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Your Ref: TP/IP/15449/2020 7th July 2020
Our Ref : CI/TPD20004877/P

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

MECHANICAL INSPECTION REPORT OF OIL TANKER YN 2909X

1. I refer to your request on 2nd April 2020 to conduct a physical inspection of an Oil Tanker bearing registration number YN 2909X (herein referred to as "**Oil Tanker**"), which was involved in a fatal road traffic accident on 21st March 2020.

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

3. Following the request, I had carried out a physical inspection of the Oil Tanker on 2nd July 2020 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.

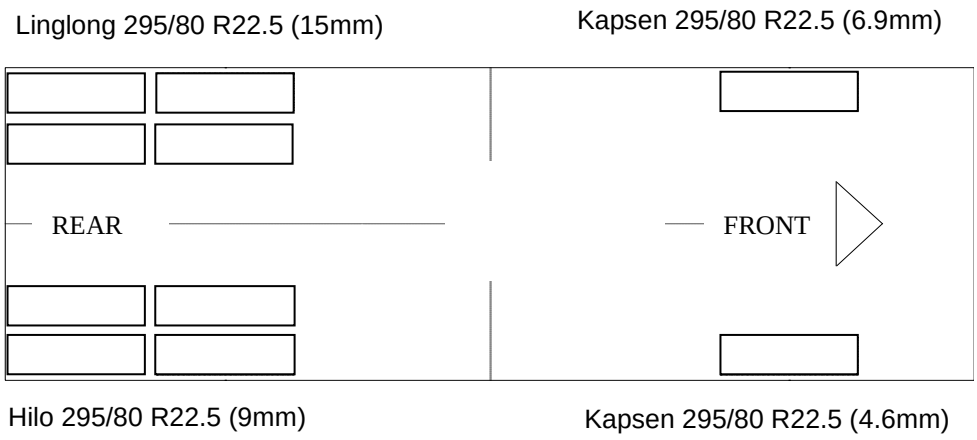
General Condition

4. The mileage of the Oil Tanker at the time of my inspection was 368,165km.

5. The Oil Tanker was observed to have sustained damage at its front portion. Its front windscreen and front body panel were amongst the body parts that were damaged as a result of the accident.

Tyres and Wheel Rims

6. The 10 tyres of the Oil Tanker 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 10 tyres of the Oil Tanker. The tyre brand, tyre size and remaining tread depth of the 10 tyres of the Oil Tanker were recorded as follows:-



7. The 10 tyres of the Oil Tanker were observed to be wrapped around standard steel wheel rims that were found to be without any damage. See photo 1 – 11 below.

Photo 1 shows a general view of the instrument cluster of the Oil Tanker at the time of my inspection. The mileage of the Oil Tanker was 368,165km

Photo 2 shows a general view of the front body of the Oil Tanker at the time of my inspection. The Oil Tanker was observed to have sustained damage at its frontal portion. Its front windscreen and front body panel were amongst the body parts that were damaged as a result of the accident.

Photo 3 shows the close up view of the Oil Tanker front body at the time of my inspection. The Oil Tanker was observed to have sustained damage at its front windscreen (circled), as a result of the accident.

