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Your Ref: TP/IP/59659/2017
Our Ref : CI/TPD18000534/Z

12th January 2018

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

MECHANICAL INSPECTION REPORT OF TIPPER TRUCK XE 2780H

1. We refer to your request on 14th November 2017 to conduct a physical inspection of a tipper truck bearing registration number XE 2780H (herein referred to as "**Tipper Truck**"), which was involved in a road traffic accident on 04th November 2017.

2. The objective of this inspection is to determine if there was any possible mechanical failure to the Tipper Truck that may have contributed to the accident.

3. Following the request, we had carried out a physical inspection of the Tipper Truck on 11th December 2017 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 Tipper Truck at the time of our inspection was recorded as 22,677 km.

5. The Tipper Truck was observed to have no signs of fresh damages on its body portion, this is likely due to the consistency of the accident's case facts that the Tipper Truck ran over the other involved party (bicycle) without touching the Tipper Truck's body parts.

6. Further investigation on the other parts of the Tipper Trucks reveals that there's no other damages sustained.

Photo 1 shows the mileage of the Tipper Truck at the time of our inspection was recorded as 22,677 km.

Photo 2 shows a general view of the front body of the Tipper Truck at the time of our inspection. The Tipper Truck was observed to have no signs of fresh damages on its body portion, this is likely due to the consistency of the accident's case facts that the Tipper Truck ran over the other involved party (bicycle).

Photo 3 shows a general view of the front right body of the Tipper Truck at the time of our inspection. The Tipper Truck was observed to have no signs of fresh damages on its body portion, this is likely due to the consistency of the accident's case fact that the Tipper Truck ran over the other involved party (bicycle).

Photo 4 shows a general view of the front left body of the Tipper Truck at the time of our inspection. The Tipper Truck was observed to have no signs of fresh damages on its body portion, this is likely due to the consistency of the accident's case fact that the Tipper Truck ran over the other involved party (bicycle).

Photo 5 shows a general view of the rear body of the Tipper Truck at the time of our inspection. The Tipper Truck was observed to have no signs of fresh damages on its body portion, this is likely due to the consistency of the accident's case fact that the Tipper Truck ran over the other involved party (bicycle).

Photo 6 shows a general view of the rear left body of the Tipper Truck at the time of our inspection. The Tipper Truck was observed to have no signs of fresh damages on its body portion, this is likely due to the consistency of the accident's case fact that the Tipper Truck ran over the other involved party (bicycle).

Photo 7 shows a general view of the rear right body of the Tipper Truck at the time of our inspection. The Tipper Truck was observed to have no signs of fresh damages on its body portion, this is likely due to the consistency of the accident's case fact that the Tipper Truck ran over the other involved party (bicycle).

Tyres and Wheel Rims

7. The 10 tyres fitted on the Tipper Truck were all 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 10 tyres. The tyre brand, tyre size and remaining tread depth of the Tipper Truck's 10 tyres were recorded as follows:-

8. The 10 tyres were observed to be wrapped around standard steel wheel rims that were found to be without any damage. See photo 8 – 13 below.

Photo 8 shows the condition of the front left tyre of the Tipper Truck, which was observed to be in serviceable condition with remaining tread depth of approximately 3mm.

Photo 9 shows the condition of the front right tyre of the Tipper Truck, which was observed to be in serviceable condition with remaining tread depth of approximately 6mm.

Photo 10 shows the condition of the rear left tyres of the Tipper Truck, which were observed to be in serviceable condition with remaining tread depth of approximately 6mm. The tyres were also observed to be sufficiently inflated for vehicular operation.

Photo 11 shows the condition of the rear left tyres (centre axle) of the Tipper Truck, which were observed to be in serviceable condition with remaining tread depth of approximately 6mm. The tyres were also observed to be sufficiently inflated for vehicular operation.

Photo 12 shows the condition of the rear right tyres of the Tipper Truck, which were observed to be in serviceable condition with remaining, tread depth of approximately 6mm. The tyres were also observed to be sufficiently inflated for vehicular operation with no tear, cut or burst mark(s) on the outer and the inner sidewalls.

Photo 13 shows the condition of the rear right tyres (centre axle) of the Tipper Truck, which were observed to be in serviceable condition with remaining, tread depth of approximately 3mm. The tyres, which were wrapped around standard alloy wheel rims, were also observed to be sufficiently inflated for vehicular operation.

Engine Compartment & Operating Fluids

9. Upon examination of the engine compartment of the Tipper Truck, we had observed all the parts and components inside the engine compartment to be intact and unaffected by the accident. The brake fluid, steering fluid and engine coolant were all found to be of sufficient level for operating purposes. Visually, there was also no contamination found to these fluids.

