LAK 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: A28834218MKC
Our Ref :CS/MSG18012062/Z

11th July 2018

M/s MSIG Insurance (Singapore) Pte Ltd
4 Shenton Way #21-01, SGX Centre 2,
Singapore 068807
(Motor Claims Department)

TECHNICAL INVESTIGATION REPORT OF FIRE INCIDENT INVOLVING THE INSURED VEHICLE GX8189C ON 28th June 2018

1. We refer to your letter dated 03rd July 2018 and the instructions therein.

2. Our analysis, comments and opinions with respect to the cause of fire to the insured vehicle GX8189C (herein referred to as "**Insured Vehicle**") are set out below.

Inspection of the Insured Vehicle

3. The Insured Vehicle was physically inspected on 05th July 2018 at the premises of Lai Huat (Meng Kee) Motor Pte Ltd, Sin Ming Autocity, 160 Sin Ming Drive, #04-01, #04-02 & #07-03 Singapore 575722.

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

Vehicle Registration No.	: GX8189C
Make / Model	: Toyota Liteace
Chassis No	: CR425010314
Year of Registration	: 2004 (September)
Mileage	: 498520km

5. The Insured Vehicle was noted to have sustained fire damages that were confined to its front portion. The effected burnt area was observed to be on the middle slightly towards the front section of the engine compartment.

6. The fire had resulted in the body parts at the front top bonnet of the Insured Vehicle to be damaged by the burnt. This had included its frontal portion, at the centre area internal portion and several parts of the engine components especially at the centre of the engine. See photo 1 – 4 below.

Photo 1 shows the general view of the front portion of the Insured Vehicle at the time of our inspection. The fire damage to the Insured Vehicle was confined to its front top bonnet & at the centre area as a result of the fire.

Photo 2 shows the general view of the front centre portion of the Insured Vehicle at the time of our inspection. The fire damage to the Insured Vehicle was confined to its front bonnet, at the centre area; engine parts were amongst the body parts that were found to have been affected as a result of the fire.

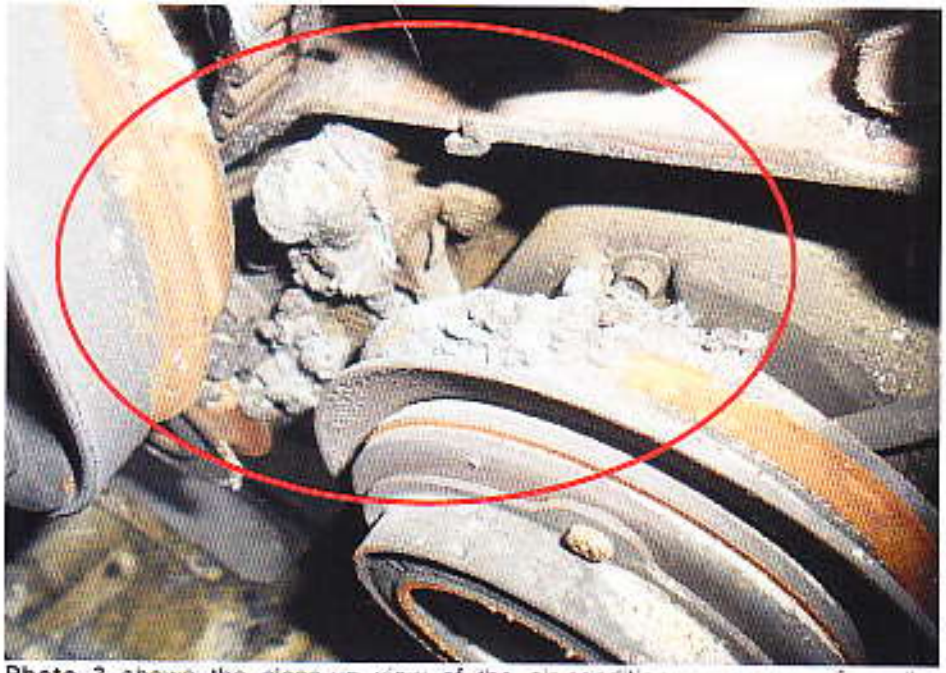

Photo 3 shows the close-up view of the air-condition compressor from the Insured Vehicle at the time of our inspection. It was observed to sustain with burnt damages.

