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3rd December 2019

Fatal Accident Investigation Team

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

MECHANICAL INSPECTION REPORT OF GARBAGE TRUCK XD 4956K

1. I refer to your request on 8th July 2019 to conduct a physical inspection of a Garbage Truck bearing registration number XD 4956K (herein referred to as "**Garbage Truck**"), which was involved in a fatal road traffic accident on 28th June 2019.
2. The objective of this inspection is to determine if there was any possible mechanical failure to the Garbage Truck that may have contributed to the accident.
3. Following the request, I had carried out a physical inspection of the Garbage Truck on 3rd December 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

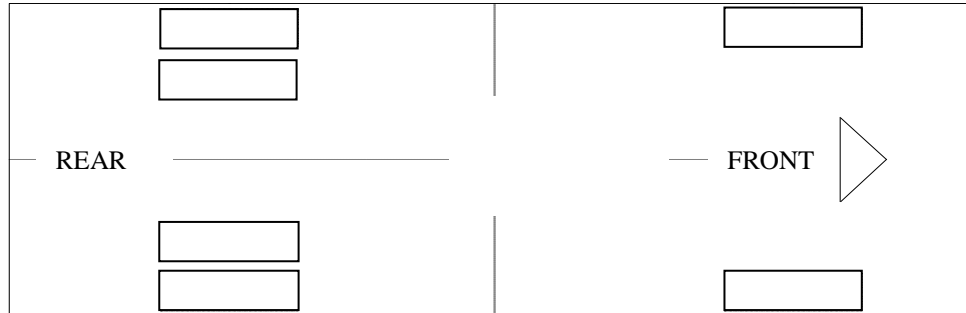
4. The mileage of the Garbage Truck at the time of my inspection was not recorded due to the damage in the ignition system as a result of the accident.
5. The Garbage Truck was observed to have sustained moderate damage at its front and left portion. Its front windscreen, left rear-view mirror, left door, rear left brake lamp and rear body panel was damaged as a result of the accident.

Tyres and Wheel Rims

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

Bridgestone 295/80 R22.5 (4.6mm)

Bridgestone 295/80 R22.5 (4.9mm)



Bridgestone 295/80 R22.5 (3.5mm)

Bridgestone 295/80 R22.5 (3.9mm)

7. The 6 tyres of the Garbage Truck were observed to be wrapped around standard steel wheel rims that were found to be without any damage. See photo 1 – 10 below.



Photo 1 shows a general view of the front body of the Garbage Truck at the time of my inspection. The Garbage Truck was observed to have sustained moderate damage at its front and left portion. Its front windscreen, left rear-view mirror, left door, rear left brake lamp and rear body panel was damaged as a result of the accident.



Photo 2 shows a close up view of the front body of the Garbage Truck at the time of my inspection. The Garbage Truck was observed to have sustained moderate damage at its front and left portion. Its front windscreen (circled) was damaged as a result of the accident



Photo 3 shows a close up view of the left body of the Garbage Truck at the time of my inspection. The Garbage Truck was observed to have sustained moderate damage at its front and left portion. Its left door (circled) and left rear-view mirror (arrowed) was damaged as a result of the accident



Photo 4 shows a general view of the front right body of the Garbage Truck at the time of my inspection, observed to have been unaffected by the accident.



Photo 5 shows a general view of the Garbage Truck's rear body at the time of my inspection. Its rear left brake lamp and rear body panel was damaged as a result of the accident.



Photo 6 shows a close up view of the Garbage Truck's rear body at the time of my inspection. Its rear left brake lamp (arrowed) and rear body panel (circled) was damaged as a result of the accident.



Photo 7 shows the condition of the front right tyre of the Garbage Truck, which was observed to be in serviceable condition with remaining tread depth of approximately 3.9 mm. 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 Garbage Truck.



Photo 8 shows the condition of the rear right tyre of the Garbage Truck, which was observed to be in serviceable condition with remaining tread depth of approximately 3.5mm. The tyre, which was wrapped around standard steel wheel rim, was also observed to be sufficiently inflated for vehicular operation.

