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30th January 2018

Fatal Accident Investigation Team

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

MECHANICAL INSPECTION REPORT OF MOTOR BUS SMB 1541J

1. We refer to your request on 30th October 2017 to conduct a physical inspection of a motor bus bearing registration number SMB 1541J (herein referred to as "**Motor Bus**"), which was involved in a fatal road traffic accident on 19th August 2017.
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, we had carried out a physical inspection of the Motor Bus on 28th November 2017 at the premises of Traffic Police vehicle pound, 517 Airport Road Singapore 539942. We now set out below our observations and comments with respect to this inspection.

General Condition

4. The mileage of the Motor Bus at the time of our inspection was not recorded due to a flat battery.
5. The Motor Bus was observed to have no signs of any fresh damages on its body portion at the time of our inspection. This is likely due to the consistency of the accident's case facts that the Motor Bus collided & ran over a pedestrian whom was crossing from the Motor Bus front left to right.
See photo 1 to 4.



Photo 1 shows a general view of the front body of the Motor Bus at the time of our inspection. The Motor Bus was observed to be in good condition. This is likely due to the consistency of the accident's case facts that the Motor Bus collided & ran over a pedestrian whom was crossing from the Motor Bus left to right.



Photo 2 shows a general view of the front right body of the Motor Bus at the time of our inspection. The Motor Bus was observed to be in good condition. This is likely due to the consistency of the accident's case facts that the Motor Bus collided & ran over a pedestrian whom was crossing from the Motor Bus left to right.

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Photo 3 shows a general view of the front left body of the Motor Bus at the time of our inspection. The Motor Bus was observed to in good condition. No damages were noted on this side of the Motor Bus.



Photo 4 shows a general view of the Motor Bus's rear left body at the time of our inspection. There was no impact damage found at the rear portion of the Motor Bus.

Tyres and Wheel Rims

6. The 6 tyres fitted on the Motor Bus were all observed to be in serviceable condition and sufficiently inflated for vehicular operation. We 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 6 tyres. The tyre brand, tyre size and remaining tread depth of the Motor Bus's 6 tyres were recorded as follows:-

Continental Urban Traffic 275/70 R22.5 (11mm)	Firenza SSU 05 Urban Bus 275/70 R22.5 (9mm)
<div> <div></div> <div></div> <div>REAR</div> <div></div> <div></div> </div>	<div> <div></div> <div>FRONT</div> <div></div> </div>
Continental Conti Urban HA3 275/70 R22.5 (11mm)	Firenza SSU 05 275/70 R22.5 (12mm)

7. The 6 tyres were observed to be wrapped around standard alloy wheel rims that were found to be without any damage. See photo 5 – 8 below.



Photo 5 shows the condition of the front right tyre of the Motor Bus, which was with remaining tread depth of approximately 12mm. The tyre was also observed to be sufficiently inflated for vehicular operation.



Photo 6 shows the condition of the front left tyre of the Motor Bus, which was observed to be in serviceable condition with remaining tread depth of approximately 9mm. The tyre was also observed to be sufficiently inflated for vehicular operation.



Photo 7 shows the condition of the rear right tyres of the Motor Bus, which were observed to be in serviceable condition with remaining tread depth of approximately 11mm. The tyres, which were wrapped around standard alloy wheels rims, were also observed to be sufficiently inflated for vehicular operation.



Photo 8 shows the condition of the rear left tyres of the Motor Bus, which were observed to be in serviceable condition with remaining tread depth of approximately 11mm. The tyres, which were wrapped around standard alloy wheel rims, were also observed to be sufficiently inflated for vehicular operation.

Engine Compartment & Operating Fluids

8. Upon examination of the engine compartment of the Motor Bus, we had observed all the parts and components inside the engine compartment to be intact and unaffected by the accident. The engine fluid was found to be of sufficient level for operating purposes. Visually, there was also no contamination found to these fluids.
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 Bus.
10. Our subsequent checks on the underside of the Motor Bus reveals some fluid stain sighted under the engine compartment. Further investigation found that the fluid stain was a pre-existed prior the accident & not a fresh fluid. This was due to some dirt observed on the fluid stain. Conclusive, it is not likely to be related to the accident. Visually, the various undercarriage components of the Motor Bus were all observed to be intact and without any visible damage. See photo 9 – 11 below.

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Photo 9 shows the engine compartment of the Motor Bus was located at the rear of the Motor Bus.

