



Your Ref: 7497983040SG  
Our Ref : CI/AIG20001597/N

31 January 2020

**M/s AIG Asia Pacific Insurance Pte. Ltd.**  
78 Shenton Way #08-16  
CHARTIS Building  
Singapore 079120  
(Motor Claims Department)

**TECHNICAL INVESTIGATION REPORT OF FIRE INCIDENT INVOLVING THE  
INSURED VEHICLE SGU 629T ON 12 JANUARY 2020**

1. We refer to your letter dated 28 January 2020 and the instructions therein.
2. Our analysis, comments and opinions with respect to the cause of fire to the insured vehicle SGU 629T (herein referred to as "**Insured Vehicle**") are set out below.

**Inspection of the Insured Vehicle**

3. The Insured Vehicle was physically inspected on 29 January 2020 at the premises of Cycle & Carriage Mercedes-Benz Authorised Service Centre (herein referred to as "**C&C**") located at 188 Pandan Loop, Singapore 128378.
4. A static inspection was carried out to the Insured Vehicle where the following general information was recorded:-

Vehicle Registration No.	: SGU 629T
Make / Model	: MERCEDES BENZ C200 AVANTGARDE (R17 LED)
Chassis No	: WDD2050422R253729
Year of Registration	: March 2017
Mileage	: N.A. (battery melted)

5. The exterior front body of the Insured Vehicle sustained visible fire damage. This included its windscreen, front bonnet, headlights, front bumper and side panels.
6. The fire had resulted in extensive damage to the engine compartment of the Insured Vehicle. Most 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 rear view of the Insured Vehicle. The rear portion of the Insured Vehicle was observed to be relatively unaffected by the fire.



**Photo 2** 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, front bonnet, front bumper, front bumper reinforcement panel, headlights and side panels.



**Photo 3** shows the general view of the left 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, front bonnet, left headlight, front bumper and left front panel.



**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 extensive fire damage.



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

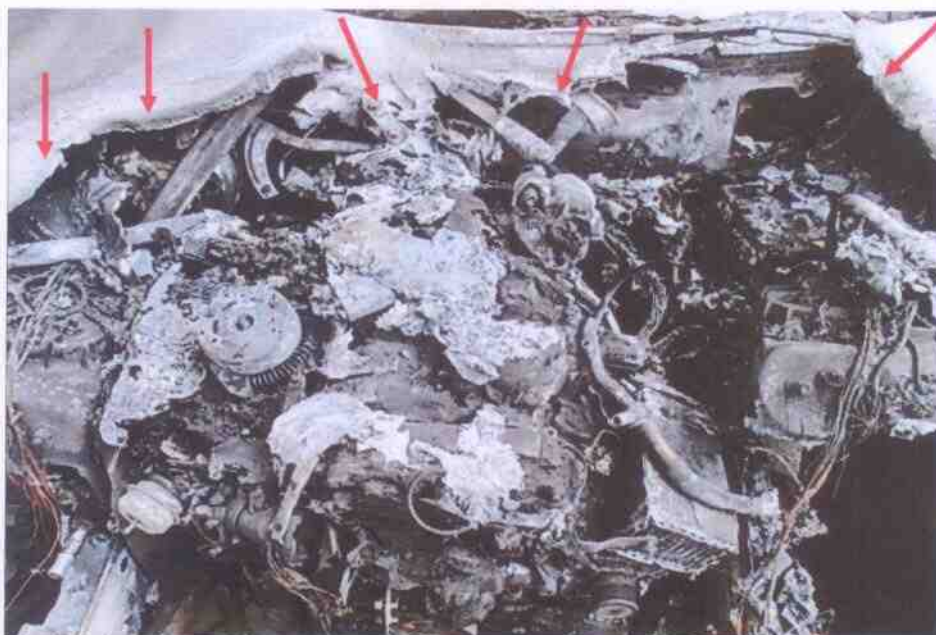


**Photo 6** shows the interior compartment of the Insured Vehicle, which was observed to be relatively unaffected by the fire.

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 left portion of the engine compartment due to the nature of the fire damage which was more extensive at the left portion. Furthermore, the intense whitish burn marks on the left front fender and hole found in the front bonnet of the Insured Vehicle indicate that the front left portion of the Insured Vehicle was exposed to prolonged high heat intensity. The right front fender had sustained minimal fire damage. Following the characteristic of heat (hot air rises), the origin of fire can then be determined to be from the engine compartment of the Insured Vehicle as the engine compartment is covered by the front bonnet and front fenders. Flames from the confined spaces of the engine compartment would travel outwards and upwards, exposing the front bonnet and front fenders of the Insured Vehicle to high heat intensity hence leaving a hole in the front bonnet as seen.
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 left portion of the engine compartment is an indication that the left portion of the engine compartment had sustained exposure to prolonged high heat intensity. See photos 7 - 9 below.



