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Your Ref: TP/IP/58341/2019 26th September 2019
Our Ref : CI/TPD19016850/P

**General Investigation Team**
Traffic Police Department
Singapore Police Force
10 Ubi Avenue 3
Singapore 408865

**MECHANICAL INSPECTION REPORT OF MOTOR CAR SGT 6808J**

1. I refer to your request on 24th September 2019 to conduct a physical inspection of a Motor car bearing registration number SGT 6808J (herein referred to as "**Motor Car**"), which was involved in a road traffic accident on 16th September 2019.

2. The objective of the inspection is to determine if there was any possible mechanical failure to the Motor car that may have contributed to the accident.

3. Following the request, I had carried out a physical inspection of the Motor Car on 25th September 2019 at the premises of Traffic Police vehicle pound, 517 Airport Road Singapore 539942. I now set out below my observations and comments with respect to this inspection.

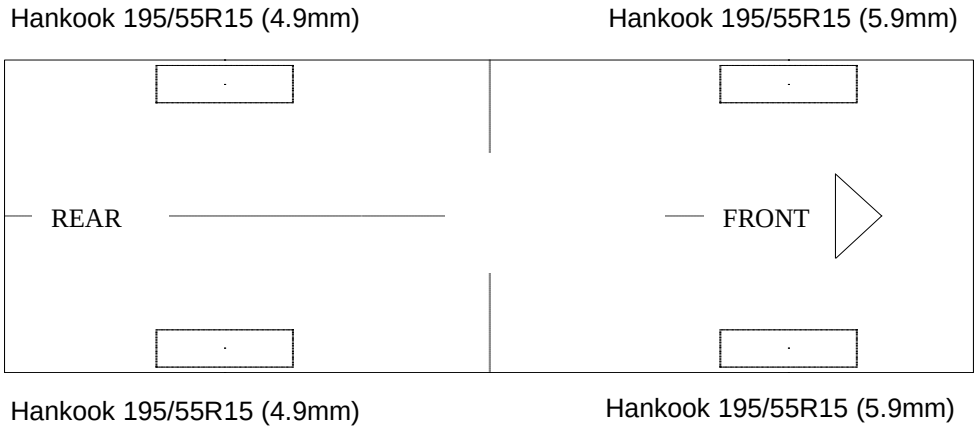
**General Condition**

4. The mileage of the Motor car recorded at the time of my inspection was 334,731km.

5. The Motor car was observed to have sustained damage at its front and left side portion. Its front windscreen, front bonnet, front bumper, front left headlamp, front left fender, front left door panel, front left windscreen and left rear mirror was amongst the body parts that were damaged as a result of the accident. The Supplemental Restraint System (SRS) was activated as a result of the accident.

**Tyres and Wheel Rims**

6. The condition of the Motor car's 4 tyres was observed to be in serviceable condition. I did not find any tear, cut or burst mark(s) on the outer and the inner sidewalls as well as across the tread of the 4 tyres. The 4 tyres were also observed to be sufficiently inflated for vehicular operation. The tyre brand, tyre size and remaining tread depth of the 4 tyres were recorded as follows:-




7. The 4 tyres were observed to be wrapped around alloy wheel rims however the front left rim was found to be damaged as a result of the accident. See photo 1 – 14 below.


**Photo 1** shows the mileage of the Motor Car at the time of inspection 334,731km/


**Photo 2** shows a general view of the Motor Car's front body at the time of my inspection. The Motor car was observed to have sustained moderate damage at its front and left side portion. Its front windscreen, front bonnet, front bumper, front left headlamp, front left fender, front left door panel, front left windscreen and left rear mirror was amongst the body parts that were damaged as a result of the accident. The Supplemental Restraint System (SRS) was activated as a result of the accident.

**Photo 3** shows the close up view of the Motor Car's front body at the time of my inspection. The Motor car front windscreen (circled) was observed to have sustained damage as a result of the accident.


**Photo 4** shows a close up view of the Motor Car's front body at the time of my inspection. Its front bonnet and front bumper body panel (arrowed) was amongst the body parts that were damaged as a result of the accident.

**Photo 5** shows the general view of the Motor Car's left body at the time of my inspection. Its front left headlamp, front left fender, front left door panel, front left windscreen and left rear mirror was amongst the body parts that were damaged as a result of the accident.

**Photo 6** shows a close up view of the Motor Car's left body at the time of my inspection. Its front left headlamp and front left fender (arrowed) was amongst the body parts that were damaged as a result of the accident.

