

Your Ref: M2004905-CK
Our Ref : CS4/TMI20010785/N

31 December 2020

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

TECHNICAL INVESTIGATION REPORT OF FIRE INCIDENT INVOLVING THE MOTOR VEHICLE XE 3905J ON 30 SEPTEMBER 2020

1. We refer to your letter dated 6 October 2020 and the instructions therein.
2. Our analysis, comments and opinions with respect to the cause of fire to the Motor Vehicle XE 3905J (herein referred to as "**Insured Vehicle**") are set out below.

Inspection of the Motor Vehicle

3. The Insured Vehicle was physically inspected on 7 October 2020 at the premises of ST Engineering. Pte. Ltd. (herein referred to as "**ST**") located at 31 Corporation Road, Singapore 649806.
4. A static inspection was carried out to the Insured Vehicle where the following general information was recorded:-

Vehicle Registration No.	: XE 3905J
Make / Model	: MAN / TGS 35.400 8X4 BB
Chassis No	: WMA37SZZ0HM729564
Year of Registration	: December 2017
Mileage	: N.A (wiring affected)

5. The Insured Vehicle was noted to have sustained fire damage that was confined to its interior portion. The fire damage was observed to be most severe at its interior compartment. The front exterior portion was unaffected by the fire except for the front windscreen. The engine compartment was unaffected by the fire. See photos 1 – 6 below.



Photo 1 shows the front view of the Insured Vehicle at the time of our inspection. The fire damage to the Insured Vehicle was confined to its interior compartment. Most parts of the front portion were unaffected by the fire except for the front windscreen.



Photo 2 shows the general view of the front windscreen of the Insured Vehicle. The centre portion of the windscreen seemed to have sustained visible fire damage (circled).



Photo 3 shows the right side view of the Insured Vehicle at the time of our inspection. The fire damage to the Insured Vehicle was confined to its interior compartment. The right body was observed to have been unaffected by the fire.



Photo 4 shows the left side view of the Insured Vehicle at the time of our inspection. The fire damage to the Insured Vehicle was confined to its interior compartment. The left body was observed to have been unaffected by the fire.



Photo 5 shows the rear view of the Insured Vehicle at the time of our inspection. The fire damage to the Insured Vehicle was confined to its interior compartment. The rear portion was observed to have been unaffected by the fire.



Photo 6 shows the interior compartment of the Insured Vehicle at the time of inspection. Most of the components in the centre of the dashboard (circled) were found to be burnt and/or melted as a result of 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 started from the centre of the dashboard. This can be determined basing on the area where the extent of fire damage was most severe which was the centre portion of the instrument panel. Various components of the instrument panel were observed to have been burnt and/or partly melted from prolonged exposure to high heat intensity which included the upper and central parts of the instrument panel assembly, air outlet assembly, beaker holder assembly and carrier assembly, amongst others. See photos 7 - 9 below.



Photo 7 shows the centre of the dashboard of the Insured Vehicle. The fire seemed to have originated from the centre portion of the instrument panel basing on the area where the extent of fire damage was most severe. Various components of the instrument panel were observed to have been burnt and/or partly melted from prolonged exposure to high heat intensity which included the upper and central parts of the instrument panel assembly, air outlet assembly, beaker holder assembly and carrier assembly, amongst others.