10. Further examination of the engine compartment revealed no sign(s) or indication(s) of fluid leakage and/or fluid stain within the engine compartment of the Tipper Truck.

11. Our subsequent checks on the underside of the Tipper Truck also revealed no fluid stain. Visually, the various undercarriage components of the Tipper Truck were all observed to be intact and without any visible damage. See photo 14 – 17 below.

Photo 14 shows a general view of the engine compartment area from the front bonnet of the Tipper Truck. It was observed to be intact and unaffected by the collision. There was also no sign(s) or indication(s) of fluid leak and/or fluid stain found.

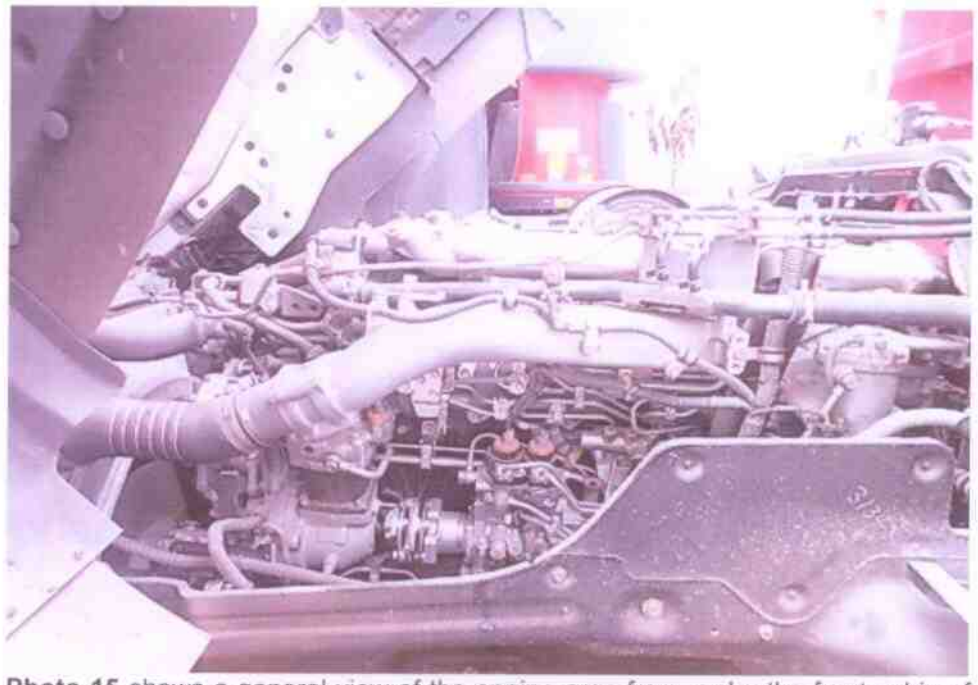

Photo 15 shows a general view of the engine area from under the front cabin of the Tipper Truck. The engine assembly and transmission assembly of the Tipper Truck were both observed to be intact and unaffected by the collision. There was also no sign(s) or indication(s) of fluid leak and/or fluid stain found.

Photo 16 shows a general view of the engine area from the underside of the Tipper Truck. The engine assembly and transmission assembly of the Tipper Truck were both observed to be intact and unaffected by the collision. There was also no sign(s) or indication(s) of fluid leak and/or fluid stain found.

Photo 17 shows the engine coolant reservoir of the Tipper Truck at the time of our inspection. The engine coolant was observed to be of sufficient level and without any visible contamination for operational purposes.

Steering System & Braking System

12. The mechanical components of the Tipper Truck's steering system were all found to be visually intact and undamaged. The steering shaft and steering rack of the Tipper Truck 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.

13. Static test on the steering system of the Tipper Truck also revealed no abnormality to the steering system. We did not experience any abnormal free play and/or other resistance when turning the steering wheel left and right to full lock positions. It is likely that the steering system of the Tipper Truck was in serviceable condition at the material time of accident since its mechanical components were all found to be generally intact and securely fitted. See photo 18 – 22 below.

