



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: SMA 1533M
Our Ref : CI/TP19020899/D

14 January 2020

Automobile Inspection Report of a Motor Car SMA 1533M

**Requested By
Mr Kung Ming Ern
5A Balmoral Park
Singapore 259829
(Owner of Motor Car SMA 1533M)**

A. Introduction & Background Information

1. I refer to your request dated 25 April 2019.
2. By way of introduction, I set out below a brief description of my professional qualifications and professional work experiences.
3. I am a Senior Technical Investigator and certified Accident Reconstructionist with LKK Auto Consultants Pte Ltd. I have been carrying out assessments, valuations, inspections and technical investigations of motor vehicles involved in, among other things, accidents since 2007. I have also carried out accident reconstruction basing on the laws of dynamics and physics by applying mathematical equations with technique competencies aligned with international standards, ensuring proper cause analysis. Some of my clients include the Singapore Police Force, NTUC Income Insurance Co-Operative Limited, AIG Asia Pacific Insurance Pte Ltd, AXA Insurance Singapore Pte Ltd, Cycle & Carriage Industries Pte Ltd and Performance Motors Limited amongst others. I also have experience in providing analysis and commentaries on damages and faults of motor vehicles.
4. I have given oral evidence as an expert witness in both the State Court and High Court, for both the prosecution and the defence for criminal proceedings and also for both the plaintiff and the defendant in civil proceedings. For instance, in MC Suit 17701/2010/Q, I acted as an expert witness in proceedings which involved among other things, a claim by an owner of a Mercedes sedan against the dealer for allegedly carrying out negligent works on the Mercedes sedan; in Suit 760/2011, I was asked by the dealer to provide my expert opinion on whether a brand new BMW sedan sold to a customer was defective. I have also been jointly appointed by both a car dealer and a car owner to provide my expert opinion as to whether the transmission of a brand-new car was defective.
5. My testimony as an expert witness for accident reconstruction and speed analysis cases involving criminal proceedings for the prosecution include amongst others, MAC 2350-51/2011, an accident involving four motor cars and a motorcycle resulting in the death of the motorcyclist; DAC 039421-2011, a motor car and motorcycle accident resulting in the death of the motorcyclist; MAC 3935/12, a motor lorry and pedal bicycle accident resulting in the death of the cyclist.

6. Cases where I have been engaged by an accused person include amongst others, DAC 60889-90/10, a motorcycle and motor car accident resulting in the death of the pillion rider; DAC 049130-2013 & DAC 049131-2013, self-accident involving a SMRT bus resulting in the death of one of its passengers.
7. I have also carried out numerous line of sight simulation, in close replication of an accident scenario, to determine a driver's view and sighting capability.
8. I hold a certificate in Technical Accident Investigation and Reconstruction from the Society of Automotive Engineers Australasia and a National ITE Certificate (Intermediate) in Automotive Technology (Light Vehicle) from the Institute of Technical Education. I have also attended training and passed a practical examination on correct repair methods, safe and cost-effective assessment of damaged motor vehicles (Thatcham Escribe System).
9. I am an affiliate member of the Society of Automotive Engineers Australasia; an affiliate member of the Institute of Automotive Engineer Assessors (UK); an associate member with the Society of Operations Engineers (UK).
10. For this report, I was requested to provide my opinions and comments on whether a Jaguar XE Prestige (2.0 litre) motor car with registration number SMA 1533M (herein referred to as "**Motor Car**") can reasonably be considered to be of a satisfactory quality to an ordinary customer.
11. I was instructed by the owner, Mr Kung Ming Ern (herein referred to as "**Mr Kung**") that he purchased the Motor Car brand new at an agreed price of \$174,020 from Wearnes Automotive Pte Ltd, the local distributor for Jaguar make motor cars. He took delivery of the Motor Car on 30 May 2018 and thereafter had encountered multiple different issues with the Motor Car through the time of his possession. The first issue encountered was on the day that he took delivery of the Motor Car.
12. Mr Kung made several complaints about these issues to Wearnes Automotive Pte Ltd and as at the time of this request, I was instructed that some of the issues were resolved and/or were not encountered again while others had continued to be unresolved.