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

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 its centre portion at the engine compartment. This can be determined from the burn pattern and the high heat intensity burn marks found on the internal compartment of the front bonnet of the Insured Vehicle; at the engine centre front portion and also given that there was no other area of the Insured Vehicle that were found with damage of burnt nature.

9. These (peeling) burn marks are a result of exposure to prolong heat intensity. However, due to non-extensive burnt rust did not develop around these areas. The fire did not penetrate to the base metal that causes steel/metal material body parts to be exposed to natural environmental condition. See photo 5 & 6 below.

Photo 5 shows the burn pattern and peeling burn marks (circled) that were found on the topside of the front bonnet of the Insured Vehicle. Such peeling burn marks are a result of exposure to prolong heat intensity, which may indicate where the fire had started.

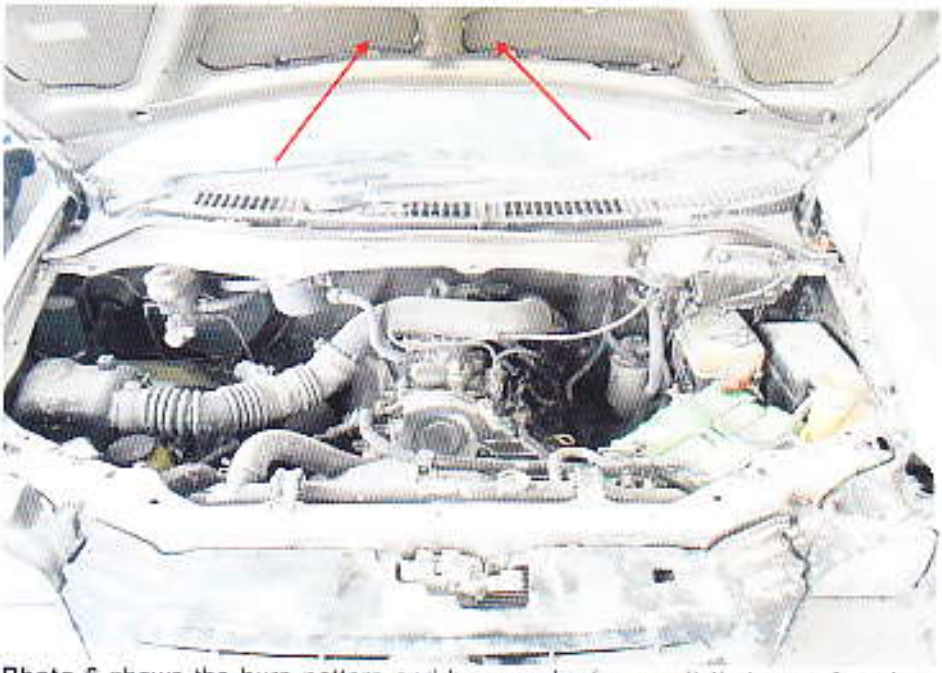

Photo 6 shows the burn pattern and burn marks (arrowed) that were found on the underside of the front bonnet of the Insured Vehicle. Such burn marks are a result of exposure to heat intensity, which may indicate where the fire had started.

10. Upon closer examination of the area around the centre of the engine compartment, which was in the immediate vicinity of where the fire to the Insured Vehicle had likely started, we had found burnt belting that linked the main pulley crankshaft & air-condition compressor. A misalignment was observed on the components affected.

11. Such misalignment condition normally indicate a mal-function on the air-condition compressor which probably had stuck & causes friction to the rubber belting hence creates heat due to the continuous pulley movements from the main crankshaft prior to the fire incident. A prolonged friction will eventually cause fire to ignite. Due to its location that was near & also in contact with combustible materials such as rubber, plastic & fuel. Therefore, such entities possibly contribute to the fire incident. This would then appear to suggest that the cause of fire to the Insured Vehicle could have possibly been due to mechanical in nature. See photo 7 & 8 below.

