

Your Ref: TP/IP/64375/2018
Our Ref : CI/TPD18022208/Z

15th March 2019

Fatal Accident Investigation Team

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

MECHANICAL INSPECTION REPORT OF MOTOR BUS PC 5941X.

1. We refer to your request on 28th November 2018 to conduct a physical inspection of a Motor Bus bearing registration number PC 5941X (herein referred to as "**Motor Bus**"), which was involved in a fatal road traffic accident on 21st November 2018.
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 21st December 2018 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 77907km.
5. The Motor Bus was observed to have sustained minor dent at its front right panel likely due to the accident.
6. This was likely due to the consistency of the accident's case facts that on 21st November 2018 at about 1907hrs, the Motor Bus pick-up 6 residents from Forestville Condo and he was proceeding to Woodlands MRT to alight them. While exiting from the said condo, the Motor Bus made a right turn from the exit point of the condo. Halfway making the intended right turn, the frontal right portion of the Motor Bus collided into the right side of a pedestrian while he was still walking ahead of the Motor Bus. See photo 1 to 6 below.



Photo 1 shows the mileage of the Motor Bus was recorded at 77907km at time of our inspection.



Photo 2 shows a general view of the front body of the Motor Bus at the time of our inspection. The Motor Bus was observed to sustained damages at the front right portion due to the accident's impact.



Photo 3 shows a close-up view of the damages on the front right panel of the Motor Bus at the time of our inspection. It was likely due to the accident's impact collision.



Photo 4 shows a general view of the rear left body of the Motor Bus at the time of our inspection. The Motor Bus was observed to be in good general condition at time of inspection.

51 UBI AVE 1, #01-25 PAYA UBI INDUSTRIAL PARK, SINGAPORE 408933 TEL : (065) 62563561 FAX : (065) 67414108



Photo 5 shows a general view of the rear right body of the Motor Bus at the time of our inspection. The Motor Bus was observed to be in good general condition at time of inspection.



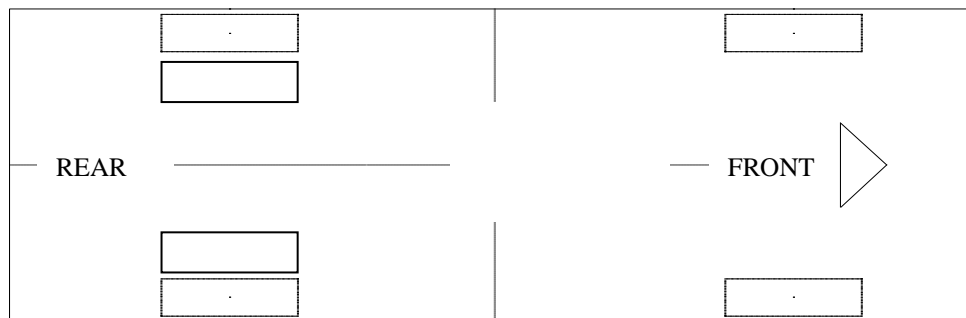
Photo 6 shows a general view of the rear body of the Motor Bus at the time of our inspection. The Motor Bus was observed to be in good general condition at time of inspection.

Tyres and Wheel Rims

7. The 6 tyres were 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 6 tyres of the Motor Bus were recorded as follows:-

Bridgestone R202 205/85R16 (4mm)

Bridgestone R202 205/85R16 (8mm)



Bridgestone R202 205/85R16 (3mm)

Bridgestone R202 205/85R16 (8mm)

8. The 6 tyres were observed to be wrapped around standard wheel rims with wheel caps fitted on its outer side. There was no significant damage observed on all of the wheel caps. See photo 7 – 10 below.



Photo 7 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 8mm. The tyres were all observed to be sufficiently inflated for vehicular operation with no tear, cut or burst mark(s) on the outer and the inner sidewalls as well as across the tread.



Photo 8 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 8mm. The tyre, which was wrapped around standard wheel rim, was also observed to be sufficiently inflated for vehicular operation.



