

Your Ref: TP/IP/41385/2017
Our Ref : CI/TPD18001920/D

03 February 2018

Fatal Accident Investigation Team

Traffic Police Department
Singapore Police Force
10 Ubi Avenue 3
Singapore 408865

MECHANICAL INSPECTION REPORT OF MOTOR CAR SLF 2021C

1. I refer to your request on 22 August 2017 to conduct a physical inspection of a motor car bearing registration number SLF 2021C (herein referred to as "**Motor Car**"), which was involved in a fatal road traffic accident on 07 August 2017.
2. The purpose of this inspection is to primarily determine if there was any possible mechanical failure to the Motor Car that may have contributed to the accident, in particular whether there was any issue with the braking system and the CTBA (City Brake Active System) button of the Motor Car.
3. Following the request, I had carried out a physical inspection of the Motor Car on 26 September 2017 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 at the time of my inspection was not recorded as its ignition system was affected by the collision.
5. The Motor Car had sustained extensive impact damage all around. Body parts at the rear portion, front portion and left portion were observed to have been badly damaged. Its roof panel was also observed to be dented as a result of the accident. The front windscreen, rear windscreen and left front door window were all shattered.
6. Parts towards the front of the engine compartment were also damaged. This had included the air intake system, radiator and fuse box. The driver's air bag, front left passenger air bag and left curtain air bag were all deployed as a result of the accident. See photo 1 – 3 below.



Photo 1 shows a general view of the rear portion of the Motor Car at the time of my inspection. Its rear tailgate, rear windscreen, rear right fender and roof panel were amongst the body parts that were severely damaged as a result of the accident.



Photo 2 shows a general view of the front left portion of the Motor Car at the time of my inspection. The Motor Car was also observed to have sustained extensive impact damage at its frontal portion and left portion. Its front bumper, front bonnet, front left fender, front windscreen, left front door and roof panel were amongst the body parts that were observed to have been damaged as a result of the accident.



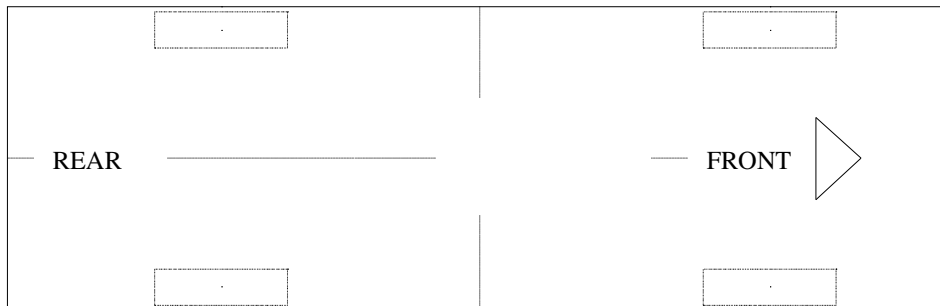
Photo 3 shows a general view of the Motor Car's interior compartment. Several parts and components inside the interior compartment were observed to have been damaged. This had included the front dashboard, trims and seats. The driver's air bag, front left passenger air bag and left curtain air bag were also deployed as a result of the accident.

Tyres and Wheel Rims

7. The 2 rear tyres of the Motor Car were found to be sufficiently inflated for vehicular operations. These 2 tyres were observed to be in serviceable condition with remaining tread depth of approximately 7mm each. There was also no cut, tear or burst mark(s) observed on these tyres.
8. The 2 front tyres, on the other hand, were observed to be deflated. A cut to the outer sidewall of the front left tyre was observed while the front right tyre was found to have slipped out from its wheel rim. The remaining tread depth of the 2 front tyres were approximately 6mm each.
9. All 4 tyres of the Motor Car were wrapped around alloy wheel rims. The rear left wheel rim and rear right wheel rim were found to be without any significant damage while the front left wheel rim and front right wheel rim were observed to be slightly dented due to the collision. See photo 4 – 9 below.

