

Your Ref: TP/IP/77615/2019
Our Ref : CI/TPD20001934/P

14th May 2020

Fatal Accident Investigation Team

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

MECHANICAL INSPECTION REPORT OF MOTOR TRAILER MCT 9184

1. I refer to your request on 3rd February 2020 to conduct a physical inspection of a Motor Trailer bearing registration number MCT 9184 (herein referred to as "**Motor Trailer**"), which was involved in a fatal road traffic accident on 16th December 2019.
2. The objective of this inspection is to determine if there was any possible mechanical failure to the Motor Trailer that may have contributed to the accident.
3. Following the request, I had carried out a visual inspection of the Motor Trailer on 14th May 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 Motor Trailer at the time of my inspection was not recorded due to a flat battery.
5. There Motor Trailer was observed to have sustained damage at its front portion. Its front right body panel & front right headlamp was damaged.

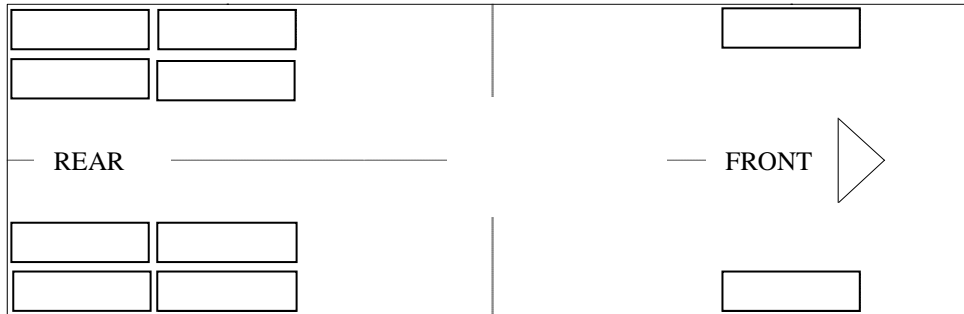
Tyres and Wheel Rims

6. The 2 front tyres and 8 rear tyres of the Motor Trailer and 12 tyres of the trailer 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 Motor Trailer and the 12 tyres of the trailer. The tyre brand, tyre size and remaining tread depth of the 10 tyres of the Motor Trailer and 12 tyres of the trailer were recorded as follows: -

Motor Trailer

ChaoYang 295/80 R22.5 (10.9mm)

Bridgestone 295/80 R22.5 (11.4mm)

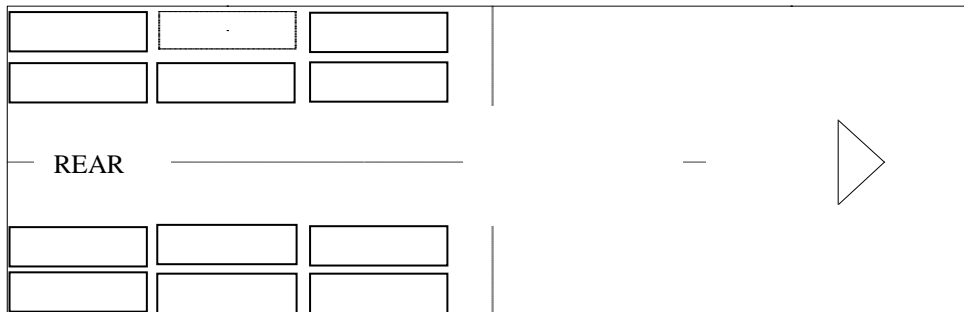


Bridgestone 295/80 R22.5 (9mm)

Bridgestone 295/80 R22.5 (11mm)

Trailer

JoyAll 295/80 R22.5 (6.8mm)



Michelin 295/80 R22.5 (4mm)

7. The 10 tyres of the Motor Trailer and 12 tyres of the Trailer were observed to be wrapped around standard steel wheel rims that were found to be without any damage. See photo 1 – 15 below.



