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Your Ref: S1M03EQ6
Our Ref : CS4/ASM21008377/N

16 August 2021

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 SMV 91S ON 24 JULY 2021**

1. We refer to your letter dated 10 August 2021 and the instructions therein.
2. Our analysis, comments and opinions with respect to the cause of fire to the insured vehicle SMV 91S (herein referred to as "**Insured Vehicle**") are set out below.

Inspection of the Insured Vehicle

3. The Insured Vehicle was physically inspected on 12 August 2021 at the premises of Elite AM Pte. Ltd. located at 280 Woodlands Industrial Park E5, Harvest @ Woodlands, #01-17, Singapore 757322.
4. A static inspection was carried out to the Insured Vehicle where the following general information was recorded:-

Vehicle Registration No.	: SMV 91S
Make / Model	: BMW M3 SEDAN AT ABS D/AIRBAG 2WD LED NAV HUD
Chassis No	: WBS3C92060J274182
Year of Registration	: June 2014
Mileage	: N.A. (wiring affected)
5. The exterior front body of the Insured Vehicle sustained visible fire damage. This included its front windscreen and front bonnet.
6. The fire had resulted in serious damage to the engine compartment of the Insured Vehicle. Some of the components inside the engine compartment were found to be severely burnt and/or melted as a result of the fire. The interior compartment was observed to have been relatively unaffected by the fire. 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 exterior body of the Insured Vehicle had sustained visible fire damage. This included its front windscreen and front bonnet.



Photo 2 shows the general view of the left frontal portion of the Insured Vehicle at the time of our inspection. The exterior body of the Insured Vehicle had sustained visible fire damage. This included its front windscreen and front bonnet.



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 engine compartment. The rear portion of the Insured Vehicle was observed to be relatively unaffected by the fire.



Photo 4 shows a closer view of the front windscreen of the Insured Vehicle at the time of our inspection. The front windscreen had sustained minor fire damage at the lower left portion (arrowed).



Photo 5 shows a general view of the engine compartment of the Insured Vehicle at the time of our inspection. Some of the components inside the engine compartment were found to be severely burnt and/or melted as a result of the fire.



Photo 6 shows the interior compartment of the Insured Vehicle, which was observed to be relatively unaffected by the fire.

7. 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

8. For this particular case, the fire appears to have originated within the engine compartment of the Insured Vehicle, somewhere around the rear left portion of the engine compartment. A closer examination revealed faint whitish burn marks on the bottom left portion on the underside of the bonnet due to prolonged exposure to high heat intensity. We also observed paint bubbles on the rear left portion of the front bonnet. In general the location of the fires' origin was determined given that the damage of fire nature was confined to these particular areas on the Insured Vehicle.
9. The whitish burn marks are a result of exposure to prolonged heat intensity. Rust would normally start to develop around these areas soon after a fire as prolonged exposure to high heat intensity usually causes steel/metal material body parts to be exposed to natural environmental condition. The rust that had developed on the underside of the front bonnet, around the rear left area, is an indication that the rear left portion of the engine compartment had sustained exposure to prolonged high heat intensity. See photos 7 & 8 below.



Photo 7 shows paint bubbles on the rear left portion of the front bonnet (circled).



Photo 8 shows the faint whitish burn marks on the bottom left portion on the underside of the bonnet (arrowed) and the rust (circled) that had developed on the underside of the front bonnet, around the bottom left area. The development of rust is an indication that this area was exposed to prolonged exposure to high heat intensity, which had caused the steel/metal material of the front bonnet to be exposed to natural environmental condition. Hence the fire to the Insured Vehicle can be determined to have originated towards the rear left portion of the engine compartment.

10. Upon closer examination of the rear left portion of the engine compartment, which was where the fire to the Insured Vehicle had likely started, we had found traces of greenish residue on several stretches of burnt wirings. The presence of 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 9 - 13 below.



Photo 9 shows the burnt wirings around the rear left portion of the engine compartment (circled), which is in the immediate vicinity where the fire to the Insured Vehicle had likely started.



Photo 10 shows a closer view of the burnt wirings around the rear left portion of the engine compartment, which is in the immediate vicinity where the fire to the Insured Vehicle had likely started. We noticed greenish residue on several stretches of burnt wirings (circled). The presence of 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.