**Photo 7** shows the close up view of the Motor Car's left body at the time of my inspection. Its front left door panel, front left windscreen (red arrow) and left rear mirror (yellow circle) was amongst the body parts that were damaged as a result of the accident.


**Photo 8** shows a general view of the Motor Car's right body at the time of my inspection. The right portion of the Motor Car was observed to have been undamaged by the accident.


**Photo 9** shows a general view of the Motor Car's rear body at the time of my inspection. The rear portion of the Motor Car was observed to have been undamaged by the accident.

**Photo 10** shows the condition of the front right tyre of the Motor Car, which was observed to be in serviceable condition with remaining tread depth of approximately 5.9mm. The tyre was sufficiently inflated for vehicular operation. There was also no tear, cut or burst mark(s) on the outer and the inner sidewalls as well as across the tread of the Motor Car's 4 tyres.

**Photo 11** shows the condition of the rear right tyre of the Motor Car, which was observed to be in serviceable condition with remaining tread depth of approximately 4.9mm. The tyre was also observed to be sufficiently inflated for vehicular operation with no tear, cut or burst mark(s).

**Photo 12** shows the condition of the rear left tyre of the Motor Car, which was observed to be in serviceable condition with remaining tread depth of approximately 4.9mm. The tyre was also observed to be sufficiently inflated for vehicular operation with no tear, cut or burst mark(s).

**Photo 13** shows the condition of the front left tyre of the Motor Car, which was observed to be in serviceable condition with remaining tread depth of approximately 5.9mm. The tyre, which was wrapped around alloy wheel rim, was also observed to be sufficiently inflated for vehicular operation. There were minor scratches on the surface of the wheel rim as a result of the accident.

**Photo 14** shows the deployment of the Supplemental Restraint System (SRS) airbag (arrowed), as a result of the accident.

**Engine Compartment & Operating Fluids**

8. Upon examination of the engine compartment of the Motor Car, I had observed all the parts and components inside the engine compartment to be intact and unaffected by the accident. The engine oil and engine coolant were all found to be of sufficient level for operating purposes. Visually, there was also no contamination found to these fluids. However the brake fluid was observed to be insufficient level due to a leakage at the front left brake caplier as a result of the accident.

9. Further examination of the engine compartment revealed no sign(s) or indication(s) of fluid leakage and/or fluid stain within the engine compartment of the Motor Car.

10. My subsequent checks on the underside of the Motor Car also revealed no sign(s) or indication(s) of fluid leak and/or fluid stain(s). Visually, the various undercarriage components of the Motor Car were all observed to be intact and without any visible damage. See photo 15 – 19 below.

**Photo 15** shows a general view of the Motor Car's engine compartment and the various parts and components inside the engine compartment. There was also no sign(s) or indication(s) of fluid leakage and/or fluid stain within the engine compartment.


**Photo 16** shows checks being carried out to the engine oil of the Motor Car at the time of my inspection. The engine oil on the indicator dip stick was observed to be of sufficient level and without any visible contamination.

**Photo 17** shows the brake fluid reservoir of the Motor Car at the time of my inspection. The brake fluid was observed to be of insufficient level (red arrow) and below the minimum mark (yellow arrow). A leakage was observed at the brake caplier as a result of the accident.

**Photo 18** shows checks being carried out to the engine coolant of the Motor Car at the time of my inspection. The engine coolant was observed to be of sufficient level and without any visible contamination.

**Photo 19** shows the undercarriage of the Motor Car, at the area where the engine housing and transmission housing are located. I did not find any sign(s) or indication(s) of fluid leak and/or fluid stain(s) on the underside of the Motor Car.

**Braking System & Steering System**

11. For this inspection, I was not able to conduct any tests on the steering system of the Motor Car due to outer CV joint of the driveshaft slipped out of place due to the impact sustained as a result of the accident.

12. My subsequent checks on the underside of the various steering components were observed that the front left wheel outer CV joint was damaged as a result of the accident.

13. Static brake tests conducted on the Motor Car revealed abnormality. The brake booster did not respond well to the various tests conducted. There was abnormal movement of both the driver and passenger side brake pedal, when it was depressed the brake pedal had sink down onto the floorboard. In general, the static brake tests had suggested that there was internal leakage of pressure/vacuum in the braking system of the Motor Car.

14. The brake fluid was observed to be insufficient level. There was sign(s) of old and fresh brake fluid stains leaking out from the front left brake caplier of the Motor Car as a result of the accident.

