

Your Ref: TP/IP/50349/2020
Our Ref : CI/TPD21000237/P

18th January 2021

General Investigation Team

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

MECHANICAL INSPECTION REPORT OF MOTOR LORRY YL 1643D

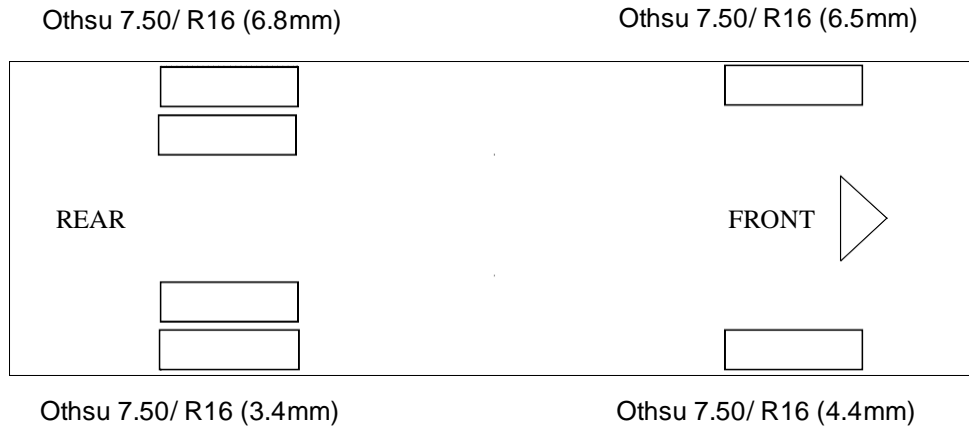
1. I refer to your request on 5th January 2021 to conduct a physical inspection of a Motor Lorry bearing registration number YL 1643D (herein referred to as "**Motor Lorry**"), which was involved in a road traffic accident.
2. The objective of this inspection is to determine if there was any possible mechanical failure to the Motor Lorry that may have contributed to the accident.
3. Following the request, I had carried out a physical inspection of the Motor Lorry on 3th March 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 Motor Lorry at the time of my inspection was 418,054km.
5. The Motor Lorry appeared to have sustained damage at its frontal portion. Its front windscreen, front body panel, front bumper, both front headlamps, left and right doors were damage at the time of my inspection.

Tyres and Wheel Rims

6. The 6 tyres of the Motor Lorry 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 Lorry 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 – 13 below.



Photo 1 shows a general view of the instrument cluster of the Motor Lorry at the time of my inspection. The mileage of the Motor Lorry was 418,054 km



Photo 2 shows a general view of the rear body of the Motor Lorry at the time of my inspection. The Motor Lorry was observed to be intact and unaffected by the accident.



Photo 3 shows a general view of the Motor Lorry's frontal portion at the time of my inspection. It appeared to have sustained damage at its frontal portion. Its front windscreen, front body panel, front bumper, both front headlamps, left and right doors were damage at the time of my inspection.



Photo 4 shows a close up view of the Motor Lorry's frontal portion at the time of my inspection. It appeared to have sustained damage at its frontal portion. Its front windscreen (circled) and front body panel (arrowed) was damage at the time of my inspection as a result of the accident.



Photo 5 shows a close up view of the Motor Lorry's frontal portion at the time of my inspection. It appeared to have sustained damage at its frontal portion. Its front bumper (circled) and both front headlamps (arrowed) was damage at the time of my inspection as a result of the accident.



Photo 6 shows a close up view of the Motor Lorry's frontal portion at the time of my inspection. It appeared to have sustained damage at its frontal portion. Its right door (circled) was damage at the time of my inspection as a result of the accident.



Photo 7 shows a close up view of the Motor Lorry's frontal portion at the time of my inspection. It appeared to have sustained damage at its frontal portion. Its left door (circled) was damage at the time of my inspection as a result of the accident.



Photo 8 shows a general view of the right body of the Motor Lorry at the time of my inspection. The Motor Lorry was observed to be intact and unaffected by the accident.



Photo 9 shows a general view of the left body of the Motor Lorry at the time of my inspection. The Motor Lorry was observed to be intact and unaffected by the accident.