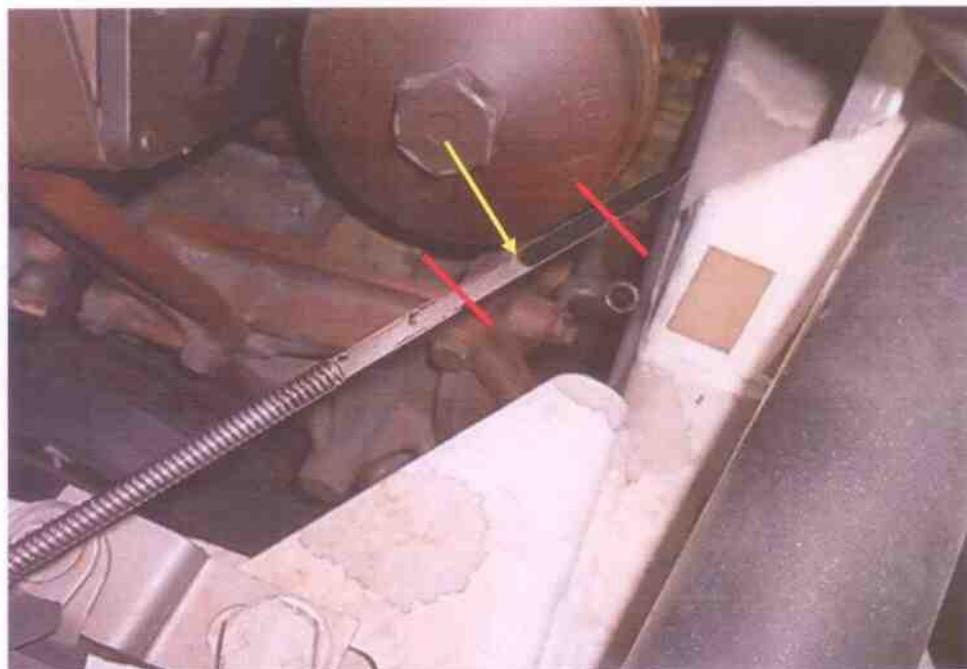


Photo 10 shows the engine fluid of the Motor Bus. It was observed to be of sufficient level (Yellow) without any contamination at time of our inspection.



Photo 11 shows the engine underside of the Motor Bus. Our subsequent checks on the underside of the Motor Bus reveals some fluid stain sighted under the engine compartment. Further investigation found that the fluid stain was a pre-existed prior the accident & not a fresh fluid. This was due to some dirt observed on the fluid stain. Conclusive, it is not likely to be related to the accident. Visually, the various undercarriage components of the Motor Bus were all observed to be intact and without any visible damage.

Steering System & Braking System

11. The mechanical components of the Motor Bus's steering system were all found to be visually intact and undamaged. The steering shaft and steering rack of the Motor Bus were observed to be intact and securely attached to the front left wheel and front right wheel. The steering ball joints were also observed to be in a serviceable condition.
12. Although the steering system could not be tested at the time of our inspection (engine unable to be started), it is likely that the steering system of the Motor Bus was in serviceable condition since its mechanical components were all found to be generally intact and securely fitted. See photo 12 & 13 below.



Photo 12 shows some of the mechanical components (arrowed) of the Motor Bus's steering system. Our visual checks on the various mechanical components of the steering system revealed all to be intact and in good condition. The steering system of the Motor Bus is hence likely to be in serviceable condition at the time of accident.



Photo 13 shows the undercarriage components at the front right wheel of the Motor Bus. The various undercarriage components of the Motor Bus were all observed to be intact and without any visible damage. This had included the steering rack and steering ball joints (arrowed) of the Motor Bus.

13. The braking system of the Motor Bus was noted to be of a full air-assisted braking system. Briefly, in this system, compressed air is used to press onto the brake shoes (for drum brakes) or onto the brake pads (for disc brakes), through the respective braking mechanism, thus slowing the rotation of the wheels.
14. Since the engine of the Motor Bus could not be started, we were hence not able to carry out test(s) on whether there was any leakage of compressed air that could have affected the braking efficiency of the Motor Bus. However the air pipes, air tanks and connecting valves had all appear to be in good general condition and securely fitted upon our visual examination of these parts.
15. In general, our visual inspection of the mechanical components of the Motor Bus's braking system appear to suggest that its braking system was in serviceable condition at the material time of accident. See photo 14 below.



Photo 14 shows a general view of the air tank, valves, pipes and hoses, which are some of the components for the air-assisted braking system of the Motor Bus. This was at the underside of the Motor Bus. We were however not able to carry out any operational test(s) to the braking system of the Motor Bus as its engine was unable to be started.

Electronic Safety / Operational indicators

16. The Motor Bus was not fitted with any electronic safety feature(s) like Anti-Brake Lock System (ABS), Supplemental Restraint System (SRS) etc. There was hence no test carried out on the functionality of these systems.
17. Other operational indicators were unable to be initialize due to the flat battery. Hence, no test was carried out to the Motor Bus operational indicators. See photo 15 & 16 below.



Photo 15 shows the indicators at the driver's seat. Other operational indicators were unable to be initialize due to the flat battery. Hence, no test was carried out to the Motor Bus operational indicators.



Photo 16 shows the indicators at the driver's seat. Other operational indicators were unable to be initialize due to the flat battery. Hence, no test was carried out to the Motor Bus operational indicators.

Operational Behaviour of the Motor Bus

18. As the engine of the Motor Bus could not be started, we were hence not able to carry out any operational test(s) to primarily determine whether there was any operational abnormality to its engine system, transmission system, steering system and braking system.

Conclusion

19. At the time of our inspection of the Motor Bus, its steering system and braking system could not be tested as the Motor Bus's engine could not be started. However basing on our observations, it would appear that the steering system and braking system of the Motor Bus were in serviceable condition. This is taking into consideration that the various mechanical components of the steering system and braking system were found to be intact and undamaged.

20. Although our subsequent checks on the underside of the Motor Bus reveals some fluid stain sighted under the engine compartment. Further investigation found that the fluid stain was a pre-existed prior the accident & not a fresh fluid. This was due to some dirt observed on the fluid stain. Conclusive, it is not likely to be related to the accident. Visually, the various undercarriage components of the Motor Bus were all observed to be intact and without any visible damage.
21. The observation gathered from our physical inspection of the Motor Bus had indicated no evidence to suggest possible mechanical failure to the Motor Bus that may have contributed to the accident.
22. The 6 tyres fitted on the Motor Bus were also found to be in serviceable condition. There was no tear, cut or burst mark(s) on the outer and the inner sidewalls as well as across the tread of the 6 tyres. The 6 tyres were sufficiently inflated for vehicular operation with remaining tread depth of approximately 9mm to 12mm each.
23. Our findings were based solely on a static and visual inspection of the Motor Bus. No operational test(s) could be carried out to the Motor Bus as its engine could not be started at the time of our inspection.



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