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Your Ref: TP/IP/14569/2021 27th September 2021
Our Ref : CI/TPD21007783/P

Fatal Accident Investigation Team
Traffic Police Department
Singapore Police Force
10 Ubi Avenue 3
Singapore 408865

MECHANICAL INSPECTION REPORT OF BUS PA 8825P

1. I refer to your request on 19th July 2021 to conduct a physical inspection of a Bus bearing registration number PA 8825P (herein referred to as "**Bus**"), which was involved in a road traffic accident on 22nd March 2021

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

3. Following the request, I had carried out a physical inspection of the Bus on 27th September 2021 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.

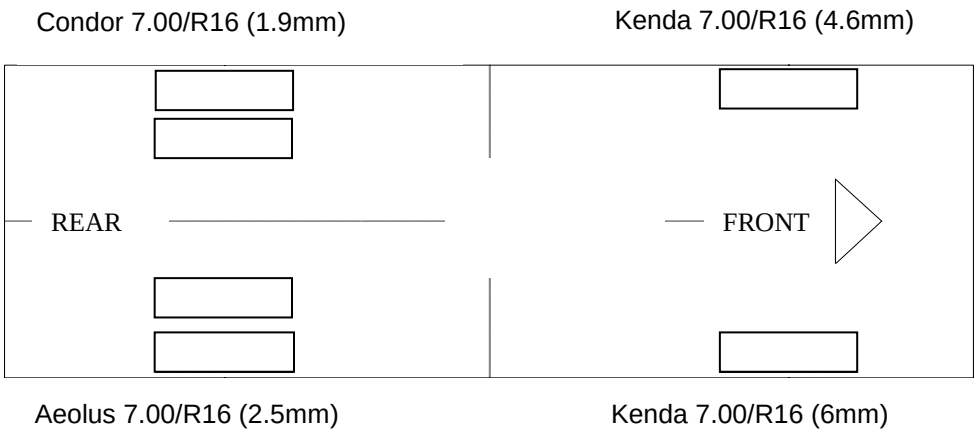
General Condition

4. The mileage of the Bus at the time of my inspection was not recorded at the time of my inspection. As the engine was unable to be jumpstarted up despite multiple attempts in jumpstarting it.

5. The Bus appeared to have sustained damage at its rear portion. Its rear bumper were damage at the time of my inspection as result of the accident.

Tyres and Wheel Rims

6. The 6 tyres of the 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 4 tyres. The tyre brand, tyre size and remaining tread depth of the 4 tyres of the Bus were recorded as follows:-



7. The 6 tyres were observed to be wrapped around standard steel wheel rims that were found to be without any damage. See photo 1 – 9 below.

Photo 1 shows a general view of the Bus's rear portion at the time of my inspection. The Bus rear portion was observed to have sustained damage at its rear bumper at the time of my inspection as result of the accident.

Photo 2 shows a close up view of the Bus's rear portion at the time of my inspection. The Bus rear portion was observed to have sustained damage at its rear bumper (circled) at the time of my inspection as result of the accident.

Photo 3 shows general view of the Bus's front portion at the time of my inspection. The Bus rear portion was observed to be intact and unaffected by the accident.

Photo 4 shows general view of the Bus's right portion at the time of my inspection. The Bus was observed to be intact and unaffected by the accident.

Photo 5 shows a general view of the left body of the Bus at the time of my inspection. The Bus was observed to be intact and unaffected by the accident.

Photo 6 shows the condition of the front right tyre of the Bus, which was observed to be in serviceable condition with remaining tread depth of approximately 6mm. 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 6 tyres that were fitted on the Bus.