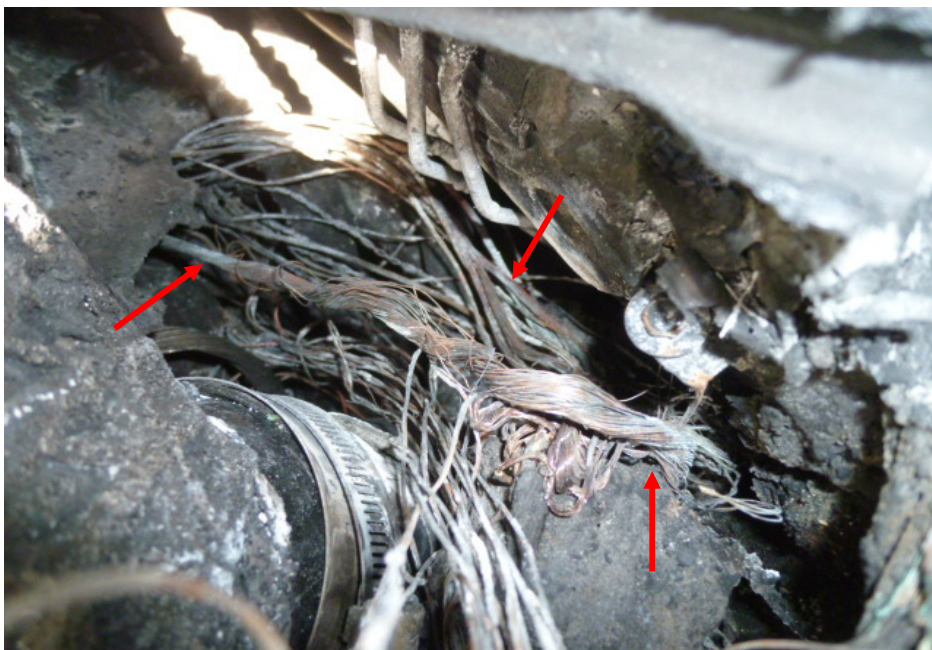


Photo 11 shows a close up view of the greenish residue found on several stretches of burnt wirings (red arrows). The presence of such greenish residue suggests occurrence of an electrical short circuit.