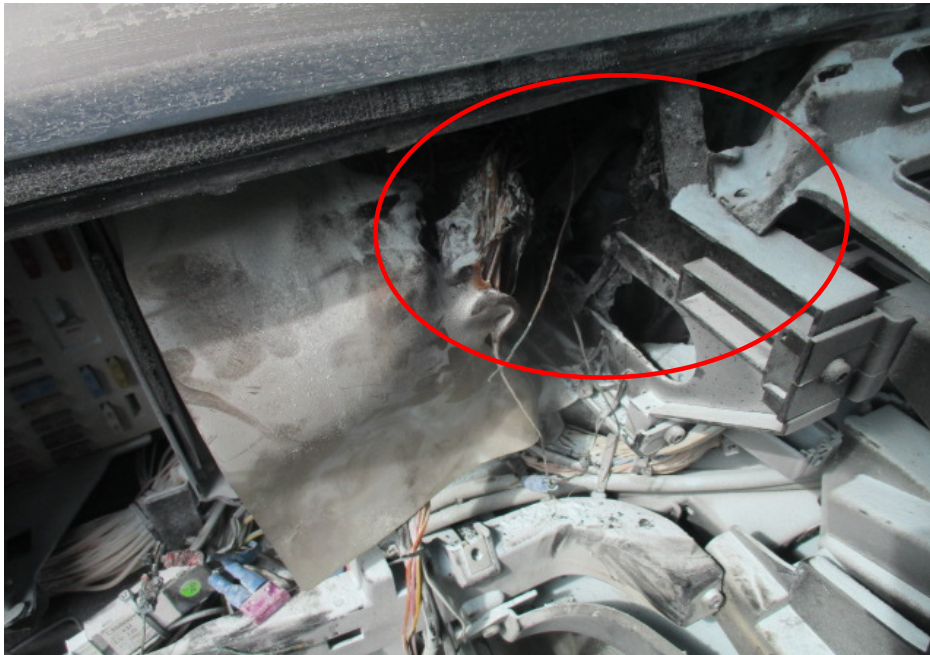


Photo 8 shows a closer view of the centre portion of the instrument panel. Various components of the instrument panel were observed to have been burnt and/or partly melted from prolonged exposure to high heat intensity which included the upper and central parts of the instrument panel assembly, air outlet assembly, beaker holder assembly and carrier assembly, amongst others (circled).



Photo 9 shows a close up view of the centre portion of the instrument panel. Most of the components of the instrument panel were observed to have been burnt and/or partly melted from prolonged exposure to high heat intensity.

8. Upon closer examination of the various components contained within the centre portion of the instrument panel, which was where the fire to the Insured Vehicle had likely started, we had found greenish residue on some of the wirings leading to a component that belonged to the mobile crane of the Insured Vehicle. 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 10 - 12 below.



Photo 10 shows greenish residue on some wirings leading to a component that belonged to the mobile crane of the Insured Vehicle (arrowed). The presence of such greenish residue suggests occurrence of an electrical short circuit.

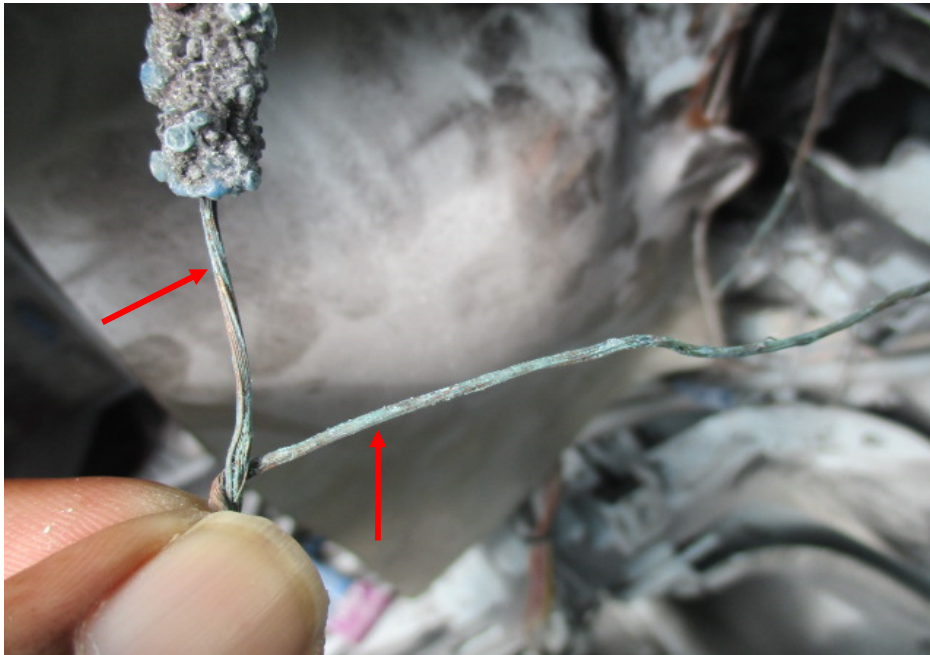


Photo 11 shows a closer view of the greenish residue (arrowed) on some wirings leading to a component that belonged to the mobile crane of the Insured Vehicle. The presence of such greenish residue suggests occurrence of an electrical short circuit.