Yokohama 215/60R16 (7mm)

Dunlop 215/60R16 (6mm)
Deflated from accident



Achilles 215/60R16 (7mm)

Dunlop 215/60R16 (6mm)
Deflated from accident



Photo 4 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 7mm. There was no tear, cut or burst mark(s) on the outer and the inner sidewalls as well as across the tread of this tyre. The tyre, which was wrapped around alloy wheel rim, was also observed to be sufficiently inflated for vehicular operation.



Photo 5 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 7mm. There was no tear, cut or burst mark(s) on the outer and the inner sidewalls as well as across the tread of this tyre. The tyre, which was wrapped around alloy wheel rim, was also observed to be sufficiently inflated for vehicular operation.



Photo 6 shows a general view of the front right wheel rim and tyre of the Motor Car. The front right tyre was observed to be deflated and loosely wrapped around the front right wheel rim as a result of the accident.



Photo 7 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 6mm. The tyre was observed to be deflated and loosely wrapped around the front right wheel rim as a result of the accident.



Photo 8 shows a general view of the front left wheel rim and tyre of the Motor Car. The front left tyre was observed to be deflated with a cut on its outer sidewall. The front left wheel rim was also observed to be dented as a result of the accident.



Photo 9 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 6mm. The tyre was observed to be deflated and cut as a result of the accident.

Engine Compartment & Operating Fluids

10. The impact from the collision had affected the engine compartment of the Motor Car. Parts towards the front of the engine compartment were observed to be damaged. The locking mechanism of the Motor Car's front bonnet was also affected and I was unable to unlock and lift the front bonnet to carry out examination of the Motor Car's engine compartment. The various operating fluids like its engine coolant, brake fluid and transmission fluid etc were hence unable to be inspected.
11. My subsequent checks on the underside of the Motor Car revealed damage to the undercarriage components at the front left wheel and front right wheel of the Motor Car. Components like the front suspension, front lower arm, front drive shaft, front steering tie rod and front stabilizer bar were all damaged. See photo 10 & 11 below.



Photo 10 shows the undercarriage components at the front right wheel of the Motor Car. My checks on the underside of the Motor Car revealed damage to the various undercarriage components at the front right wheel and front left wheel of the Motor Car. Components like the front right lower arm (red arrow), front right drive shaft (yellow arrow) and front right steering tie rod were all found to be have been damaged.

