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Our Ref : CI/TPD18013730/Z

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

MECHANICAL INSPECTION REPORT OF MOTOR LORRY JRV 1328

1. We refer to your request on 19th July 2018 to conduct a physical inspection of a motor lorry bearing registration number JRV 1328 (herein referred to as "**Motor Lorry**"), which was involved in a fatal road traffic accident on 30th June 2018.
2. The purpose of this inspection is to primarily determine if there was any possible mechanical failure to the Motor Lorry that may have contributed to the accident.
3. Following the request, we carried out a physical inspection of the Motor Lorry on 17th August 2018 at the premises of Traffic Police vehicle pound, 517 Airport Road Singapore 539942. We now set out below our observations and comments with respect to this inspection.

General Condition

4. The mileage of the Motor Lorry at the time of our inspection was not recorded as its ignition system was damaged by the collision.
5. The Motor Lorry had sustained extensive impact damage at its frontal portion. The impact force was relatively significant, causing its front portion to be pushed towards the rear. Several mechanical parts and components at the frontal portion were also severely damaged as a result of the accident.
6. The windshield, front crash bar, left & right headlamp, front panel and lower bumper were all observed to be pushed inwards, towards the rear of the Motor Lorry. This is consistent to the nature of this accident where the direction of impact onto the Motor Lorry was from the front to the rear direction. See photo 1 to 10 below.



Photo 1 shows a general view of the frontal portion of the Motor Lorry at the time of our inspection. The Motor Lorry was observed to have sustained extensive impact damage at its frontal portion. The impact force was relatively significant, causing its front portion to be pushed towards the rear.



Photo 2 shows a general view of the frontal right portion of the Motor Lorry at the time of our inspection. The Motor Lorry was observed to have sustained extensive impact damage at its frontal portion. The impact force was relatively significant, causing its front portion to be pushed towards the rear.



Photo 3 shows a general view of the frontal left portion of the Motor Lorry at the time of our inspection. The Motor Lorry was observed to have sustained extensive impact damage at its frontal portion. The impact force was relatively significant, causing its front portion to be pushed towards the rear.



Photo 4 shows a closer view of the frontal portion of the Motor Lorry at the time of our inspection. A number of mechanical parts and components at the frontal portion were also severely damaged as a result of the accident.



Photo 5 shows a closer view of the left headlamp of the Motor Lorry at the time of our inspection. It had also sustained damages on other components as a result of the accident.



Photo 6 shows a closer view of the right headlamp of the Motor Lorry at the time of our inspection. It had also sustained damages on other components as a result of the accident.



Photo 7 shows a closer view of the frontal lower portion (crash bar) of the Motor Lorry at the time of our inspection. A number of mechanical parts and components at the frontal portion were also severely damaged as a result of the accident.



Photo 8 shows the interior of the front cabin. It was observed to be unaffected by the accident's impact collision.




Photo 9 shows the front cabin. The windshield was observed to be cracked due to the accident.



Photo 10 shows a general view of the rear left portion of the Motor Lorry at the time of my inspection. The rear portion was observed to be relatively unaffected by the accident.

Tyres and Wheel Rims

7. The 2 left & right front tyres, 1 rear inner left tyre and 1 rear outer right tyre of the Motor Lorry were observed to be deflated likely due to the accident's impact collision. We also observed cut mark(s) on the outer sidewall of the front left tyre and the outer sidewall of the rear outer tyre likely due to the accident's impact collision.
8. As for the 2 rear outer left & inner right tyres of the Motor Lorry were observed to be in serviceable condition and sufficiently inflated for vehicular operation. We did not find any tear, cut or burst mark(s) on the 2 rear outer left & inner right tyres sidewalls as well as across the tread of the 6 tyres. The tyre brand, tyre size and remaining tread depth of the 6 tyres were recorded as follows:-

Sailun S880 225/80 R17.5 (1.6mm)
(Deflated & rim dented )

Linglong LFL866 225/80 R17.5 (8mm)
(Deflated)(Cut at outer wall & rim dented)



LEAO AFL866 225/80 R17.5 (4mm) (Deflated)
(Cut at outer wall & rim dented )

Linglong LFL866 225/80 R17.5 (7mm)
(Deflated)(Rim dented)

9. The 6 tyres were observed to be wrapped around steel wheel rims. However, 04 of the wheel rims were found to be dented due to the accident's impact collision. The front left wheel rim, front right wheel rim, rear left inner wheel rim & rear right outer wheel rim was observed to be dented likely due to the accident's impact collision. Hence causing deflation on the affected tyres. See photo 11 to 14 below.



Photo 11 shows the condition of the rear right tyres of the Motor Lorry with remaining tread depth of approximately 4mm. However, the outer tyre was found to be deflated with cut mark on the outer sidewall & dented wheel rim.



Photo 12 shows the condition of the rear left tyres of the Motor Lorry with remaining tread depth of approximately 1.6mm. However, the inner tyre was found to be deflated with dented wheel rim.



Photo 13 shows the condition of the front left tyre of the Motor Lorry with remaining tread depth of approximately 8mm. However, it was found to be deflated with cut mark on the sidewall & dented wheel rim.