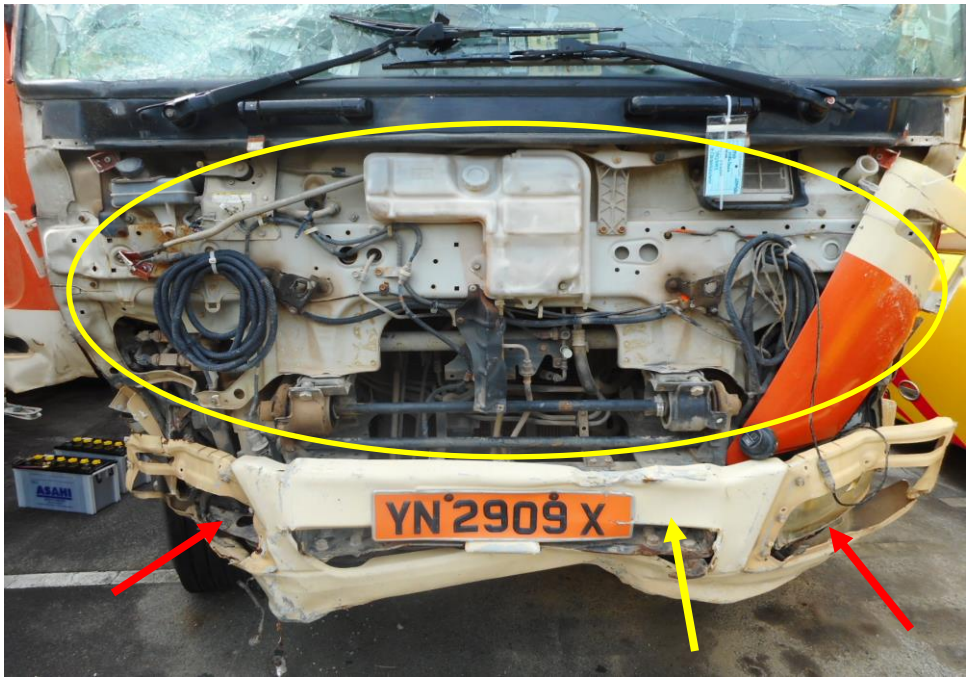


Photo 4 shows the close up view of the Oil Tanker front body at the time of my inspection. The Oil Tanker was observed to have sustained damage at its front body panel (circled), it's both front headlamps (red arrow) and front bumper (yellow arrow) was also damaged as a result of the accident.

Photo 5 shows a general view of the front right body of the Oil Tanker at the time of my inspection, observed to have been unaffected by the accident.

Photo 6 shows a general view of the front right body of the Oil Tanker at the time of my inspection, observed to have been unaffected by the accident.

Photo 7 shows a general view of the Oil Tanker's rear body at the time of my inspection. There was no damage found to the rear portion of the Oil Tanker.

Photo 8 shows the condition of the front right tyre of the Oil Tanker, which was observed to be in serviceable condition with remaining tread depth of approximately 4.6 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 10 tyres that were fitted on the Oil Tanker.

