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Our Ref : CI/TPD20012448/P

2<sup>nd</sup> December 2020

**General Investigation Team**

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

**MECHANICAL INSPECTION REPORT OF MOTOR TRAILER MCL 8869 and  
REAR TRAILER T/JJ2214 (CHASSIS)**

1. I refer to your request on 11<sup>th</sup> November 2020 to conduct a physical inspection of a Motor Trailer and Rear Trailer bearing registration number MCL 8869 and T/JJ2214 (herein referred to as “**Motor Trailer and Rear Trailer**”), which was involved in a road traffic accident on 25<sup>th</sup> September 2020.
2. The objective of this inspection is to determine if there was any possible mechanical failure to the Motor Trailer and Rear Trailer that may have contributed to the accident.
3. Following the request, I had carried out a visual inspection of the Motor Trailer and Rear Trailer on 25<sup>th</sup> November 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, as the Motor Trailer was not started up.
5. The Motor Trailer was observed to have sustained damage at its right and middle portion. The Motor Trailer’s right door, middle chassis, fifth wheel unit and its rear trailer right body panel was damaged as a result of the accident.

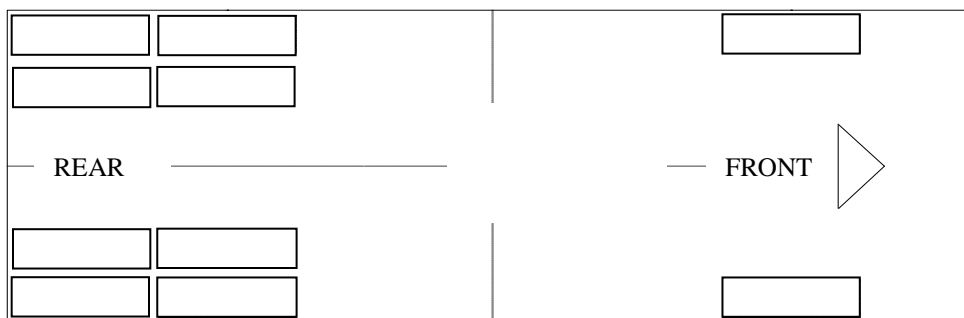
## Tyres and Wheel Rims

6. The 2 front tyres and 8 rear tyres of the Motor Trailer and 12 tyres of the rear 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 rear trailer were recorded as follows:-

### Motor Trailer

Yokohama 295/80 R22.5 (4.8mm)

Yokohama 295/80 R22.5 (8.5mm)

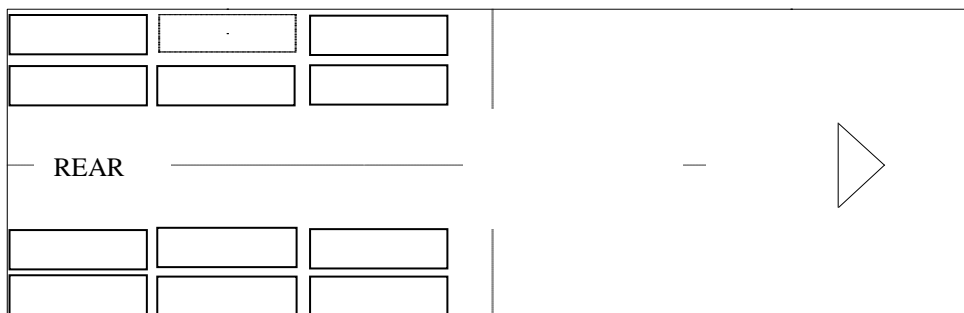


Yokohama 295/80 R22.5 (7.4mm)

Yokohama 295/80 R22.5 (8.9mm)

### Trailer

Wellplus 295/80 R22.5 (4.2mm)



Bridgestone 295/80 R22.5 (5mm)

51 UBI AVE 1, #01-25 PAYA UBI INDUSTRIAL PARK, SINGAPORE 408933 TEL : (065) 62563561 FAX : (065) 67414108

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 – 18 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 right and middle portion. The Motor Trailer's right door, middle chassis, fifth wheel unit and its rear trailer right body panel was damaged as a result of the accident.



**Photo 2** shows a general view of the right body of the Motor Trailer at the time of my inspection. The Motor Trailer was observed to sustain damage at its right door as a result of the accident.



**Photo 3** shows a close up view of the right body of the Motor Trailer at the time of my inspection. The Motor Trailer was observed to sustain damage at its right door (arrowed) as a result of the accident.