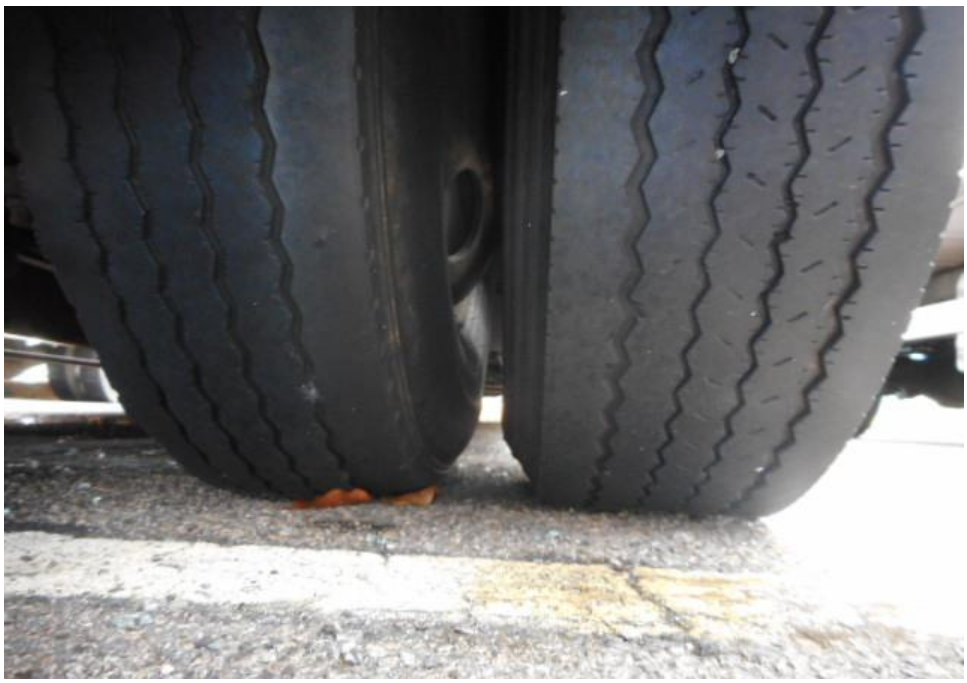


Photo 7 shows the condition of the rear right tyre of the Bus, which was observed to be in serviceable condition with remaining tread depth of approximately 2.5mm. The tyre, which was wrapped around standard steel wheel rim, it was observed to be sufficiently inflated for vehicular operation.

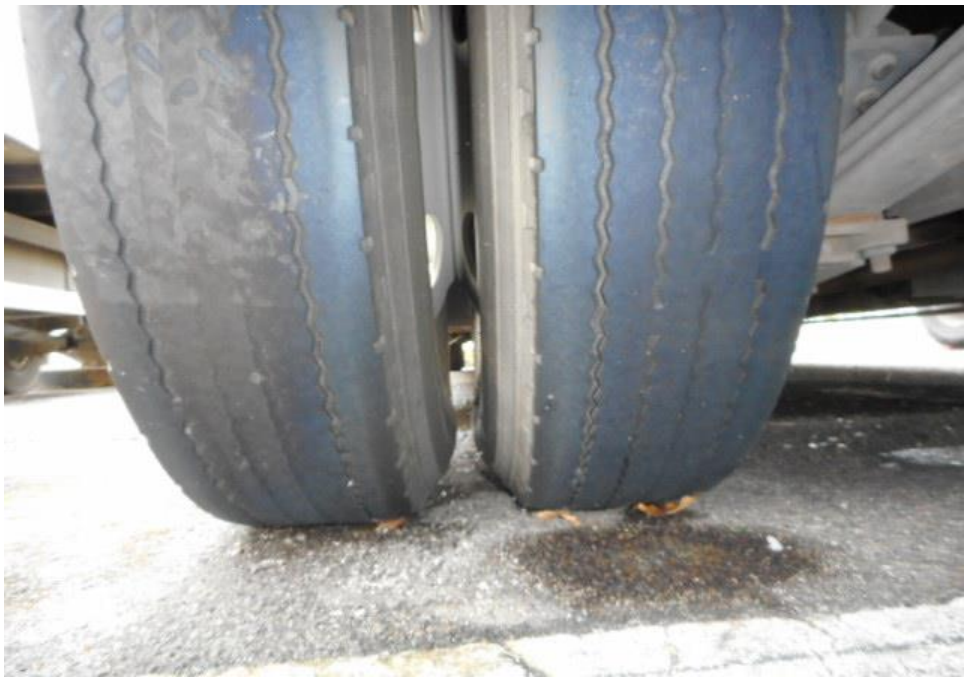


Photo 8 shows the condition of the rear left tyres of the Bus, which was observed to be in serviceable condition with remaining tread depth of approximately 1.9mm. The tyres, which were wrapped around standard steel wheel rim, were also observed to be sufficiently inflated for vehicular operation. There was also no damage found on all 6 steel wheel rims of the Bus.

Photo 9 shows the condition of the rear right tyres of the Bus, which were observed to be in serviceable condition with remaining, tread depth of approximately 4.6mm. 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 6 tyres that were fitted on the Bus.

Engine Compartment & Operating Fluids

8. Upon examination of the 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 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.

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 Bus.