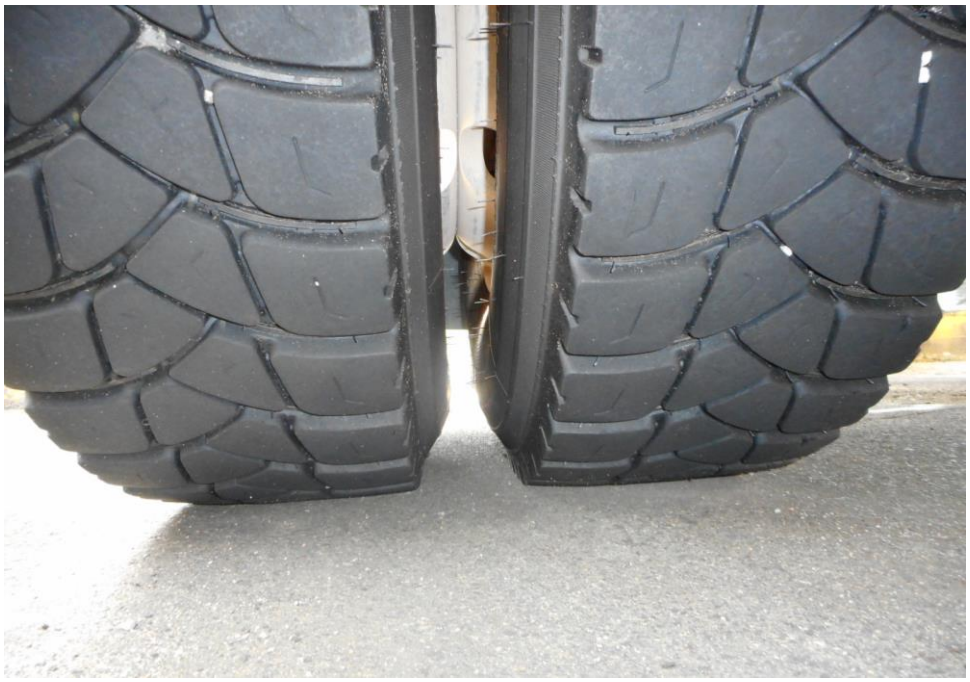


Photo 9 shows the condition of the rear right tyre of the Oil Tanker, which was observed to be in serviceable condition with remaining tread depth of approximately 9mm. The tyre, which was wrapped around standard steel wheel rim, was also observed to be sufficiently inflated for vehicular operation.

Photo 10 shows the condition of the rear left tyres of the Oil Tanker, which was observed to be in serviceable condition with remaining tread depth of approximately 15mm. 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 10 steel wheel rims of the Oil Tanker.

Photo 11 shows the condition of the front left tyres of the Oil Tanker, which were observed to be in serviceable condition with remaining tread depth of approximately 6.9mm. 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 10 tyres that were fitted on the Oil Tanker.

Engine Compartment & Operating Fluids

8. Upon examination of the Oil Tanker'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, power steering fluid 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 Oil Tanker.

10. My subsequent checks on the underside of the Oil Tanker also revealed no fluid stain. Visually, the various undercarriage components of the Oil Tanker were all observed to be intact and without any visible damage. See photo 12 – 17 below.

Photo 12 shows a general view of the Oil Tanker's engine compartment, which was accessed by lifting the front cabin of the Oil Tanker. 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 13 shows the air in the air brake cylinders of the Oil Tanker at the time of my inspection. The air in the cylinder was observed to be of sufficient level & serviceable at the time of the accident.

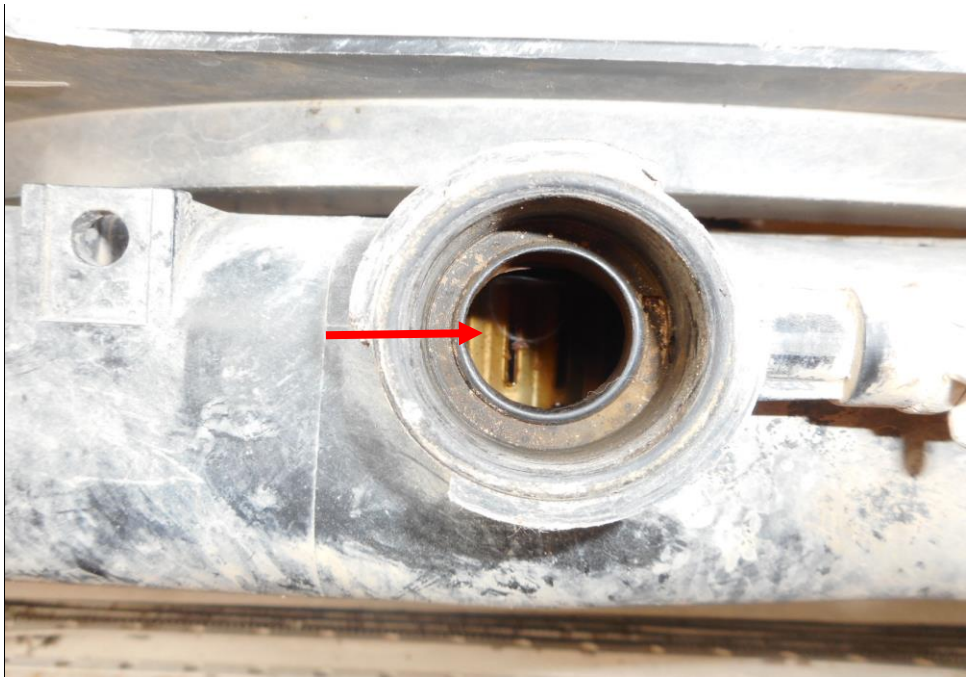


Photo 14 shows the engine coolant reservoir of the Oil Tanker at the time of my inspection. The engine coolant was observed to be of sufficient level (arrowed) and without any visible contamination.

