

Your Ref: TP/IP/60899/2017
Our Ref : CI/TPD18001965/Z

05th February 2018

Fatal Accident Investigation Team

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

MECHANICAL INSPECTION REPORT OF MOTOR LORRY YN 3671Z

1. We refer to your request on 09th January 2018 to conduct a physical inspection of a motor lorry bearing registration number YN 3671Z (herein referred to as "**Motor Lorry**"), which was involved in a fatal road traffic accident on 10th November 2017.
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 02nd February 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, windshield, 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.
7. This was likely due to the consistency of the accident's case facts that the Motor Lorry had collided onto a stationary Motor Trailer on the 3rd lane of a 3 lane along Tembusu Avenue towards end. See photo 1 to 7 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 entire front cabin to be buckled and crumpled.



Photo 2 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 3 shows a general view of the front 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 front left portion. The impact force was relatively significant, causing its entire front cabin to be buckled and crumpled.



Photo 4 shows a general view of the front 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 front left portion. The impact force was relatively significant, causing its entire front cabin to be buckled and crumpled.

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Photo 5 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 the front to rear direction.



Photo 6 shows a general view of the rear right portion of the Motor Lorry at the time of our inspection. The rear portion was observed to be relatively unaffected by the accident.



Photo 7 shows a general view of the rear 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

8. 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:-

Yokohama 7.00-16 (5mm)		Yokohama 7.00-16 (5mm)	
REAR	<input type="text"/>	<input type="text"/>	FRONT 
	<input type="text"/>	<input type="text"/>	
	<input type="text"/>	<input type="text"/>	
	<input type="text"/>	<input type="text"/>	
Yokohama 7.00-16 (5mm)		Yokohama 7.00-16 (5mm)	

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

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Photo 8 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 5mm. There was no tear, cut or burst mark(s) on the outer and the inner sidewalls as well as across the tread of this 2 tyres. The tyres, which was wrapped around alloy wheel rim, was also observed to be sufficiently inflated for vehicular operation.



Photo 9 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 5mm. 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.

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Photo 10 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 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 this tyre.



Photo 11 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 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 this tyre.

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 damages 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 intact and unaffected by the collision.
11. With regard to the operating fluids, we were unable to inspect most of the fluids. This is due to their reservoir tanks and/or dip stick being within the damaged area of the Motor Lorry. However, for brake fluid it shows an insufficient level inside the brake fluid reservoir likely due to damages as a result of the accident.
12. Visual checks on the underside of the Motor Lorry had revealed its various undercarriage components to be intact and without visible damage. See photo 12 & 13 below.



Photo 12 shows the underside of the Motor Lorry, at the area where the engine is located. We were not able to closely inspect the engine compartment of the Motor Lorry due to the extensive damage to its front cabin. Our visual checks from the underside had however appear to indicate that the engine assembly and transmission assembly were both intact and unaffected by the collision.



Photo 13 shows the transmission assembly (arrowed) of the Motor Lorry intact and unaffected by the collision.

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 front cabin, which had affected several mechanical components of the steering system and braking system like the steering wheel, steering box, brake booster and brake pedal amongst others. Brake fluids were observed to be insufficient likely due to the damages to the brake reservoir as a result of the accident.
14. We were however able to carry out visual checks on the unaffected mechanical components of the steering system & 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. The brake hoses & piping were observed to be without any damages. It was noted to be intact & secured to all wheels at time of our inspection. See photo 14 - 18 below.