**Photo 7** shows the hole found in the front bonnet of the Insured Vehicle which indicates that the front portion of the Insured Vehicle was exposed to prolonged high heat intensity. The whitish burn marks (arrowed) are a result of exposure to prolonged heat intensity.



**Photo 8** shows a closer view of the rust that had developed on the left rear portion of the engine compartment (circled). The development of rust is an indication that this area was subjected 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 left portion of the engine compartment.



**Photo 9** shows the whitish burn marks that were found on the left front fender of the Insured Vehicle (circled). Such whitish burn marks are a result of exposure to prolonged heat intensity, which may indicate where the fire had started. Rust would also begin to develop on these areas soon after the fire.

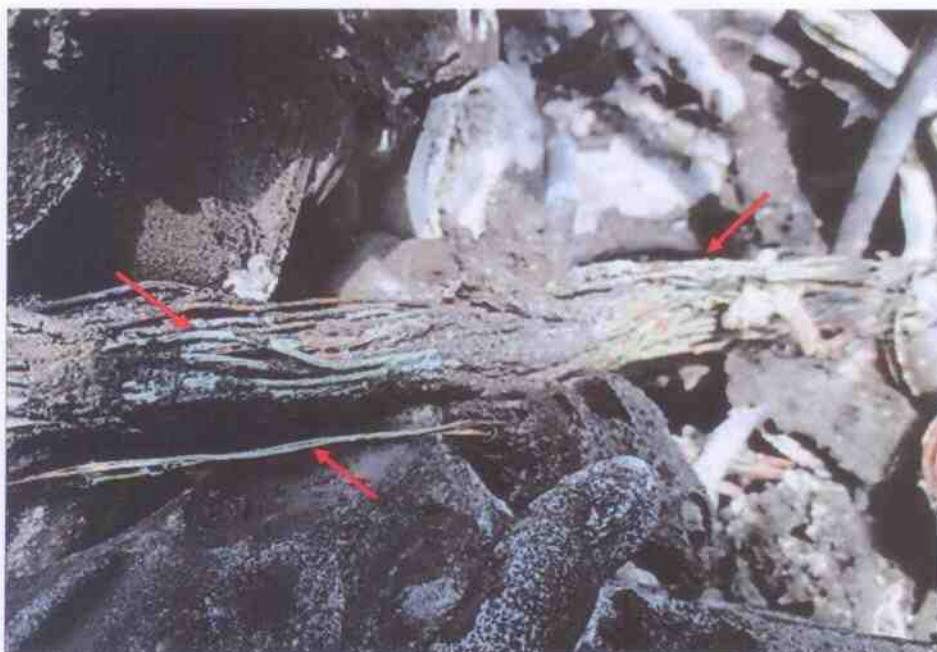
10. Upon closer examination of the left portion of the engine compartment, which was where the fire to the Insured Vehicle had likely started, we had found traces of greenish residue on several stretches of burnt wirings. The presence of greenish residue indicates internal heating of copper wires, a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