Photo 15 shows the engine oil dipstick of the Oil Tanker at the time of my inspection. The engine oil was observed to be of sufficient level and without any visible contamination.

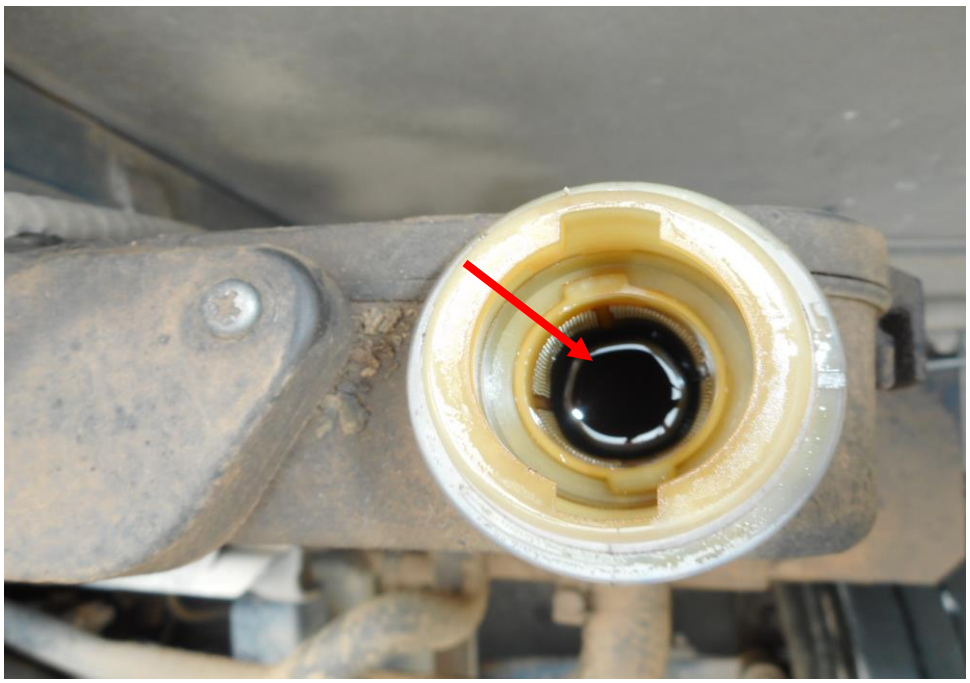


Photo 16 shows the power steering reservoir of the Oil Tanker at the time of my inspection. The steering fluid was observed to be of sufficient level (arrowed) and without any visible contamination.

Photo 17 shows the undercarriage of the Oil Tanker, at the area where the engine housing located. I did not find any sign(s) or indication(s) of fluid leak and/or fluid stain(s) on the underside of the Oil Tanker.

Steering System & Braking System

11. Static brake tests conducted on the Oil Tanker 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 Oil Tanker. The braking system of the Oil Tanker 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 test on the steering system of the Oil Tanker also revealed no abnormality to the steering system. I did not experience any abnormal free play and/or other resistance when turning the steering wheel left and right to full lock positions. 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 18 - 26 below.

Photo 18 shows the brake pipe (arrowed) at the rear right wheel of the Oil Tanker. I did not observe any leakage of brake fluid at the time of my inspection of the Oil Tanker. My static tests of the Oil Tanker'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 Oil Tanker was likely to be in serviceable condition at the material time of accident.