15. Our static test on the handbrakes of the Motor Car, we did not reveal any abnormalities and suggested that it is in serviceable condition at the time of the accident. See photo 20 - 27 below.

**Photo 20** shows the brake hose/pipe (arrowed) at the rear left wheel of the Motor Car. It was observed to be intact and undamaged by the accident.

**Photo 21** shows the brake hose/pipe (arrowed) at the rear right wheel of the Motor Car. No leakage of brake fluid was observed. Visual examination of the various components of the braking system like the drum brake, brake booster, brake pedal etc had revealed all to be intact and without visible damage.

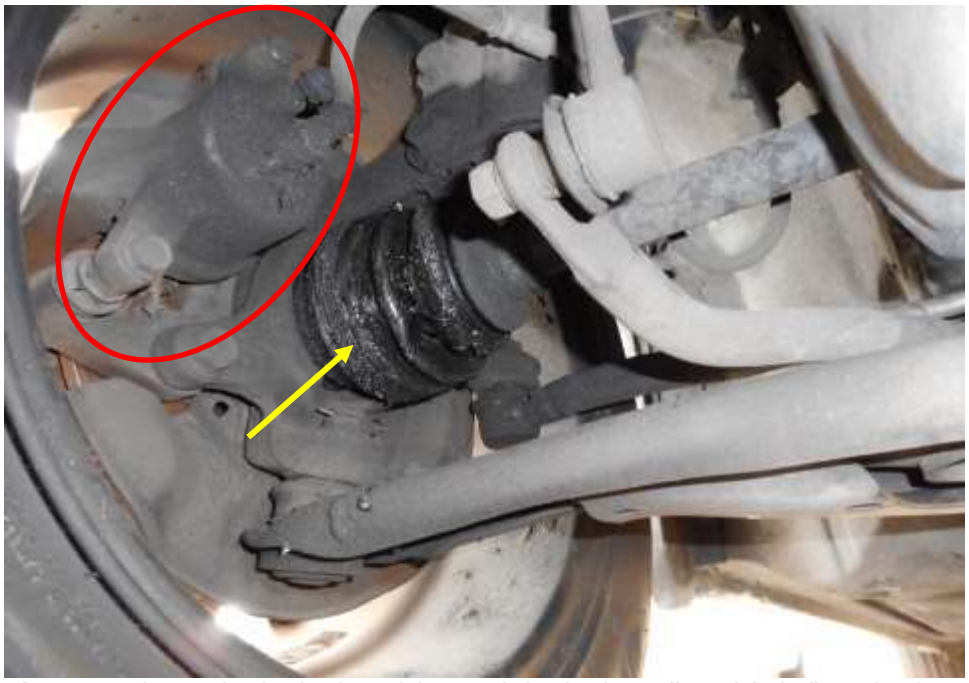


**Photo 22** shows the brake hose/pipe and the brake caliper (circled) at the front right wheel of the Motor Car, old brake fluid stain was observed on the surface of the brake caplier. Visual examination revealed that the rubber of the right outer CV joint is broken with grease flowing out (yellow arrow).

**Photo 23** shows the brake caplier (circled) at the front left wheel of the Motor Car. We observed old brake and fresh brake fluid stain on the surface on the brake caplier. The leakage was cause by the induced impact of the collision as a result of the accident.