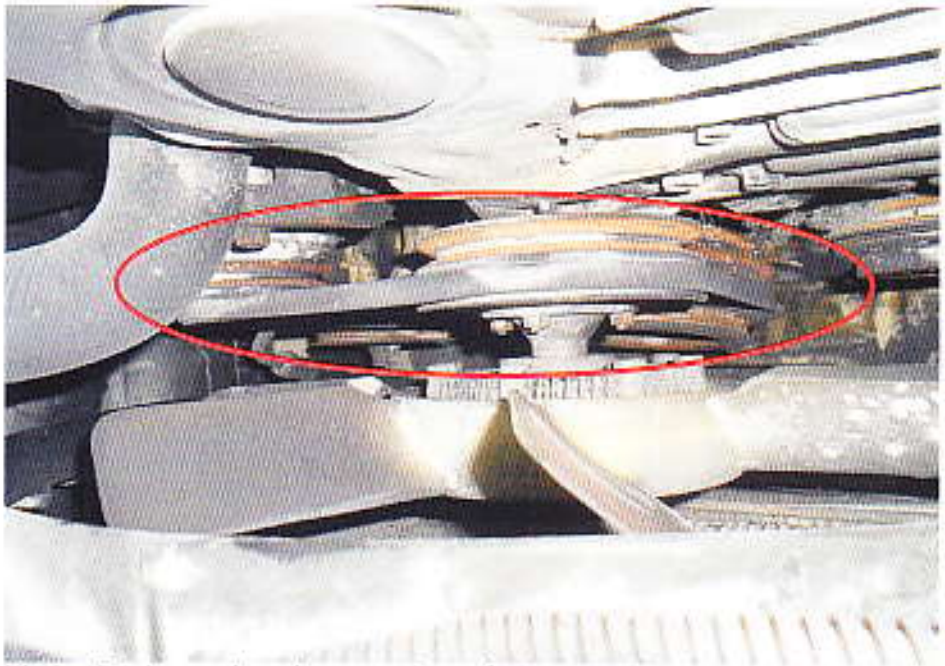

Photo 7 shows the close-up view of the misalignment on the affected components such as air-condition compressor, main pulley crankshaft & alternator where it was link by rubber belting & as a result of the fire incident.

Photo 8 shows the close-up view of the melted rubber materials as a result of the fire incident. This would indicate where the fire had started at time of the fire incident.

12. From the Singapore Police Report no. F/20180628/2062, which was made by Mr Tan Eng Kwang (Chen Yongguang) (herein referred to as "**Mr Tan**"), who was the person in-charge of the Insured Vehicle informed that his subordinate Mr Kamaruddin (herein referred to as "**Mr Kamar**") was the company employed driver & also the last person driving the Insured Vehicle prior to the fire incident. He had parked the Insured Vehicle at the basement car park in the vicinity of 54 Edgedale Plains "River Isles" condominium the day before. Mr Kamar as usual will collect the Insured Vehicle from the "River Isle" basement car park for work purposes. At about 0900hrs Mr Tan received a call from Mr Kamar informing him that the Insured Vehicle has got smoke & on fire when the engine was started. However, the fire was extinguished by a security guard who was on duty on the day of the fire incident.

13. We note that the fire to the Insured Vehicle had started when it was still in the parking lot. Mr Kamar had started the Insured Vehicle's engine normally & was running smoothly which includes switching on the air-conditioning for the purpose of warming up.

14. We had arranged for a face to face interview session with Mr Tan at the vicinity of McDonalds restaurant at No. 10 Ang Mo Kio Street 12 on 09th July 2018 where we were able to gather further information pertaining to the incident as well as information pertaining to the history of the Insured Vehicle.

15. According to Mr Tan, the Insured Vehicle was parked by his subordinate Mr Kamar the night before at about 2230hrs. Mr Kamar usually came at about 8.30am to start his duty for the day. On 28th July 2018 at about 0745hrs, Mr Kamar arrived to "River Esle" condominium basement car park to start his daily routine. At about 0900hrs, Mr Tan had received a call from his subordinate Mr Kamal informing him that the Insured Vehicle was on fire after he started the Insured Vehicle. However, the fire was extinguished by the security guard who was on duty that morning.