13. The resolved and/or were not encountered again issues at the time of his request, according to Mr Kung, were as follows: -
- a) “coolant level low” warning light observed on the dashboard panel on the day of delivery;
 - b) rear right door sill distorted;
 - c) “gearbox not found” warning light observed on the dashboard panel;
 - d) reverse camera malfunction intermittently;
 - e) auto start/stop malfunction intermittently;
 - f) dynamic stability control (DSC) light observed on the dashboard panel;
 - g) infor-tainment system self-reboot after a “pop” sound.
14. I was instructed that the unresolved issues, despite several complaints made to Wearnes Automotive Pte Ltd, were as follows: -
- a) high fuel consumption - actual vs displayed on dashboard panel vs stated in sales brochure;
 - b) hot air being blown from air-conditioning vents at the driver and front left passenger footwell area;
 - c) front proximity sensors frequently activated (beeping sounds) without any object(s) in front of the Motor Car.
15. For the purpose of this report, I was instructed that I need only consider the 3 unresolved issues that were highlighted in paragraph 14 above.

B. Documents Referred To & Methodology

16. The following were provided to me for consideration and analysis in the preparation of this report: -
- a) data and records in an excel spreadsheet showing a summary of the fuel consumption of the Motor Car with supporting receipts and photographs for the period 21 September 2018 to 23 April 2019;

- b) copy of Jaguar XE sales brochure;
 - c) multiple photographs showing the temperature at the driver footwell area of the Motor Car in comparison to the temperature set for the air-conditioning system of the Motor Car;
 - d) multiple photographs showing the temperature at the driver footwell area of 2 loaned motor cars provided to Mr Kung by Wearnes Automotive Pte Ltd in comparison to the temperature set for the air-conditioning system for the 2 loaned motor cars;
 - e) multiple video recordings and photographs showing the activation of the Motor Car's front proximity sensors;
 - f) 06 repair orders of the Motor Car from Wearnes Automotive Pte Ltd for the period 13 June 2018 to 27 March 2019.
17. For this case, I had carried out a physical inspection and test drive of the Motor Car on 06 June 2019. A fuel consumption test on the Motor Car from 13 July 2019 to 31 July 2019 was also carried out. Thereafter, the observations and information were reviewed and analyzed together with the same that were gathered from the provided documents listed in paragraph 16 above.
18. My comments and opinions are now set out in the below paragraphs.

C. General Condition of the Motor Car

19. The Motor Car was first inspected on 06 June 2019. At the time of my inspection, I had found the Motor Car to be of relatively good physical condition. There was no loose exterior fitting(s) observed. The various operating fluids like the engine oil, brake fluid and engine coolant were all checked and found to be of sufficient level and without contamination for operating purposes.
20. There was no modification(s) observed on the Motor Car. The size of the 4 tyres and wheel rims were also checked and found to be of the allowable size range as stated in page 63 of the Jaguar XE sales brochure that was provided to me for review. The mileage of the Motor Car recorded at the time of my inspection was 7,315km. See photo 1 – 4 below.



Photo 1 shows a general view of the front right body of the Motor Car at the time of my inspection on 06 June 2019. The Motor Car was observed to be in relatively good physical condition with no loose exterior fittings observed.



Photo 2 shows a general view of the rear left body of the Motor Car at the time of my inspection on 06 June 2019. The Motor Car was observed to be in relatively good physical condition with no loose exterior fittings observed. There was no modification(s) observed on the Motor Car. The size of the 4 tyres and wheel rims were observed to be of the allowable size range.



Photo 3 shows a general view of the engine compartment of the Motor Car at the time of my inspection on 06 June 2019. The various operating fluids like the engine oil, brake fluid and engine coolant were checked and found to be of sufficient level and without contamination for operating purposes. The various parts and components inside the engine compartment were all observed to be intact and properly fitted.



Photo 4 shows the interior compartment of the Motor Car. The mileage of the Motor Car recorded at the time of my inspection on 06 June 2019 was 7,315km.

D. Temperature at Footwell Area of the Motor Car

21. During my physical inspection of the Motor Car on 06 June 2019, I had also test driven the Motor Car. During this test drive, a digital temperature gauge was placed at the driver footwell area and also at the front left passenger footwell area, near the respective air-conditioning vents. The temperature of the air-conditioning system of the Motor Car was set to the range of 20°C to 23°C during this test drive, which is around the 22°C to 23°C temperature range that Mr Kung would usually set whilst driving. Air distribution was left at default settings, with both the upper (face distribution) and lower (body/feet distribution) areas selected. The primary purpose was to verify the complaint of hot air being blown from the air-conditioning vents at the driver and front left passenger footwell area of the Motor Car.
22. The temperature at both footwell areas were periodically checked during the test drive whilst the accuracy of the temperatures displayed by the temperature gauge was tested by placing the temperature gauge near the front of the upper air-conditioning vents at the centre of the front dashboard. It was observed that temperature close to the temperature that was set for the air-conditioning system of the Motor Car was displayed by the temperature gauge. This would indicate that the temperature gauge was in a normal working condition and that temperatures displayed by the temperature gauge are relatively accurate. See photo 5 - 12 below.