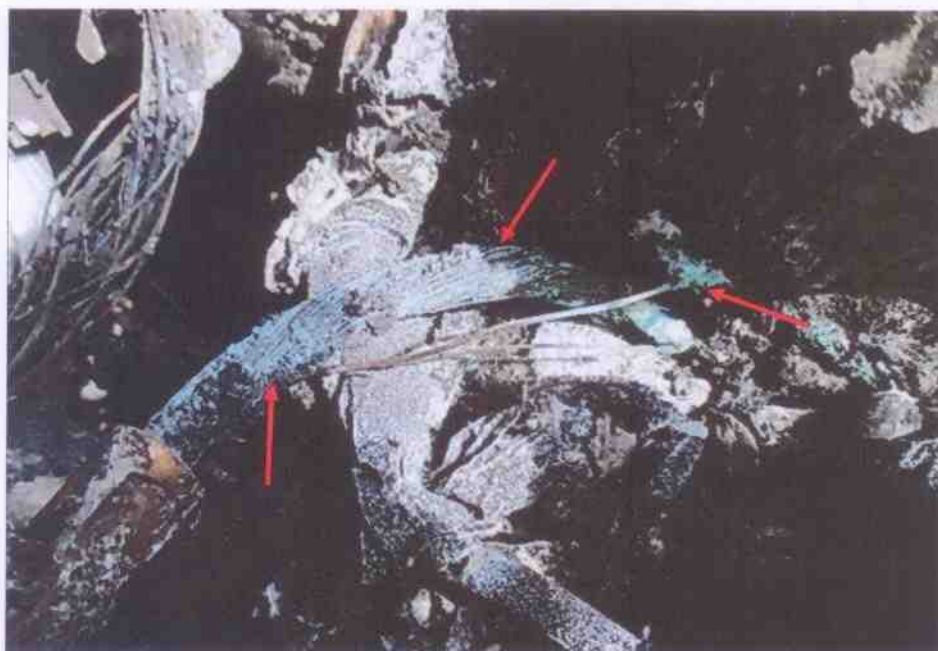
Photo 10 shows the burnt wirings around the left portion of the engine compartment (circled), which is in the immediate vicinity where the fire to the Insured Vehicle had likely started.



Photo 11 shows a closer view of the burnt wirings around the 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 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, which was made by Ms Florence (herein referred to as "**Ms Florence**"), we note that the fire to the Insured Vehicle had started at a time while she was driving. She was alerted of the fire when she saw smoke emitting from the engine compartment.
12. We managed to speak to Ms Florence where 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 Ms Florence, at about 1000hrs on 12 January 2020, she was driving from her home located at Limau Rise to fetch her husband, Mr Kok Choong Hwa (herein referred to as "**Mr Kok**") at Bedok Central. As she passed the Bedok Community Centre, she noticed white smoke emitting from the front bonnet. The smoke got thicker. She stopped the Insured Vehicle and switched off the engine. Soon after the fire broke out. Passers-by from the community centre grabbed as many available fire extinguishers as they could and tried to put out the flames but the fire had intensified. Mr Kok who was witnessing the incident nearby immediately called the SCDF.
14. The SCDF arrived 10 minutes later and extinguished the fire soon after. The police were also at the scene. Mr Kok called AIG and made towing arrangements. Mr Kok assisted the SCDF in their preliminary investigations and his as well as Ms Florence's statement was also taken by the police. The tow truck arrived about 1 and a half hours later and the Insured Vehicle was towed to C&C. Ms Florence made the insurance report at AIG on 17 January 2020 at 1318 hours.
15. With regards to the history of the Insured Vehicle, we were able to gather from Mr Kok that the Insured Vehicle was purchased new in 2017. Mr Kok is the owner and main driver of the Insured Vehicle. Ms Florence drives the Insured Vehicle occasionally. To the best of his recollection, there has not been any major mechanical problem and/or electrical problem with the Insured Vehicle.
16. Pertaining to the maintenance aspect, Mr Kok sends the Insured Vehicle for periodic servicing at C&C as it is still under warranty.

17. During the course of our investigations, we were also able to obtain from C&C, documents relating to the last 3 periodic servicing of the Insured Vehicle. The servicing package done on 14 February 2019 had included changing of engine oil, oil filter, oil filter element, air filter element, air filter insert, dust filter, fine particle filter, radiator coolant, spark plugs, auto transmission fluid (ATF), gear oil filter, brake fluid, v- belt, windshield washer fluid, and brake pads. The battery and wiper blades were replaced. The tyres were also rotated and balanced. Refer to invoices 1 - 3 below.



**TAX INVOICE**

**Customer Name & Address**  
 K&K Chong Hwa  
 10 Little River  
 Singapore 480835

**Customer Name & Vehicle Info**  
 Chong Hwa  
 Reg No/Reg Date: 6G0629T / 28/05/2017  
 Date of Invoice: 14/02/2019  
 Chassis No: WD000004220253728  
 Engine No: 2749205004140T  
 Make/Model: MB/MB C 200 SEDAN (W206) "AVANTGARDE" / 4  
 Colour: Silver

**Invoice No:** WCVZ9415  
**Date/Time Period:** 15/02/2019 / 15:23  
**Operator:** 672 / 2019 / 5114  
**WSP No:** 91010  
**Invoice/Work Order No:** 2706424

