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

Your Ref: C10006910/JM
Our Ref : CI/AGI20008175/P

21th August 2020

M/s Auto & General Insurance (Singapore) Pte. Ltd.
190 Clemenceau Avenue, #03-01
Singapore Shopping Centre
Singapore 239924
(Motor Claims Department)

TECHNICAL INVESTIGATION REPORT OF FIRE INCIDENT INVOLVING THE INSURED VEHICLE SKZ 6102H ON 21st JULY 2020

1. We refer to your letter dated 7th August 2020 and the instructions therein.

2. Our analysis, comments and opinions with respect to the cause of fire to the insured vehicle SKZ 6102H (herein referred to as **"Insured Vehicle"**) are set out below.

Inspection of the Insured Vehicle

3. The Insured Vehicle was physically inspected on 11th August 2020 at the premises of Automotive Repair Centre Pte Ltd - HQ located at 38 Woodlands Industrial Park E1 #05-18, Singapore 757700.

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

Vehicle Registration No.	: SKZ 6102H
Make / Model	: BMW 116D 5DR HATCHBACK DSC LED
Chassis No	: WBA1V720805C07041
Year of Registration	: January 2016
Mileage	: 125,576KM

5. The Insured Vehicle was observed to have sustained minor fire damage confined only to its engine compartment in the front, the engine cover, electrical wirings and components was damaged as a result of the fire. The other parts of the Insured Vehicle was not affected by the fire See photos 1 – 8 below.

Photo 1 shows the rear portion of the Insured Vehicle, which was observed to be unaffected by the fire.

Photo 2 shows the right body of the Insured Vehicle, which was observed to be unaffected by the fire.

Photo 3 shows the left body of the Insured Vehicle, which was observed to be unaffected by the fire.

Photo 4 shows the front portion of the Insured Vehicle, which was observed to be unaffected by the fire.

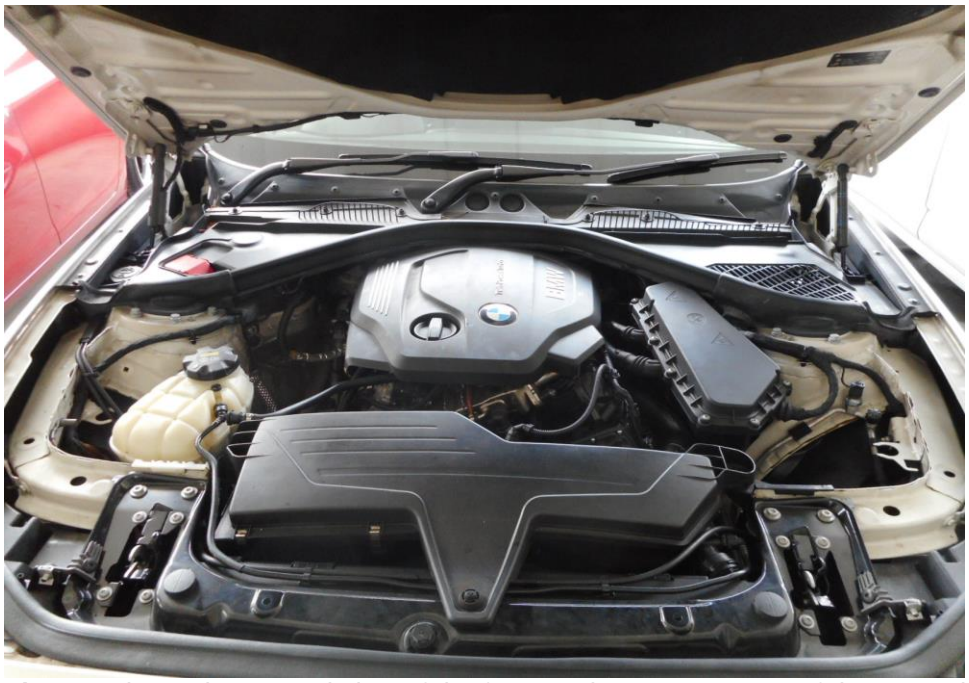


Photo 5 shows the general view of the front engine compartment of the Insured Vehicle at the time of our inspection. The Insured Vehicle was observed to have sustained minor fire damage confined only to its engine compartment in the front, the engine cover, electrical wirings and components was damaged as a result of the fire.