Photo 5 shows the digital temperature gauge that was used to verify the complaint of hot air being blown from the air-conditioning vents at the driver and front left passenger footwell area of the Motor Car during a test drive that was carried out on 06 June 2019.



Photo 6 shows the digital temperature gauge placed at the driver footwell area of the Motor Car. Temperatures at the driver and front left passenger footwell areas were periodically checked during the test drive of the Motor Car. The temperature of the air-conditioning system of the Motor Car was set to the range of 20°C to 23°C, which is around the 22°C to 23°C temperature range that Mr Kung would usually set whilst driving the Motor Car.



Photo 7 shows the default air-distribution settings, with both the upper (face distribution) and lower (body/feet distribution) areas selected during the test drive on 06 June 2019.



Photo 8 shows the digital temperature gauge placed near the front of the upper air-conditioning vents at the centre of the front dashboard. This was to check on the accuracy of the temperature displayed by the gauge. At the 22°C temperature that was set for the Motor Car's air-conditioning system, the temperature displayed by the gauge was 23.4°C. This would indicate that the temperature gauge was in a normal working condition and that temperatures displayed by the temperature gauge are relatively accurate.



Photo 9 shows the digital temperature gauge placed near the air-conditioning vent at the driver footwell area of the Motor Car during the test drive. The temperature displayed by the temperature gauge was periodically checked and it was observed that the temperature at the driver footwell area throughout the test drive was in the above 30°C range.



Photo 10 shows the temperature (circled) displayed by the temperature gauge at the driver footwell area. Generally, it was observed that although the Motor Car's air-conditioning system was in the range of 20°C to 23°C, the temperature at the driver footwell area was in the above 30°C range throughout my test drive of the Motor Car.



Photo 11 shows the digital temperature gauge placed near the air-conditioning vent at the front left passenger footwell area of the Motor Car during the test drive. The temperature displayed by the temperature gauge was periodically checked and it was observed that the temperature at the front left passenger footwell area was in the above 30°C range, similar to the temperature at the driver footwell area of the Motor Car.



Photo 12 shows the temperature (circled) displayed by the temperature gauge at the front left passenger footwell area. Generally, it was observed that the temperature at the driver footwell area was in the above 30°C range during my test drive of the Motor Car. The temperature of the Motor Car's air-conditioning system can be seen to be at 22°C (arrowed).

23. Throughout the entire test drive, the digital temperature gauge had constantly displayed temperatures that were above 30°C range at both the driver and front left passenger footwell areas of the Motor Car. Generally, the temperatures at both footwell areas were $\pm 10^\circ\text{C}$ above the 20°C to 23°C temperature range that was set for the air-conditioning system of the Motor Car. Such significant difference in temperature cannot be considered to be normal given that the air-conditioning system was operating within a small confined space i.e. interior compartment of the Motor Car.
24. Whilst it is normal to expect some slight difference in temperature between the temperature set for an air-conditioning system and the actual temperature of the air that is being blown out from the air-conditioning vents (due to weather condition, heat from engine etc), the observations gathered from the temperature displayed by the digital temperature gauge indicates that hot air instead of cool air was being blown out from the air-conditioning vents at the driver and front left passenger footwell areas of the Motor Car.
25. In fact, Mr Kung's own tests carried out on 2 loaned motor cars that were provided to him by Wearnes Automotive Pte Ltd had showed temperature difference of between 1.6°C to 6.8°C from the temperature at the driver footwell area to the temperature that was set for the air-conditioning system of the 2 loaned motor cars. From my review of the photographs that were taken by Mr Kung during the tests on the 2 loaned motor cars, it was noted that the temperature at the driver footwell area did not go beyond 30°C.
26. In comparison, my review of the photographs that were taken by Mr Kung during his own tests carried out to the Motor Car had showed temperature constantly beyond 30°C. The temperature difference was between 8.1°C to 10.9°C from the temperature at the driver footwell area to the temperature set for the air-conditioning system of the Motor Car.
27. To summarize, my observations during the test drive of the Motor Car and my review of Mr Kung's own testing of the Motor Car and 2 loaned motor cars indicates that the air-conditioning system of the Motor Car was blowing hot air instead of cool air at the air-conditioning vents at the driver and front left passenger footwell area of the Motor Car; and this cannot be considered to be a normal operating characteristic for an air-conditioning system.