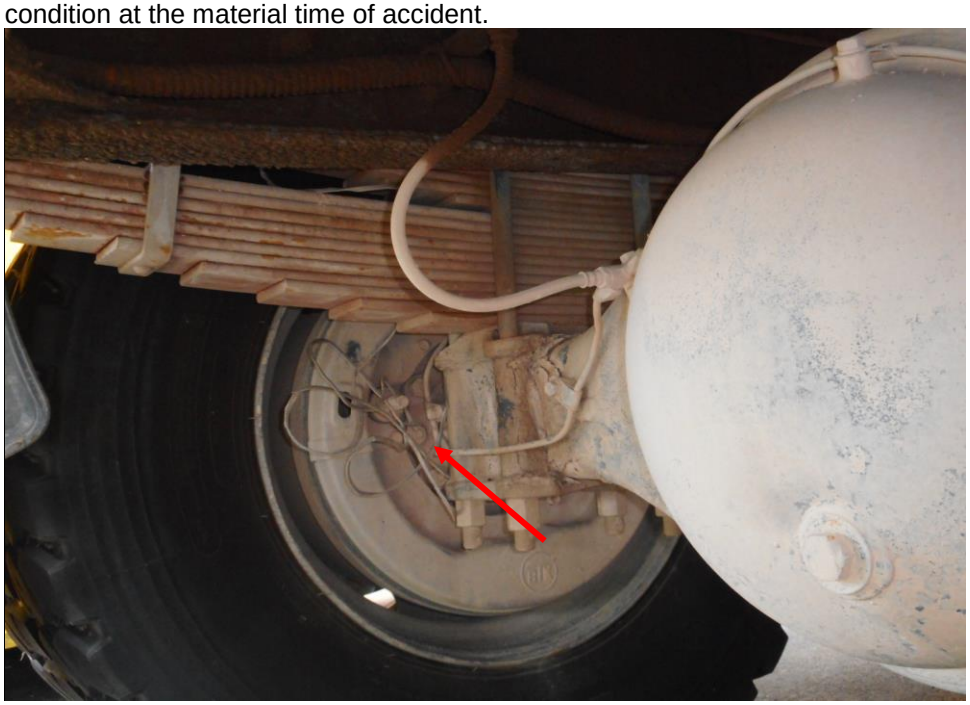


Photo 19 shows the brake pipe (arrowed) at the rear left wheel of the Oil Tanker. I did not observe any leakage of brake fluid at the time of my inspection of the Oil Tanker. My static tests of the Oil Tanker's braking system, along with my visual examination of the various mechanical components in the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