Photo 14 shows the condition of the front right tyre of the Motor Lorry with remaining tread depth of approximately 7mm. However, it was found to be deflated with dented wheel rim.

Engine Compartment & Operating Fluids

10. The engine compartment of the Motor Lorry, which was located beneath the front cabin, could not be closely inspected given the extensive damage to the front cabin. The cabin could not be lifted due to the accident's impact that caused the misalignment to the lifting components. Our visual checks from the underside of the Motor Lorry had however appear to indicate that the engine assembly and transmission assembly were both unaffected by the collision. Visually, there were fluid stains covering the engine underside. However, having further investigation revealed that it was a pre-existed fluid stain prior the material time of the accident. This was concluded with the dust stain associated with the fluid stain.
11. With regard to the operating fluids, we were only able to inspect the brake fluid. As for the other operating fluids such as power steering fluid and engine coolant and engine fluid, it was inaccessible due to its reservoir tanks and/or dip stick being within the underside of the Motor Lorry's cabin.
12. Visual checks on the underside of the Motor Lorry had revealed its various undercarriage components was unaffected by the accident's impact. See photo 15 to 17 below.



Photo 15 shows that there was also fluid stains covering the engine underside, indicating fluid leakage. However, it was associated with dust which concluded to pre-existed leakage prior the material time of the accident.



Photo 16 shows the radiator was observed to be damaged due to the accident's impact.



Photo 17 shows the transmission assembly (circled) of the Motor Lorry was observed to be unaffected by the accident.

Steering System & Braking System

13. We were not able to conduct any tests on the steering system and braking system of the Motor Lorry. This was mainly due to the extensive damage of the Motor Lorry's which had affected several mechanical components of the steering system such as the ignition system, deflated tyres & damaged wheel rims amongst others.
14. We were however able to carry out visual checks on the unaffected mechanical components of the steering system and braking system. The steering shaft and steering rack of the Motor Lorry 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. See photo 18 to 23 below.



Photo 18 shows the steering rod of the Motor Lorry. It was observed to be in serviceable condition unaffected by the accident's impact collision.



Photo 19 shows the unaffected mechanical components on the front left wheel of the steering system. The steering shaft and steering rack of the Motor Lorry were observed to be intact and securely attached to the front left wheel. No fluid leakage on the brake fluid hoses.



Photo 20 shows the unaffected mechanical components on the front right wheel of the steering system. The steering shaft and steering rack of the Motor Lorry were observed to be intact and securely attached to the front left wheel. No fluid leakage on the brake fluid hoses.



Photo 21 shows the brake fluid reservoir of the Motor Lorry. I had found the brake fluid to be of sufficient level for operational purposes. Visually there was also no contamination found to the brake fluid.



Photo 22 shows the brake pipes and hoses, which were visibly unaffected by the accident. We were however not able to carry out any operational tests to the braking system of the Motor Lorry due to the extent of damage to its front cabin, which had affected several mechanical components of the braking system like the brake booster and brake pedal amongst others.



Photo 23 shows the brake pipes and hoses, which were visibly unaffected by the accident. We were however not able to carry out any operational tests to the braking system of the Motor Lorry due to the extent of damage to its front cabin, which had affected several mechanical components of the braking system like the brake booster and brake pedal amongst others.

Electronic Safety / Warning Indicators

15. The Motor Lorry's automatic self-test of the functionality of its various operating systems like the Anti-Brake Lock System (ABS) and Supplemental Restraint System (SRS) was not able to be initiated due to major mechanical damages which includes its ignition system and engine system of the Motor Lorry.

Operational Behaviour of the Motor Lorry

16. No operational test to primarily determine whether there was any abnormality to the engine system, transmission system steering system and braking system of the Motor Lorry could be conducted given the extent of damages that it had sustained.

Conclusion

17. For this particular case, we were unable to determine whether there was any possible mechanical failure to the Motor Lorry that may have contributed to the accident. This was mainly due to the extent of damages that it had sustained as a result of the accident.
18. Although the steering system and braking system of the Motor Lorry was unable to be tested, from our examination of the unaffected mechanical parts of these 2 systems, it would appear that the steering system and braking system of the Motor Lorry were in serviceable condition at the material time of accident.
19. The 2 left & right front tyres, 1 rear inner left tyre and 1 rear outer right tyre of the Motor Lorry were observed to be deflated likely due to the accident's impact collision. We also observed cut mark(s) on the outer sidewall of the front left tyre and the outer sidewall of the rear outer tyre likely due to the accident's impact collision.
20. As for the 2 rear outer left & inner right tyres of the Motor Lorry were observed to be in serviceable condition and sufficiently inflated for vehicular operation. We did not find any tear, cut or burst mark(s) on the 2 rear outer left & inner right tyres sidewalls as well as across the tread of the 6 tyres. The remaining tread depth was found to be approximately 1.6mm & 8mm each.

21. Our findings were based solely on a static and visual inspection of the Motor Lorry. No operational test could be carried out to the Motor Lorry given the extent of damage that it had sustained as a result of the accident.



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