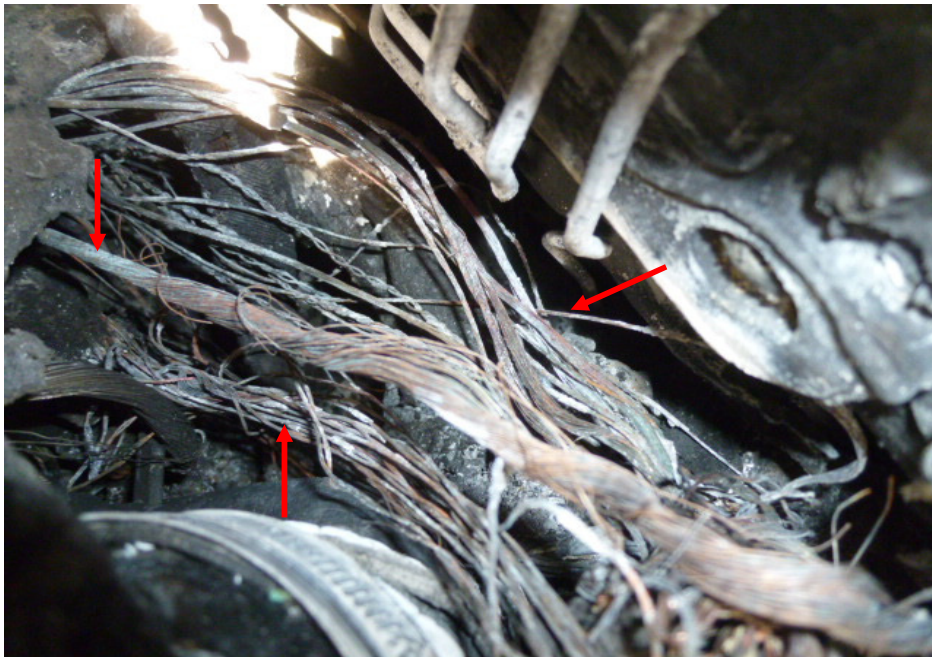


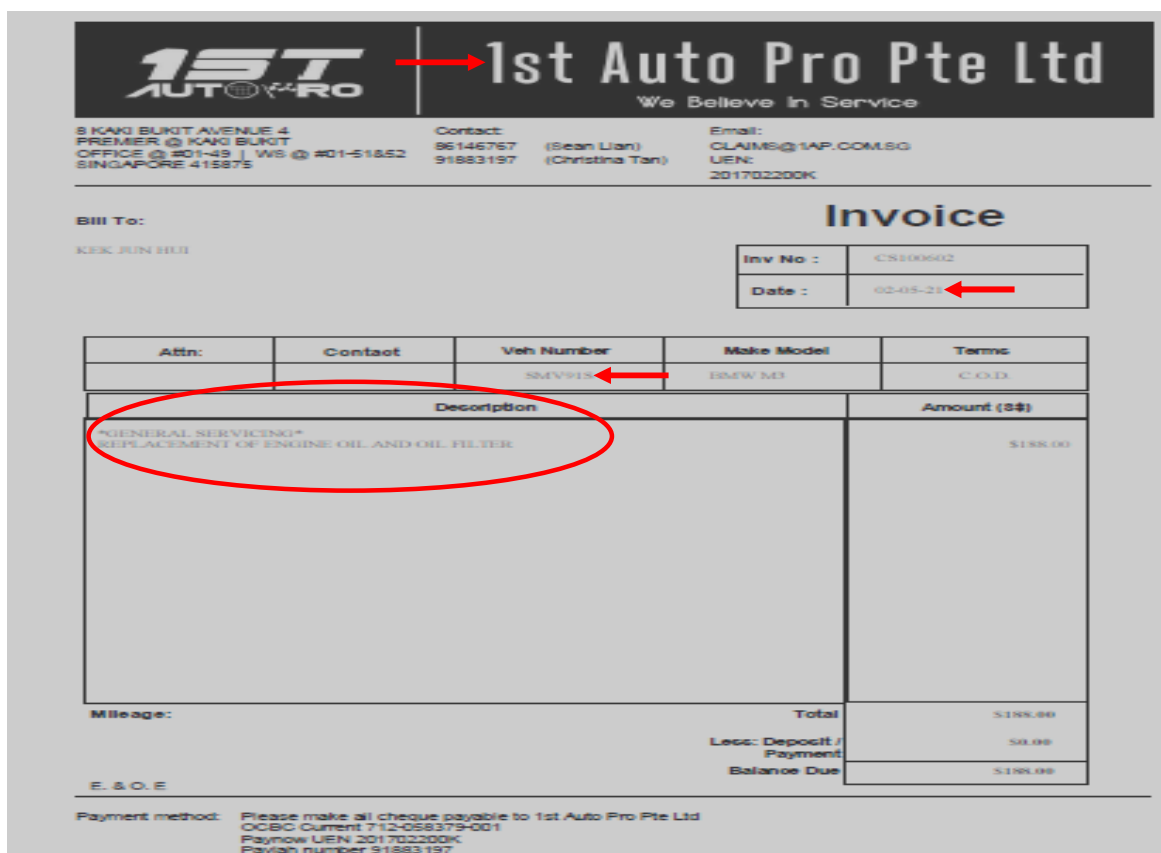
Photo 12 shows a close up view of the greenish residue found on several stretches of burnt wirings (red arrows). The presence of such greenish residue suggests occurrence of an electrical short circuit.



Photo 13 shows a close up view of the greenish residue found on several stretches of burnt wirings (red arrows). The presence of such greenish residue suggests occurrence of an electrical short circuit.

11. From the Singapore Accident Statement (herein referred to as “**SAS**”), which was made by Mr Kek Jun Hui (herein referred to as “**Mr Kek**”), we note that the fire to the Insured Vehicle had started at a time after he had left the office and was on his way home. He was alerted of the fire when he saw smoke emitting from the front bonnet.
12. From the SAS which was provided to us, we were able to gather further information pertaining to the incident as well as information pertaining to the history of the Insured Vehicle.
13. According to Mr Kek, at about 2010 hours on 24 July 2021, he was on his way home from the office along Tampines Avenue 10. He was heading towards the direction of Pasir Ris Drive 12. As he waited at a signalised cross junction between Tampines Avenue 10 and Tampines Avenue 11, he saw smoke emitting from both sides of the front bonnet. He also saw the ‘drivetrain malfunction’ warning light. As soon as the traffic light turned green, he turned right into Tampines Avenue 11. He stopped at the side of the road, switched off the engine and alighted from the Insured Vehicle. He went to inspect the Insured Vehicle which was when he saw fire from the left portion of the engine compartment. He then distanced himself from the Insured Vehicle and called the police. The police activated the SCDF.
14. Within 5 minutes after calling the police, a vehicle transporting a group of foreign workers stopped by the incident scene. The foreign workers then grabbed fire extinguishers and attempted to put out the fire. He is unsure if they managed to extinguish the fire but he mentioned that the SCDF arrived within 3 minutes and sprayed the affected parts of the engine compartment with a water jet.
15. Traffic police attended to the incident and Mr Kek was informed there was no need for him to lodge a police report. He then called his workshop, 1st Auto Pro Pte. Ltd. (herein referred to as “**1st Auto**”) and made towing arrangements. Unfortunately he did not take any photographs of the incident.
16. Mr Kek went to 1st Auto on 26 July 2021 to assess the Insured Vehicle. He intended to repair the Insured Vehicle at his own expense as he assumed the Insured Vehicle had sustained minor fire damage. When he received a quotation from 1st Auto amounting to \$200,000 on 30 July 2021, he was advised to make an insurance claim. Mr Kek then lodged a police report before making an insurance report at 1st Auto on that same day.