Description of Goods / Services	Qty	Unit Price \$	Amount \$
2 MAINTENANCE SERVICE B4			
Carry out maintenance			
W 00003010 Labour to carry out work (By K&K)			67.50
W 00110001 EXTRA WORK FOR SERVICE: REPLACE DUST FILTER			15.00
W 00110001 EXTRA WORK FOR SERVICE: REPLACE AIR FILTER ELEMENT			15.00
W 00110001 EXTRA WORK FOR SERVICE: REPLACE BRAKE PADS			61.00
W 00110001 EXTRA WORK FOR SERVICE: PERFORM OIL CHANGE IN AUTOMATIC TRANSMISSION ON XE, WITH TRANSMISSION 722.9			140.00
W 00120001 EXTRA WORK FOR SERVICE: REPLACE SPARK PLUGS			67.50
W 00120001 REPLACE V-BELT ON 4SP, WITH SINGLE-BELT DRIVE			54.00
W 00140001 REPLACE COOLANT INCLUDING ANTIFREEZE, CHECK FOR LEAKS			61.00
W 00150001 Tyre Rotation & Balancing (Balance all 4 wheels)			20.00
W 00160001 Wiper			5.00
W 00170001 NEXT SERVICE DUE: 75,000km/4-5 years (whichever earlier)			
W 00180001 PERFORM SERVICE B WITH PLUS PACKAGE			140.00
X WINDSHIELD WASHER FLUID	1.00	9.72	9.72
X FINE PARTICLE FILTER	1.00	122.07	122.07
X 75 OIL FILTER ELEMENT	1.00	91.20	91.20
X 40TER V-BELT 40TER	2.00	28.50	57.00

Invoice 1 shows page 1 of the servicing done on the Insured Vehicle at C&C on 14 February 2019 (red arrows). The servicing package had included changing of engine oil, oil filter, oil filter element, air filter element, air filter insert, dust filter, fine particle filter, radiator coolant, spark plugs, auto transmission fluid (ATF), gear oil filter, brake fluid, v- belt, windshield washer fluid, and brake pads. The battery and wiper blades were also replaced. The tyres were also rotated and balanced.




**Mercedes-Benz**

Cycle & Carriage  
 Indemnity Pte Limited  
 100 Robinson Road  
 Singapore 068902

**TAX INVOICE**

Insured Name & Address		Owner Name & Vehicle Info	
Kok Chongp Heng	10 Ubi Ave 1, #01-25 Singapore 408933	Cost No/Name W029455/Kok Chongp Heng	W029455 / 28/03/2017
Contact No		Date of Damage	14/02/2019
		Chassis No	W029455122023729
		Engine No	27482030091437
		Make/Model	W029455 C 200 320MP (W029455) *AVANTGARDE / A
		Colour/Type	007 756 Citrine Brn/ 042 302 8146

Account No	Term	Date/Term Period	CSD	Operator	VSP No	Invoice/Credit Note No
W029455	CSD/C	15/02/2019/ 15/02	25	003 / John Siva	51016	27060100

Description of Goods/Services		Qty	Unit Price \$S	Amount \$S
1. BRAKE PAD FRONT		2.00	0.00	0.00
2. ROAD TEST		2.00	0.00	0.00
3. 40-1030-013				0.00
4. Labour for Brake Pads Replacement				0.00
5. 40-1030-013				0.00
6. Labour for Brake Pads Replacement				0.00
7. 40-1030-013				0.00
8. Labour for Brake Pads Replacement				0.00
9. BRAKE PAD REAR		2.00	0.00	0.00
10. BRAKE PAD REAR		2.00	0.00	0.00
11. BRAKE PAD REAR		2.00	0.00	0.00

Cycle & Carriage Indemnity Pte. Ltd.  
 100 Robinson Road, Singapore 068902

Part	Qty	Unit Price \$S	Amount \$S
Part	2,230.54		4,500.20
Labour	216.00		450.00
Schedule Parts	1,476.36		4,500.20
Specktest Job	22.36		0.00
Diagnosis Job	0.00		0.00
Sumo/Other	0.00		0.00
Total (w/o GST)	4,500.20		4,500.20

	Total Payable	Total Due	Balance \$/USD
Total Payable	4,500.20	4,500.20	0.00
Total Due	4,500.20	4,500.20	0.00
Balance \$/USD	0.00	0.00	0.00

Invoice 3 shows page 3 of the servicing done on the Insured Vehicle at C&C on 14 February 2019 (red arrows). The servicing package had included changing of engine oil, oil filter, oil filter element, air filter element, air filter insert, dust filter, fine particle filter, radiator coolant, spark plugs, auto transmission fluid (ATF), gear oil filter, brake fluid, v- belt, windshield washer fluid, and brake pads. The battery and wiper blades were also replaced. The tyres were also rotated and balanced.