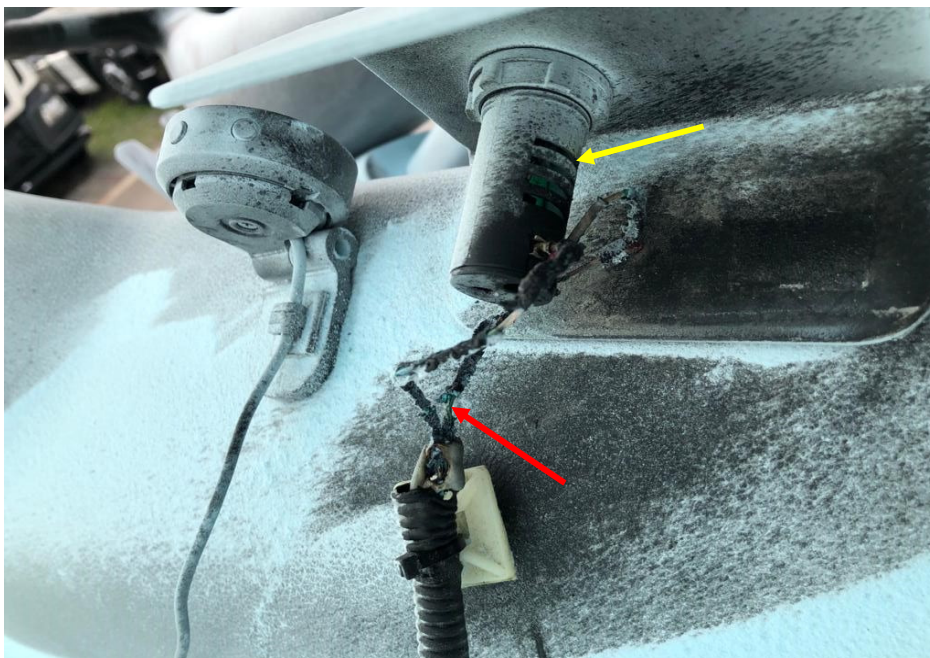


Photo 12 shows a close up view of the greenish residue (red arrow) on some wirings leading to a component that belonged to the mobile crane of the Insured Vehicle (yellow arrow). The presence of such greenish residue suggests occurrence of an electrical short circuit.

9. From the Singapore Accident Statement which was made by the driver of the Insured Vehicle, Mr Yong Chee Fui Gregory (herein referred to as **"Mr Yong"**), we note that the fire to the Insured Vehicle had started at a time when the mobile crane was in operation. Mr Yong was first alerted of the fire when the mobile crane seized operating.
10. We managed to speak to Mr Yong where we were able to gather information pertaining to the incident and history of the Insured Vehicle.
11. According to Mr Yong, at about 1115hrs on 30 September 2020, he was tasked to unload an excavator followed by loading of a skid loader at the premises of Tanglin Corporation Pte. Ltd. (herein referred to as **"Tanglin"**) located at 1 Gul Street 5. He mentioned that the crane had ceased midway. Mr Yong opened the left cabin door when he noticed smoke emitting from the dashboard. A fire then broke out from inside the centre portion of the dashboard. One of the workers and a mechanic who saw the fire immediately got the fire extinguishers from the rear portion of the Insured Vehicle. The fire was put out shortly after and the battery connector was disconnected from the battery terminal.
12. Mr Wong called his manager who made towing arrangements. He also contacted MAN Truck and Bus Singapore Pte. Ltd. (herein referred to as **"MAN"**) and Wong Fong Engineering Works (1988) Pte. Ltd. (herein referred to as **"Wong Fong"**) to inspect the Insured Vehicle and mobile crane respectively. The Insured Vehicle was towed to ST the following day. Mr Yong made an incident report at Tanglin on the same day. The insurance report was made at Lee Kuan Hwa Motor Service on 5 October 2020 at 1212 hours.
13. Mr Yong was assigned the Insured Vehicle and has been the main driver of the Insured Vehicle about 2 years. 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 to MAN as well as Wong Fong by him or the mechanic.
14. With regards to the history of the Insured Vehicle, we were able to gather from Mr Yong that the Insured Vehicle was purchased new in 2017 from MAN and the mobile crane was installed by Wong Fong.

15. During our conversation with Mr Yong, we were informed that he had taken some photographs whilst at the incident scene. These were duly forwarded to us for our review.
16. The photographs taken by Mr Yong had showed the Insured Vehicle parked in Tanglin post- incident.
17. Upon further examination of the photographs, we 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 was parked. See photos 13 & 14 below.



Photo 13 shows a general view of the Insured Vehicle post- incident. The Insured Vehicle could be seen parked at Tanglin. Generally, the information that could be gathered from the incident scene photographs provided by Mr Yong had corresponded to the events that he had related to us, which was the mobile crane had ceased operation midway before the fire occurred (arrowed).