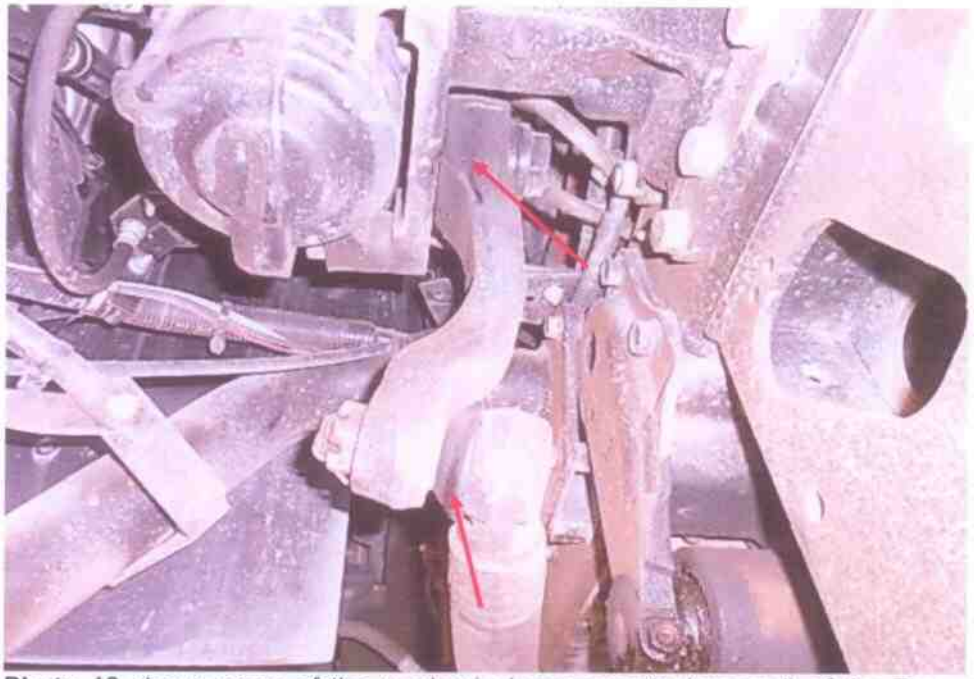

Photo 18 shows some of the mechanical components (arrowed) of the Tipper Truck's steering system. Our visual checks on the various mechanical components of the steering system revealed all to be intact and in good condition. The steering system of the Tipper Truck is hence likely to be in serviceable condition at the time of accident.

Photo 19 shows the undercarriage components at the front right wheel of the Tipper Truck. The various undercarriage components of the Tipper Truck were all observed to be intact and without any visible damage. This had included the steering rack and steering linkages (arrowed) of the Tipper Truck.

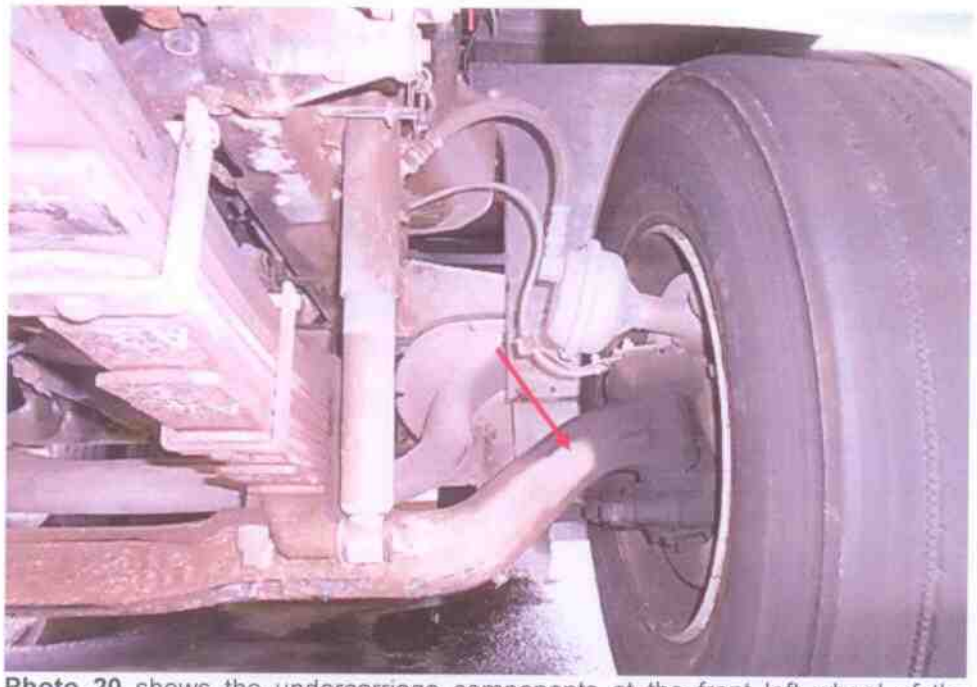

Photo 20 shows the undercarriage components at the front left wheel of the Tipper Truck. The various undercarriage components of the Tipper Truck were all observed to be intact and without any visible damage. This had included the steering rack (arrowed) of the Tipper Truck, which was observed to be securely attached to the front left wheel and front right wheel.

