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Your Ref: TP/IP/56107/2021 27th December 2021
Our Ref : CI/TPD21013037/P

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

MECHANICAL INSPECTION REPORT OF MOTOR TIPPER, XD 6191L

1. I refer to your request on 22nd December 2021 to conduct a visual inspection of a Motor Tipper bearing registration number XD 6191L (herein referred to as "**Motor Tipper**"), which was involved in a road traffic accident on 24th November 2021.

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

3. Following the request, I had carried out a visual inspection of the Motor Tipper on 27th December 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

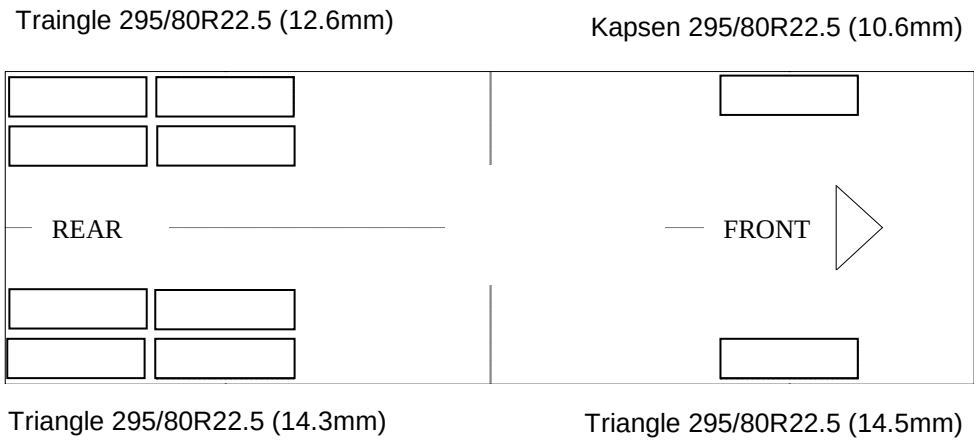
4. The mileage of the Motor Tipper at the time of my inspection was 660,397km.

5. The Motor Tipper was observed to sustained damage at its front and rear portion. Its front bumper and rear tipper body panel were damage at the time of my inspection as a result of the accident.

Tyres and Wheel Rims

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

Motor Tipper



7. The 10 tyres 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 Motor Tipper at the time of my inspection. The mileage of the Motor Tipper was 660,397km

Photo 2 shows a general view of the front body of the Motor Tipper at the time of my inspection. The Motor Tipper was observed to sustained damage at its front portion. Its front bumper were damage at the time of my inspection as a result of the accident.

Photo 3 shows a close up view of the front body of the Motor Tipper at the time of my inspection. The Motor Tipper was observed to sustained damage at its front portion. Its front bumper (circled) were damage at the time of my inspection as a result of the accident.

Photo 4 shows a general view of the Motor Tipper's rear body at the time of my inspection. The Motor Tipper was observed to sustained damage at its rear portion. Its rear tipper body panel were damage at the time of my inspection as a result of the accident.

Photo 5 shows a close up view of the Motor Tipper's rear body at the time of my inspection. The Motor Tipper was observed to sustained damage at its rear portion. Its rear tipper body panel (circled) were damage at the time of my inspection as a result of the accident.

Photo 6 shows a general view of the right body of the Motor Tipper at the time of my inspection. The Motor Tipper was observed to be intact and unaffected by the accident.

Photo 7 shows a general view of the left body of the Motor Tipper at the time of my inspection. The Motor Tipper was observed to be intact and unaffected by the accident.

Photo 8 shows the condition of the front right tyre of the Motor Tipper, which was observed to be in serviceable condition with remaining tread depth of approximately 14.5mm. The tyre, which was wrapped around standard steel wheel rim, was also observed to be sufficiently inflated for vehicular operation. These 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 Motor Tipper.

Photo 9 shows the condition of the rear right tyre of the Motor Tipper, which was observed to be in serviceable condition with remaining tread depth of approximately 14.3m. 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 tyre of the Motor Tipper, which was observed to be in serviceable condition with remaining tread depth of approximately 12.6m. The tyre, which was wrapped around standard steel wheel rim, was also observed to be sufficiently inflated for vehicular operation.

Photo 11 condition of the front left tyre of the Motor Tipper, which was observed to be in serviceable condition with remaining tread depth of approximately 10.6mm. The tyre, which was wrapped around standard steel wheel rim, was also observed to be sufficiently inflated for vehicular operation.

Engine Compartment & Operating Fluids

8. Upon examination of the Motor Tipper's engine compartment, I had observed all the parts and components inside the engine compartment to be intact and unaffected by the accident. The air brake, power steering 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 Motor Tipper. However, we observed the gearbox shifter cable linkage to be damaged and detached as a result of the accident.