Photo 9 shows the condition of the rear left tyre of the Motor Bus, which was observed to be in serviceable condition with remaining tread depth of approximately 4mm. The tyre, which was wrapped around standard wheel rim, was also observed to be sufficiently inflated for vehicular operation. There was also no significant damage found on the 6 wheel rims of the Motor Bus.



Photo 10 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 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 tyre, which was also sufficiently inflated for vehicular operation.

Engine Compartment & Operating Fluids

9. Upon examination of the Motor Bus's engine compartment, we had observed all the parts and components inside the engine compartment to be intact and unaffected by the accident. The brake fluid, 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.
10. 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.
11. Our subsequent checks on the underside of the Motor Bus revealed no fluid stain. Visually, the various undercarriage components of the Motor Bus were all observed to be intact and without any visible damage. See photo 11 – 14 below.



Photo 11 shows a general view of the Motor Bus's engine compartment. The various parts and components inside the engine compartment were unaffected by the accident. There was also no sign(s) or indication(s) of fluid leakage and/or fluid stain within the engine compartment.



Photo 12 shows the brake fluid reservoir of the Motor Bus at the time of our inspection. The brake fluid was observed to be of sufficient level and without any visible contamination.



Photo 13 shows the power steering fluid of the Motor Bus at the time of our inspection. It was observed to be of sufficient level and without any visible contamination.



Photo 14 shows the engine dip stick of the Motor Bus at the time of our inspection. The engine oil was observed to be of sufficient level and without any visible contamination.

Steering System & Braking System

12. Static brake tests conducted on the Motor Bus revealed no abnormality. The brake booster had responded well to the various tests conducted. There was also no abnormal movement of the brake pedal when it was depressed. In general, the static brake tests had suggested that there was no internal leakage of pressure/vacuum in the braking system of the Motor Bus. The braking system of the Motor Bus was likely to be in serviceable condition at the material time. This was also taking into consideration that the brake fluid was of sufficient level with no contamination found, and also that there was no sign(s) of brake fluid leakage along the brake hoses and brake pipes.
13. Static test on the steering system of the Motor Bus also revealed no abnormality to the steering system. We did not experience any abnormal free play and/or other resistance when turning the steering wheel left and right to full lock positions. Our visual examination of 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 all generally in good condition. See photo 15 - 18 below.



Photo 15 shows the various undercarriage components at the rear left wheel of the Motor Bus, in particular the brake hose (arrowed). We did not observe any leakage of brake fluid at the time of our inspection of the Motor Bus.



Photo 16 shows the brake hose at the front left wheel of the Motor Bus. We did not observe any leakage of brake fluid. Our visual inspection of the various mechanical components of the Motor Bus'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.