Photo 21 shows that we did not experience any abnormal free play and/or other resistance when turning the steering wheel left and right to full lock positions.

Photo 22 shows that we did not experience any abnormal free play and/or other resistance when turning the steering wheel left and right to full lock positions.

14. The braking system of the Tipper Truck was noted to be of an air-assisted hydraulic braking system. Briefly, in this system, compressed air is used to force the hydraulic fluid to the brake wheel cylinders (for drum brakes) or to the brake callipers (for disc brakes). The pressurized hydraulic fluid then presses 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.

15. A static brake test(s) was able to be carried at time of our inspection. This is to determine on whether there was any leakage of compressed air that could have affected the braking efficiency of the Tipper Truck. The air pipes, air tanks and connecting valves had all appeared to be in good general condition and securely fitted upon our static brake test. The static brake test was of a satisfactory result. Its brake pedal responded by releasing excessive compressed air upon stepping on the brake pedal suggesting that it's braking system was in serviceable condition at the material time of accident. The brake fluids, was found to be of sufficient level for operating purposes. Visually, there was also no contamination found to these fluids. See photo 20 - 25 below.

Photo 20 shows the air tanks, valves, pipes and hoses, which are some of the components for the air-assisted braking system of the Tipper Truck. These components were mainly located around the right centre body of the Tipper Truck, and were unaffected by the accident.

Photo 21 shows the valves, brake hoses and pipes, which are some of the components for the air-assisted braking system of the Tipper Truck. These components were mainly located around the right centre body of the Tipper Truck, and were unaffected by the accident. Our visual examination of these parts revealed all to be in good general condition and securely fitted.

Photo 22 shows the brake hoses (arrowed) leading to the rear left wheel and rear right wheel of the Tipper Truck. At the time of our inspection, the various mechanical components of the air-assisted hydraulic braking system of the Tipper Truck were all found to be in good general condition and securely fitted.

Photo 23 shows the brake air cylinder (arrowed) at the rear left rear wheel of the Tipper Truck. Such air cylinder, which is amongst the various components for the air-assisted hydraulic braking system, can be found attached to all the front wheels and all the rear wheels of the Tipper Truck. Upon our checks, we had found all the brake air cylinders to be undamaged and securely fitted to all the wheels of the Tipper Truck.

Photo 24 shows the brake fluid at the front bonnet of the Tipper Truck. The brake fluid was found to be of sufficient level for operating purposes. Visually, there was also no contamination found to these fluids.

Photo 25 shows the brake shoes (brake pads) at the rear left wheel (rear axle) of the Tipper Truck. The brake shoes (brake pads) of the Tipper Truck were all found to be in serviceable condition with sufficient frictional material for operational purposes.

Electronic Safety / Warning Indicator

16. The Tipper Truck's automatic self-test of the functionality of its electronic operating systems such as the Anti-Brake Lock System (ABS) during cranking of the engine was observed to be lighted up. The indicator was noted to stay lighted up even after the engine was in idling speed.

Photo 26 shows the warning indicator for Anti-Brake Lock System (ABS) was observed to be lighted up during cranking & after engine was in idling speed.

Photo 27 shows the compressed air meters for braking system. This shows that there's no dropped of pressure. Hence, revealed that no air leakage at the time of our inspection.

Photo 28 shows the warning indicator for Anti-Brake Lock System (ABS) was observed to be lighted up during cranking & after engine was in idling speed.

Operational Behaviour of the Tipper Truck

17. During the operational test, the transmission system of the Tipper Truck was able to be shifted to drive mode and reverse mode without any difficulty. There were no abnormal sounds heard and/or abnormal behaviour of the Tipper Truck's engine system. The braking system was also found to be in working condition.

Conclusion

18. From our physical inspection of the Tipper Truck, it appears that its engine system, transmission system, steering system and braking system were all in serviceable condition. We did not find any evidence(s) to suggest that there was possible mechanical failure to the Tipper Truck that may have caused and/or contributed to the accident.

19. A short operational test of the Motor Car, which we had conducted, did not produce any sign(s) or symptom(s) to suggest that there was any abnormality to its engine system, its transmission system and braking system.

20. The Anti-Brake Lock System (ABS) indicator was noted to stay lighted up even after the engine was in idling speed. This would indicate that there was an electronic fault to the Anti-Brake Lock System (ABS). However, we are of the opinion that this did not cause and/or contributed to the accident as the braking system was still able to function normally.

21. The 10 tyres fitted on the Tipper Truck were also found to be in serviceable condition. 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. The 10 tyres were sufficiently inflated for vehicular operation with remaining tread depth of approximately 3mm to 6mm.

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