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

18. The latest servicing package done on 18 July 2019 had included changing of engine oil, oil filter, windshield washer fluid and oil filter element. The engine was washed. The tyres were also rotated and balanced. Refer to invoice 4 below.

INTERNAL INVOICE		Mercedes-Benz	
<b>Customer Name &amp; Address</b> Star Car Freshen - BE Effective 05 Mar 2019		<b>Owner Name &amp; Vehicle Info</b> /Kok Cheong Hoo / 28/03/2017 78329 4000004028053224 27492030851437 88/88 C 200 320AM (V215) "AVANTGARDE" / A 023 766 C100me Benz 542 231 8TACK	
<b>Contract No.</b> 		<b>Vehicle No.</b> 28/03/2017 / 78329	
<b>Account No.</b>	<b>Terms</b>	<b>Date/Time Period</b>	<b>Operator</b>
85000001		21/07/2019 / 19:30	73 / John Goh
<b>Description of Goods &amp; Services</b>			
A. 5010000142 Labour for Star Car Wash Package: Replace Engine oil, Engine oil filter & windshield washer fluid, Blue Package perform and carry out complimentary engine wash, Short Test (by Sentry) performed.			Qty Unit Price \$8 Amount \$8
A. 50000010 Labour to carry Short Test (by Sentry)			
A. 50100001 Tyre Rotation & Balancing (Balance all 4 wheels)			
08 MS 1 785512			
A. 50100001 CLEANING AGENT			1.00
A. 75-011 FILTER ELEMENT			4.00
A. 08-08A-S-081X-01-01			7.00
Cycle & Carriage charges for 18 years. Visit www.cyclecarriage.com.sg for more info.			
<b>Parts</b>			
Labour			0.00
Standard Rate			0.00
Standard Rate			422.00
Specialized Job			0.00
Diagnostic Fee			0.00
Supply/Driver			0.00
Total (incl GST)			422.00
<b>Total</b>			422.00
<b>Total Payable</b>			422.00
<b>Total Paid</b>			0.00
<b>Total Due</b>			422.00

Invoice 4 shows the latest servicing done on the Insured Vehicle at C&C on 18 July 2019 (red arrows). The servicing package done on 18 July 2019 had included changing of engine oil, oil filter, windshield washer fluid and oil filter element. The engine was washed. The tyres were also rotated and balanced.

19. Mr Kok 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 mentioned that there were neither warning lights displayed nor was there an abnormal rise in temperature of the Insured Vehicle when Ms Florence was driving the Insured Vehicle on the day of the incident.

20. Mr Kok mentioned that since the purchase of the Insured Vehicle, he has not done any modification(s) and/or additionally fitted any electrical or electronic component(s) to the Insured Vehicle.

### Incident Scene Photographs

21. We were able to obtain from Mr Kok, photos of the Insured Vehicle which he had taken after the fire was put out. In general, the information that could be gathered from these photographs had corresponded to the events that were related to us by Ms Florence. 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 where the Insured Vehicle was positioned. See photos 14 & 15 below.



Photo 14 shows the SCDF having just put out the fire on the Insured Vehicle.



Photo 15 shows the Insured Vehicle at the incident scene after the fire was extinguished. In general, the information that could be gathered from this photograph had corresponded to the events that were related to us by Ms Florence. The extent of damage indicates that the fire had started in the left portion of the engine compartment.

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 Ms Florence had mentioned to us there were no indications of abnormally high temperatures on the Insured Vehicle when she 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 given that our examination of the available incident scene photographs did not reveal any unusual material(s)/object(s) found on the ground where the Insured Vehicle was positioned. The location of where the Insured Vehicle was positioned 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 in the engine compartment of the Insured Vehicle, which was earlier discussed in paragraph 10 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 pose a fire risk. See search result from LTA below.

### Vehicle Recall Details

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

Owner ID Type: Singapore NRIC	Owner ID: 997B
Vehicle No: SGU629T	Make/Model: MERCEDES BENZ / C200 AVANTGARDE (R17 LED)
Engine No: 27492030861437	Chassis No: WDD2050422R253729
Recall Details: No Recall Detail records	

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**Conclusion**

27. Having investigated and technically analysed the damages 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 left portion. The wirings were original factory wirings 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.

**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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