Photo 1 shows a general view of the front body of the Motor Trailer at the time of my inspection. The Motor Trailer was observed to sustain damage at its front portion. Its front body panel & front right headlamp was damaged.



Photo 2 shows a close up view of the front body of the Motor Trailer at the time of my inspection. The Motor Trailer was observed to sustain damage at its front portion. Its front body panel & front right headlamp (circled) was damaged.



Photo 3 shows a general view of the front right body of the Motor Trailer at the time of my inspection. The Motor Trailer was observed to be intact and unaffected by the accident.



Photo 4 shows a general view of the front left body of the Motor Trailer at the time of my inspection. The Motor Trailer was observed to be intact and unaffected by the accident.



Photo 5 shows a general view of the Motor Trailer's rear body at the time of my inspection. The Motor Trailer was observed to be intact and unaffected by the accident.



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



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



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



Photo 9 shows a general view of the trailer's rear body at the time of my inspection. The Motor Trailer was observed to be intact.



Photo 10 shows the condition of the front right tyre of the Motor Trailer, which was observed to be in serviceable condition with remaining tread depth of approximately 11mm. 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 22 tyres that were fitted on the Motor Trailer.



Photo 11 shows the condition of the rear right tyre of the Motor Trailer, 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 12 shows the condition of the rear left tyres of the Motor Trailer, which was observed to be in serviceable condition with remaining tread depth of approximately 10.9mm. 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 Trailer.

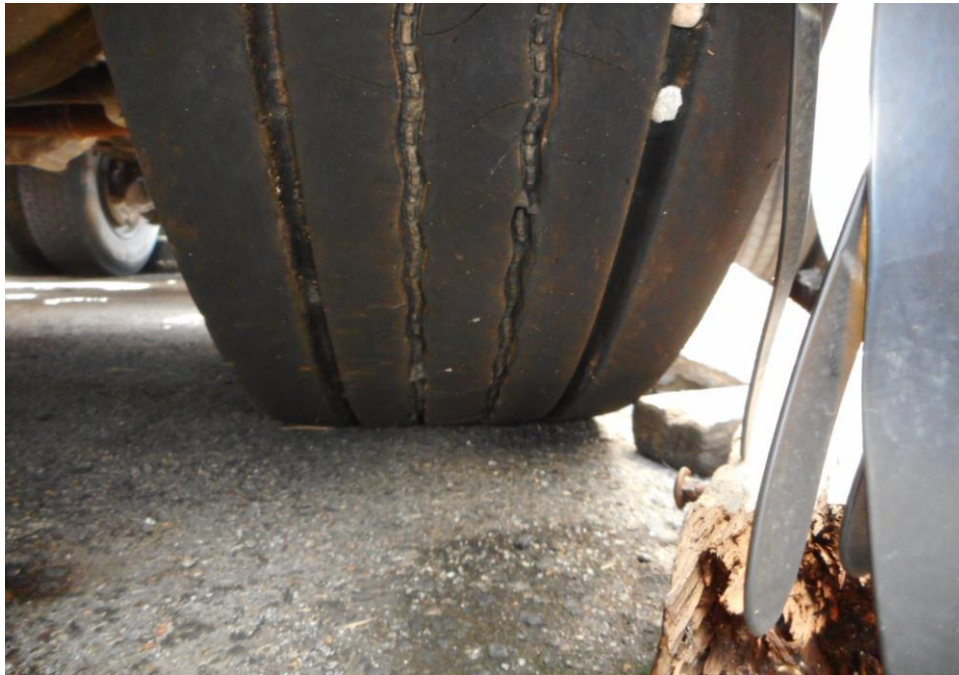


Photo 13 shows the condition of the front left tyres of the Motor Trailer, which were observed to be in serviceable condition with remaining tread depth of approximately 11.4mm. There was also no tear, cut or burst mark(s) on the outer and the inner sidewalls as well as across the tread of the 6 tyres that were fitted on the Motor Trailer.