10. My subsequent checks on the underside of the Motor Tipper also revealed no fluid stain. Visually, the various undercarriage components of the Motor Tipper were all observed to be intact and without any visible damage. See photo 12 – 18 below.

Photo 12 shows a general view of the Motor Tipper's engine compartment, which was accessed by lifting the front cabin of the Motor Tipper. 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 a close up view of the Motor Tipper's engine compartment, which was accessed by lifting the front cabin of the Motor Tipper. The gearbox shifter cable linkage (arrowed) was observed to be damaged and detached as a result of the accident.

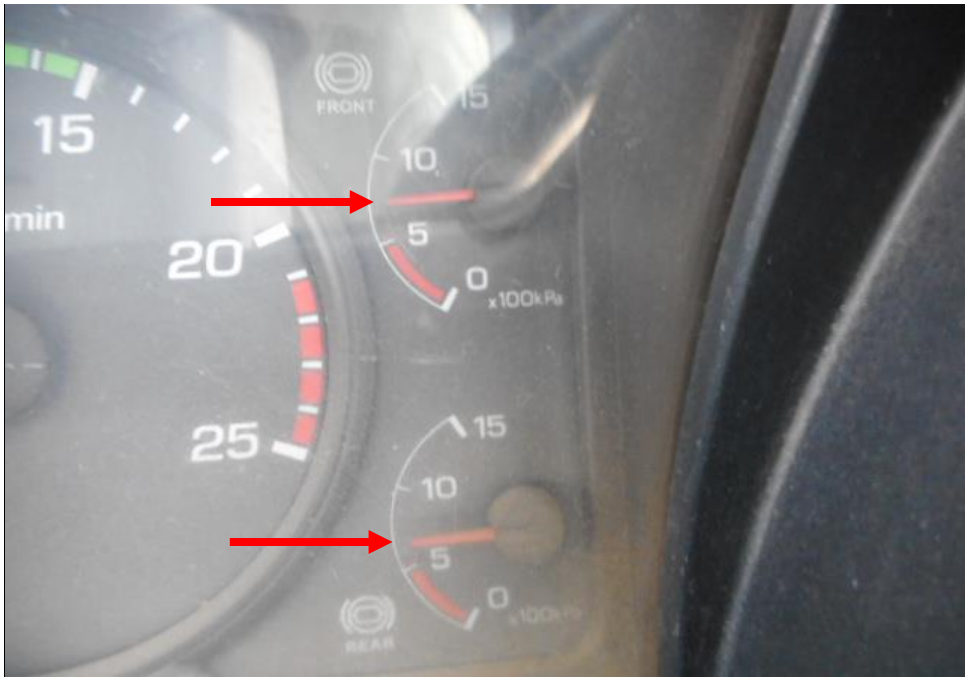


Photo 14 shows the air in the air brake cylinders of the Prime Mover at the time of my inspection. The air in the cylinder was observed to be of sufficient level & serviceable at the time of the accident.