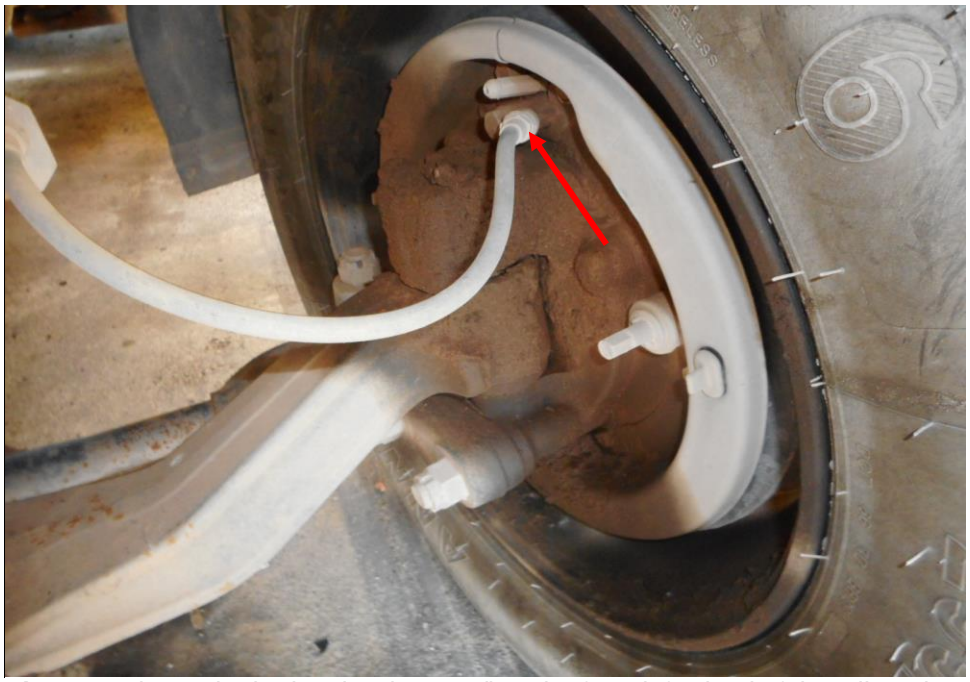


Photo 20 shows the brake pipe (arrowed) at the front left wheel of the Oil Tanker. I did not observe any leakage of brake fluid at the time of my inspection of the Oil Tanker. My static tests of the Oil Tanker's braking system, along with my visual examination of the various mechanical components in the braking system, had indicated that there was no internal leakage of pressure/vacuum. Hence the braking system of the Oil Tanker was likely to be in serviceable condition at the material time of accident.

Photo 21 shows the brake pipe (arrowed) at the front right wheel of the Oil Tanker. I did not observe any leakage of brake fluid at the time of my inspection of the Oil Tanker. My static tests of the Oil Tanker'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 Oil Tanker was likely to be in serviceable condition at the material time of accident.

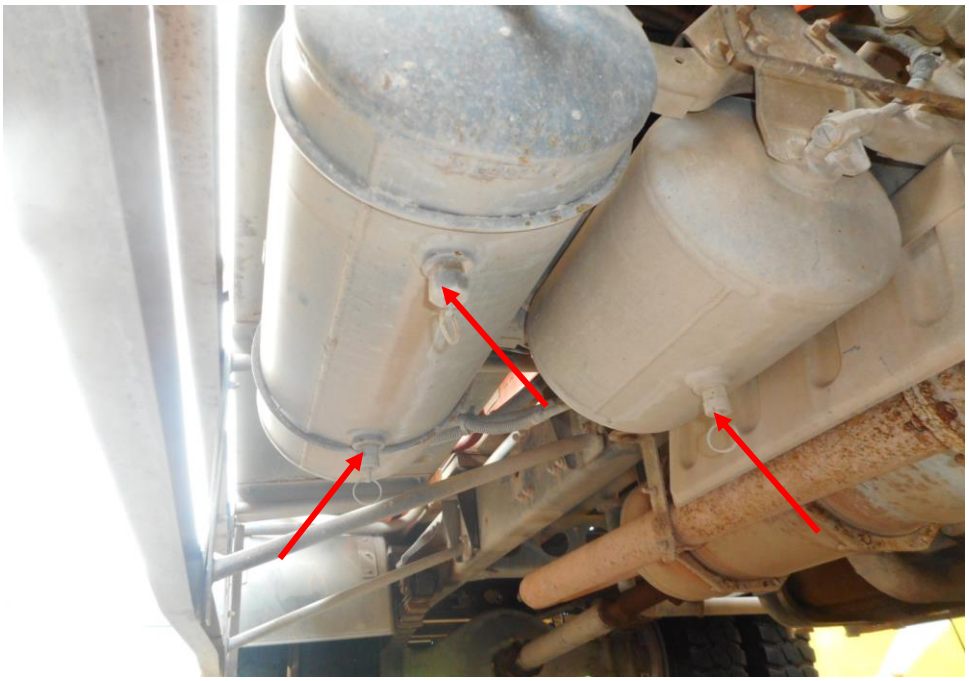


Photo 22 shows the air brake cylinders (arrowed) at the undercarriage of the Oil Tanker. I did not observe any leakage of air brake fluid at the time of my inspection of the Oil Tanker. My static tests of the Oil Tanker's braking system, along with my visual examination of the various mechanical components in the braking system had indicated that there was no internal leakage of pressure/vacuum. Hence the braking system of the Oil Tanker was likely to be in serviceable condition at the material time of accident.

Photo 23 shows the various undercarriage components at the front right wheel of the Oil Tanker, 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 Oil Tanker 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 24 shows the various undercarriage components at the front left wheel of the Oil Tanker, in particular the steering tie rod end (arrowed). The various undercarriage components of the Oil Tanker 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.