Photo 10 shows the condition of the front right tyre of the Motor Lorry, which was observed to be in serviceable condition with remaining tread depth of approximately 4.4mm. 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 Motor Lorry.



Photo 11 shows the condition of the rear right tyre of the Motor Lorry, which was observed to be in serviceable condition with remaining tread depth of approximately 3.4mm. The tyre, which was wrapped around standard steel wheel rim, it was observed to be sufficiently inflated for vehicular operation.



Photo 12 shows the condition of the rear left tyres of the Motor Lorry, which was observed to be in serviceable condition with remaining tread depth of approximately 6.8mm. 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 Motor Lorry.

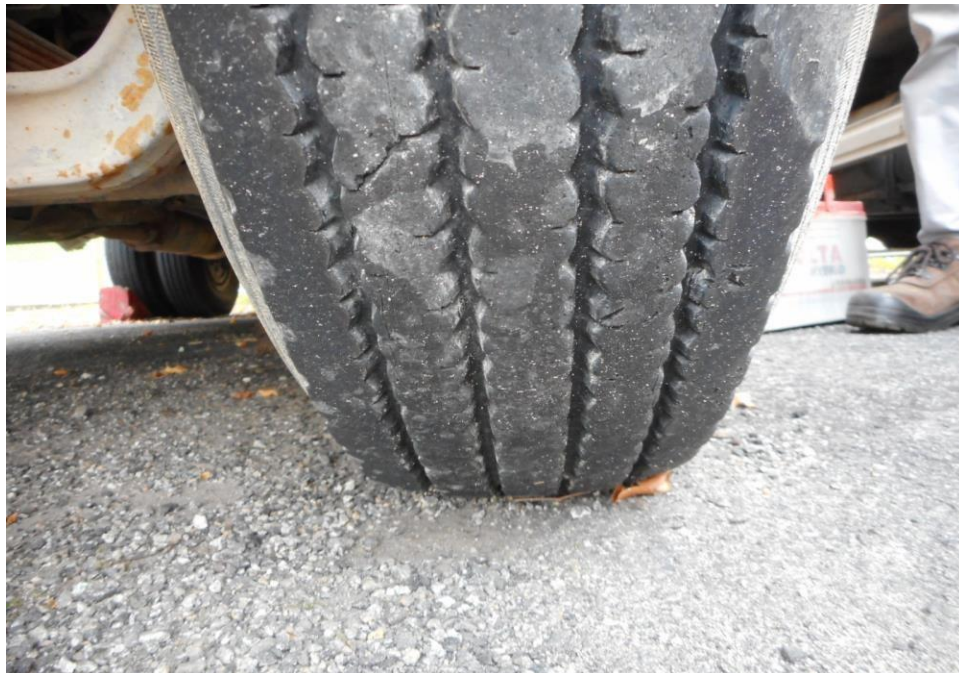


Photo 13 shows the condition of the rear right tyres of the Motor Lorry, which were observed to be in serviceable condition with remaining, tread depth of approximately 6.5mm. There was also no tear, cut or burst mark(s) on the outer and the inner sidewalls as well as across the tread of the 6 tyres that were fitted on the Motor Lorry.

Engine Compartment & Operating Fluids

8. Upon examination of the Motor Lorry'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 Motor Lorry.
10. My subsequent checks on the underside of the Motor Lorry also revealed no fluid stain. Visually, the various undercarriage components of the Motor Lorry were all observed to be intact and without any visible damage. See photo 14 – 19 below.



Photo 14 shows a general view of the Motor Lorry's engine compartment, which was accessed by lifting the front cabin of the Motor Lorry. 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 15 shows the brake fluid reservoir of the Motor Lorry at the time of my inspection. The brake fluid was observed to be of sufficient level (arrowed) and without any visible contamination.



Photo 16 shows the engine coolant reservoir of the Motor Lorry at the time of my inspection. The engine coolant was observed to be of sufficient level (arrowed) and without any visible contamination.



Photo 17 shows the engine oil dip stick of the Motor Lorry at the time of my inspection. The engine oil was observed to be of sufficient level and without any visible contamination.