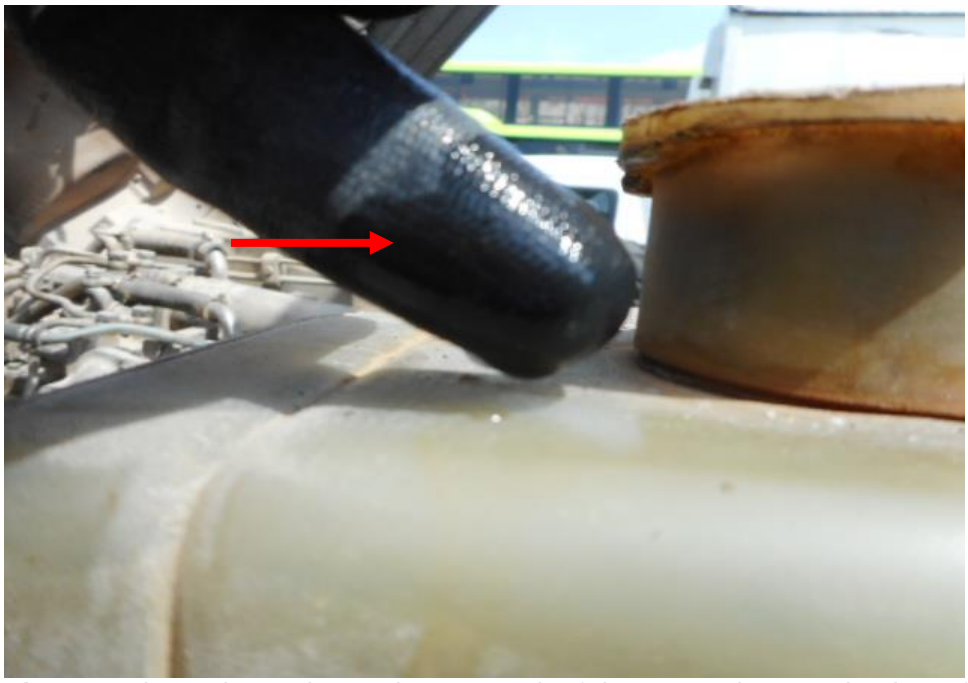


Photo 15 shows the engine coolant reservoir of the Motor Tipper at the time of my inspection. The engine coolant was observed to be of sufficient level (arrowed) and without any visible contamination.

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

Photo 17 shows the power steering fluid reservoir of the Motor Tipper at the time of my inspection. The power steering fluid was observed to be of sufficient level (arrowed) and without any visible contamination.

Photo 18 shows the undercarriage of the Motor Tipper, 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 Tipper.

Steering System & Braking System

11. Static brake tests conducted on the Motor Tipper revealed no abnormality. The 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 Motor Tipper. The braking system of the Motor Tipper was 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.

12. Static test on the steering system of the Motor Tipper 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 observed that the tie rod ends and steering box was intact, however the steering tie rods tie had sustained damages as a result of the accident. See photo See photo 19 - 27 below.

Photo 19 shows the brake pipe (arrowed) at the rear right wheel of the Motor Tipper. I did not observe any leakage of brake fluid at the time of my inspection of the Motor Tipper. My visual examination of the various mechanical components in the braking system, had indicated that these was no internal leakage of pressure/vacuum and these components were generally in good condition.

Photo 20 shows the brake pipe (arrowed) at the rear left wheel of the Motor Tipper. I did not observe any leakage of brake fluid at the time of my inspection of the Motor Tipper. My static tests of the Motor Tipper's braking system, along with my visual examination of the various mechanical components in the braking system, had indicated that these was no internal leakage of pressure/vacuum and these components were generally in good condition.

Photo 21 shows the brake pipe (arrowed) at the front right wheel of the Motor Tipper. I did not observe any leakage of brake fluid at the time of my inspection of the Motor Tipper. My static tests of the Motor Tipper's braking system, along with my visual examination of the various mechanical components in the braking system, had indicated that these was no internal leakage of pressure/vacuum and these components were generally in good condition.

Photo 22 shows the brake pipe (arrowed) at the front left wheel of the Motor Tipper. I did not observe any leakage of brake fluid at the time of my inspection of the Motor Tipper. My visual examination of the various mechanical components in the braking system had indicated that these was no internal leakage of pressure/vacuum and these components were generally in good condition.

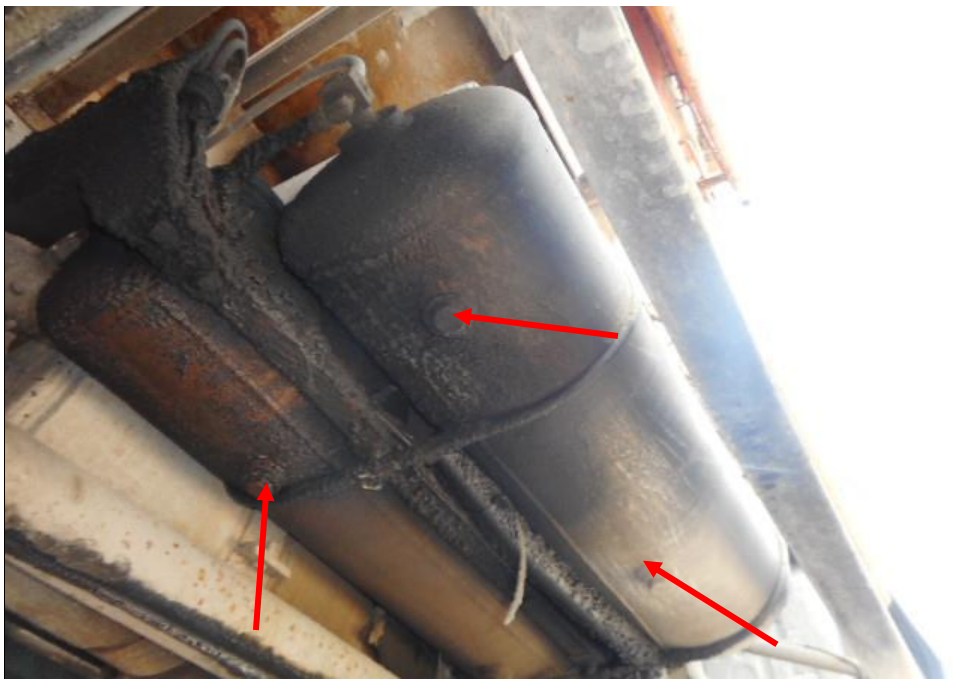


Photo 23 shows the air brake cylinders (arrowed) at the undercarriage of the Motor Tipper. I did not observe any leakage of air brake fluid at the time of my inspection of the Motor Tipper. My visual examination of the various mechanical components in the braking system had indicated that these was no internal leakage of pressure/vacuum and these components were generally in good condition.

