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05 November 2017

General Investigation Team D
Traffic Police Department
Singapore Police Force
10 Ubi Avenue 3
Singapore 408865

MECHANICAL INSPECTION REPORT OF MOTOR BUS PC 3728J

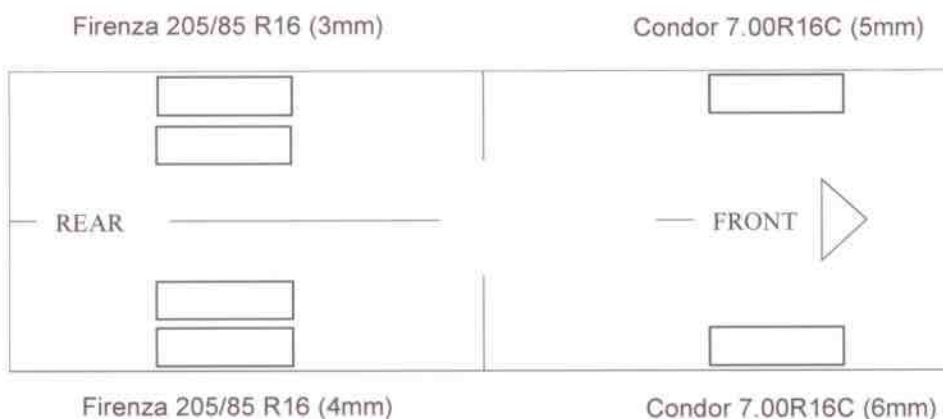
1. I refer to your request on 07 August 2017 to conduct a physical inspection of a motor bus bearing registration number PC 3728J (herein referred to as "**Motor Bus**"), which was involved in a road traffic accident.
2. The objective of this inspection is to determine if there was any possible mechanical 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 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 Bus at the time of my inspection was not recorded as the key was not made available to me.
5. The Motor Bus had sustained relatively extensive damage at multiple areas. Damages as a result of the accident was observed at its front left body, right front body, right centre body and rear body. Its roof panel was also observed to be affected while its driver's door was observed to have been removed for rescue purposes.

Tyres and Wheel Rims

6. The 2 front tyres and 4 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 6 tyres. The tyre brand, tyre size and remaining tread depth of the 6 tyres of the Motor Bus were recorded as follows:-



7. The 6 tyres were observed to be wrapped around standard alloy wheel rims that were found to be without any damage except for the front right wheel rim and rear right outer wheel rim, which were both dented due to the accident. See photo 1 – 11 below.



Photo 1 shows a general view of the front left body of the Motor Bus at the time of my inspection. The Motor Bus was observed to have sustained damage at its front left body. Its front bumper, front left signal lamp and front panel were amongst the body parts at the front left of the Motor Bus that had sustained damages as a result of the accident.



Photo 2 shows a general view of the front right body of the Motor Bus at the time of my inspection. The right front body of the Motor Bus was observed to have been damaged. Its roof panel was also observed to be affected while its driver's door was observed to have been removed for rescue purposes.



Photo 3 shows the right centre body of the Motor Bus. The body panels along the right side of the Motor Bus were observed to be have been dented/buckled.



Photo 4 shows a general view of the Motor Bus's rear right body at the time of my inspection. The rear doors, rear bumper and rear right panel were amongst the body parts at the rear right of the Motor Bus that had sustained damages. Its roof panel was also observed to have been buckled as a result of the accident.



Photo 5 shows a general view of the Motor Bus's rear left body at the time of my inspection. The rear doors, rear bumper and rear right panel were amongst the body parts at the rear right of the Motor Bus that had sustained damages. Its roof panel was also observed to have been buckled as a result of the accident. The left side of the Motor Bus was relatively unaffected by the collision.



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 5mm. The tyre, which was wrapped around standard alloy 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 Motor Bus.



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 6mm. The tyre, which was wrapped around standard alloy wheel rim, was also observed to be sufficiently inflated for vehicular operation.



Photo 8 shows the front right tyre of the Motor Bus wrapped around standard alloy wheel rim. The front left wheel rim was observed to be dented due to the accident.



Photo 9 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 3mm. The tyres, which were wrapped around standard alloy wheel rim, were also observed to be sufficiently inflated for vehicular operation. There was also no damage found on all 6 standard alloy wheel rims of the Motor Bus except for the front right wheel rim and rear right outer wheel rim, which were both dented due to the accident.



Photo 10 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 4mm. 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 Motor Bus.



Photo 11 shows the rear right outer wheel rim of the Motor Bus which was observed to be dented due to the accident.

Engine Compartment & Operating Fluids

8. Upon examination of the Motor Bus's engine compartment, which was accessed from the interior of the Motor Bus by lifting the cover adjacent to the left side of the driver's seat, 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 no sign(s) or indication(s) of 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 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 12 – 16 below.



