mr Cheong, a document relating to the latest servicing of the Insured Vehicle done on 5 May 2022 at The Brake Shop Pte. Ltd. The servicing package had included changing of engine oil and oil filter. Refer to Invoice 1 below.



Invoice 1 shows the last servicing done on the Insured Vehicle at The Brake Shop Pte. Ltd. on 5 May 2022 (red arrows). The servicing package had included changing of engine oil and oil filter (circled).

14. Mr Cheong mentioned that after the servicing was done, he had not experienced any mechanical or electrical problems with the Insured Vehicle till the day of the incident. He also mentioned that there was no abnormal rise in temperature of the Insured Vehicle when he was driving the Insured Vehicle on the day of the incident.
15. Mr Cheong informed us that he had taken a photograph and a video recording during his time at the incident location and these were duly forwarded to us for review.

Investigation and Technical Analysis

16. The photograph and video recording provided had showed the Insured Vehicle with fire emitting from the undercarriage as well as after the fire being put out. The extent of fire damage was similar to what we observed when we inspected the Insured Vehicle. The background seen from the photograph had also corresponded to the incident occurring along the road shoulder of PIE (Tuas). Generally, the information that we were able to gather from the photograph and video recording provided by Mr Cheong had corresponded to the information that he had related to us. See photos 7 & 8 below.

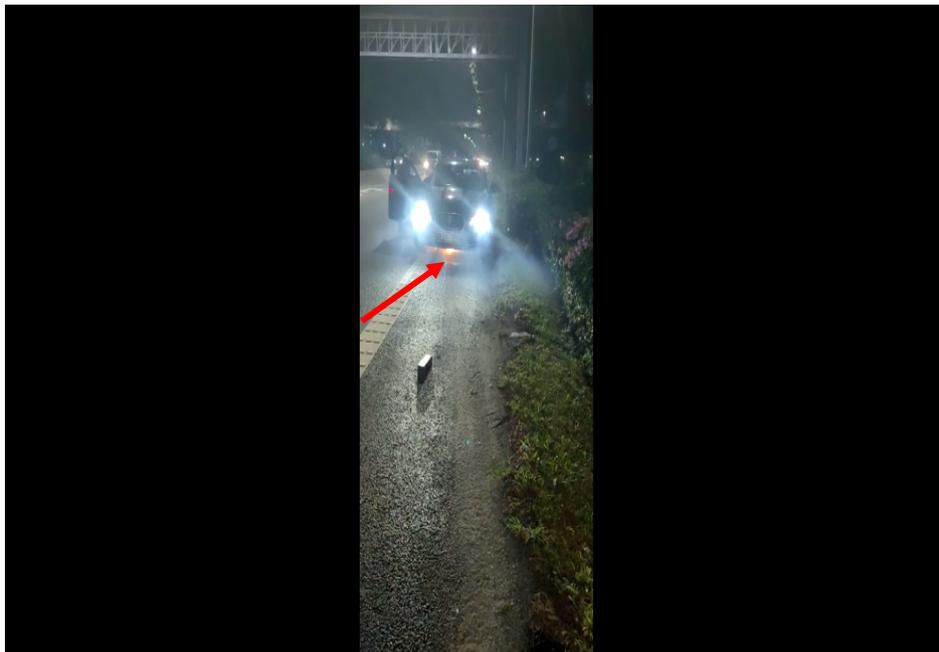


Photo 7 shows a screenshot taken from the video recording that was provided by Mr Cheong. The Insured Vehicle could be seen with fire emitting from the undercarriage (arrowed).



Photo 8 shows one of the drivers assisting Mr Cheong to put out the fire to the Insured Vehicle with his fire extinguisher (arrowed) which corresponded to Mr Cheong's statement.

17. For this case, from our review of the video recording and photograph taken at the incident scene, the origin of fire can be established basing on the presence flames that were seen emitting from the Insured Vehicle when the fire started.
18. As seen in photograph 8 above, the smoke was coming out from the centre undercarriage area of the Insured Vehicle. The subsequent outbreak of fire was also at the centre undercarriage area of the Insured Vehicle as seen in photograph 8 above. Given these observations from the photographs that were taken at the incident scene, the origin of fire can be established to be at the centre undercarriage area of the Insured Vehicle.
19. Our research and ground investigation revealed that this model vehicle is fitted with a Diesel Particulate Filter (DPF). As with all modern-day diesel engine motor vehicles like the Insured Vehicle, DPF, a cannister like component (part), is fitted along the exhaust system of such type of motor vehicles. Briefly, DPF is a component (part) that captures diesel particulates through a combination of filtration mechanisms, preventing the diesel particulates from being release into the atmosphere as harmful gases. An illustration of a simple filtration mechanism inside a PDF is shown below.