10. My subsequent checks on the underside of the Bus also revealed no fluid stain. Visually, the various undercarriage components of the Bus were all observed to be intact and without any visible damage. See photo 10 – 15 below.

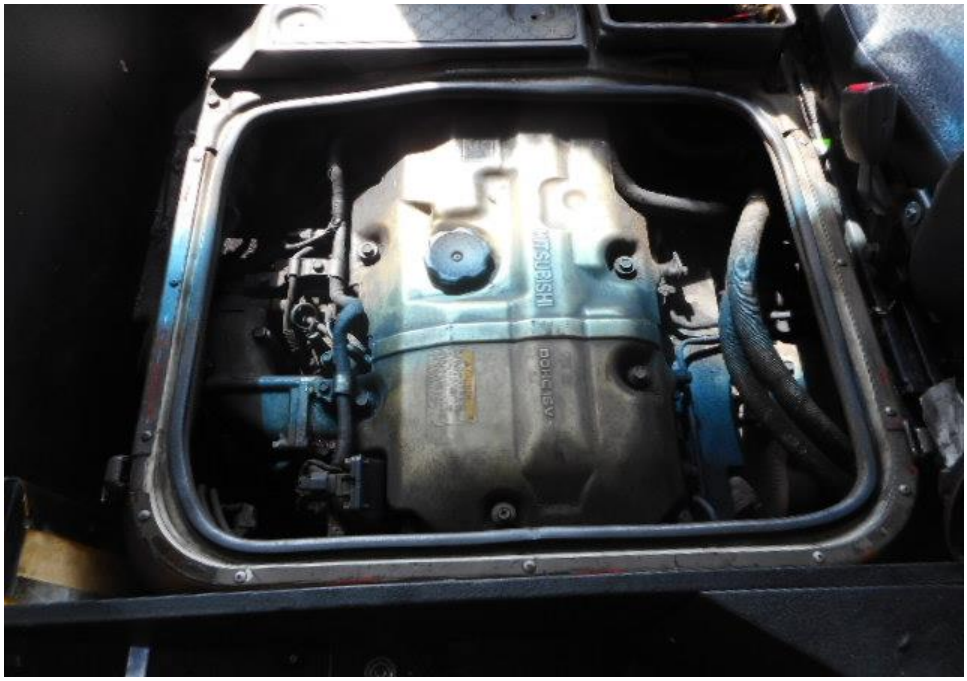


Photo 10 shows a general view of the Bus's engine compartment, which was accessed by lifting the front cabin of the Bus. The various parts and components inside the engine compartment were unaffected by the accident. There was also no sign(s) or indication(s) of fresh fluid leakage and/or fluid stain within the engine compartment

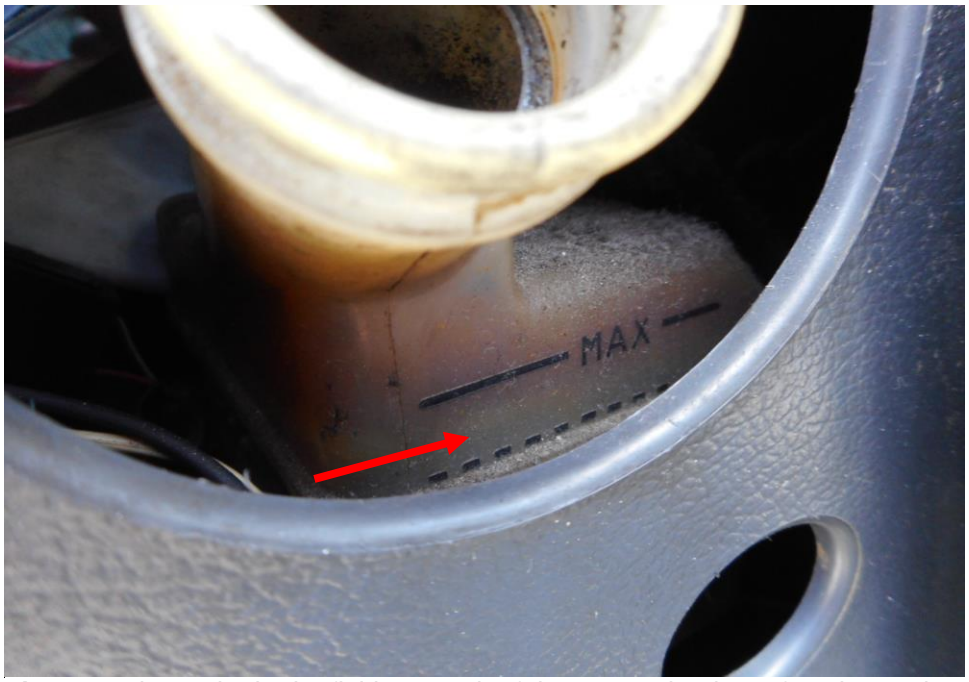


Photo 11 shows the brake fluid reservoir of the Bus at the time of my inspection. The brake fluid was observed to be of sufficient level (arrowed) and without any visible contamination.