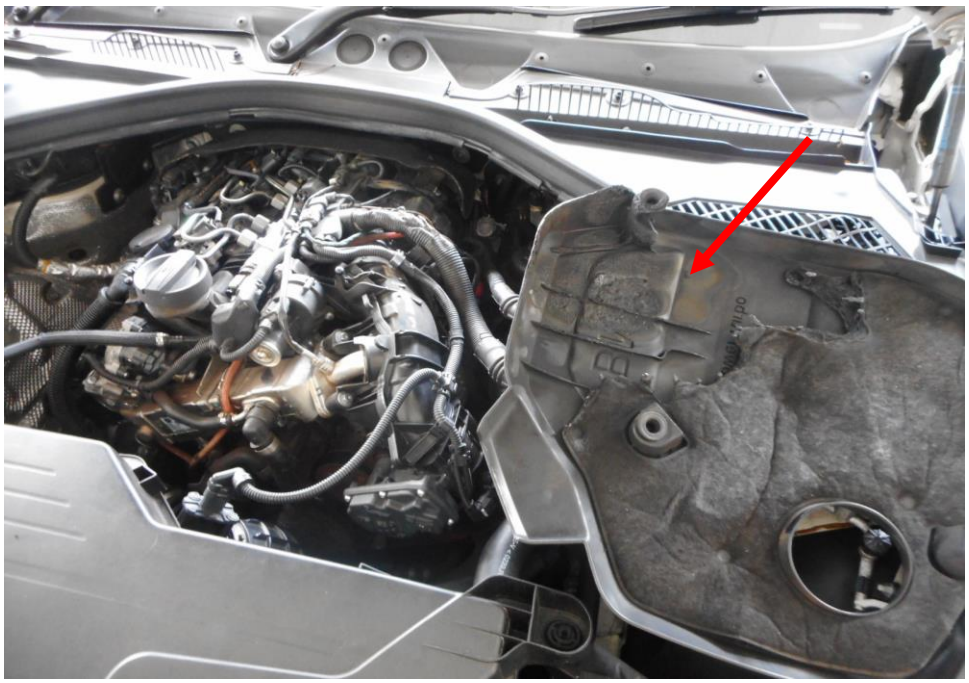


Photo 6 shows the engine compartment of the Insured Vehicle at the time of our inspection with the engine cover removed. The Insured Vehicle was observed to have sustained minor fire damage to its engine cover (arrowed) was damaged as a result of the fire.

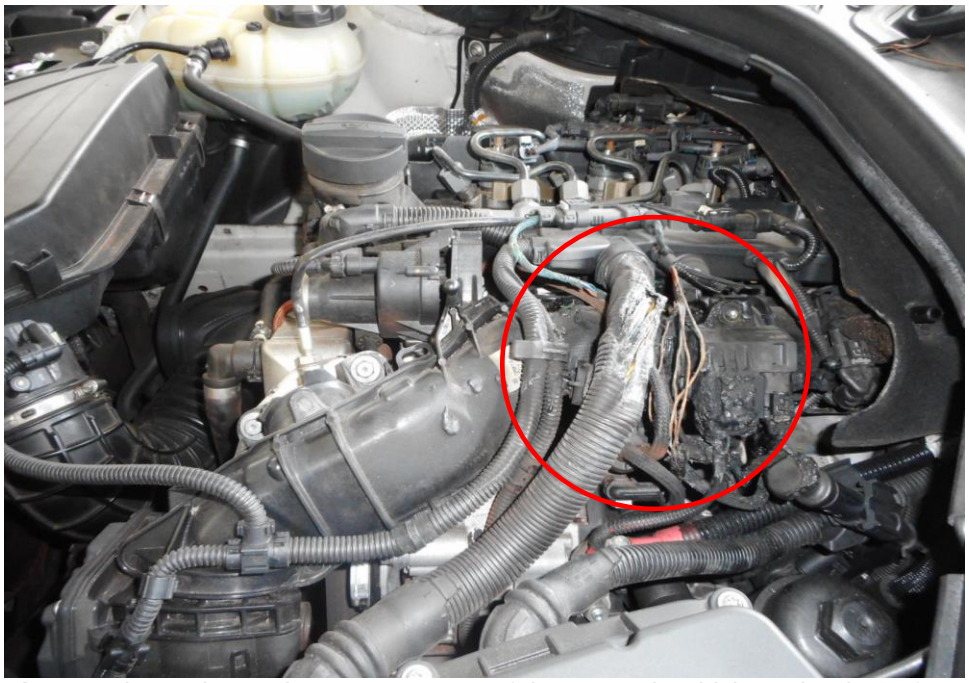


Photo 7 shows the engine compartment of the Insured Vehicle at the time of our inspection with the engine cover removed. The Insured Vehicle was observed to have sustained minor fire damage to its electrical wirings and components (circled) and was damaged as a result of the fire.

