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30th December 2019

General Investigation Team

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

MECHANICAL INSPECTION REPORT OF MOTOR BUS SBS 6430D

1. I refer to your request on 14th November 2019 to conduct a physical inspection of a Motor Bus bearing registration number SBS 6430D (herein referred to as "**Motor Bus**"), which was involved in a road traffic accident on 10th November 2019.
2. The objective of this inspection is to determine if there was any possible mechanical failure to the Motor Bus that may have contributed to the accident.
3. Following the request, I had carried out a physical inspection of the Motor Bus on 28th November 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

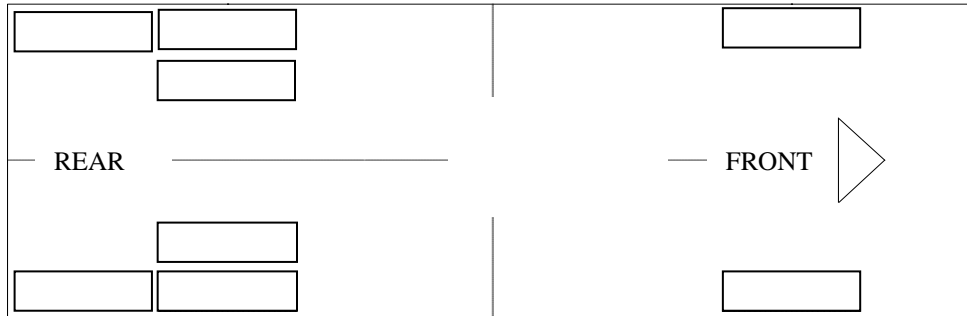
4. The mileage of the Motor Bus at the time of my inspection was 350,006km.
5. The Motor Bus was observed to have sustained damages at its front, left rear and undercarriage portion. Its front bumper, left rear body panel, rear left headlamp and undercarriage diesel fuel hose was damaged as a result of the accident at the time of my inspection.

Tyres and Wheel Rims

6. The 2 front tyres and 6 rear tyres of the Motor Bus were observed to be in serviceable condition and sufficiently inflated for vehicular operation. 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 8 tyres. The tyre brand, tyre size and remaining tread depth of the 8 tyres of the Motor Bus were recorded as follows:-

Continental 275/70R22.5 (12.6mm)

Continental 275/70R22.5 (12.3mm)



Continental 275/70R22.5 (11.8mm)

Continental 275/70R22.5 (11.7mm)

7. The 8 tyres were observed to be wrapped around standard steel wheel rims that were found to be without any damage. See photo 1 – 11 below.



Photo 1 shows a general view of the instrument cluster of the Motor Bus at the time of my inspection. The mileage of the Motor Bus was 350,006km



Photo 2 shows a general view of the rear body of the Motor Bus at the time of my inspection. The Motor Bus sustained damages at its front, left rear and undercarriage portion. Its front bumper, left rear body panel and rear left headlamp was damaged as a result of the accident at the time of my inspection.



Photo 3 shows a general view of the front body of the Motor Bus at the time of my inspection. Its front bumper was damaged as a result of the accident at the time of my inspection.



Photo 4 shows a close up view of the front body of the Motor Bus at the time of my inspection. Its front bumper (circled) was damaged as a result of the accident at the time of my inspection.



Photo 5 shows a general view of the right body of the Motor Bus at the time of my inspection. The Motor Bus was observed to be in good general condition and unaffected by the accident.



Photo 6 shows a general view of the left rear body of the Motor Bus at the time of my inspection. Its body panel and rear left headlamp was damaged as a result of the accident.



Photo 7 shows a close up view of the left rear body of the Motor Bus at the time of my inspection. Its body panel and rear left headlamp (circled) was damaged as a result of the accident.



Photo 8 shows the condition of the front right tyre of the Motor Bus, which was observed to be in serviceable condition with remaining tread depth of approximately 11.7mm. The tyre, which was wrapped around standard steel wheel rim, was also observed to be sufficiently inflated for vehicular operation. There was no tear, cut or burst mark(s) on the outer and the inner sidewalls as well as across the tread of the 8 tyres that were fitted on the Motor Bus.



Photo 9 shows the condition of the rear right tyre of the Motor Bus, which was observed to be in serviceable condition with remaining tread depth of approximately 11.8mm. The tyre, which was wrapped around standard steel wheel rim, was also observed to be sufficiently inflated for vehicular operation.



Photo 10 shows the condition of the rear left tyres of the Motor Bus, which was observed to be in serviceable condition with remaining tread depth of approximately 12.6mm. The tyres, which were wrapped around standard steel wheel rim, were also observed to be sufficiently inflated for vehicular operation. There was also no damage found on all 8 steel wheel rims of the Motor Bus.



Photo 11 shows the condition of the front left tyres of the Motor Bus, which were observed to be in serviceable condition with remaining tread depth of approximately 12.3mm. 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 8 tyres that were fitted on the Motor Bus.

Engine Compartment & Operating Fluids

8. Upon examination of the Motor Bus's engine compartment, I had observed all the parts and components inside the engine compartment to be intact and unaffected by the accident. The engine oil was observed to be sufficient. However, the power steering fluid and the engine coolant was observed to be insufficient. The checks to the air in the air brake cylinders unable to be conducted due to the damage to the undercarriage diesel fuel hose causing a fuel leakage in which cuts the supply of fuel to the Motor Bus's engine resulting it unable to be started up to have the air compressor generating air to the air brake system of the Motor Bus.
9. Further examination of the engine compartment revealed, there was no sign(s) or indication(s) of fresh fluid leakage and/or fluid stain within the engine compartment of the Motor Bus.
10. My subsequent checks on the underside of the Motor Bus also revealed the various undercarriage diesel fuel hose of the Motor Bus were damaged as a result of the accident. See photo 12 – 16 below.