Photo 12 shows the engine coolant reservoir of the Bus at the time of my inspection. The engine coolant was observed to be of sufficient level (arrowed) and without any visible contamination.

Photo 13 shows the engine oil dip stick of the Bus at the time of my inspection. The engine oil was observed to be of sufficient level and without any visible contamination.

Photo 14 shows the undercarriage of the Bus, 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 Bus.

Steering System & Braking System

11. Static brake tests was not conducted on the Bus as it was unable to be started. The brake fluid was of sufficient level, and also that there was no sign(s) of brake fluid leakage along the brake hoses and brake pipes.

12. For this inspection, I was not able to conduct any tests on the steering system of the Bus due to the Bus running on power steering which requires the Bus to be started and the engine was unable to be started up. (Unable to be started) However, my 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 - 21 below.

Photo 15 shows the jumpstarting process of the Bus's engine. The engine of the Bus was unable to be jumpstarted up despite multiple attempts in starting it.

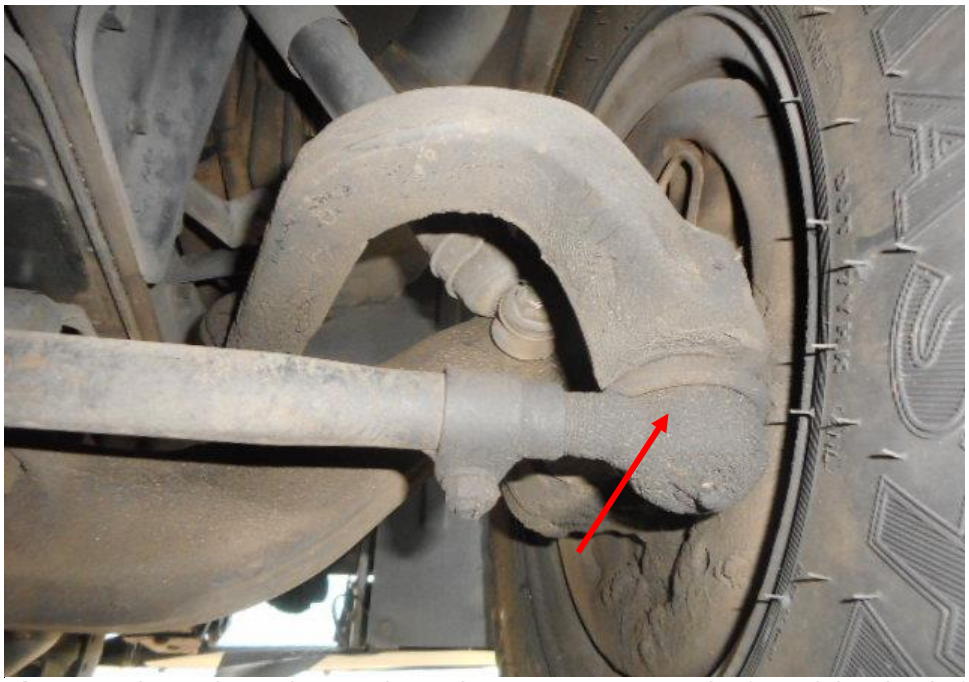


Photo 16 shows the various undercarriage components at the front right wheel of the Bus, in particular the steering tie rod end (arrowed). The various steering components were all found to be intact, suggesting that the steering system of the Bus was likely to be in serviceable condition at the material time of accident. There was also no sign of fluid stain(s) observed on the various undercarriage components.

Photo 17 shows the various undercarriage components at the front left wheel of the Bus, in particular the steering tie rod end (arrowed). The various undercarriage components of the 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.