Photo 8 shows the interior view from the right side of the Insured Vehicle at the time of our inspection. The right side 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.

Investigation and Technical Analysis

7. For this particular case, the fire appears to have originated from the engine wirings of the engine compartment on the Insured Vehicle. This can be determined from the burn pattern of the various components in the engine compartment, which were observed to have been partly melted and burn from the high heat intensity and the exposure of bare copper wirings. See photo 9 & 10 below.

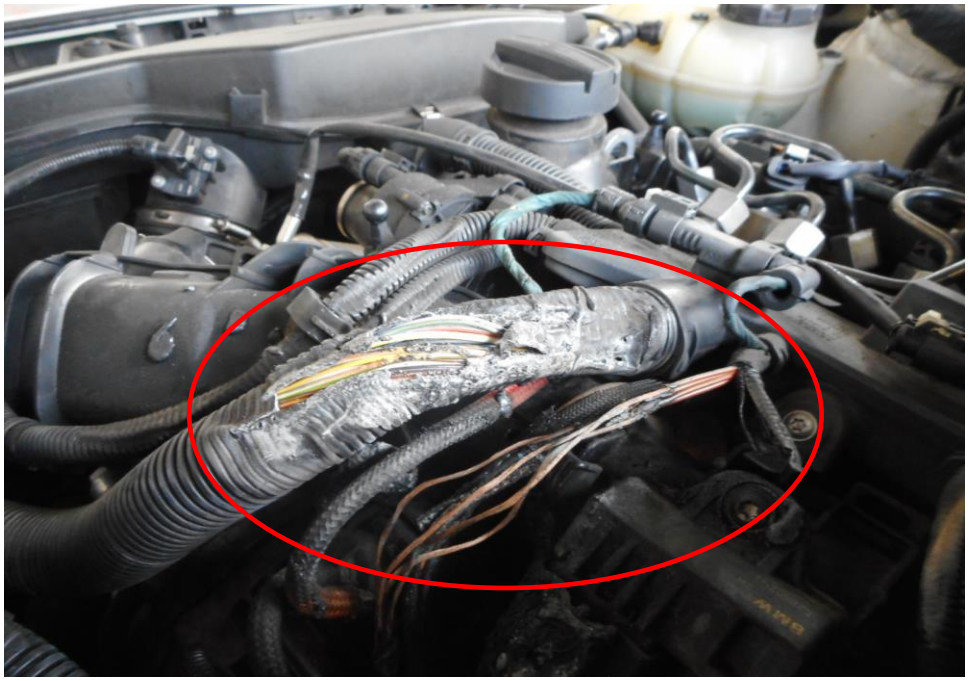


Photo 9 shows the close up view of the engine of the Insured Vehicle at the time of our inspection. The burn pattern of the various components which were observed to be partly melted and burn from the high heat intensity and exposure of bare copper wirings (circled) indicates that the fire had originated from the wirings of the engine portion of the Insured Vehicle.