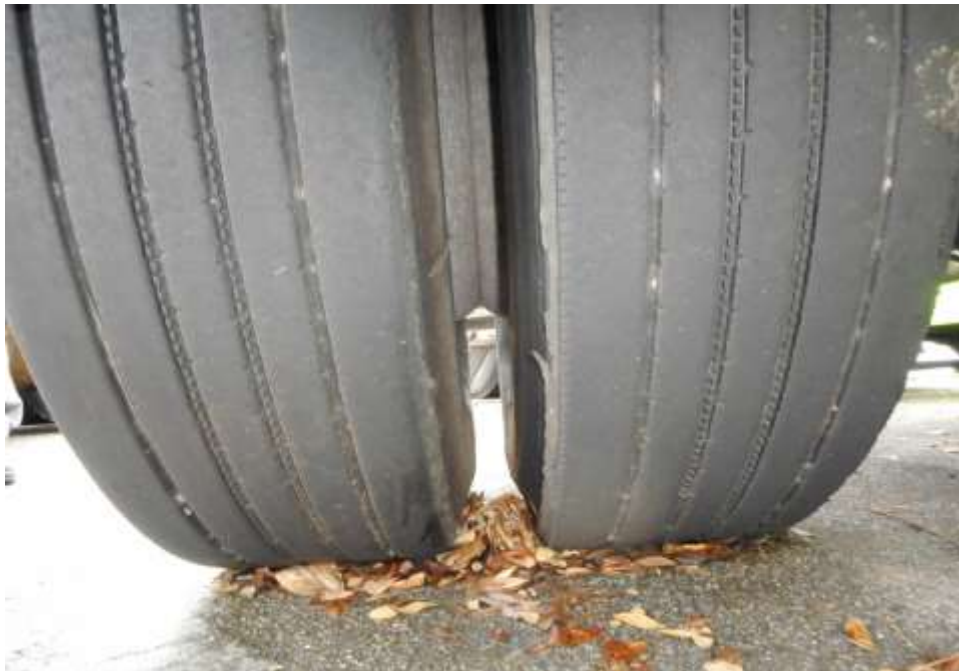


Photo 9 shows the condition of the rear left tyres of the Garbage Truck, which was observed to be in serviceable condition with remaining tread depth of approximately 4.6mm. The tyres, which were wrapped around standard steel wheel rim, were also observed to be sufficiently inflated for vehicular operation. There was also no damage found on all 6 steel wheel rims of the Garbage Truck.



Photo 10 shows the condition of the front left tyres of the Garbage Truck, which were observed to be in serviceable condition with remaining tread depth of approximately 4.9mm. 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 Garbage Truck.

Engine Compartment & Operating Fluids

8. Upon examination of the Garbage Truck's engine compartment, I had observed all the parts and components inside the engine compartment to be intact. Only the power steering fluid was found to be of sufficient level for operating purposes. Visually, there was also no contamination found to these fluids. However the air brake, engine oil level and the coolant level was not measured due to the readings of the various components can only be read from the instrument panel with the Garbage Truck engine started. Due to the accident, the engine was not able to be started. (unable to start)
9. Further examination of the engine compartment revealed, there was no sign(s) or indication(s) of fresh fluid leakage. However observed old fluid stain on the engine cover of the Garbage Truck.
10. My subsequent checks on the underside of the Garbage Truck also revealed no fluid stain. See photo 11 – 13 below.



Photo 11 shows a general view of the Garbage Truck's engine compartment, which was accessed by lifting the front cabin of the Garbage Truck. The various parts and components inside the engine compartment were intact. There was also no sign(s) or indication(s) of fresh fluid leakage. However there was old fluid stain on the engine cover.



Photo 12 shows the power steering fluid reservoir of the Garbage Truck at the time of my inspection. The power steering fluid was observed to be of sufficient level and without any visible contamination.



Photo 13 shows the undercarriage of the Garbage Truck, at the area where the engine housing located. I did find old fluid stain(s) on the underside oil sump of the Garbage Truck.

Steering System & Braking System

11. Static brake tests conducted on the Garbage Truck revealed no abnormality. The air 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 Garbage Truck. The braking system of the Garbage Truck was likely to be in serviceable condition at the material time. This was also taking into consideration that the air brake was of sufficient level, and also that there was no sign(s) of air leakage along the brake hoses, brake pipes and air cylinders.
12. Static brake and steering tests on the braking and steering system of the Garbage Truck was not conducted as the Garbage Truck was not able to be started due to the damage in the ignition system. 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 intact. However the rear right brake cylinder was damage due to the impact caused by the accident. See photo 14 - 22 below.



Photo 14 shows the brake cylinder of the (circled) the rear right wheel of the Garbage Truck. It was damaged was due to the impact caused by the result of the accident.



Photo 15 shows the brake pipe (arrowed) at the rear left wheel of the Garbage Truck. I did not observe any leakage of air at the time of my inspection of the Garbage Truck.



Photo 16 shows the brake pipe (arrowed) at the front left wheel of the Garbage Truck. I did not observe any leakage of air at the time of my inspection of the Garbage Truck.



Photo 17 shows the brake pipe (arrowed) at the front right wheel of the Garbage Truck. I did not observe any leakage of brake fluid at the time of my inspection of the Garbage Truck.



Photo 18 shows the air brake cylinders (arrowed) at the undercarriage of the Garbage Truck. I did not observe any leakage of air brake fluid at the time of my inspection of the Garbage Truck.



Photo 19 shows the various undercarriage components at the front right wheel of the Garbage Truck, 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 Garbage Truck 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 20 shows the various undercarriage components at the front left wheel of the Garbage Truck, in particular the steering tie rod end (arrowed). The various undercarriage components of the Garbage Truck 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.