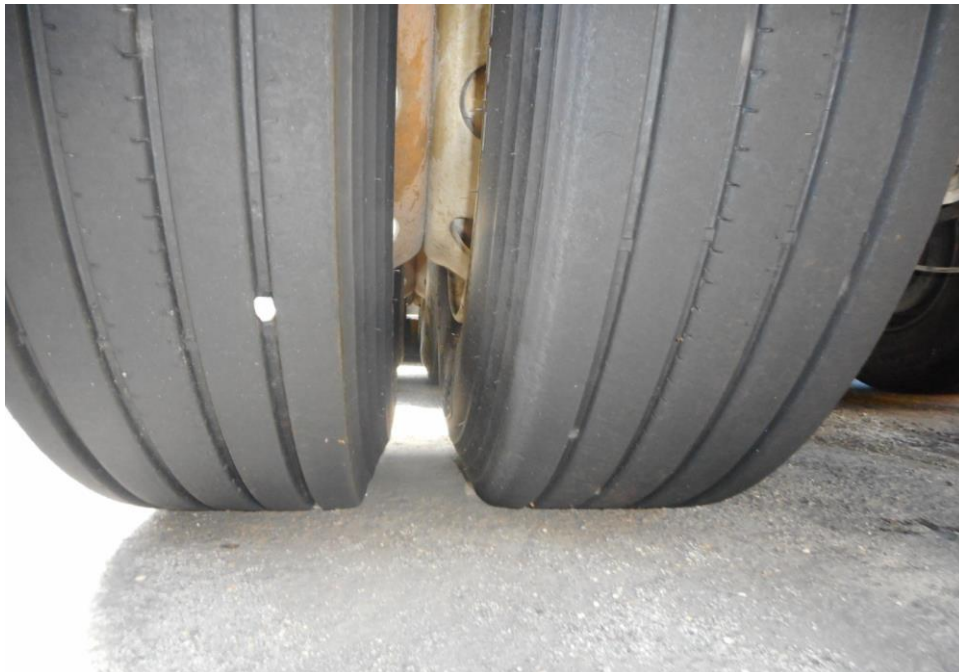


Photo 14 shows the condition of the right tyres of the trailer, which was observed to be in serviceable condition with remaining, tread depth of approximately 6.8mm. The tyre, which was wrapped around standard steel wheel rim, was also observed to be sufficiently inflated for vehicular operation.



Photo 15 shows the condition of the left tyres of the trailer, which was observed to be in serviceable condition with remaining tread depth of approximately 4mm. 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 22 steel wheel rims of the Motor Trailer.

Engine Compartment & Operating Fluids

8. The engine compartment of the Motor Trailer was located below the front cabin of the Motor Trailer. I was not able to carry out any checks on the engine compartment as the cabin of the Motor Trailer was not able to be lifted to the engine compartment as it requires the battery powered. The various operating fluids were also not able to be checked.
9. My visual checks on the underside of the Motor Trailer also revealed no fluid stain. Visually, the various undercarriage components of the Motor Trailer were all observed to be intact and without any visible damage. See photo 16 – 18 below.



Photo 16 shows the undercarriage of the Motor Trailer, at the area where the engine housing located. I did not find any sign(s) or indication(s) of fluid leak, or fluid stain(s) was observed on the underside of the Motor Trailer.



Photo 17 shows the undercarriage of the Motor Trailer, at the area where the transmission housing located. I did not find any sign(s) or indication(s) of fluid leak, or fluid stain(s) was observed on the underside of the Motor Trailer.



Photo 18 shows the undercarriage of the Motor Trailer, at the area where the rear differential housing located. I did not find any sign(s) or indication(s) of fluid leak, or fluid stain(s) was observed on the underside of the Motor Trailer.

Steering System & Braking System

10. The mechanical components of the Motor Trailer's steering system were all found to be visually intact and undamaged. The steering shaft and steering rack of the Motor Trailer were observed to be intact and securely attached to the front left wheel and front right wheel. The steering ball joints were also observed to be in a serviceable condition.
11. Although the steering system could not be tested at the time of my inspection (engine unable to be started), it is likely that the steering system of the Motor Trailer was in serviceable condition since its mechanical components were all found to be generally intact and securely fitted.. See photo 19 - 21 below.