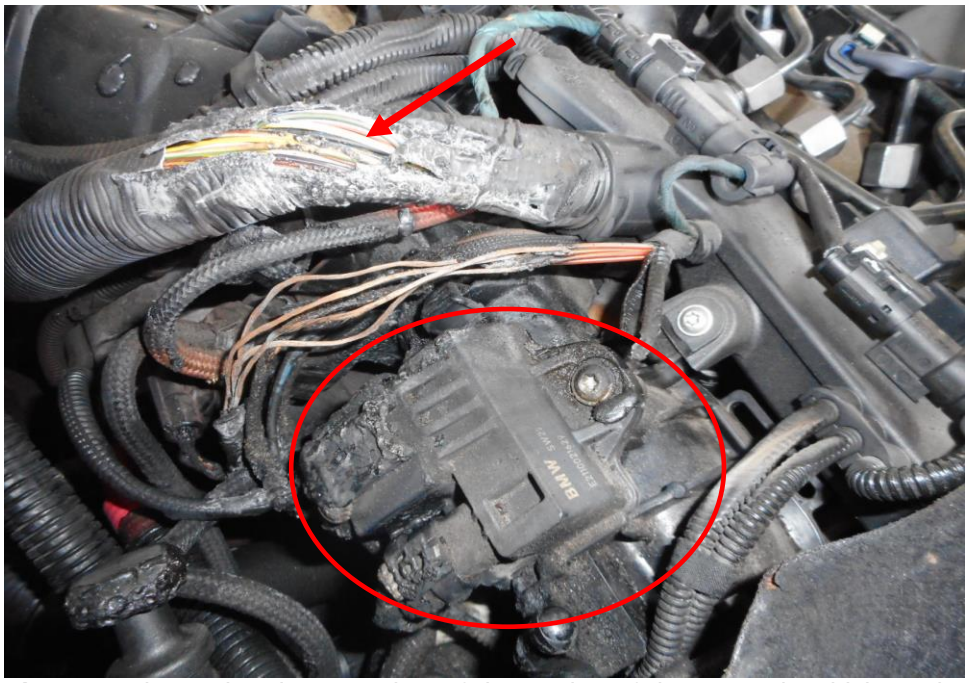


Photo 10 shows the close up view of the engine of the Insured Vehicle at the time of our inspection. The heat from the fire had also damaged the components in the engine compartment. Its glow plug relay (circled) and original wiring harness (arrowed) were the various components which were observed to be partly melted and burn from the high heat intensity indicates that the fire had originated from the area of the engine portion of the Insured Vehicle.

8. Upon closer examination of the engine compartment of the Insured Vehicle which was where the fire had started, we had found traces of greenish residue on the original wirings leading from the alternator. The wirings were original wirings fitting from manufacturer. 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 the 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 11 & 12 below.

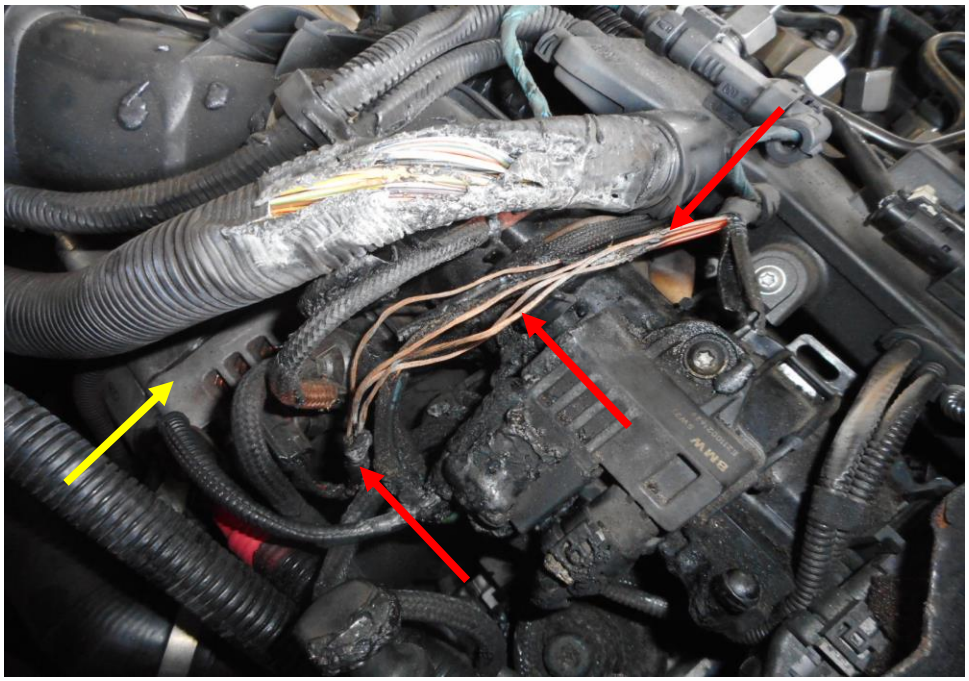


Photo 11 shows the general view of the front right engine compartment portion of the Insured Vehicle at the time of our inspection. Observed that the fire had likely started from the original wiring harnesses (red arrow) leading out from the alternator (yellow arrow) as there was greenish residue on the surface. 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.