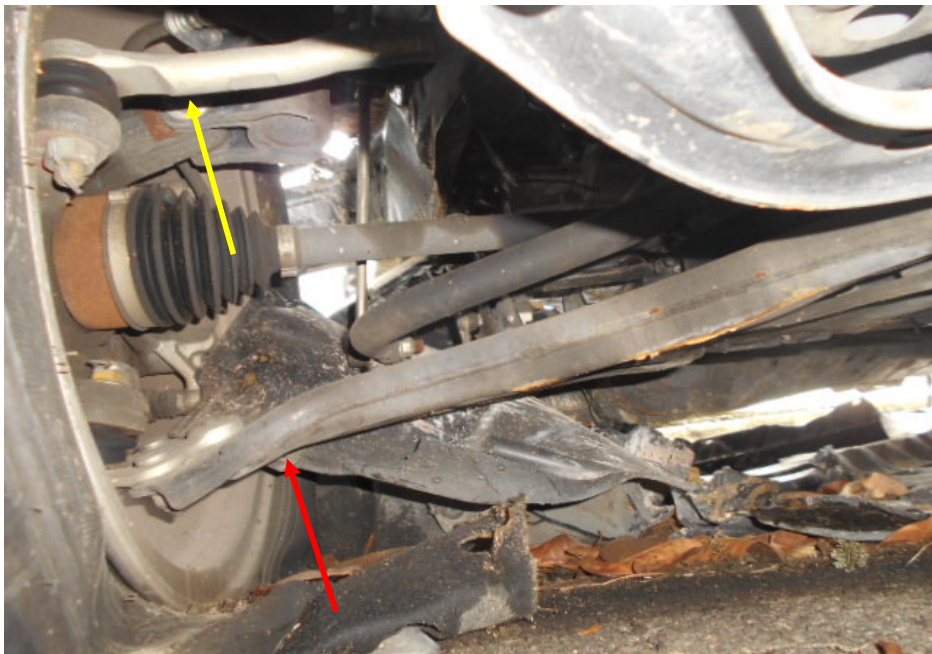


Photo 11 shows the undercarriage components at the front left wheel of the Motor Car. My checks on the underside of the Motor Car revealed damage to the various undercarriage components at the front right wheel and front left wheel of the Motor Car. Components like the front left lower arm (red arrow) and front left steering tie rod (yellow arrow) were damaged.

Steering System & Braking System

12. For this inspection, I was not able to conduct any tests on the steering system of the Motor Car due to damage to several mechanical components of the steering system like the steering tie rod (refer to photograph 11 above).
13. With regard to the braking system, although I was also not able to carry out any tests given that the Motor Car's engine could not be started due to damage to its ignition system as a result of the accident, my visual inspection of the various mechanical components of the braking system had however appear to suggest that the braking system was in serviceable condition. Parts like the brake master pump, brake booster, brake calipers and brake hoses amongst others were all observed to be intact and undamaged. There was also no sign(s) or indication(s) of brake fluid leak observed at the 4 wheels of the Motor Car. See photo 12 & 13 below.



Photo 12 shows the brake hose (arrowed) at the front right wheel of the Motor Car. I did not observe any leakage of brake fluid at the 4 wheels of the Motor Car. My visual inspection of the various mechanical components of the Motor Car's braking system, including its brake caliper (circled), revealed all to be intact and without visible damage, indicating that the braking system was likely to be in serviceable condition at the material time of accident.



Photo 13 shows the various undercarriage components at the rear left wheel of the Motor Car, in particular the brake hose (arrowed). I did not observe any leakage of brake fluid at the 4 wheels of the Motor Car. My visual inspection of the various mechanical components of the Motor Car's braking system revealed all to be intact and without visible damage, indicating that the braking system was likely to be in serviceable condition at the material time of accident.

Electronic Safety / Warning Indicators

14. The Motor Car's automatic self-test of the functionality of its various operating systems like the Anti-Brake Lock System (ABS) and Supplemental Restraint System (SRS) during cranking of the engine was not able to be initiated as the engine of the Motor Car could not be started due to damage to its ignition system arising from the accident.
15. The Supplemental Restraint System (SRS) of the Motor Car was however likely to be in normal operating condition at the material time. The evidence of the deployed driver's air bag, front left passenger air bag and left curtain air bag indicate that the impact sensors and control module of the Motor Car's SRS were all in serviceable condition at the material time of accident.
16. The Motor Car was fitted with City Brake Active System (CTBA). This CTBA is an electronic safety feature that is designed to help avoid or mitigate low speed accident. However, it is not intended as replacement for the conventional braking by a driver. Such system is fitted on most modern day motor vehicles.

17. The system uses laser radar unit to detect potential collisions and mitigate the level of damage in an unavoidable collision. If a driver does not take action to slow down, the system will apply the brakes automatically. However the system will only activate during low travel speed.
18. The functionality of the Motor Car's CTBA could not be tested given that the system will only operate when the vehicle is travelling at low speed, and since the engine of the Motor Car could not be started, I was hence not able to test the CTBA.

Operational Behaviour of the Motor Car

19. 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 (engine could not be started and undercarriage components affected).

Conclusion

20. 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 braking system.
21. The CTBA (City Brake Active System) of the Motor Car was not able to be tested due to the extent of damage to the Motor Car, which had rendered the Motor Car immobile for testing purposes.
22. The 4 tyres of the Motor Car were found to be in serviceable condition with remaining tread depth of approximately 6mm to 7mm each. This had included both front tyres, which were deflated as a result of the accident.

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