Photo 19 shows the front underside of the Motor Trailer. I was not able to conduct any test(s) on the steering system of the Motor Trailer as the engine of the Motor Trailer could not be started. However my visual checks on the various mechanical components of the steering system like the steering box, steering shaft and steering linkages (arrowed) amongst others revealed all to be intact



Photo 20 shows the various undercarriage components at the front right wheel of the Motor Trailer, in particular the steering tie rod end (arrowed). The various undercarriage components of the Motor Trailer 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 to indicate that the Motor Trailer's steering system was in serviceable condition.



Photo 21 shows the various undercarriage components at the front left wheel of the Motor Trailer, in particular the steering tie rod end (arrowed). The various undercarriage components of the Motor Trailer 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 to indicate that the Motor Trailer's steering system was in serviceable condition.

12. The braking system of the Motor Trailer was noted to be of a full air-assisted braking system. Briefly, in this system, compressed air is used to press onto the brake shoes (for drum brakes) or onto the brake pads (for disc brakes), through the respective braking mechanism, thus slowing the rotation of the wheels.
13. Since the engine of the Motor Trailer could not be started, I was hence not able to carry out test(s) on whether there was any leakage of compressed air that could have affected the braking efficiency of the Motor Trailer. However the air pipes, air tanks and connecting valves had all appear to be in good general condition and securely fitted upon my visual examination of these parts.
14. In general, my visual inspection of the mechanical components of the Motor Trailer's braking system appear to suggest that its braking system was in serviceable condition at the material time of accident. See photo 22 -26 below.



Photo 22 shows the brake pipe (arrowed) at the rear right wheel of the Motor Trailer. I did not observe any leakage of brake fluid at the time of my inspection of the Motor Trailer. My visual examination of the various mechanical components in the braking system, had indicated that there was no internal leakage of pressure/vacuum and were generally intact to suggest that its braking system was in serviceable condition at the material time of accident.



Photo 23 shows the brake pipe (arrowed) at the rear left wheel of the Motor Trailer. I did not observe any leakage of brake fluid at the time of my inspection of the Motor Trailer. My visual examination of the various mechanical components in the braking system, had indicated that there was no internal leakage of pressure/vacuum and were generally intact to suggest that its braking system was in serviceable condition at the material time of accident.



Photo 24 shows the brake pipe (arrowed) at the front right wheel of the Motor Trailer. I did not observe any leakage of brake fluid at the time of my inspection of the Motor Trailer. My visual examination of the various mechanical components in the braking system, had indicated that there was no internal leakage of pressure/vacuum and were generally intact to suggest that its braking system was in serviceable condition at the material time of accident.



Photo 25 shows the brake pipe (arrowed) at the front left wheel of the Motor Trailer. I did not observe any leakage of brake fluid at the time of my inspection of the Motor Trailer. My visual examination of the various mechanical components in the braking system, had indicated that there was no internal leakage of pressure/vacuum and were generally intact to suggest that its braking system was in serviceable condition at the material time of accident.