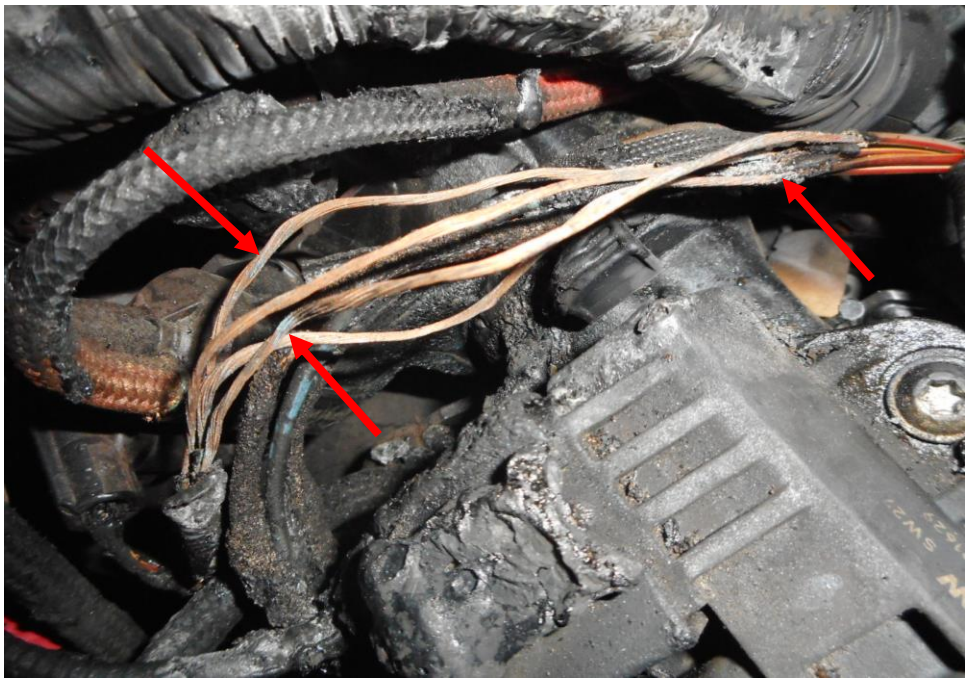


Photo 12 shows a close up view of the original wiring harness in the engine compartment. The original wiring harness (arrowed) was observed with greenish residue on the surface. The presence of greenish residue indicates internal heating of copper wires, a sign of an electrical short circuit occurring. The greenish residue is normally left behind from oxidation as a result of chemical reaction involving the copper wires.

9. From the Singapore Accident Statement, which was made by Mr Yeo Siew Meng (herein referred to as **"Mr Yeo"**), we note that the fire to the Insured Vehicle had started at a time when it was in the midst of travelling on the road. Mr Yeo was first alerted of the fire when he felt that the Insured Vehicle was losing engine power.

10. We managed to speak to Mr Yeo on 12th August 2020 where we were able to gather further information pertaining to the incident as well as information pertaining to the history of the Insured Vehicle.

11. According to Mr Yeo, at about 1500hrs on 21st July 2020, he was travelling from Farrer Road towards Woodlands Road. He was driving the Insured Vehicle along the highway on SLE, suddenly he felt a loss of engine power from the Insured Vehicle and subsequently, he saw white smoke emitting out from the front left area of the insured vehicle. Mr Yeo informed that he immediately drove the Insured Vehicle to the road shoulder, turned off the engine and proceed to do a check on the engine compartment of the Insured Vehicle. When he opened the bonnet of the Insured Vehicle, a small flame was seen emitting out from the right side engine compartment of the Insured Vehicle, Mr Yeo than proceeded proceed to retrieve mineral water that was storage in the Insured vehicle and attempted to extinguish the fire out. Mr Yeo managed to extinguish the fire shortly.

12. Mr Yeo mentioned that no SCDF assistance was activated as he had put out the fire by himself.

13. Upon putting out the fire, Mr Yeo was approached by EMAS personnel and they towed the Insured Vehicle to the nearby nearest car park and Mr Yeo subsequently contacted Performance Motor workshop (BMW SINGAPORE) and they advised to have the Insured Vehicle towed to their workshop for assessment, the tow truck arrived within an hour and the Insured Vehicle was towed to Performance Motor Pte Ltd (Kampong Arang). Mr Yeo made an insurance report on 6h August 2020 at 1444 hours.

14. Mr Yeo mentioned that he had waited a few days for the assessment report of the Insured Vehicle, however did not received it. Subsequently, he decided and arranged the Insured Vehicle to be towed to the insurance authorised workshop instead.

