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Our Ref : CI/TPD18013726/Z

18<sup>th</sup> October 2018

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

### **MECHANICAL INSPECTION REPORT OF MOTOR LORRY YN 5405M**

1. We refer to your request on 19<sup>th</sup> July 2018 to conduct a physical inspection of a motor lorry bearing registration number YN 5405M (herein referred to as "**Motor Lorry**"), which was involved in a fatal road traffic accident on 20<sup>th</sup> 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 20<sup>th</sup> 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 and front cabin was severely 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 entire front cabin to be buckled and crumpled. Several mechanical parts and components at the frontal portion were also severely damaged as a result of the accident.
6. The dashboard, steering wheel, doors, floor panel, windshield and roof panel inside the front cabin were all observed to be pushed/buckled 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 my inspection. The Motor Lorry was observed to have sustained extensive impact damage at its frontal portion. The impact force was relatively significant, causing its entire front cabin to be buckled and crumpled.



**Photo 2** shows a closer view of the frontal portion (engine) of the Motor Lorry at the time of my inspection. A number of mechanical parts and components at the frontal portion (engine) were also severely damaged as a result of the accident.



**Photo 3** shows a closer view of the frontal portion (engine) of the Motor Lorry at the time of my inspection. A number of mechanical parts and components at the frontal portion (engine) were also severely damaged as a result of the accident.



**Photo 4** shows a general view of the distorted structure of the Motor Lorry at the time of our inspection. It had sustained damaged as a result of the accident.





**Photo 5** shows a closer view of the dislodged steering wheel rod of the Motor Lorry at the time of my inspection. It was likely due the result of the accident.



**Photo 6** shows a closer view of the frontal right portion of the Motor Lorry at the time of my inspection. A number of mechanical parts and components at the frontal portion were also severely damaged as a result of the accident.



**Photo 7** shows the interior of the front cabin. The dashboard, steering wheel, seats, floor panel and roof panel inside the front cabin were all observed to be pushed/buckled 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 a front to rear direction.



**Photo 8** shows the interior of the front cabin. The windshield was observed to be cracked due to the accident.



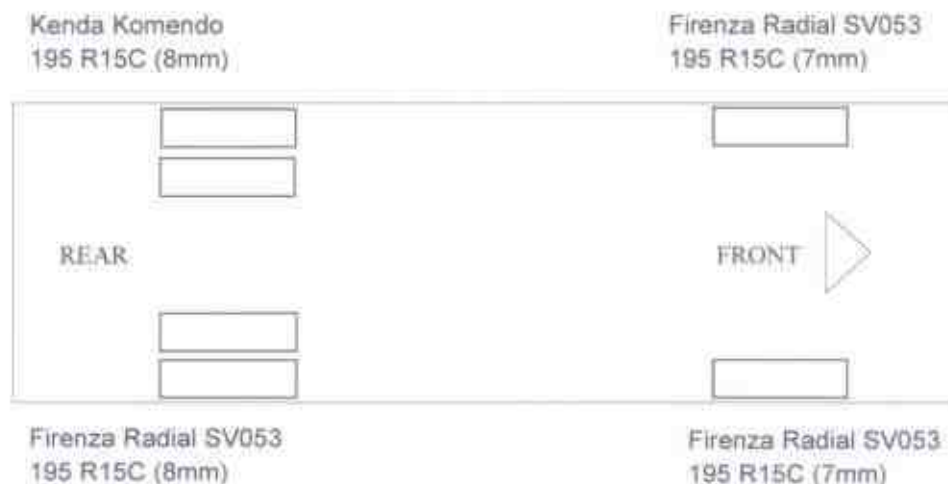
Photo 9 shows a general view of the rear left portion of the Motor Lorry at the time of my inspection. The rear portion was observed to be relatively unaffected by the accident.



Photo 10 shows a general view of the rear right 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 front tyres and 4 rear 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 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 were recorded as follows:-



8. The 6 tyres were observed to be wrapped around steel wheel rims that were found to be without any damage. See photo 11 – 14 below.





**Photo 11** shows the condition of the rear right tyres of the Motor Lorry, which was observed to be in serviceable condition with remaining tread depth of approximately 8mm.



**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 8mm. There was no tear, cut or burst mark(s) on the outer and the inner sidewalls as well as across the tread of these 2 tyres, which were also observed to be sufficiently inflated for vehicular operation.





**Photo 13** shows the condition of the front left tyre of the Motor Lorry, which was observed to be in serviceable condition with remaining tread depth of approximately 7mm. There was also no tear, cut or burst mark(s) on the outer and the inner sidewalls as well as across the tread of this tyre.