Photo 18 shows the power steering fluid reservoir of the Motor Lorry at the time of my inspection. The power steering fluid was observed to be of sufficient level (arrowed) and without any visible contamination.



Photo 19 shows the undercarriage of the Motor Lorry, 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 Motor Lorry.

Steering System & Braking System

11. Static brake tests conducted on the Motor Lorry revealed abnormality. The brake booster do not responded well to the various tests conducted as there was abnormal movement of the brake pedal when it was depressed.
12. In general, the static brake tests had suggested that there was internal leakage of pressure/vacuum in the braking system of the Motor Lorry and braking system of the Motor Lorry was likely to be unserviceable 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. This was likely the cause that had resulted in the accident of the Motor Lorry.

13. Static test on the steering system of the Motor Lorry had revealed abnormality to the steering system. I had experience abnormal free play when turning the steering wheel left and right to full lock positions. This was due to the steering box that had been damaged as a result of the accident.
14. However, my visual examination of the other 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 20 - 28 below.



Photo 20 shows the brake pipe (arrowed) at the rear right wheel of the Motor Lorry. I did not observe any leakage of brake fluid at the time of my inspection of the Motor Lorry.



Photo 21 shows the brake pipe (arrowed) at the rear left wheel of the Motor Lorry. I did not observe any leakage of brake fluid at the time of my inspection of the Motor Lorry.



Photo 22 shows the brake hose/pipe (arrowed) at the front right wheel of the Motor Lorry. No leakage of brake fluid was observed. Visual examination of the various components of the braking system like the brake drum (circled), 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 23 shows the brake hose/pipe (arrowed) at the front left wheel of the Motor Lorry. No leakage of brake fluid was observed. Visual examination of the various components of the braking system like the brake drum (circled), 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.

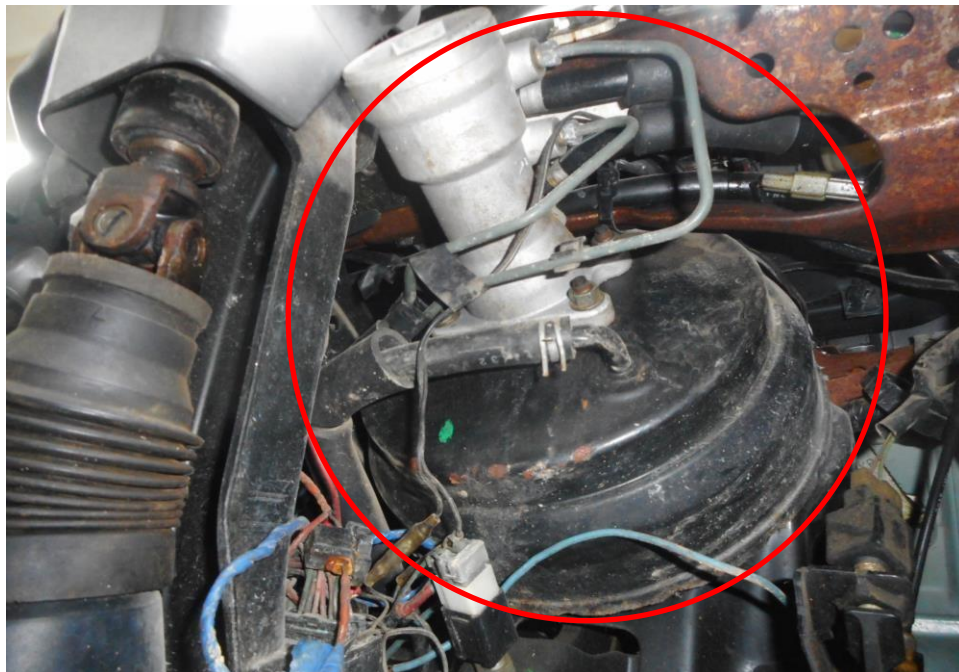


Photo 24 shows the brake booster (arrowed) of the Motor Lorry. No leakage of brake fluid was observed. Visual examination of the various components of the brake booster had revealed all to be intact and without visible damage at the time of inspection. There was also no sign of fluid stain(s) observed on the various undercarriage components.