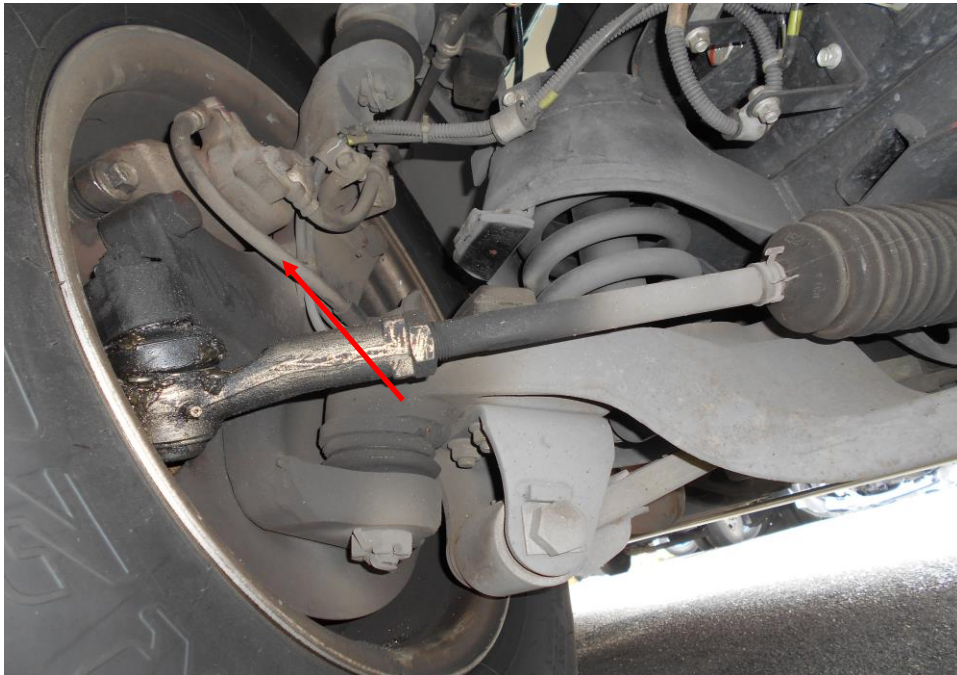


Photo 17 shows the brake hose (arrowed) at the front right wheel of the Motor Bus. We did not observe any leakage of brake fluid at the time of our inspection of the Motor Bus. Our visual inspection of the various mechanical components of the Motor Bus's braking system, including its brake calliper, revealed all to be intact and without visible damage.



Photo 18 shows the various undercarriage components at the rear right wheel of the Motor Bus. The various steering components were all found to be intact, suggesting that the steering system of the Motor Bus was likely to be in serviceable condition at the material time of accident. There was also no sign of fluid stain(s) observed on the various undercarriage components at the 4 wheels of the Motor Van.

Electronic Safety / Warning Indicators

14. The Motor Bus's automatic self-test of the functionality of its various electronic operating systems like the Battery check, engine check, fluid check & etc. 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. See photo 19 & 20 below.



Photo 19 shows the warning lights for the various electronic operating systems of the Motor Bus appearing on its instrument panel during the self-test when the engine was cranked.



Photo 20 shows no warning lights illuminated on the instrument panel of the Motor Bus after the engine was cranked. This would suggest that there was no abnormality to the various electronic operating systems of the Motor Car.

Operational Behaviour of the Motor Van

15. A short operational test of the Motor Bus, to primarily determine whether there was any abnormality to its various operating systems like its engine system, its transmission system, steering system and braking system was subsequently carried out. The test was conducted by driving the Motor Bus forward, stopping, before reversing and coming to a stop again.
16. During the operational test, the various transmission gears of the Motor Bus were able to be engaged without any difficulty by manually shifting the gear lever. There were no abnormal sounds heard and/or abnormal behaviour of the Motor Bus's engine system. It was able to move forward and backward normally. The braking system was found to be in working condition as the Motor Bus was able to slow down and come to a complete stop upon depressing of the brake pedal. See photo 21 & 22 below.



Photo 21 shows a short operational test of the Motor Bus, to primarily determine whether there was any abnormality to its various operating systems like its engine system, its transmission system, steering system and braking system was subsequently carried out. The test was conducted by driving the Motor Bus forward, stopping, before reversing and coming to a stop again.



Photo 22 shows a short operational test of the Motor Bus, the test was conducted by driving the Motor Bus forward, stopping, before reversing and coming to a stop again.

Conclusion

17. From our physical inspection of the Motor Bus, it appears that its engine system, steering system, braking system and transmission system were all in serviceable condition. We did not find any evidence(s) to suggest that there was possible mechanical failure to the Motor Bus that may have caused and/or contributed to the accident. This is also taking into consideration that the operational test of the Motor Bus, which we had conducted, did not produce any sign(s) or symptom(s) to suggest that there was any abnormality to its various operating systems.
18. The observations 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.
19. The 6 tyres of 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 3mm to 8mm each.

Rohaizal A. Rahim

Technical Investigator

Ang Bryan Tani

AMSOE, AMIRTE, AFF SAE, M.MATAI, AFF.Inst.AEA

Senior Technical Investigator

Technical Investigation & 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.