**Photo 14** shows the condition of the front right tyre of the Motor Lorry. The front right tyre was observed to be in serviceable condition with remaining tread depth of approximately 7mm. There was also no tear, cut or burst mark(s) on the outer and the inner sidewalls as well as across the tread of this tyre. The tyre, which was wrapped around alloy wheel rim, was also observed to be sufficiently inflated for vehicular operation.

### Engine Compartment & Operating Fluids

9. 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. Our visual checks from the underside of the Motor Lorry had however appear to indicate that the engine assembly and transmission assembly were both damaged by the collision. There were also signs of fluid stains covering the engine underside, indicating fluid leakage that had occurred due to the accident's impact.
10. With regard to the operating fluids, we were only able to inspect the brake fluid. The power steering fluid, engine oil and engine coolant were inaccessible due to their reservoir tanks and/or dip stick being within the damaged area of the Motor Lorry. For the brake fluid, we had found the brake fluid to be of sufficient level for operational purposes. Visually there was also no contamination found to the brake fluid.
11. Visual checks on the underside of the Motor Lorry had revealed its various undercarriage components to be damage likely due to the accidents impact. See photo 15 & 16 below.



Photo 15 shows that there was also a fresh fluid stains covering the engine underside, indicating fluid leakage that had occurred due to the accident's impact.



Photo 16 shows the transmission system which includes the gear knob (circled) of the Motor Lorry was observed to be bent due to the accident's collision.

### Steering System & Braking System

12. 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 front cabin, which had affected several mechanical components of the steering system, ignition system, body structure and braking system like the steering wheel, steering wheel rod and gear knob for transmission purposes amongst others.
13. We were however able to carry out visual checks on the unaffected mechanical components of the steering system and braking system. The steering shaft, steering tie rod 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.
14. As for the braking system mechanical components such as brake pedal, brake booster, brake hoses & connectors were observed to be intact and undamaged. The brake fluids were observed to be at a sufficient level without any contamination at time of our examination. See photo 17 - 22 below.

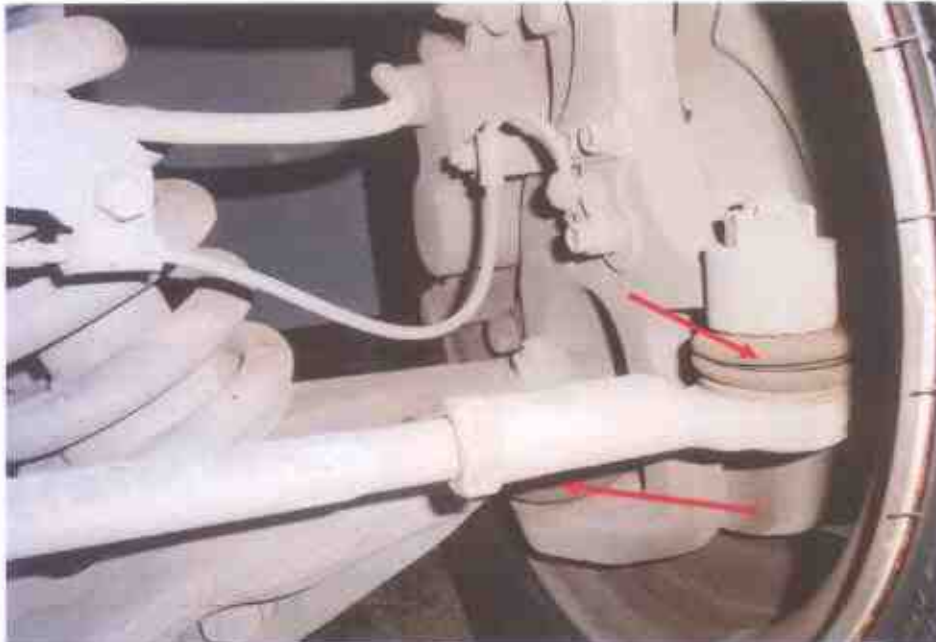




**Photo 17** shows the damaged steering wheel rod (red arrow) of the Motor Lorry. Hence, we were not able to conduct any tests on the steering system of the Motor Lorry.



**Photo 18** shows the damaged steering wheel rod due to the accident's impact.



**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. We 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 Motor Lorry.



### **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 front tyres and 4 rear tyres of the Motor Lorry were found to be in serviceable condition. We 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 7mm to 8mm each.

20. 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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