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





**Photo 5** shows a general view of the Motor Trailer's middle chassis portion at the time of my inspection. The Motor Trailer middle chassis was bent and had slanted to the right side and its middle fifth wheel unit was observed to be missing from the middle chassis as a result of the accident.



**Photo 6** shows a close up view of the Motor Trailer's middle portion at the time of my inspection. The Motor Trailer middle chassis was bent and had slanted to the right side (arrowed); its fifth wheel unit was also observed to be missing as a result of the accident.

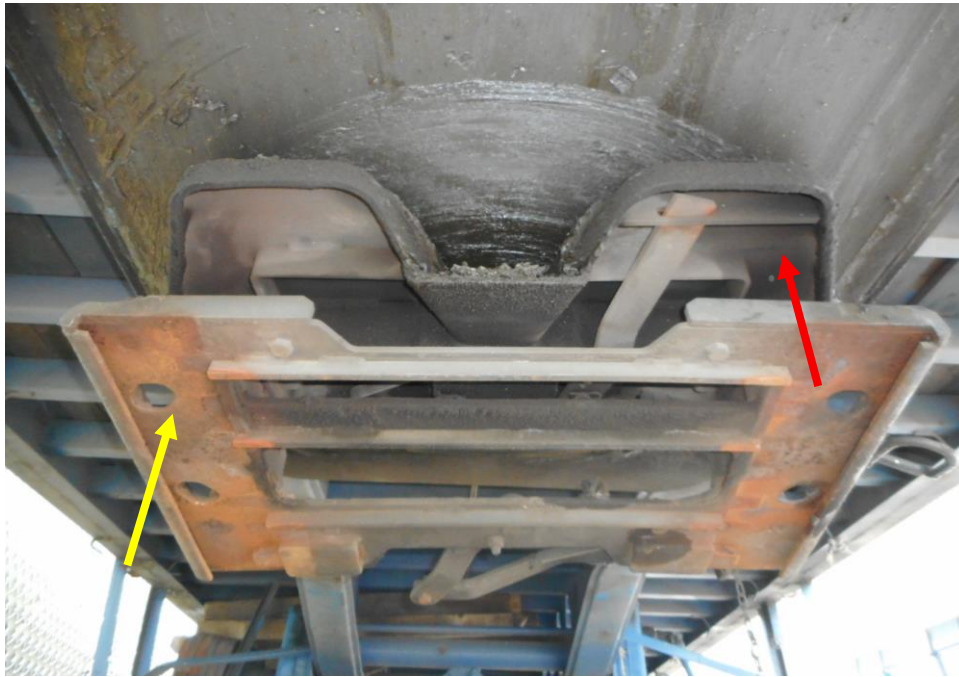


**Photo 7** shows a close up view of the Motor Trailer's middle portion at the time of my inspection. The support bars for mounting plate for the middle fifth wheel unit was observed to be bent as a result of the accident.



**Photo 8** shows a general view of the rear Trailer undercarriage at the time of my inspection. We observed that the fifth wheel unit (red arrow) and the base plate (yellow arrow) that was supposedly mounted on the Motor Trailer had detached and stayed on the rear Trailer after the accident.





**Photo 9** shows a general view of the rear Trailer undercarriage at the time of my inspection. We observed that the fifth wheel unit (red arrow) and the base plate (yellow arrow) that was supposedly mounted on the Motor Trailer had detached and stayed on the rear Trailer after the accident.



**Photo 10** shows a general view of the rear trailer's right body at the time of my inspection. The Motor Trailer's right body panel was observed to sustained damage as a result of the accident.



**Photo 11** shows a general view of the trailer's left body at the time of my inspection. The Motor Trailer's left body was observed to be intact and unaffected by the accident.



**Photo 12** shows a general view of the rear body of the trailer at the time of my inspection. The Motor Trailer's rear body was observed to be intact and unaffected by the accident.





**Photo 13** 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 8.9 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 10 tyres that were fitted on the Motor Trailer.



**Photo 14** 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 7.4mm. 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 rear left tyres of the Motor Trailer, which was observed to be in serviceable condition with remaining tread depth of approximately 4.8mm. 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 10 steel wheel rims of the Motor Trailer.



**Photo 16** 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 8.5mm. 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 10 tyres that were fitted on the Motor Trailer.





**Photo 17** shows the condition of the right tyres of the rear trailer, which was observed to be in serviceable condition with remaining tread depth of approximately 5mm. The tyre, which was wrapped around standard steel wheel rim, was also observed to be sufficiently inflated for vehicular operation.