15. Mr Yeo mentioned that he had not experienced any mechanical or electrical/electronic problems with the Insured Vehicle till the day of the incident. He also mentioned that there were neither warning lights displayed nor was there an abnormal rise in temperature throughout the period the Insured Vehicle and when driven, prior to the fire.

16. With regards to the history of the Insured Vehicle, we were able to gather from Mr Yeo and Mr Andjar Ong that the Insured Vehicle was purchased brand new and the Insured Vehicle belongs to his good friend Mr Andjar Ong who is the registered owner of the Insured Vehicle. Mr Yeo informed us that he is the sharing driver of the Insured vehicle since the day the Insured Vehicle bought on January 2016.

17. Pertaining to the maintenance aspect, Mr Yeo sends the Insured Vehicle for periodical servicing. He provided us with his latest servicing record and informed that there was no major overhaul done or modifications done to the Insured Vehicle. See servicing invoice below.

RIVERVIEW AUTO SERVICES PTE LTD

10 AMK INDUSTRIAL PARK 2A, AMK AUTOPOINT
#04-07/16 SINGAPORE 568047
Tel: 6481 2025/ 6481 5797 Fax No: 6481 8715
Email: service@riverviewauto.com.sg
Website: www.riverviewauto.com.sg
Co. Reg.:200800062E GST Reg. No.:200800062E

ANDJAR ONG

ANDJAR ONG
Tel: 96417824

Tax Invoice: RA200943
Invoice Date: 14/04/2020
Vehicle Num: SKZ 6102 H
Make/Model: BMW 116D F20
Mileage (Km): 119,598
Advisor: KANASH
Technical Person: TECK
Ref./Remark:
Terms: Cash
Currency: SGD

No.	Particular	Quantity	Unit Price	Amount $
1	* SERVICING PACKAGE FOR CONTINENTAL CAR *			118.00
2	ENGINE OIL 5W-40 SHELL HELIX ULTRA FULLY SYNTHETIC	4.0 LTR(S)	0.00	
3	ENGINE OIL FILTER	1.0 PC(S)	0.00	
	* * * ADDITIONAL PARTS : -			
4	ENGINE OIL 5W-40 SHELL HELIX ULTRA FULLY SYNTHETIC	0.5 LTR(S)	12.00	6.00
5	AGM VARTA BATTERY ASSY (95AH)	1.0 PC(S)	476.00	476.00
	* LABOUR CHARGE :-			
6	TO REGISTER BATTERY REPLACEMENT (DISCOUNT)			20.00