16. We managed to speak to Mr Kamar with regards to the fire incident. According to Mr kamar, he managed to crank the Insured Vehicle normally that morning. Switching on the air-conditioning system without any abnormality. He will normally start the Insured Vehicle engine for the purpose of warming up. After about 10 minutes, he noticed smoke emitted out from the front bonnet.

17. Mr Kamar rushed to the security post informing Security Supervisor Tay Min Kiat (herein referred to as "**SS Tay**") of the incident. SS Tay grabs 2 fire extinguishers proceeding to the fire location. SS Tay then sprayed the dry powdered extinguisher on the top front bonnet to let it cool down. Mr Kamar then open the front bonnet and SS Tay sprayed into the internal engine compartment. SS Tay utilized 2 cylinders of dry powdered fire extinguishers to extinguish the fire.

18. SCDF & SPF was not summon due to the fire had already been extinguished. We noted that an official incident report was raised by SS Tay to notify the condominium management team. The incident report was address to Mr Richard Tan from the committee council.

19. Mr Tan then contacted the MSIG Insurance helpline informing them of the incident. The Insured Vehicle was eventually arranged to be towed from the incident location to Lai Huat (Meng Kee) Motor Pte Ltd, Sin Ming Autocity, 160 Sin Ming Drive, #04-01, #04-02 & #07-03 Singapore 575722 on the same day.

20. We were able to gather from Mr Tan that the Insured Vehicle was purchased pre-owned. It was registered under a company "Adkel Solutions LLP" registration number T13LL0946F. "Adkel Solutions LLP" was owned by a duo partnership where Mr Tan was one of the owner dealing with toiletries products supplies. He has been in the business since the last 5 years. According to Mr Tan prior to the fire incident his driver Mr Kamar was driving the Insured Vehicle. To the best of his recollection, there has not been any major mechanical and/or electrical problem with the Insured Vehicle apart from the usual wear and tear that a vehicle would experience.

21. Regarding the maintenance aspect, Mr Tan informed us that the last servicing carried out on the Insured Vehicle was on 16th March 2018 at Seet Auto Serrvice at Blk 17 Sector A Sin Ming (Sin Ming Industrial Est) #01-67 Singapore 575675 . He was able to provide me with a document relating to this servicing. The engine oil, oil filter, standard scope servicing and some parts were replaced during this servicing. See document below relating to this servicing which was provided to me by Mr Tan.