Photo 12 shows a general view of the Motor Bus's engine compartment, which was accessed from the interior of the Motor Bus by lifting the cover adjacent to the left side of the driver's seat. 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 13 shows a general view of the Motor Bus's transmission housing, as viewed from the bottom of the Motor Bus. The engine and transmission, along with all its related parts, were found to be intact and unaffected by the accident. There was also no sign(s) or indication(s) of fluid leak/stain observed on the underside of the Motor Bus.



Photo 14 shows the brake fluid reservoir of the Motor Bus at the time of my inspection. The brake fluid was observed to be of sufficient level (arrowed) and without any visible contamination.



Photo 15 shows checks being carried out to the engine coolant of the Motor Bus at the time of my inspection. The engine coolant was observed to be of sufficient level (arrowed) and without any visible contamination.



Photo 16 shows the engine dip stick of the Motor Bus at the time of my inspection. The engine oil was observed to be of sufficient level and without any visible contamination.

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 wheel, steering column, steering rack and pinion and steering ball joints of the Motor Bus were all observed to be intact and securely attached to the front left wheel and front right wheel.
12. Although the steering system could not be tested at the time of my inspection (no key available), it is likely that the steering system of the Motor Bus was in serviceable condition at the material time of accident since its mechanical components were all found to be generally in serviceable condition and securely fitted.
13. Static brake tests was also unable to be conducted on the Motor Bus due to similar reason (no key available). However my visual examination of the mechanical parts of the braking system like the brake booster, brake pipes/hoses and brake pedal revealed all the parts to be intact and undamaged. The braking system of the Motor Bus was therefore likely to be in serviceable condition at the material time. This was also taking into consideration that 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. See photo 17 - 20 below.

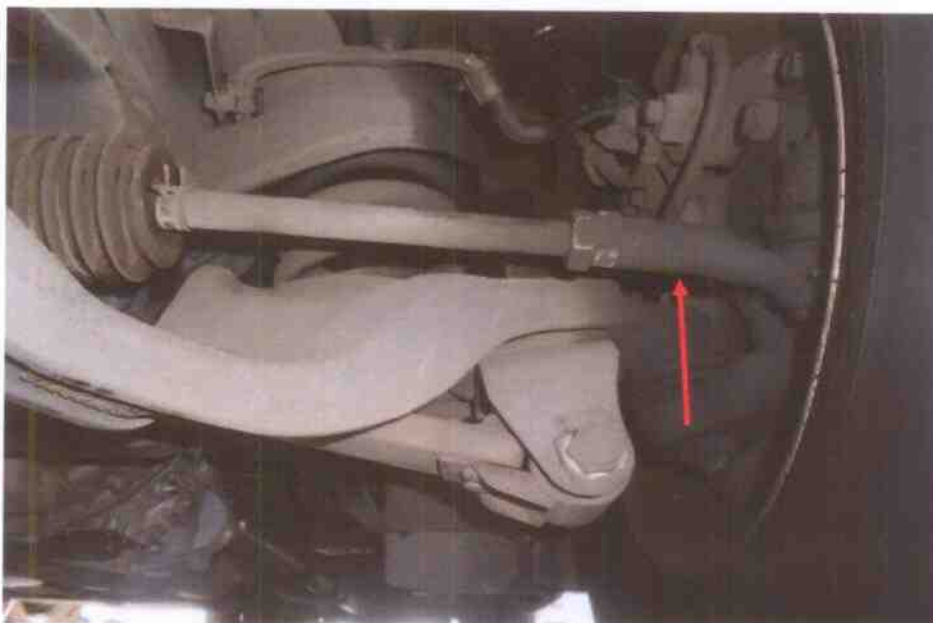


Photo 17 shows the various undercarriage components at the front right wheel of the Motor Bus, in particular the steering tie rod end (arrowed). The various steering mechanical components were all found to be intact, suggesting that the steering system of the Motor Bus was likely to be in serviceable condition.