E. Front Proximity Sensors of the Motor Car

28. From my review of the multiple video recordings and photographs provided by Mr Kung in support of what he had encountered (refer to paragraph 14c)), I note that there were multiple occasions where the front proximity sensors had activated when there appeared to be no object(s) close to the front of the Motor Car.
29. Briefly, proximity sensors make use of sensors, for example ultrasonic sensors, electromagnetic sensors etc, to alert a driver when a motor vehicle gets close to an object(s). The driver is alerted through a series of beeping sounds when the Motor Car is within the distance range of the object(s). At the time of writing this report, the technical specifications specific for the front proximity sensors fitted on the Motor Car was not available, hence the minimum distance that triggers the beeping alert sound for the front proximity sensors of the Motor Car could not be ascertained.
30. However, if one was to view the video recordings provided by Mr Kung, it can be noted that beeping sounds from the triggering of the front proximity sensors of the Motor Car were heard largely after the Motor Car came to a stop due to red traffic light. On some occasions, the beeping sounds were even heard after the Motor Car had stopped for a few seconds with no positioning change of the Motor Car and/or other immediate surrounding motor vehicles or objects.
31. From the video recordings, distances between the front of the Motor Car and the rear of the motor vehicle(s) in front were not close (entire rear portion of the motor vehicle(s) in front could be seen). Other motor vehicles in the immediate left and/or right lane were also within their respective lanes. In summary, the front proximity sensors of the Motor Car had triggered when there did not seem to be reasonable cause(s) for them to be triggered. Triggering of the front proximity sensors under such situation does not represent a normal operating characteristic for front proximity sensors of a motor vehicle. See photo 13 & 14 below, extracted from one of the video recordings and photographs that were provided by Mr Kung.



Photo 13 shows a screenshot extracted from one of the video recordings that were provided by Mr Kung for my review. At this time stamp of 10:59:45 on 04 January 2019 (arrowed), the front proximity sensors of the Motor Car were triggered. Beeping sounds can be heard from the video recording however from what can be seen, there was no object(s) close to the front of the Motor Car. The 3 motor vehicles ahead of the Motor Car were not close to the front of the Motor Car (entire rear portion of the 3 motor vehicles can be seen).



Photo 14 shows the infotainment screen of the Motor Car at the time when the front proximity sensors of the Motor Car was triggered as per photograph 13 above. The indication (arrowed) of the illustration shows an object(s) that is close to the front right of the Motor Car. However as seen from photograph 13 above, there was no object(s) close to the front right of the Motor Car.

F. Fuel Consumption of the Motor Car

32. I tested the Motor Car's fuel consumption over the period 13 July 2019 to 31 July 2019. The methodology applied was to carry out a normal use of the Motor Car akin to day to day requirement with a full tank of petrol. Usage of the Motor Car includes city driving (along local arterial roads) and highway driving (along the various local expressways). Testing fuel consumption over a full tank of petrol would yield measurements that are more accurate as compared to testing done by driving for a short specific distance where such short specific distance method does not utilize a full tank of petrol.
33. On 13 July 2019, the petrol of the Motor Car was filled up (to full tank) to the first click of the pump at a SPC petrol station along Havelock Road. The distance to empty tank, as seen from the dashboard panel prior to the fill up, was 54km. After the fill up, the mileage of the Motor Car was recorded at 8,236km. The Motor Car was thereafter used on a daily basis for my work purposes, which as mentioned earlier, include city driving and highway driving.
34. On 31 July 2019, the distance to empty tank was 57km as seen from the dashboard panel of the Motor Car. The petrol of the Motor Car was re-filled at this point at the same SPC petrol station along Havelock Road. The fill up (to full tank) was also up to the first click of the pump. The mileage of the Motor Car recorded was 8,653km while the fuel consumption displayed on the dashboard panel was 11.8 litres per 100km. The litres of petrol used to re-fill the tank was 56.453 litres as seen from the receipt.
35. The table below shows the results of the fuel consumption test that I had carried out to the Motor Car basing on the mileage of the Motor Car and litres of petrol before and after the test. Photo 15 – 19 thereafter shows the photographs taken during this test.

Date	Mileage at SPC petrol station	Litres as per receipt	Distance Travelled	Fuel consumption displayed	Actual fuel consumption
13 July 2019	8,236km				
31 July 2019	8,653km	56.453 litres	417km	11.8 litres per 100km	13.5 litres per 100km



Photo 15 shows the Motor Car during the fill up at a SPC petrol station along Havelock Road on 13 July 2019. This was at the start of my fuel consumption test of the Motor Car. The fill up (to full tank) was up to the first click of the pump. Fuel consumption testing with a full tank of petrol would yield measurements that are more accurate as compared to testing done by driving for a short specific distance where such short specific distance method does not utilize a full tank of petrol.