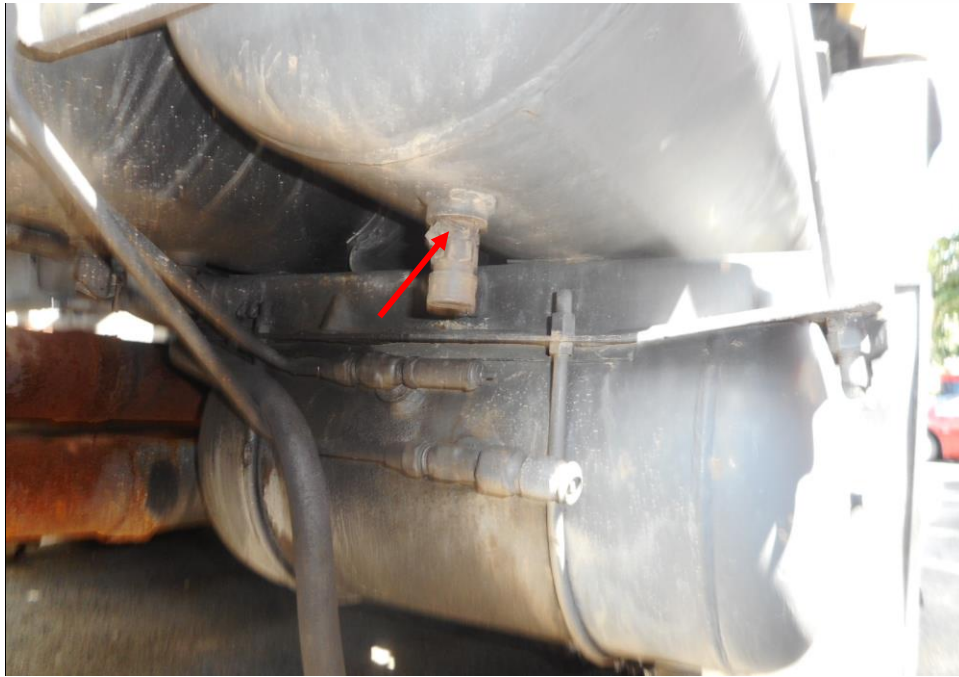


Photo 26 shows the air brake cylinders (arrowed) at the undercarriage of the Motor Trailer. I did not observe any leakage of air brake fluid at the time of my inspection of the Motor Trailer. My visual examination of the various mechanical components in the braking system, had indicated that there was no internal leakage of pressure/vacuum and were generally intact

Electronic Safety / Speed Limit Device

15. The Electronic safety feature(s) like Anti-Brake Lock System (ABS), Supplemental Restraint System (SRS) and speed limiting device was similarly unable to be tested due to the Motor Trailer's flat battery.

Operational Behaviour of the Motor Trailer

16. As the engine of the Motor Trailer could not be started, I was hence not able to carry out any operational test(s) to primarily determine whether there was any operational abnormality to its engine system, transmission system, steering system and braking system.

Conclusion

17. At the time of my inspection of the Motor Trailer, its steering system and braking system could not be tested as the Motor Trailer's engine could not be started. However basing on my observations, it would appear that the steering system and braking system of the Motor Trailer were in serviceable condition. This takes into consideration that the various mechanical components of the steering system and braking system were found to be intact and undamaged.

18. The observation gathered from my physical inspection of the Motor Trailer had indicated no evidence to suggest possible mechanical failure to the Motor Trailer that may have contributed to the accident.
19. The 2 front tyres, 8 rear tyres fitted on the Motor Trailer and the 12 tyres of the trailer 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 Motor Trailer 10 tyres and the 12 tyres of the trailer. The 10 tyres of the Motor Trailer and the 12 tyres of the trailer were also observed to be sufficiently inflated for vehicular operation with remaining tread depth of approximately 9mm – 11.4mm. & 4mm – 6.8mm.
20. My findings were based solely on a static and visual inspection of the Motor Trailer. No operational test(s) could be carried out to the Motor Trailer as its engine could not be started at the time of my inspection.

**Sherwin Beh***Technical Investigator***Ang Bryan Tani***AMSOE, AMIRTE, AFF SAE, M.MATAI, AFF.Inst.AEA**Senior Technical Investigator**Technical Investigation & Reconstructionist (SAE-A)*

DISCLAIMER OF LIABILITY TO THIRD PARTIES: - This Report is made solely for the use and benefit of the Client named on the front page of this Report. No liability or responsibility whatsoever, in contract or tort, is accepted to any third party who may rely on the Report wholly or in part. Any third party acting or relying on this Report, in whole or in part, does so at his or her own risk.