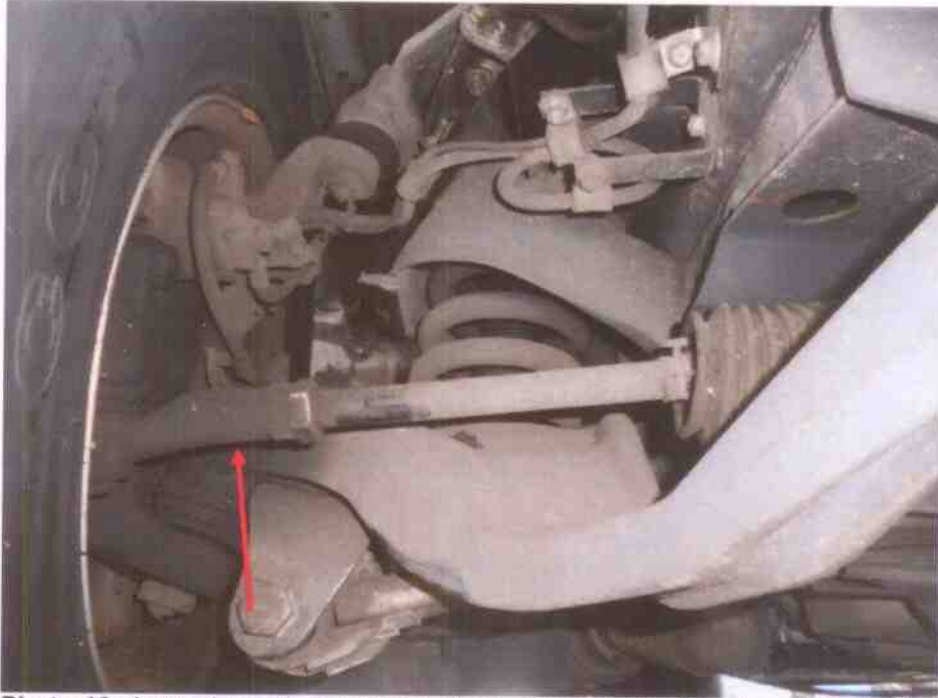


Photo 18 shows the various undercarriage components at the front left wheel of the Motor Bus, in particular the steering tie rod end (arrowed). The various steering mechanical components of the Motor Bus were all found to be intact without any visible damage. There was also no sign of fluid stain(s) observed on the various undercarriage components.

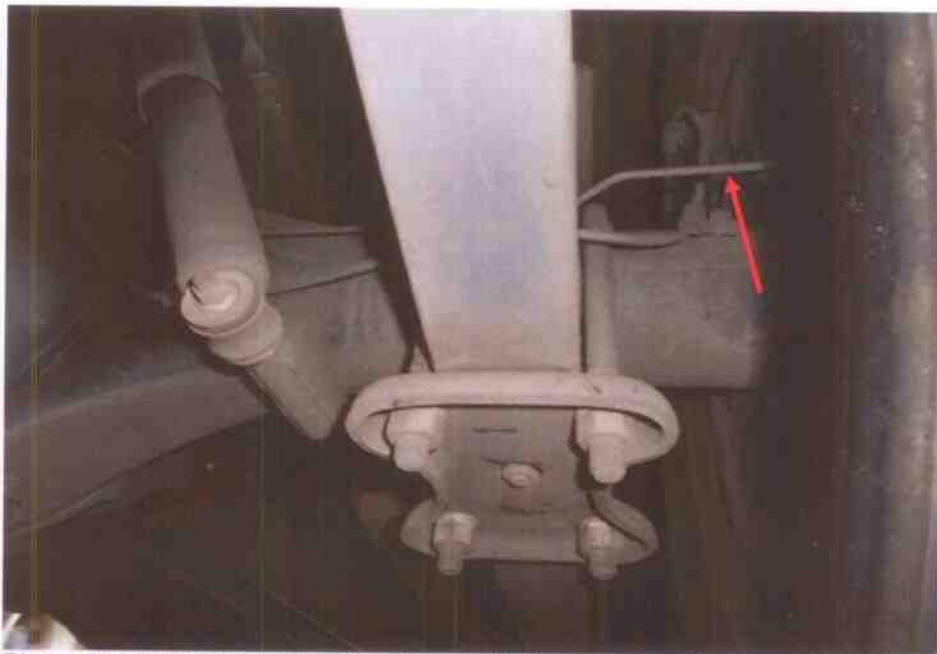


Photo 19 shows the brake pipe (arrowed) at the rear right wheel of the Motor Bus. I did not observe any leakage of brake fluid at the time of my inspection of the Motor Bus.



Photo 20 shows the undercarriage components at the front right wheel of the Motor Bus, in particular the brake hose (arrowed). The Motor Bus's braking system was likely to be in serviceable condition at the material time of accident as my visual examination of the various mechanical parts in the braking system did not produce any observations that had suggested otherwise. This was also taking into consideration that the brake fluid was of sufficient level and without any visible contamination.

Electronic Safety / Warning Indicators

14. 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.

Operational Behaviour of the Motor Bus

15. I was not able to carry out any operational test to primarily determine whether there was any operational abnormality to the engine system, transmission system, steering system and braking system of the Motor Bus due to the unavailability of its key. In any case, the extent of damage to the Motor Bus would have made it unsafe for any operational test to be carried out even if the key was made available.

Conclusion

16. At the time of my 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 due to the unavailability of its key. However basing purely on my 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 all the various mechanical components were found to be intact and undamaged.
17. The observations gathered from my 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.
18. The 2 front tyres and 4 rear 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 6 tyres. The 6 tyres were also observed to be sufficiently inflated for vehicular operation with remaining tread depth of approximately 3mm to 6mm.



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