Photo 14 shows interior compartment of the Insured Vehicle at the incident scene after the fire was put out. Generally, the information that could be gathered from the incident scene photographs provided by Mr Yong had corresponded to the events that he had related to us, which is the fire had started from the centre portion of the dashboard of the Insured Vehicle (arrowed)

18. During the course of our investigations, we managed to obtain from Mr Yong, a document relating to the latest servicing and maintenance aspect of the Insured Vehicle. Upon reviewing this document, we note that the Insured Vehicle was last serviced on 29 March 2020. The servicing package had included the changing of engine oil, oil filter, air filter and fuel filter. See Invoice 1 below.

TANGLIN CORPORATION
Equipment Service/Repair Report

SR No 49637

(Plant & Machinery Department)
101 Street 5, Singapore 670215
Tel: (65) 6884 1750 Fax: (65) 6362 3765
Cst Reg No: 137803346 GST Reg No: M2-0029136-X

CUSTOMER: T C P L
LOCATION: LORRY SERVICE
DESCRIPTION: LORRY CRANE
MODEL: MAN
S/No PLANT No: XE 39053

HOUR METER: 61953
FUEL GAUGE: E 1/2 1/4 3/4 4/5 F

LEGEND:
CHECKED: ✓
REPLACEMENT: R
TOP UP: T
ADJUSTMENT: A
NEEDED ATTENTION: X

MAINTENANCE		QTY	MAINTENANCE		QTY	MAINTENANCE		QTY
1. Engine Oil	✓		21. Engine - Performance	✓		41. Radiator Coolant	✓	
2. Hydraulic Oil	✓		22. Fuel Pump - Injectors	✓		42. Spark Plug		
3. Compressor Oil	✓		23. Valve Clearance - Timing	✓		43. Condenser		
4. Gear Oil	✓		24. Fan Belt	✓		44. Carburetor		
5. Diesel Fuel/Petrol	✓		25. Alternator	✓		45. Shock Absorber		
6. Fuel Filter	✓		26. Starter Motor	✓		46. Wheel Alignment		
7. Air Filter	✓		27. Wiring	✓		47. Water Blade	✓	
8. Air Filter (Engine)	✓		28. Water Pump	✓		48. Battery	✓	
9. Air Filter (Compressor)	✓		29. Radiator Hose - Cap	✓		49. Push Button Switch		
10. Compressor Oil Filter	✓		30. Greasing All Points	✓		50. Pressure Gauge		
11. Hydraulic Filter	✓		31. Key Switch	✓		51. Rubber Mounting	✓	
12. Separator	✓		32. Engine Mounting - Brackets	✓		52. Grease Nipple	✓	
13. Water Separator Fuel Filter	✓		33. Exhaust Pipe - Muffler	✓		53. Left Hand Arm		
14. Oil Filter	✓		34. Brake Lining - Pad	✓		54. Right Hand Arm		
15. Clutch Fluid Level	✓		35. Brake Pipe - Cylinder	✓		55. Left Hand Paddle		
16. Brake Fluid Level	✓		36. Hand Break / Service Brake	✓		56. Right Hand Paddle		
17. Battery Water Level	✓		37. Clutch Disc	✓		57. Center Paddle		
18. Battery Water Level	✓		38. Clutch Cover	✓		58. Lid Seal		
19. Rear Axle Oil Level	✓		39. Clutch Bearing	✓		59. Regulator		
20. Gear Steering Fluid Level	✓		40. Front Wheel Hub Bearing	✓		60. Hydraulic Hose	✓	

DATE: 29/3/2020
FROM: 08:10
TO: 12:00

NO OF HOURS: 4

OTHER REPAIRS: Monthly Service on Lorry Crane Change Engine Oil, Air Filter, Fuel Filter, Oil Filter, Battery Water, Radiator Water top up, Fanbelt Change All points greasing. Arrive Ready to use.

REMARKS: (PARTS SUPPLIED) Change -
① Engine Oil (15kg) - 12 liter
② Air Filter element - 1 pc
③ Air Filter - 1 pc
④ Fuel Filter - 1 pc
⑤ Water Separator Fuel Filter - 1 pc
⑥ Oil Filter - 1 pc
⑦ Battery Water Filter

TECHNICIAN: M. BABU
RABU


I certify that the above services have been carried out to my entire satisfaction.
All times shown above are correct.