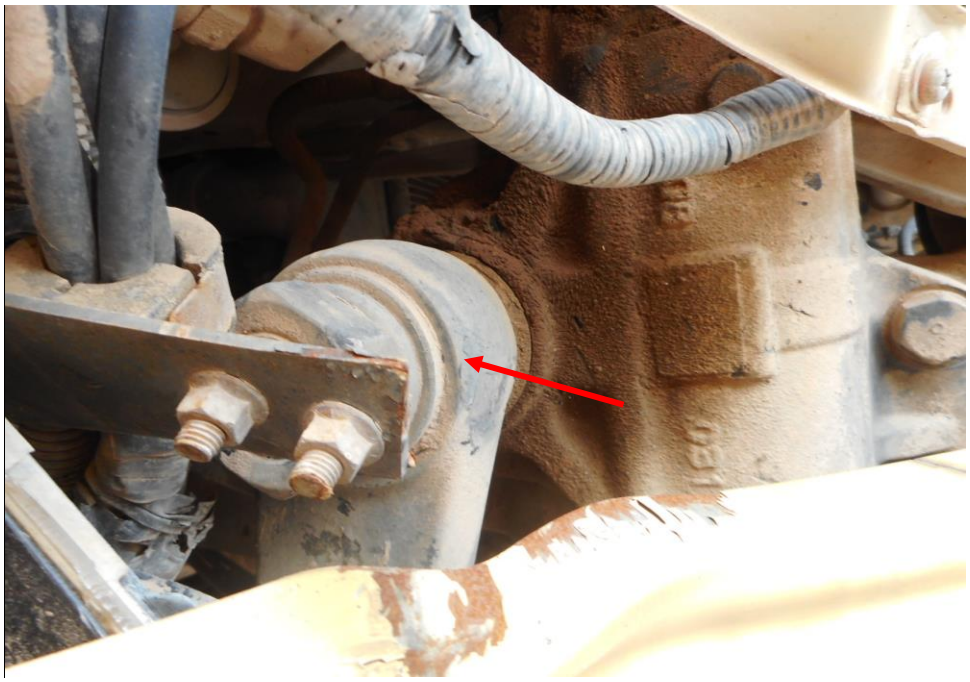


Photo 25 shows the steering box component (arrowed) at the undercarriage of the Oil Tanker was found to be intact without any visible damage. There was also no sign of fluid stain(s) observed on the various undercarriage components.

Photo 26 shows the front right wheel of the Oil Tanker turned to its full left. During my steering system test, I did not experience any abnormal free play and/or resistance when I had turned the steering wheel towards full left and full right. This would suggest that the steering system of the Oil Tanker was likely to be in serviceable condition at the material time of accident.

Electronic Safety / Warning Indicators

13. The Oil Tanker automatic self-test of the functionality of its various electronic operating systems was not conduct as there was no electric operating system installed in the Oil Tanker.

Seat Belts

14. The Front right and front left seat belts of the “Oil Tanker” 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 Oil Tanker

15. A short operational test to the Oil Tanker, 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 Oil Tanker forward, stopping, before reversing and coming to a stop again.

16. During the operational test, the various transmission gears of the Oil Tanker were able to be engage without any difficulty by stepping on the clutch pedal and manually shifting the gear lever. There were no abnormal sounds heard and/or abnormal behaviour of the Oil Tanker's engine system. It was able to move forward and backward normally. The braking system was also found to be in working condition as the Oil Tanker was able to slow down and come to a complete stop upon depressing of the brake pedal. See photo 2 & 26.

Conclusion

17. From my physical inspection of the Oil Tanker, it appears that its engine system, steering system, braking system and transmission system were all in serviceable condition. I did not find any evidence(s) to suggest that there was possible mechanical failure to the Oil Tanker that may have caused and/or contributed to the accident. This is also taking into consideration that the operational test of the Oil Tanker, which I 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 10 tyres fitted on the Oil Tanker 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 Oil Tanker 10 tyres. The 10 tyres of the Oil Tanker were also observed to be sufficiently inflated for vehicular operation with remaining tread depth of approximately 4.6mm – 15 mm.

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