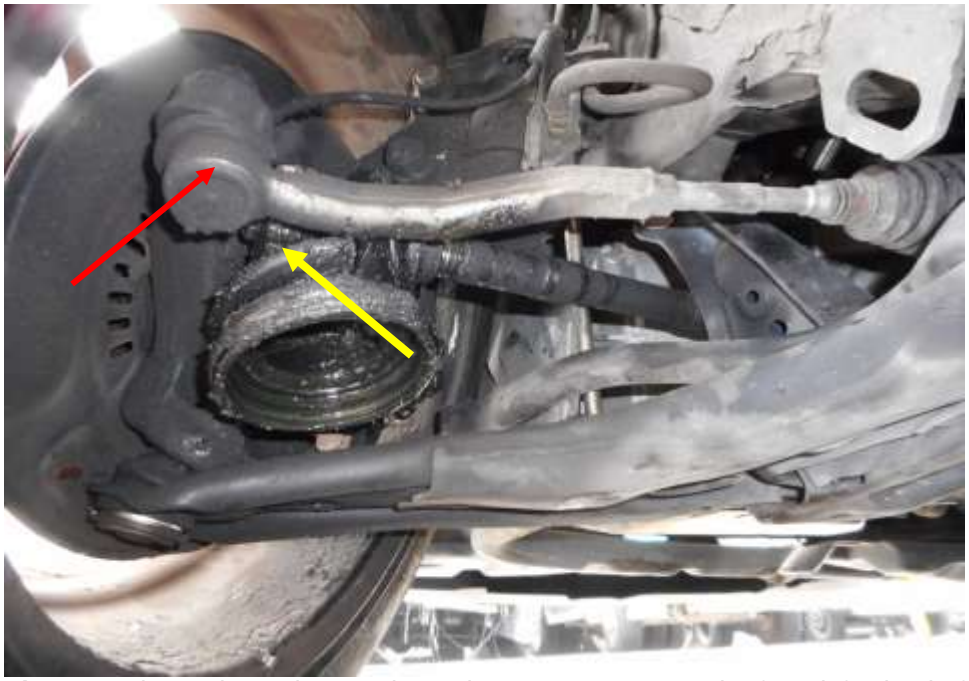


**Photo 24** shows the various undercarriage components at the front left wheel of the Motor Car, in particular the steering tie rod (red arrow) was found to be intact. However the outer CV joint of the left side drive shaft (yellow arrow) was observed to be damaged as a result of the accident. The various steering components were found to be intact, suggesting that the steering system of the Motor Car was likely to be in serviceable condition at the material time of accident.

**Photo 25** shows the front left wheel, a patch of brake fluid stain (circled) on the ground from the leaking brake caplier and a ball bearing which is part of the CV joint assembly (arrowed) which have fallen out, both is caused by the induced impact as a result of the accident.

**Photo 26** shows the various undercarriage components at the front right wheel of the Motor Car, the steering tie rod (red arrow) and the driveshaft was found to be intact suggesting that it was serviceable at the time of the accident.

**Photo 27** shows the static test conducted on the handbrake of the Motor Car by pulling and releasing it multiple times and it did not reveal any abnormalities suggesting that it is in serviceable condition at the time of the accident.

**Electronic Safety / Warning Indicators**

16. The Motor Car's automatic self-test of the functionality of its various electronic operating systems like the Anti-Lock Brake System (ABS), Electric Power Steering System (EPS), Traction Control (TC) and Supplemental Restraint System (SRS) during cranking of the engine had indicated that these systems were in working condition and without abnormality. This can be established from the warning lights disappearing from the instrument panel after the self-test. However the Airbag of the Motor Car's Supplemental Restraint System (SRS) was deployed at the material time of accident. See photo 28 & 29 below

**Photo 28** shows the warning light for Anti-Lock Brake System (ABS), Electric Power Steering System (EPS) and Supplemental Restraint System (SRS) appearing on the instrument panel of the Motor Car during the self-test of its various electronic operating systems when its engine was cranked.

**Photo 29** shows the Supplemental Restraint System (SRS) and the Anti-Lock Brake System ABS warning lights illuminated on with an error warning message on the instrument panel of the Motor Car after the engine was cranked as because of the deployment of the airbag in the Motor Car and the insufficient level of brake fluid as a result of the accident which triggered the lights. However the other warning light disappeared after cranking, this would suggest that there was no abnormality to the various electronic operating systems of the Motor Car, like the EPS and etc.

## Operational Behaviour of the Motor Car

17. Operational test to primarily determine whether there was any abnormality to the engine system, transmission system and braking system of the Motor Car could not be conducted given the extent of damage that it had sustained (CV joint was damage as a result of the accident.).

## Others

18. During our static test on the handbrakes of the Motor Car, we had pulled and released the handbrake lever multiple times and it did not reveal any abnormalities and suggested that it is in serviceable condition at the time of the accident.

## Conclusion

19. For this particular case, I was unable to determine whether there was any possible mechanical failure to the Motor Car that may have contributed to the accident. The extent of damage that it had sustained had prevented me from carrying out any operational test(s) and/or static test(s) to its engine system, transmission system, steering system and suspension system.

20. The 4 tyres of the Motor Car were also found to be in serviceable condition. I did not find any tear, cut or burst mark(s) on the outer and the inner sidewalls as well as across the tread of the 4 tyres. The 4 tyres were also observed to be sufficiently inflated for vehicular operation with remaining tread depth of approximately 4.9mm to 5.9mm.

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