DATE: 30/3/20
NAME: Plessary

SIGNATURE & COMPANY'S STAMP


Invoice 1 shows the latest servicing done on the Insured Vehicle on 29 March 2020 (arrowed). The servicing package had included the changing of engine oil, oil filter, air filter and fuel filter.



19. Mr Yong also mentioned that on 30 June 2020, an advanced stability control system was installed on the mobile crane by Wong Fong. See Invoice 2 below.

WONG FONG 

TO: TANGOS
TANGLIN CORPORATION PTE. LTD.
1 GUL STREET 5
SINGAPORE 619215
SINGAPORE



Ship To:

TAX INVOICE NO: **IN0000064704**  Original
Date: 10/06/2020

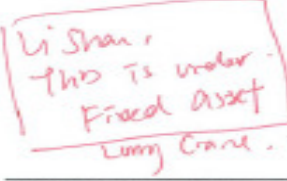
Ship Via:  BY: 

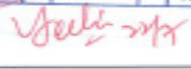
Delivery Terms:

Term	Currency	Salesman	Order No	Our Reference	Reference	Page
CTM	SGD	YUEN KAM LOON	C000093677	W006001441-YKL	PO#PM6196	Page 1 of 1

No.	Description	Packing Slip #	GST %	Qty	U/M	Unit Price	Disc(%)	Amount
60	AS PER OUR QUOTATION REF NO:20-0002588-YKL FOR PROJECT: GUL F70-ZUKUN-ASCSR ENG NO/SN : 201518 REG NO : XE3905J  CHASSIS NO: WMA3TZZDHMT29564 ZUKUN ASCS WITH REAR STABILIZER-PAL TO SUPPLY & INSTALL ZUKUN ADVANCED STABILITY CONTROL  SYSTEMS (ASCS) FOR PALFINGER CRANE MODEL: PK52002SH-H SERIAL NO: 100392807 WITH REAR STABILIZER FOR REGN NO:XE3905J MAIN TGS35.499 8X4 BB (706200mm) LD METAL BODY. SCOPE OF SUPPLY : 1) FRONT L/R STABILIZER AND VARIABLE OUTRIGGER MONITORING WITH DRAW WIRE CABLE SENSOR AND PROXIMITY SWITCH. 2) REAR L/R STABILIZER AND VARIABLE OUTRIGGER MONITORING WITH DRAW WIRE CABLE SENSOR AND PROXIMITY SWITCH. 3) CRANE 4 ZONE MONITORING WITH 12 PROXIMITY SWITCHES FRONT, LEFT, RIGHT, REAR. 4) PRESSURE TRANSDUCER FOR MAIN CYLINDER. 5) P.E. CERTIFICATION & LM765789 X (SRO 53915) 6) WARRANTY : 1 YEAR. 7) FOR LEVER OPERATED CRANES, ADDITIONAL CHARGE OF \$500 APPLIES. * REMARKS : ACTUAL LIFTING PERFORMANCE OF THE CRANE WILL BE SUBJECT TO THE ACTUAL VEHICLE STRUCTURAL CONFIGURATION.	SR7.0	1.00	EA	8,500.00		8,500.00	


SGD Nine Thousand Ninety Five





Site:	Plant No.:	7515-01T	7518-05R	7519-01R	7515-01S	7518-05R	Others	Signature	Date
Gul ship	XE 3905								

Total SGD Excl.GST 8,500.00
GST 7% 595.00
Total SGD Incl.GST 9,095.00




Authorized Signature


WONG FONG ENGINEERING WORKS (1988) PTE LTD
79 JOO KOON CIRCLE Singapore 626107
T: +65 6251 9555 F: +65 6251 2220 | sales@wongfong.com | www.wongfong.com
RCB No.: 196804265D | GST Reg No. M2-0083977-3


Invoice 2 shows the advanced stability control system installed on the mobile crane of the Insured Vehicle by Wong Fong on 30 June 2020 (arrowed).


20. Mr Yong informed us that the audio warning system was not working and that the stabilizer split pins were missing. It was checked by Wong Fong on 30 June 2020. The limit switch was replaced and new split pins were installed. See Invoice 3 below.