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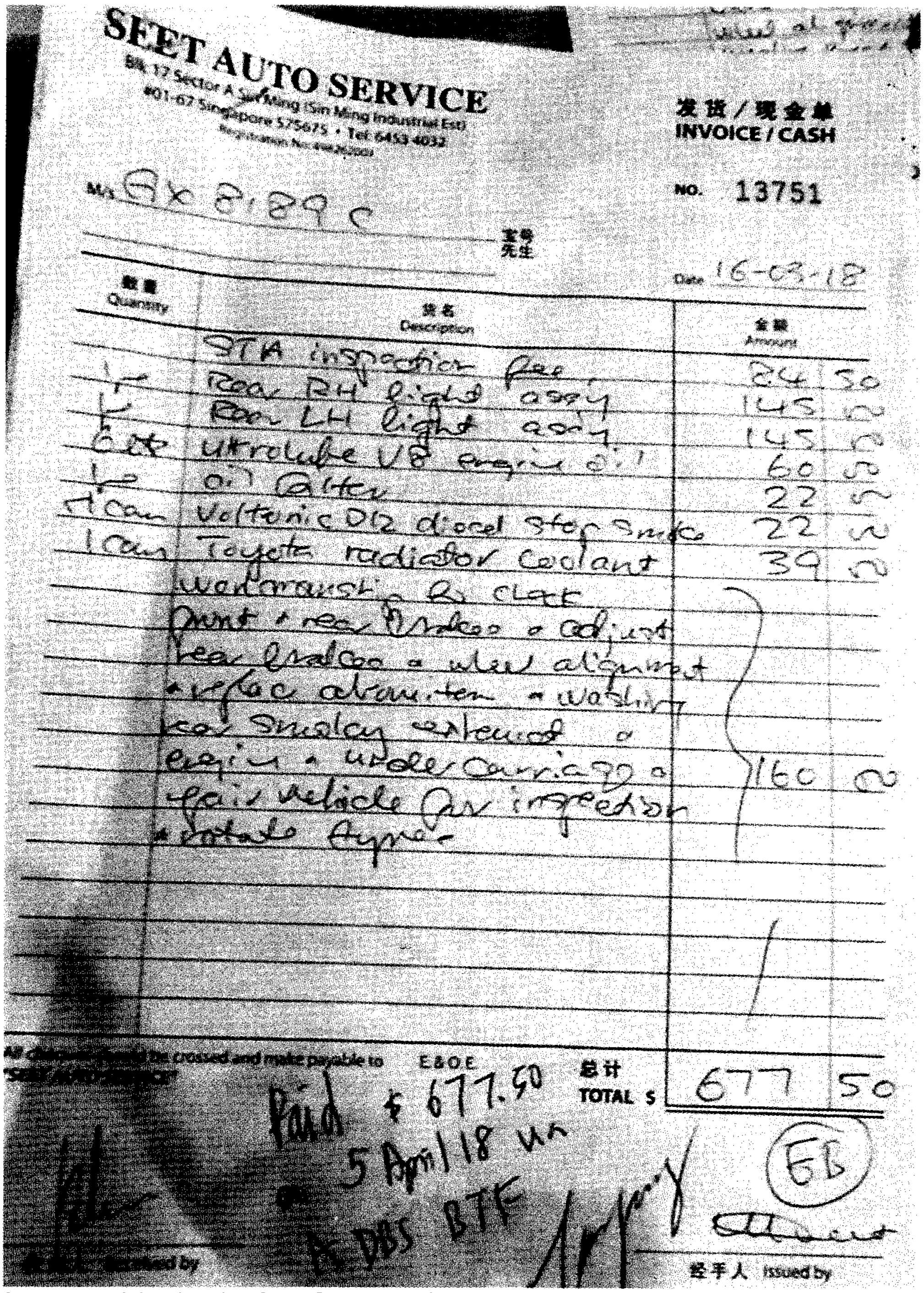

SEET AUTO SERVICE

Blk 17 Sector A Sin Ming (Sin Ming Industrial Est)
#01-67 Singapore 575675 • Tel: 6453 4032

发货/现金单
INVOICE / CASH

NO. 13751

Mr. GX 8189 C

Date 16-03-18

数量 Quantity	货名 Description	金额 Amount	
	STA inspection fee	84	50
1 pc	Rear RH light assy	145	00
1 pc	Rear LH light assy	145	00
6 ltr	Ultralube V8 engine oil	60	00
1 pc	Oil filter	22	00
1 can	Voltronic D12 diesel stop smoke	22	00
1 can	Toyota radiator coolant	39	00
	Workmanship & check front & rear brakes & adjust rear brakes & wheel alignment & replace alternator & washing rear smoking exterior & engine & undercarriage & pair vehicle for inspection & rotate tyres	160	00
	TOTAL $	677	50

All cheques should be crossed and made payable to "SEET AUTO SERVICE"

E.&O.E.

Paid $677.50 5 April 18 via DBS BTF

收货人 Received by

经手人 Issued by

Latest servicing invoice from Seet Auto Service provided by MrTan.

22. Mr Tan also did informed us that there was no modification(s) and/or additional electronic or electrical component(s) fitted on the Insured Vehicle. To the best of his knowledge, no other motor vehicle or property was affected by the fire incident.

Fire site Investigation

23. We visited the incident location on 11th July 2018 which was located at 54 Edgedale Plains River Else basement car-park with the information & photograph that we had gathered during our conversation with him as references.