17. With regard to the history of the Insured Vehicle, during the interview with Mr Kek conducted by AJAX Adjusters & Surveyors Pte. Ltd. (herein referred to as “**AJAX**”), we were able to gather that the Insured Vehicle was purchased by his mother, Madam Pang Mung Heng second-hand in December 2020 with 3 and a half years of COE left. Mr Kek is the authorised driver of the Insured Vehicle. To the best of his recollection, there has not been any major mechanical problem and/or electrical problem with the Insured Vehicle.
18. Pertaining to the maintenance aspect, Mr Kek sends the Insured Vehicle for periodic servicing.
19. During the course of our investigations, we were also provided by AJAX, with a document relating to the latest servicing of the Insured Vehicle done at 1st Auto located at Premier @ Kaki Bukit, 8 Kaki Bukit Avenue 4, #01-51, Singapore 415875 on 2 May 2021. The servicing package included changing of engine oil and oil filter. Refer to invoice 1 below.



1st Auto Pro Pte Ltd
We Believe In Service

8 KAKI BUKIT AVENUE 4
PREMIER @ KAKI BUKIT
OFFICE @ #01-49 | WS @ #01-51&52
SINGAPORE 415875

Contact:
95145767 (Sean Lian)
91883197 (Christina Tan)

Email:
CLAIMS@1AP.COM.SG
UEN:
201702200K

Invoice

Bill To:
KEK JUN HUI

Inv No :	CS100602
Date :	02-05-21

Attn:	Contact	Veh Number	Make Model	Terms
		SMV91X	BMW M3	C.O.D.

Description	Amount (\$#)
GENERAL SERVICING* REPLACEMENT OF ENGINE OIL AND OIL FILTER	\$188.00
Total	\$188.00
Less: Deposit / Payment	50.00
Balance Due	\$138.00


Mileage:

E. & O. E.

Payment method: Please make all cheque payable to 1st Auto Pro Pte Ltd
OCBC Current 712-058379-001
Paynow UEN 201702200K
Paylah number 91883197

Invoice 1 shows the last servicing done on the Insured Vehicle at 1st Auto on 2 May 2021 (red arrows). The servicing package included changing of engine oil and oil filter (circled).

20. Mr Kek mentioned that he had not experienced any mechanical problems with the Insured Vehicle till the day of the incident. He mentioned that there was no abnormal rise in temperature of the Insured Vehicle. However, he did mention that there was a 'drivetrain malfunction' warning light displayed when he saw smoke emitting from the front bonnet.
21. 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 Kek had mentioned to us there were no indications of abnormally high temperatures on the Insured Vehicle when he was driving on that day. Moreover, an overheated engine would have caused the Insured Vehicle to stall. However in this case, Mr Kek was the one who noticed smoke emitting from underneath the front bonnet while he was driving and stopped the Insured Vehicle. Therefore, we are of the opinion that the fire was not caused by an overheated engine.
22. 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 given that the location of where the Insured Vehicle was positioned was observed to be not at a secluded location.
23. 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 in nature is also supported by the burnt wirings found in the engine compartment of the Insured Vehicle, which was earlier discussed in paragraph 10 above.
24. 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 29 June 2021 for the Takata gas generator of the driver's airbag. However it was not rectified. See search result from LTA below.



Vehicle Recall Details

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

Owner ID Type Foreign Identification Number	Owner ID 455K
Vehicle No. SMV91S	Make/Model B.M.W./ M3 SEDAN AT ABS D/AIRBAG 2WD LED NAV HUD
Engine No.: 08178859S55B30A	Chassis No.: WBS3C92060J274182

Recall Details

Recall No.: R2021071012

Manufacturer Recall Date: 29 Jun 2021	Estimated Completion Year of Recall: 2023
Brief Description (As Provided by Motor Dealer): The (Takata) gas generator of the driver's airbag can malfunction if it has been exposed to high absolute air humidity and high temperature fluctuations for years.	Date Rectified: -
Hotline Information: PERFORMANCE MOTORS LIMITED at 1-800-2255-269 BIS AUTOMOBILES PTE. LTD. at 68-963-933	
For more details, contact BMW ASIA PTE LTD	

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Conclusion

25. 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 wirings inside the engine compartment, somewhere around the rear left portion of the engine compartment. The wirings were original factory wirings of the Insured Vehicle.

26. 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.
27. 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.
28. Our investigations had also revealed that at the time of writing this report, there was a manufacturer recall campaign in 2021 which had involved the Insured Vehicle however the cause of this recall does not possess a fire risk to the Insured Vehicle hence the recall can be considered to be not related to this fire incident.
29. 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.

**Muhd Nazril***Senior 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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