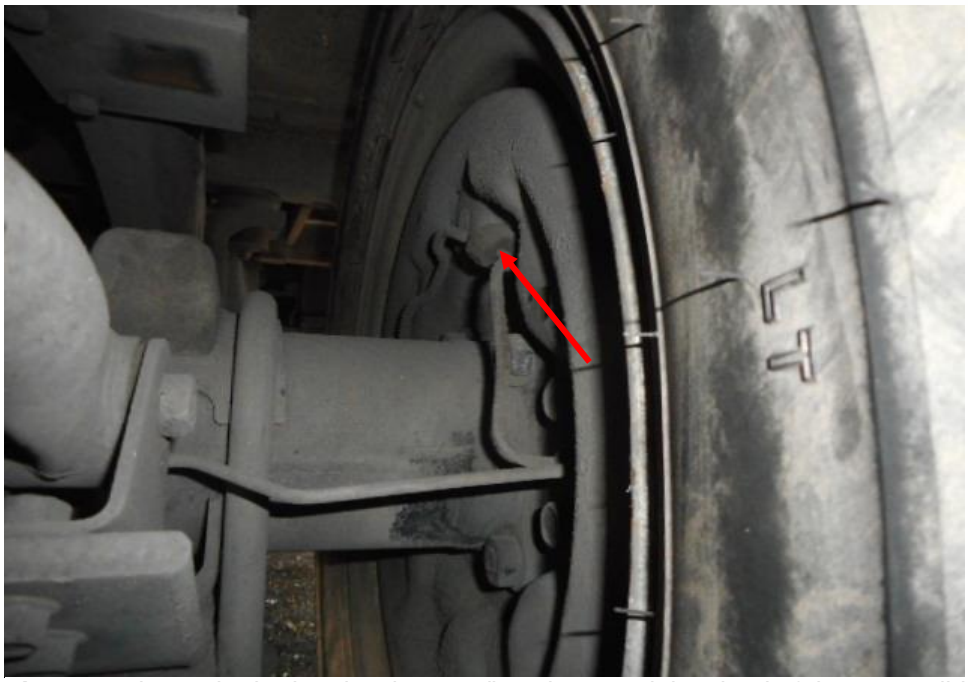


Photo 18 shows the brake pipe (arrowed) at the rear right wheel of the Bus. I did not observe any leakage of brake fluid at the time of my inspection of the Bus. My static tests of the Bus's braking system, along with my visual examination of the various mechanical components in the braking system, had indicated that there was no internal leakage of pressure/vacuum. Hence the braking system of the Bus was likely to be in serviceable condition at the material time of accident.

Photo 19 shows the brake pipe (arrowed) at the rear left wheel of the Bus. I did not observe any leakage of brake fluid at the time of my inspection of the Bus. My static tests of the Bus's braking system, along with my visual examination of the various mechanical components in the braking system had indicated that there was no internal leakage of pressure/vacuum. Hence the braking system of the Bus was likely to be in serviceable condition at the material time of accident.