PAID
14 APR 2020
BY: USA - 005357

E. & O.E.

Total $	620.00
GST @ 7% $	43.40
Amount Due $	663.40

Dollars: Six Hundred Sixty-Three And Cent Forty Only

Customer's Signature/Co. Stamp

for RIVERVIEW AUTO SERVICES PTE LTD

ADVISOR'S SIGNATURE

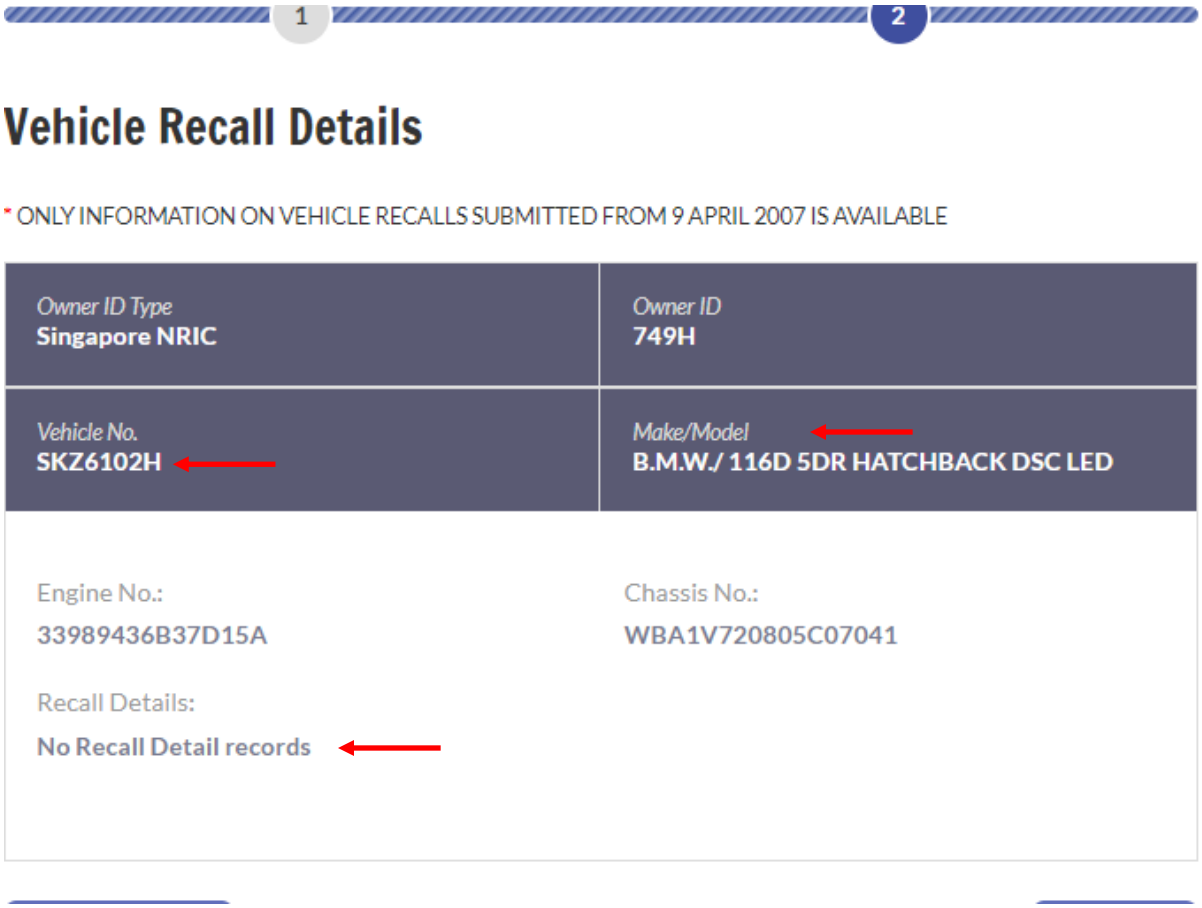
Remarks : Dear customers, please ensure that your invoice is stamped PAID after making payment.

18. 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 Yeo 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 after smoke were seen emitting from the front of the Insured Vehicle. Mr Yeo was still able to drive the Insured Vehicle.

19. 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 Yeo was driving the Insured Vehicle. The location where the Insured Vehicle caught fire was also observed to be not at a secluded location.

20. 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 alternator to the original wirings on the Insured Vehicle, which was earlier discussed in paragraph 9 above.

21. Our checks with both local and international bodies and associations had also revealed that at the time of writing this report, there is no manufacturer recall of similar make and model vehicle as the Insured Vehicle that may possibly be related to fire being originated from the engine compartment of the Insured Vehicle. See search result from LTA below.



1 2

Vehicle Recall Details

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

Owner ID Type	*Owner ID*
Singapore NRIC	**749H**
Vehicle No. **SKZ6102H**	*Make/Model* **B.M.W./ 116D 5DR HATCHBACK DSC LED**

Engine No.:
33989436B37D15A

Chassis No.:
WBA1V720805C07041

Recall Details:
No Recall Detail records

Conclusion

22. 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 nature. For this particular case, the fire had originated along the original manufacturer wirings leading to the alternator of the Insured Vehicle.

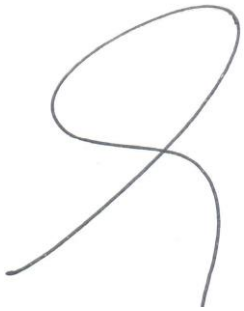
23. We did not find any evidence which had suggested that the cause of fire to the Insured Vehicle was due to poor maintenance and/or recurring electrical problem.

24. There was 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.

25. Our investigations had also revealed that at the time of writing this report, there is no manufacturer recall to similar make and model vehicle as the Insured Vehicle that may possibly be related to this incident.

26. The water was used to extinguish the fire did not cause any further damage to the engine, instead it had controlled the fire and prevent it from spreading to the other parts of the Insured Vehicle. The Insured Vehicle checked and was able to be started up at the time of our inspection.

Sherwin Beh
Technical Investigator



Ang Bryan Tani
AMSOE, AMIRTE, AFF SAE, M.MATAI, AFF.Inst.AEA
Senior Technical Investigator
Technical Investigation & Reconstructionist (SAE-A)