Photo 12 shows a general view of the Motor Bus's engine compartment, which was accessed by lifting the rear of the Motor Bus. The various parts and components inside the engine compartment were unaffected by the accident. There was also no sign(s) or indication(s) of fresh fluid leakage and/or fluid stain within the engine compartment



Photo 13 shows the engine coolant reservoir of the Motor Bus at the time of my inspection. The engine coolant was observed to be of insufficient level (arrowed).



Photo 14 shows the power steering fluid reservoir of the Motor Bus at the time of my inspection. The power steering fluid was observed to be of insufficient level (arrowed).



Photo 15 shows the engine oil dip stick system of the Motor Bus at the time of inspection. The engine oil was observed to be of sufficient level for operation and without any visible contamination.



Photo 16 shows the undercarriage diesel fuel hose of the Motor Bus at the time of inspection. The fuel hose was observed to be damaged as a result of the accident.

Steering System & Braking System

11. Static tests to the brake and steering systems of the Motor Bus was unable to be conducted due to the damaged to the diesel fuel hose thus cutting the fuel supply to the engine rendering it unable to start up. However, my visual examination of braking components and the various steering components which had included the rack and pinion, tie rods, tie rod ends and ball joints had revealed that these components were generally intact. See photo 17 - 23 below.

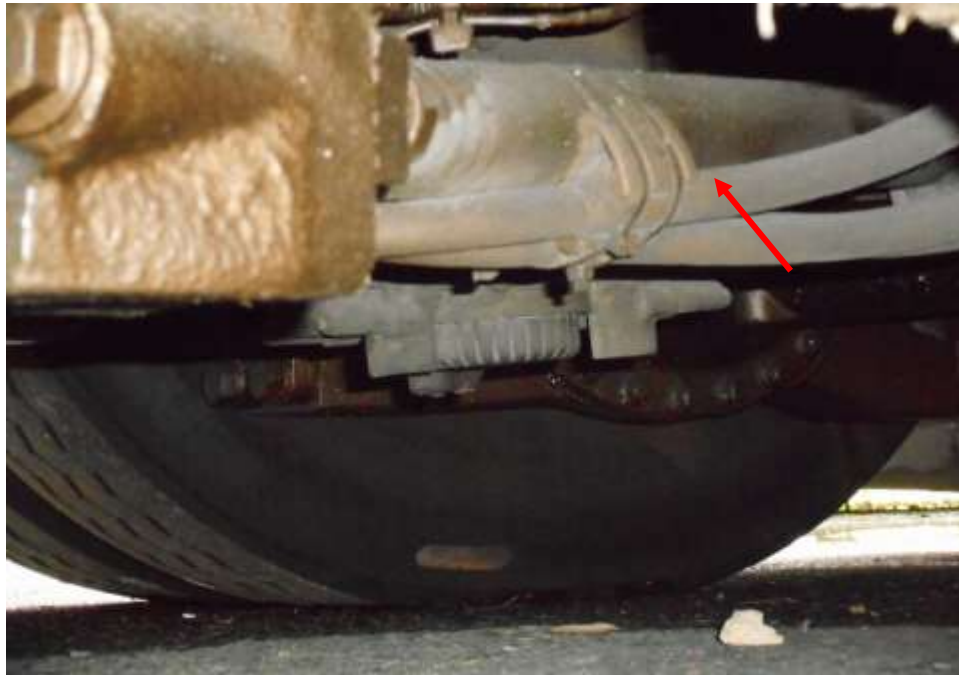


Photo 17 shows the brake pipe (arrowed) at the rear right wheel of the Motor Bus. The braking components were observed to be intact at the time of my inspection of the Motor Bus.



Photo 18 shows the brake pipe (arrowed) at the rear left wheel of the Motor Bus. The braking components were observed to be intact at the time of my inspection of the Motor Bus.



Photo 19 shows the brake pipe (arrowed) at the front right wheel of the Motor Bus. The braking components were observed to be intact at the time of my inspection of the Motor Bus.



Photo 20 shows the brake pipe (arrowed) at the front left wheel of the Motor Bus. The braking components were observed to be intact at the time of my inspection of the Motor Bus.



Photo 21 shows the various undercarriage components at the front right wheel of the Motor Bus, in particular the steering tie rod end (arrowed). The various steering components were all found to be intact without any visible damage. There was also no sign of fluid stain(s) observed on the various undercarriage components.



Photo 22 shows the various undercarriage components at the front left wheel of the Motor Bus, in particular the steering tie rod end (arrowed). The various undercarriage components of the Motor Bus were all found to be intact without any visible damage. There was also no sign of fluid stain(s) observed on the various undercarriage components.



Photo 23 shows the steering box component (arrowed) at the undercarriage of the Motor Bus was found to be intact without any visible damage. There was also no sign of fluid stain(s) observed on the various undercarriage components.

Electronic Safety / Warning Indicators

12. The Motor Bus automatic self-test of the functionality of its electronic operating systems was not conducted due to the engine unable to start up as the undercarriage diesel fuel hose was damaged as a result of the accident. (unable to be started)

Operational Behaviour of the Motor Bus

13. Operational test to primarily determine whether there was any abnormality to the engine system, transmission system and braking system of the Motor Bus could not be conducted given the extent of damage that it had sustained (Fuel system damaged & engine unable to be started).

Conclusion

14. For this particular case, I was unable to determine whether there was any possible mechanical failure to the Motor Bus 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, braking system and suspension system.

15. The 8 tyres fitted on the Motor Bus 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 8 tyres. The 8 tyres were also observed to be sufficiently inflated for vehicular operation with remaining tread depth of approximately 11.7mm – 12.6mm.

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