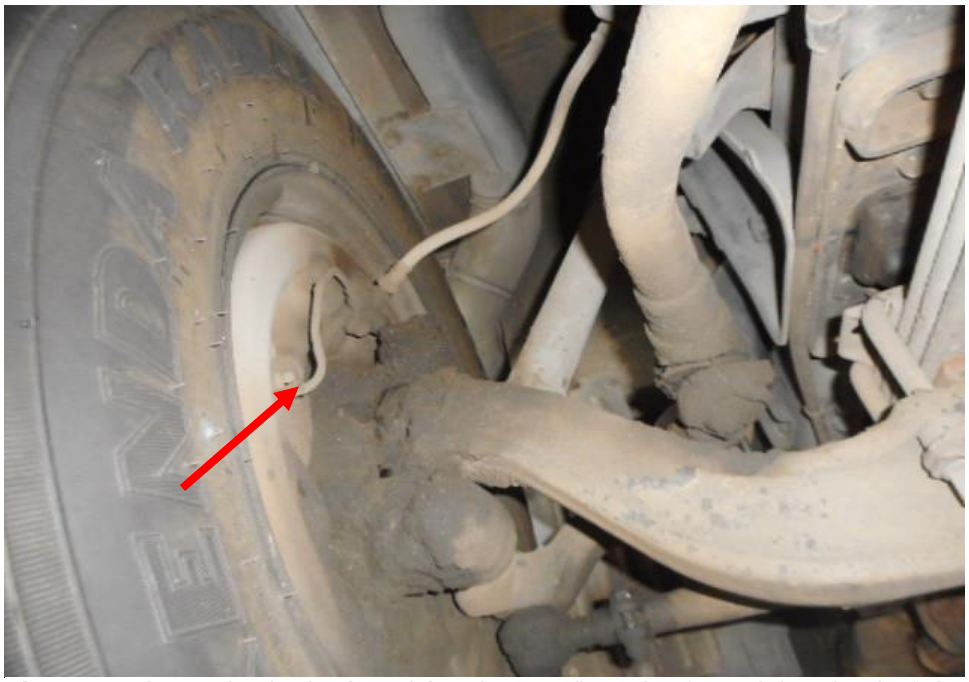


Photo 20 shows the brake hose/pipe (arrowed) at the front right wheel of the Bus. No leakage of brake fluid was observed. Visual examination of the various components of the braking system like the brake drum, brake booster, brake pedal etc had revealed all to be intact and without visible damage at the time of accident. There was also no sign of fluid stain(s) observed on the various undercarriage components.

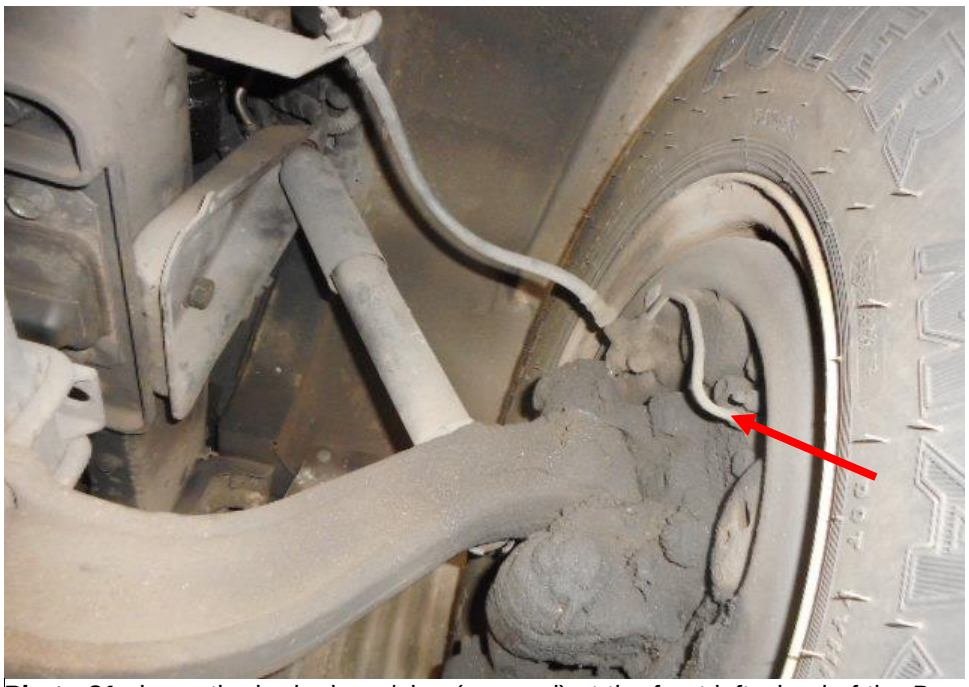


Photo 21 shows the brake hose/pipe (arrowed) at the front left wheel of the Bus. No leakage of brake fluid was observed. Visual examination of the various components of the braking system like the brake drum, brake booster, brake pedal etc had revealed all to be intact and without visible damage at the time of accident. There was also no sign of fluid stain(s) observed on the various undercarriage components.

Electronic Safety / Warning Indicators

13. Bus's automatic self-test of the functionality of its various electronic operating systems was not able to be conducted as the engine system was unable to be jumpstarted up despite multiple attempts in jumpstarting it. (unable to be started)

Seat Belts

14. The front right seat belt of the "Bus" were tested and all the seat belts were able to be fastened securely into the respective pre-tensioners that were fitted at the sides of each seat.

Operational Behaviour of the Bus

15. A short operational test to primarily determine whether there was any abnormality to the engine system, transmission system and braking system of the Bus could not be conducted given the engine of the Bus was unable to be started up.

Conclusion

16. For this particular case, I was unable to determine whether there was any possible mechanical failure to the Bus that may have contributed to the accident. Its engine not able to be started up 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.

17. However, in general our visual inspection of the mechanical components of the Bus's braking and steering system appear to suggest that its braking and steering system was in serviceable condition at the material time of accident and there was no leakage found at the braking and steering components of the Bus.

18. The 6 tyres fitted on the 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 6 tyres. The 6 tyres were also observed to be sufficiently inflated for vehicular operation with remaining tread depth of approximately 1.9mm – 6mm.

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