WONG FONG 


Bill To: TANG035
TANGLIN CORPORATION PTE. LTD.
1 GUL STREET 5
SINGAPORE 629215
SINGAPORE
Contact : MR. ROBIN CHAN
Tel : 6884 1892 / 6884 1700 (M) Fax : 6368 9281

RECEIVED
08 JUL 2020
BY: 

Tax Invoice No : IN000064898
Date : 30/06/2020 

Ship To: 



RECEIVED
16 JUL 2020
BY: 

Ship Via: 

Term	Currency	Salesman	Service Order No	Our Ref	Your Ref	Page
Cheque 1 month	SGD	YUEN KAM LOON	SR00053973			Page 1 of 1

Veh no	Serial No	Item No	Qty	Make / Model
XE3965J	100392887	F18-PK92002SH-H	No	PK92002SH-H

Description/Remark :

GENERAL GREASING
AUDIO WARNING SYSTEM NOT WORKING 
BOTH SIDE STABILIZER SPLIT PINS MISSING 

REMARKS: REPAIR FOR ASCS INSTALLATION

Matl S/N	Item No	Description	GST(%)	Qty	Unit Price	Amount
1	208LA12-005	SPLIT PIN LATCH EQ 042	7	2.00 EA	7.00	14.00
2	202LS10-005	SWITCH LIMIT HONEYWELL SZL-VL-J-N-M	7	1.00 EA	70.00	70.00
3	GR	GREASING	7	1.00 EA	0.00	0.00
Matl Subtotal						84.00


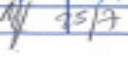
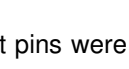
Labor S/N	Item No	Description	GST(%)	Qty	Unit Price	Amount
1	325	N LABOUR/JOB	7	1.00 HR	120.00	120.00



CHECKED AND FOUND AUDIO WARNING SYSTEM NOT WORKING. CHECK INTO WIRING FUNCTIONAL AND FOUND LIMIT SWITCH FAULTY. DISMANTLE AND REPLACEMENT OF NEW LIMIT SWITCH.



CHECKED AND FOUND BOTH SIDE STABILIZER SPLIT PINS MISSING. INSTALL NEW SPLIT PINS.

Sub Total	GST amount	Total Amount
204.00	14.28	218.28

SGD : Two Hundred Eighteen And Cents Twenty Eight

Site:	Plant No.:	7515-01T	7518-05R	7519-01R	7515-01S	7518-05R	Others
And w/Ship	XJ 3905						
All cheque to be made payable to : Wong Fong Engineering Works (1988) Pte Ltd *Any discrepancies must be notified within 7 days upon receipt of invoice. This is a computer generated document, no signature is required.							
WONG FONG ENGINEERING WORKS (1988) PTE LTD							
79 JOO KOON CIRCLE Singapore 629163							
T: +65 6881 9855 F: +65 6861 3236 sales@wongfong.com.sg www.wongfong.com.sg							
RCD No.: 738204295D GST Reg No. M2-0003973-3							
7517-05R 7518-05R 7517-26R 7518-06R 7518-03R 7518-08R 7518-04R 7518-10R							
Checked By:  Date: 16/7							
Code By:  Date: 16/7							
Approved By:  Date: 16/7							


 

Invoice 3 shows the limit switch was replaced and new split pins were installed on the mobile crane of the Insured Vehicle by Wong Fong on 30 June 2020 (arrowed).

21. Generally, there seems to be no inherent and/or recurring mechanical and/or electrical issue(s) to the Insured Vehicle.

22. Based on the vehicle service record invoices provided, we are of the opinion that it is unlikely that the fire could have been caused by poor maintenance of the Insured Vehicle.

23. 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 Yong had mentioned to us there were no indications of abnormally high temperatures on the Insured Vehicle when he was driving on that day.
24. 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 was confined to within its interior compartment with no visible exterior damage. The location where the Insured Vehicle caught fire was also observed to be not at a secluded location.
25. 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 inside the centre portion of the instrument panel of the Insured Vehicle, which was earlier discussed in paragraph 8 above.
26. 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. See search result from LTA below.



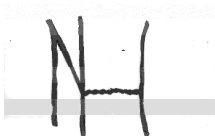
Vehicle Recall Details

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

Owner ID Type Company	Owner ID 396E
Vehicle No. XE3905J	Make/Model MAN/ TGS 35.400 8X4 BB
Engine No.: 50546182524618	Chassis No.: WMA37SZZ0HM729564
Recall Details: No Recall Detail records	

Conclusion

27. 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 from the wirings within the centre portion of the instrument panel of the Insured Vehicle. The wirings were part of a component that belonged to the mobile crane of the Insured Vehicle.
28. 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.
29. 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.
30. 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.
31. SCDF officers did not attend to the incident scene hence there will not be any SCDF fire report that may be forthcoming.

**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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