Photo 16 shows the dashboard panel of the Motor Car prior to the fill up on 13 July 2019. The distance to empty tank, as seen from the dashboard panel prior to the fill up, was 54km (red arrow) while the mileage of the Motor Car was at 8,236km (yellow arrow).



Photo 17 shows the receipt for the fill up on 13 July 2019. The petrol of the Motor Car was filled up to the first click of the pump. From the receipt provided, 56.271 litres (arrowed) of petrol was used for this fill up.



Singapore Petroleum Company Ltd
SPC Havelock
397 Havelock Road
Singapore 169630
Tel: 6734-1478

31/7/2019 18:34
Transaction No.: 272252

*** TAX INVOICE ***

GST INCLUSIVE

CRN: 196900291N GST:M2-0009896-0

POS: 3

CASHIER: Zheng Jing

Levo 95 127.02
56.453LTR @ 2.250/LTR
- Postpay Delivery on pump 3

Photo 18 shows the receipt for the refill on 31 July 2019. The re-fill was done at the same SPC petrol station. The petrol of the Motor Car was again filled up to the first click of the pump. From the receipt provided, 56.453 litres (arrowed) of petrol was used for the re-fill.



Photo 19 shows the dashboard panel of the Motor Car prior to the fill up on 31 July 2019. The distance to empty tank, as seen from the dashboard panel prior to the fill up, was 57km (red arrow), close to the 54km before the test. The mileage of the Motor Car was at 8,653km (yellow arrow). The fuel consumption displayed on the dashboard panel was 11.8 litres per 100km (circled).

36. I note in page 57 of the Jaguar XE sales brochure that the combined fuel consumption stated is 6.3 litres per 100km for the same engine specifications as the Motor Car whereas my fuel consumption test carried out by driving the Motor Car in a real-world scenario produced 13.5 litres per 100km. This represents about 114% more than the stated 6.3 litres per 100km in the sales brochure. The fuel consumption of the Motor Car displayed on the dashboard panel after my fuel consumption test was 11.8 litres per 100km, which is about 87% more than the stated 6.3 litres per 100km.
37. Whilst it is normal to expect that actual fuel consumption of a motor vehicle will exceed the fuel consumption stated in a sales brochure and/or owner's manual, given that fuel consumption tests carried out by vehicle manufacturers do not typically involve real world testing and instead are mostly carried out in laboratories; to exceed by 87% from computerized monitoring/calculation (dashboard panel) and over 100% from actual driving cannot be considered to be a reasonable difference.

38. My review of Mr Kung's data and records in an excel spreadsheet showing a summary of the fuel consumption of the Motor Car with supporting receipts and photographs for a longer period of 21 September 2018 to 23 April 2019 indicated significant fuel consumption differences between actual driving, displayed on dashboard and stated in sales brochure. Mr Kung's actual fuel consumption based on the summary was in the range of 12.0 litres per 100km to 16.1 litres per 100km. This was over several petrol re-fills and normal day to day use of the Motor Car. The dashboard-displayed fuel consumption, over the same period, was in the range of 10.7 litres per 100 km to 14.0 litres per 100km. In terms of percentage, the difference between actual and stated in sales brochure was approximately in the range of 90% to 156%.
39. Based on the summary furnished by Mr Kung and my own fuel consumption test of the Motor Car, the actual fuel consumption that the Motor Car was able to achieve on a normal day to day use cannot be considered to be within reasonable variances allowable for the fuel consumption of a motor vehicle.

G. Conclusion

40. Having considered the observations and information that I was able to gather from my inspection and tests that were carried out to the Motor Car, as well as from the material information gathered from the documents that were provided to me in preparation of this report, I am of the opinion that the Motor Car cannot be reasonably considered to be of a satisfactory quality to an ordinary customer.
41. I had experienced hot air blowing from the air-conditioning vents at the driver and front left passenger footwell area of the Motor Car; and also experienced fuel consumption that exceeded 100% of the fuel consumption stated in the sales brochure. There was also abnormal functioning/activation of the Motor Car's front proximity sensors.

Ang Bryan Tani

Senior Technical Investigator

Technical Investigation & Accident Reconstructionist (SAE-A)

DISCLAIMER OF LIABILITY TO THIRD PARTIES:- This Report is made solely for the use and benefit of the Client named on the front page of this Report. No liability or responsibility whatsoever, in contract or tort, is accepted to any third party who may rely on the Report wholly or in part. Any third party acting or relying on this Report, in whole or in part, does so at his or her own risk.