24. When driving into the basement car-park driveway of the condominium, the parking lot was observed to be on the left side of the car-park which bares lots no. 367.

25. At the time of our visit, we were able to clearly see burnt marks / residual remains on the ground inside the parking lot. Notwithstanding that it was a non-extensive fire; we found melted materials on the parking lot floor which was believed to be part of material from the burnt Insured Vehicle that had occurred at the time of incident. We did not find any nearby foreign material or object that relates to the fire incident. However, from the burnt materials that we found on the parking lot floor conclusively that a fire incident did happen at the said location.

26. The location where the Insured Vehicle was parked at the material time of incident was also noted to be not at a secluded location. See photo 9 – 13 below.

Photo 9 shows the general view of the entrance of "River Else" basement car park.

Photo 10 shows the general view of "River Esle" basement car park when we drive in. The fire location was on the left side of the car park.

Photo 11 shows the parking lot no. 367 where the Insured Vehicle was parked at time of the fire incident.

Photo 12 shows the close-up view of the melted burnt substance believed to be from the burnt Insured Vehicle.

Photo 13 shows the general view of the ceiling above parking lot no. 367 that was said to be the where the fire incident had happened. It was observed to be un-affected by the fire incident.

27. We were however able to obtain photographs which was taken by Mr Tan at time of the incident. The photographs were taken after the fire incident, when the fire had been extinguished from the Insured Vehicle.

28. In general, the information that could be gathered from the photographs had corresponded to the events that were related to us by Mr Tan & Mr Kamar. Our close examination of these photographs also showed no unusual foreign material(s) and/or object(s) found on the ground in the immediate area of the parking lot where the Insured Vehicle was parked. See photo 14 below.

Photo 14 shows the Insured Vehicle at the fire incident scene after the fire was extinguished. There appears to be no abnormal foreign material(s) and/or object(s) found on the ground in the immediate area where the Insured Vehicle was parked. In general, the information that could be gathered from these photographs had corresponded to the events that were related to us by Mr Tan & Mr Kamal.

29. Given the circumstances of incident as reported, the possibility of the cause of fire to the Insured Vehicle being due to engine overheating would seem unlikely as there were neither warning lights displayed nor was there an abnormal rise in temperature throughout the period of warming up the Insured Vehicle.

30. The possibility of the fire being due to external factor (foreign material(s) stuck on hot surfaces, arson and sabotage amongst others) would also seem unlikely given that our examination of the available incident scene photographs did not reveal any unusual material(s)/object(s) found on the ground near where the Insured Vehicle was parked.

31. Basing on the situation, the engine of the Insured Vehicle was on idling mode at the material time of fire incident, the air-conditioning system too were in operational mode. Under paragraph 32 below we states out the basic function of an air-conditioning compressor system.

32. Air conditioner compressors are not engaged unless the air conditioning is switched "on". Mounted to the front of the Air conditioner compressor is an electro-magnetic clutch. Meaning, the clutch and belt spin freely without the internals of the compressor engaged and being moved along with the clutch pulley. Once you switch the Air conditioner "on", then the clutch is energized electrically to engage the internals of the compressor and spins them along with the clutch pulley.

33. The possibility of the fire being due to mechanical in nature would then seem more likely given that engine overheating and external factor would both seem unlikely. The fire being due to mechanical nature is also supported by the condition of the misaligned compressor & belting that we had found while conducting our physical investigation on the Insured Vehicle. The continuous friction from the misaligned compressor might cause sparked ignition to start a fire which was earlier discussed in paragraph 10 & 11 above.

34. Our checks with both local and international bodies and associations had revealed that at the time of writing this report, there is no manufacturer recall of electrical nature to similar make and model vehicle as the Insured Vehicle that may possibly be related to this incident.

Conclusion

35. 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 mechanical in nature. For this particular case, the fire had originated from the air-condition compressor inside the engine compartment, somewhere around its front portion in the middle section of the engine. The air-condition compressor were likely to be the original factory fitted component.

36. 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.

37. 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.

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

Rohaizal A. Rahim
Technical Investigator

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