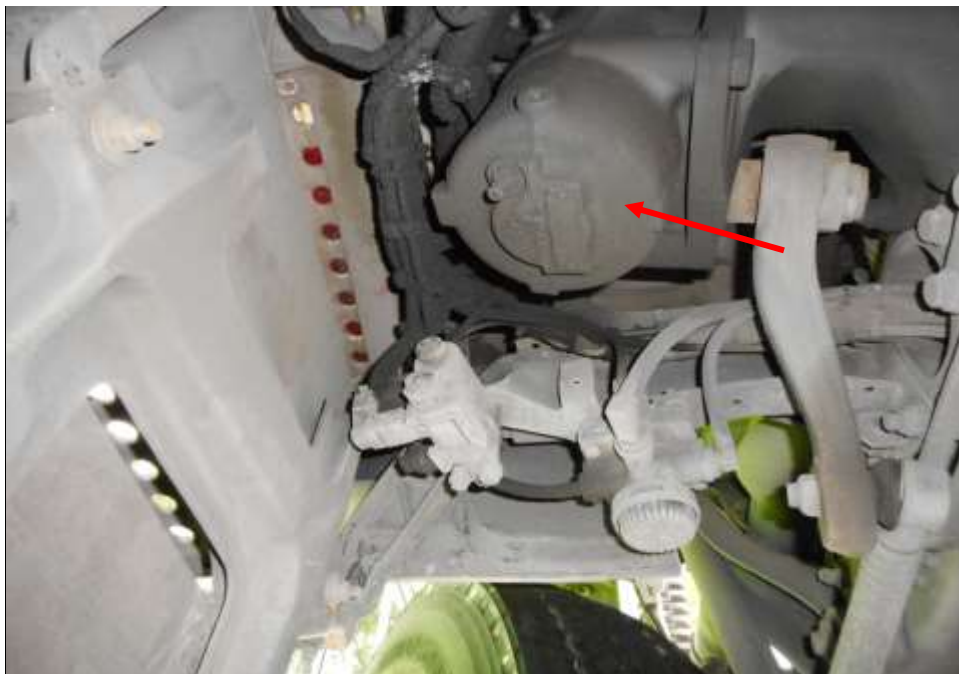


Photo 21 shows the steering box component (arrowed) at the undercarriage of the Garbage Truck was found to be intact without any visible damage. There was also no sign of fluid stain(s) observed, only rust found on the surface of the component.

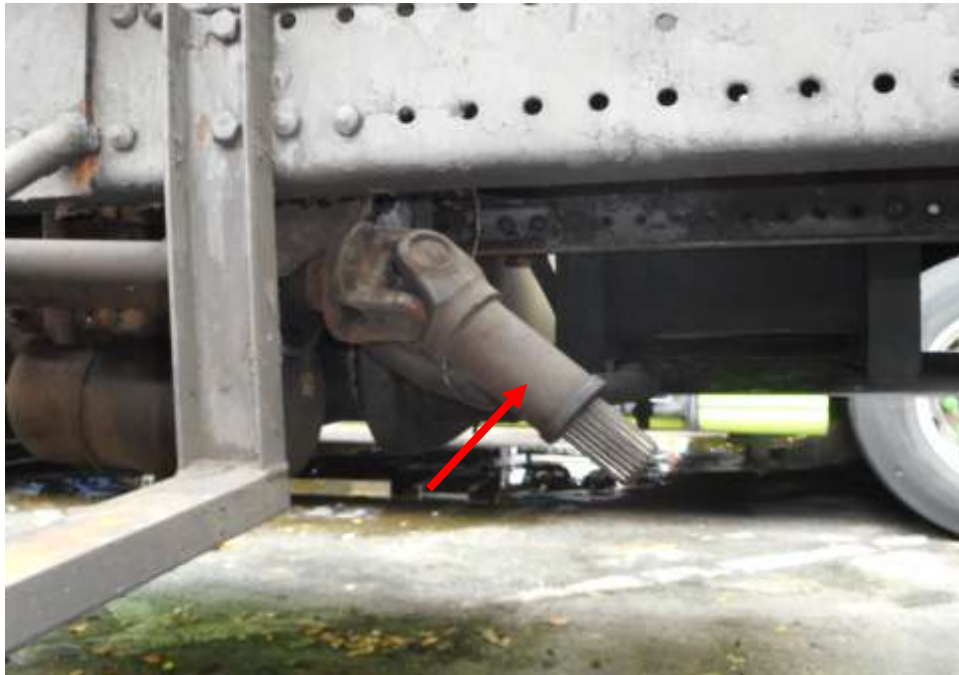


Photo 22 shows the driveshaft component (arrowed) at the undercarriage of the Garbage Truck was found to be damage as a result of the accident.

Electronic Safety / Warning Indicators

13. The Garbage Truck automatic self-test of the functionality of its various electronic operating systems was not conducted due to the damage to its engine and ignition system as a result of the accident. (unable to be started)

Operational Behaviour of the Garbage Truck

14. Operational test to primarily determine whether there was any abnormality to the engine system, transmission system and braking system of the Garbage Truck could not be conducted given the extent of damage that it had sustained (engine and ignition system damaged).

Conclusion

15. For this particular case, I was unable to determine whether there was any possible mechanical failure to the Garbage Truck 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.

16. The 6 tyres fitted on the Garbage Truck 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 Garbage Truck 6 tyres. The 6 tyres of the Garbage Truck were also observed to be sufficiently inflated for vehicular operation with remaining tread depth of approximately 3.5mm – 4.9 mm.

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