**Photo 18** shows the condition of the left tyres of the rear trailer, which was observed to be in serviceable condition with remaining tread depth of approximately 4.2mm. 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 12 steel wheel rims of the Rear 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 and its various operating fluids as the cabin of the Motor Trailer was not able to be lifted as it requires the engine to be started up to lift it up.
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 19 below.



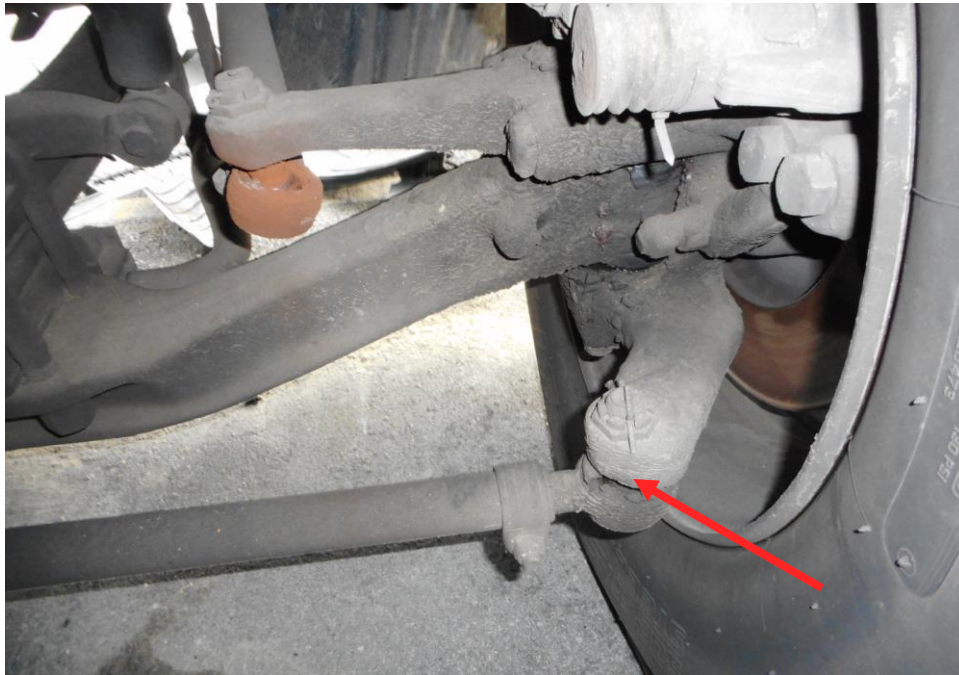
**Photo 19** shows the undercarriage of the Motor Trailer, at the area where the engine housing located. I did not find any sign(s) or indication(s) of fluid leak or fluid stain(s) on the underside of the Motor Trailer.

## 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 20 - 22 below.



**Photo 20** 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 21** 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 22** 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 23 -27 below.