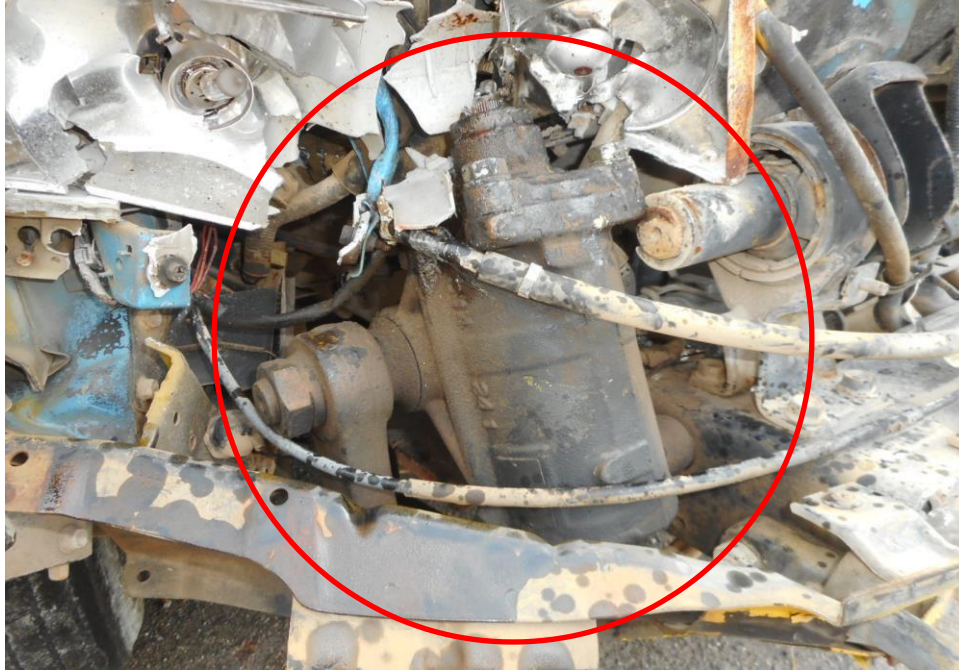


Photo 25 shows a general view of the steering box (circled) of the Motor Lorry at the time of my inspection. The steering box was observed to be damaged as result of the accident.



Photo 26 shows a close up view of the steering box (circled) of the Motor Lorry at the time of my inspection. The steering box was observed to be damaged as result of the accident.



Photo 27 shows the various undercarriage components at the front right wheel of the Motor Lorry, 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 Motor Lorry 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 28 shows the various undercarriage components at the front left wheel of the Motor Lorry, in particular the steering tie rod end (arrowed). The various undercarriage components of the Motor Lorry 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.

Electronic Safety / Warning Indicators

15. Motor Lorry's automatic self-test of the functionality of its electronic operating systems was not conducted as the Motor Lorry was not fitted with these systems.

Operational Behaviour of the Motor Lorry

16. Operational test to primarily determine whether there was any abnormality to the engine system, transmission system and braking system of the Motor Lorry could not be conducted given the extent of damage that it had sustained (Steering systems of the Motor Lorry damaged as a result of the accident.).

Conclusion

17. For this particular case, I was able to determine possible mechanical failure to the Motor Lorry that may have contributed to the accident. During the static test conducted to its braking system. The brake booster do not responded well to the various tests conducted as there was abnormal movement of the brake pedal when it was depressed.
18. We were able to determine that there was internal leakage of pressure/vacuum in the braking system of the Motor Lorry and the braking system of the Motor Lorry was likely to be unserviceable condition at the material time. As this was also taking into consideration that there was no damaged the exterior casing of the brake booster and brake fluid was of sufficient level, also that there was no sign(s) of brake fluid leakage along the brake hoses and brake pipes. This abnormality to the braking system of the Motor Lorry had likely caused the accident.

19. The 6 tyres fitted on the Motor Lorry 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 3.4mm – 6.8mm.

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