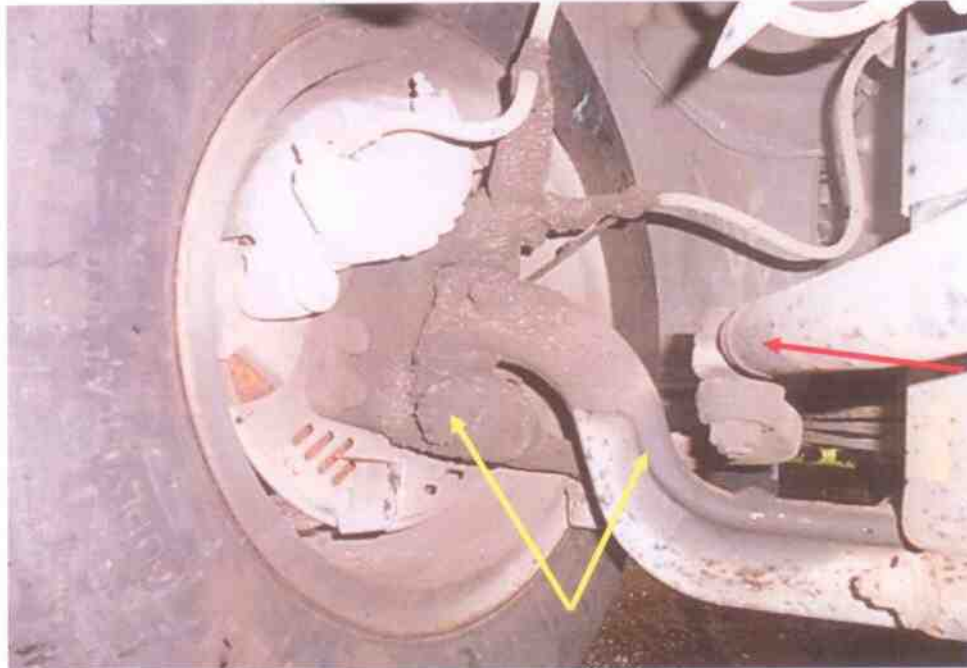


Photo 14 shows the undamaged steering shaft (red arrow) of the Motor Lorry. The steering shaft and steering rack (yellow arrow) of the Motor Lorry were however observed to be intact and securely attached to the front right wheel and front right wheel. The steering ball joints were also observed to be in a serviceable condition.



Photo 15 shows the undercarriage components at the front left wheel of the Motor Lorry. The various undercarriage components of the Motor Lorry were all observed to be intact and without any visible damage. This had included the steering rack (arrowed) of the Motor Lorry.



Photo 16 shows the brake hose (arrowed) at the rear right wheel of the Motor Lorry. At the time of our inspection, we did not find any sign(s) of brake fluid leakage along the brake hoses and brake pipes.

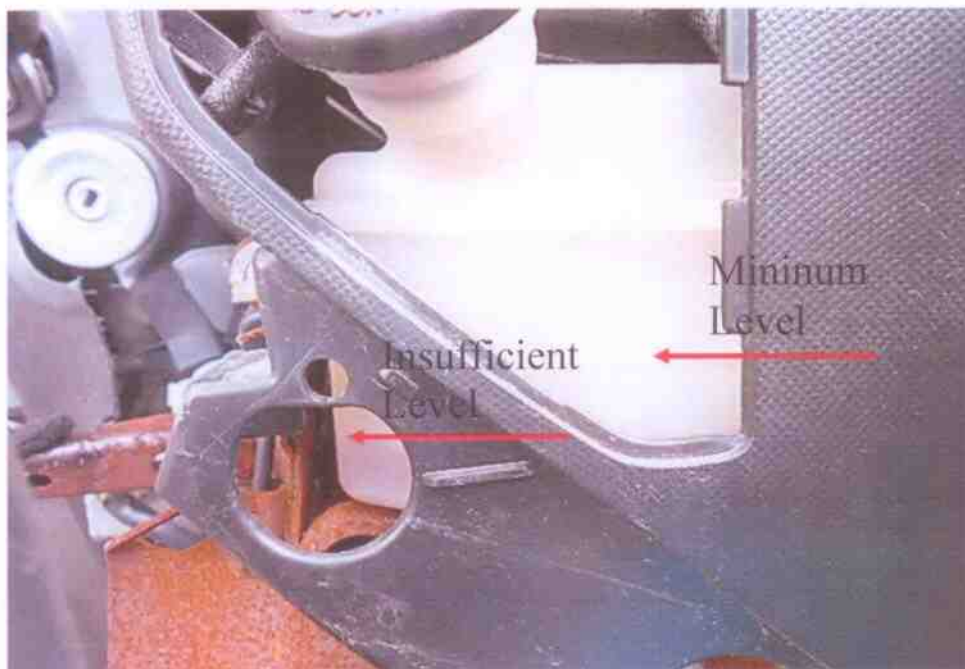


Photo 17 shows the insufficient brake fluid likely due to the damages on the braking system as a result of the accident.



Photo 18 shows the damages on the brake fluid reservoir as a result of the accident.

Electronic Safety / warning indicators

15. The Motor Lorry was not fitted with any electronic safety feature(s) like Anti-Brake Lock System (ABS), Supplemental Restraint System (SRS) etc. There was hence no test carried out on the functionality of these systems. In any case, as the test would involve cranking of the Motor Lorry's engine, the severe damages to the ignition system itself did not allow me to perform this test.

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 damage 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 damage 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 5mm 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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