20. Like all filter element, the filter element inside the DPF will begin to clog as soot (carbon) and other diesel particulate starts to accumulate on the filter element inside the DPF over a period of time. Cleaning of DPF is therefore required as part of its periodic maintenance. This is usually done through a process call “regeneration”, when the exhaust temperature becomes high enough (usually at 600°C) to burn off the soot and other diesel particulate that have accumulated in the DPF. Driving a vehicle over long distance at speeds higher than road speeds allowed for urban city driving is the most common method of regenerating (cleaning) the DPF.
21. Smoke and/or fire from the underside of the vehicle or flames emanating form within the exhaust tailpipe can occur for such diesel engine vehicles when the exhaust temperature within the DPF increases due to clogging (exhaust gases becomes restricted and unable to flow out smoothly) or even when “regeneration” (cleaning). Heat from a fire within the DPF may possibly radiate to the surrounding vehicle components leading to heating of the vehicle underside, melting of interior components and in worst case, a potential interior fire. The DPF of the Insured Vehicle is located at the underside centre of the Insured Vehicle, below the centre console of the Insured Vehicle. This area was the area where smoke and flames were seen emitting from the Insured Vehicle. The evidence gathered would then appear to indicate that the fire to the Insured Vehicle was a result of heat radiating from a fire that had occurred within the DPF that was fitted at the underside centre of the Insured Vehicle.

22. We were also able to gather during the course of our investigations that there were several precautionary notices in overseas pertaining to possible fire arising from DPF fitted on similar type of vehicles as the Insured Vehicle. See Screenshot 1 below.

2005-2007 Jaguar S Type and XJ diesel vehicles – Diesel Particulate Filter

Make & Model : 2005-2007 Jaguar S Type and XJ Diesel

Number of Vehicles Affected: 68

Model Years From: 2005 to 2008 (MY2006 to MY2008 fitted with a diesel engine and a diesel particulate filter)

Whats wrong?: When these vehicles are driven under a unique driving pattern where the vehicle is predominantly used for short journey distances, under slow driving style and light throttle application, excessive soot and hydrocarbons may become trapped in the Diesel Particulate Filter (DFP).

The DPF on 2.7 Litre V6 diesel engine vehicles may exhibit smoke and/or fire from the underside of the vehicle, flames emanating from within the rear exhaust tailpipe or an orange glow from the underside of the vehicle. Heat from a fire within the DPF can radiate to the surrounding vehicle components and may lead to heating of the underside of the transmission tunnel and subsequent melting of the interior components and potential interior fire.

VIN Range: S Type. N50727 to N82818. XJ. H00155 to H17094.

What to do?: Contact your Jaguar dealer.

Screenshot 1 shows the precautionary notice in Australia pertaining to possible fire arising from DPF fitted on similar type of vehicles as the Insured Vehicle.

23. However, our checks with Land Transport Authority (LTA) reveal that there was no manufacturer recall campaign arising from any DPF issue. See search result below obtained from LTA.



Vehicle Recall Details

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

<i>Owner ID Type</i> Singapore NRIC	<i>Owner ID</i> 614B ←
<i>Vehicle No.</i> SKL3618E ←	<i>Make/Model</i> JAGUAR/ XF 2.2 I4D AUTO ABS D/AB 2WD 4DR HID TC
<i>Engine No.:</i> 4032177224DT	<i>Chassis No.:</i> SAJAC0565DDU00869
<i>Recall Details:</i> No Recall Detail records ←	

Conclusion

24. 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 due to fire that had occurred within the Diesel Particulate Filter (DPF) of the Insured Vehicle. For this particular case, heat from a fire that had occurred within the DPF had radiated to the surrounding components leading to fire within the undercarriage of the Insured Vehicle.
25. The diesel particles (soot, carbon etc) trapped by the filter element inside the DPF of the Insured Vehicle had self-ignited when the exhaust temperature within the DPF had increased as a result of clogging in the DPF.

26. Our investigations also revealed that there was no manufacturer recall campaign for DPF related issue(s) to the Insured Vehicle. There were however several precautionary notices in overseas pertaining to possible fire arising from DPF.
27. In view of this fire incident, a similar other incident that we had also investigated, and the precautionary notices pertaining to possible vehicular fire arising from heat radiating from DPFs, it is suggested that insurers, when underwriting, should consider the possible risk of vehicular fire that such type of modern day diesel engine motor vehicles poses.

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