**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.

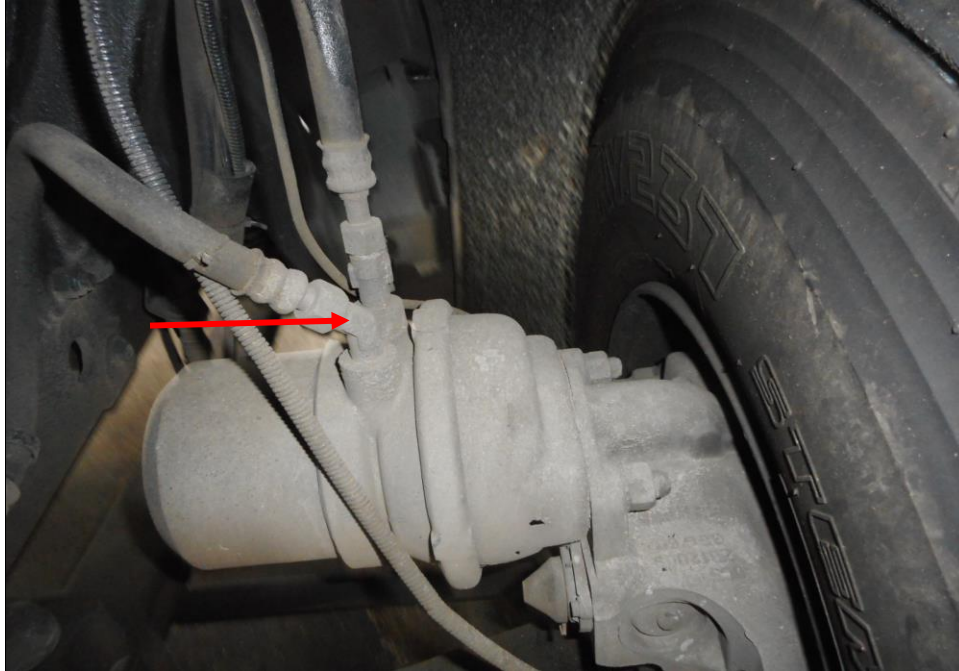


**Photo 24** shows the brake pipe (arrowed) at the rear right wheel of the Motor Trailer. I did not observe any leakage of brake fluid at the time of my inspection of the Motor Trailer. My visual examination of the various mechanical components in the braking system, had indicated that there was no internal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

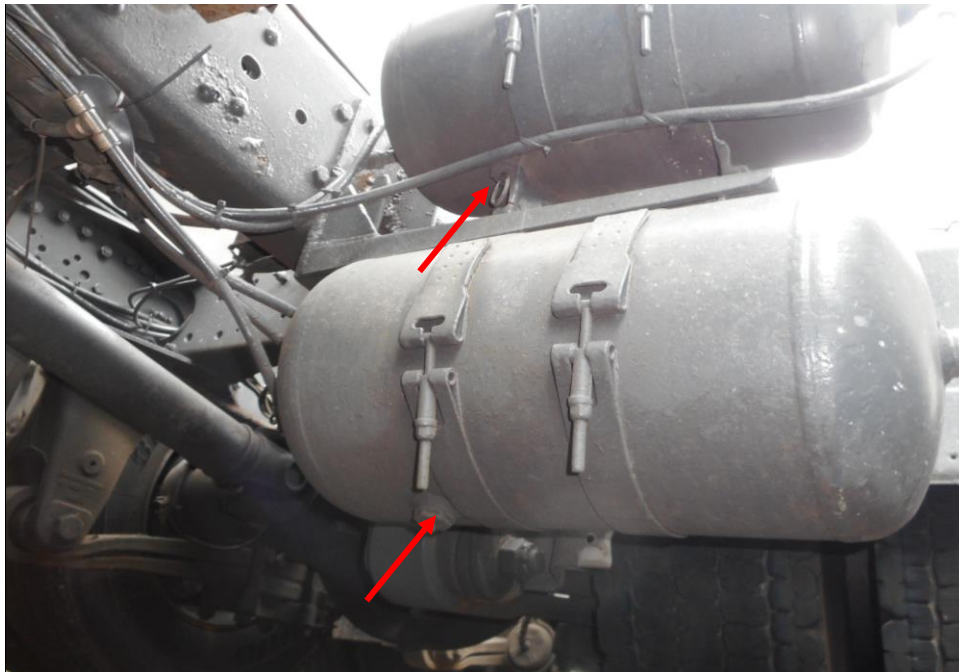


**Photo 25** shows the brake pipe (arrowed) at the front right wheel of the Motor Trailer. I did not observe any leakage of brake fluid at the time of my inspection of the Motor Trailer. My visual examination of the various mechanical components in the braking system, had indicated that there was no 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 26** 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 27** 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 / Warning Indicators**

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 as the Motor Trailer's engine was not started up.

**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.

**Seat Belts**

17. The Front right and front left seat belts of the "Motor Trailer" were tested and all the seat belts were able to be fastened securely into the respective pretensioners that were fitted at the sides of each seat.

**Conclusion**

18. 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.
19. 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.
20. From our visual inspection of the Motor Trailer, we did not observe any broken marks on the fifth wheel unit as well as on its base mounting plate and its middle chassis.
21. In our opinion, it is not possible for the driver to detect this issue as he was driving and would only come to know about it only at the material time when the accident happens.

22. We are in view that the likely cause of the accident was due to the weight transfer of the loaded rear chassis towards right side of the Motor Trailer when it is negotiating a left bend. The weight transfer had caused the middle chassis of the Motor Trailer to bend and give way, resulting in the detachment of the base mounting plate, its fifth wheel unit and the rear Trailer causing it to topple over to the right side.
23. The 2 front tyres, 8 rear tyres fitted on the Motor Trailer and the 12 tyres of the rear 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 6 tyres and the 12 tyres of the trailer. The 6 tyres of the Motor Trailer and the 12 tyres of the rear trailer were also observed to be sufficiently inflated for vehicular operation with remaining tread depth of approximately 4.8mm – 8.9mm. 4.2mm – 5mm.
24. 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 was not 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)*

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