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Photo 24 shows the various undercarriage components at the front right wheel of the Motor Tipper, in particular the steering tie rod end (arrowed) were found to be intact, these was also no sign of fluid stain(s) observed on the various undercarriage components.

Photo 25 shows the various undercarriage components at the front left wheel of the Motor Tipper, in particular the steering tie rod end (arrowed). were found to be intact, these was also no sign of fluid stain(s) observed on the various undercarriage components.

Photo 26 shows the steering tie rod end (arrowed) of the Motor Tipper. The steering tie rod was observed to sustained damage as a result of the accident.

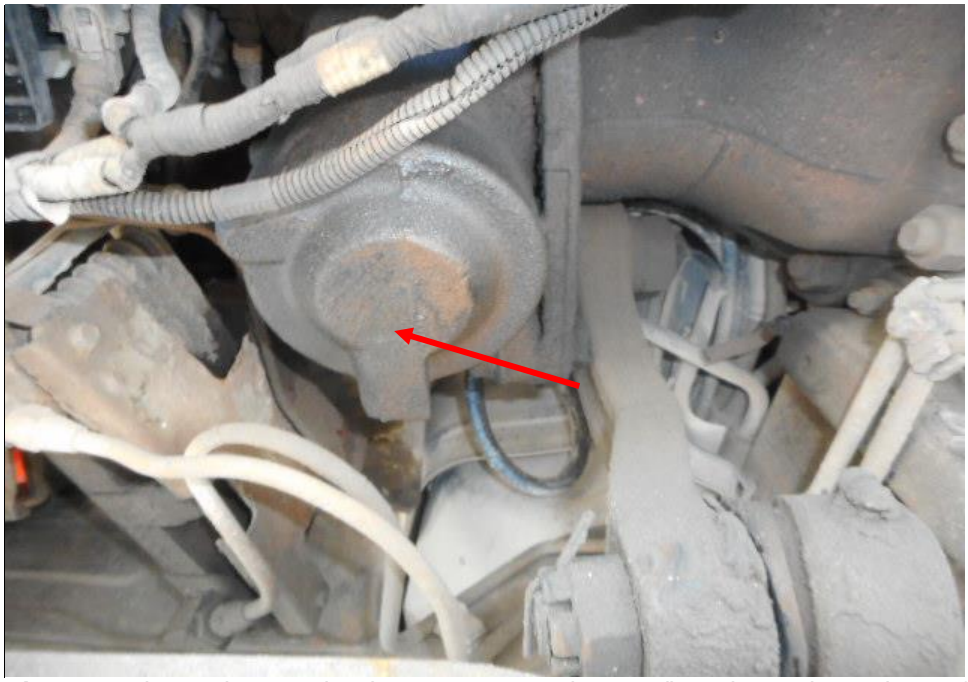

Photo 27 shows the steering box component (arrowed) at the undercarriage of the Motor Tipper was found to be intact without any visible damage. These was also no sign of fluid stain(s) observed on the various undercarriage components.

Electronic Safety / Warning Indicators

13. The Motor Tipper automatic self-test of the functionality of its various electronic operating systems was not conducted as the Motor Tipper was not equipped with them.

Operational Behaviour of the Tipper

14. A short operational test of the Motor Tipper, to primarily determine whether there was any abnormality to its various operating systems was not conducted as the gearbox could not be engaged as the gear shifter linkage was damaged and detached as a result of the accident.

Conclusion

15. For this particular case, I was unable to determine whether there was any possible mechanical failure to the Motor Tipper that may have contributed to the accident. The extent of damage that it had sustained at the gearbox shifter cable had prevented me from carrying out any operational test(s) to its engine system, transmission system, steering system and suspension system.

16. However, static brake and steering was able to be conducted and in general our visual inspection of the mechanical components of the Motor Tipper's braking 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 components of the Motor Tipper.

17. The 10 tyres fitted on the Motor Tipper 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 10 tyres. The 10 tyres were also observed to be sufficiently inflated for vehicular operation with remaining tread depth of approximately 10.6mm – 14.5mm.

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