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Your Ref: TP/IP/59561/2017
Our Ref : CI/TPD18001964/Z

19th February 2018

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

MECHANICAL INSPECTION REPORT OF MOTOR VAN GBE 6269C

1. We refer to your request on 05th February 2018 to conduct a physical inspection of a Motor Van bearing registration number GBE 6269C (herein referred to as "**Motor Van**"), which was involved in a fatal road traffic accident on 03rd November 2017.

2. The purpose of this inspection is to primarily determine if there was any possible mechanical failure to the Motor Van that may have contributed to the accident.

3. Following the request, we carried out a physical inspection of the Motor Van on 13th February 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 Motor Van at the time of our inspection was not recorded as its ignition system was severely damaged by the collision.

5. The Motor Van had sustained extensive impact damage at its frontal portion. The impact force was significant, causing the various parts and components inside the engine compartment to be damaged. This had included its engine assembly and transmission assembly, which were both amongst the multiple parts and components inside the engine compartment that were pushed inwards, towards the rear of the Motor Van.

6. Other body parts that were damaged had included the front windscreen, front bonnet, front bumper and right front door (detached) amongst others. The interior compartment was also affected badly; the driver's airbag was also activated due to the extensive impact at time of the accident.

7. This was likely due to the consistency of the accident's case facts that the Motor Van driver was travelling along Mandai Road towards Yishun Avenue 1 on the left most lane of 3 lane road when it collided onto the rear of a stationary Tipper Truck on the same lane. See photo 1 to 14 below.

Photo 1 shows a general view of the frontal portion of the Motor Van at the time of our inspection. The Motor Van was observed to have sustained extensive impact damage at its frontal portion. The impact force was significant, causing the various parts and components inside the engine compartment to be damaged.

Photo 2 shows a general view of the front right portion of the Motor Van at the time of our inspection. The Motor Van was observed to have sustained extensive impact damage at its frontal portion.

Photo 3 shows a general view of the front left portion of the Motor Van at the time of our inspection. The Motor Van was observed to have sustained with extensive impact damage at its frontal portion.

Photo 4 shows a closer view of the damage at the frontal portion of the Motor Van's engine. The impact force was significant, causing the various parts and components inside the engine compartment to be pushed inwards, towards the rear of the Motor Van.

Photo 5 shows a closer view of the damage at the frontal right portion of the Motor Van. The impact force was significant, causing the various parts and components inside the engine compartment to be pushed inwards, towards the rear of the Motor Van.

Photo 6 shows a closer view of the damage at the frontal left portion of the Motor Van. The impact force was significant, causing the various parts and components inside the engine compartment to be pushed inwards, towards the rear of the Motor Van.

Photo 7 shows a closer view of the damaged fuse box at the frontal left portion of the Motor Van. The impact force was significant, causing the various parts and components inside the engine compartment to be pushed inwards, towards the rear of the Motor Van.

Photo 8 shows a closer view of the damage gear knob at the interior portion of the Motor Van. The impact force was significant, causing the various parts and components inside the engine compartment to be pushed inwards, towards the rear of the Motor Van including its transmission system.

Photo 9 shows a closer view of the damage at the ignition section of the Motor Van. The impact force was significant, causing the various parts and components inside the interior compartment to be pushed inwards, including its ignition system.

Photo 10 shows a closer view of the detached right front door of the Motor Van. The impact force was significant, causing the various parts and components inside the engine compartment to be pushed inwards, towards the rear of the Motor Van. That includes the driver's airbag activation.

Photo 11 shows a closer view of the damage at the windscreen area of the Motor Van. The impact force was significant, causing the windscreen to sustain a shattering cracked.

Photo 12 shows a closer view of the damaged left front door of the Motor Van. The impact force was significant, causing the various parts and components inside the engine compartment to be pushed inwards, towards the rear of the Motor Van.

Photo 13 shows a general view of the rear left portion of the Motor Van at the time of our inspection. The rear portion was observed to have sustained with minor damages likely not related to the accident.

Photo 14 shows a general view of the rear right portion of the Motor Van at the time of our inspection. The rear portion was observed to have sustained with minor damages likely not related to the accident.

Tyres and Wheel Rims

8. Notwithstanding that the 4 tyres of the Motor Van were all found not to be in serviceable condition, it was observed to be sufficiently inflated for operational purposes.

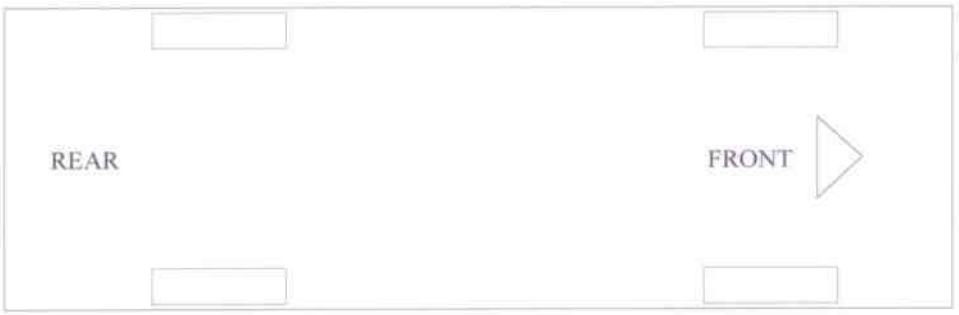
9. As for the front left & front right tyres of the Motor Van, the tread patterns were still visible with remaining tread depth of approximately 2mm (Front left tyre) & 1.6mm (Front right tyre). The front right tyre was also observed to be cut at the middle surface of the tyres likely due to the accident. Further investigation reveals that the inner cores of both tyres were found to be exposed around the outer side of the tyre surface. Hence, concludes that both tyres were not in serviceable condition.

10. Although the tread pattern was still visible for the rear left & rear right tyres of the Motor Van, its tread depth was found to be 0.5mm (Rear right tyre) & 0.2mm (Rear left tyre) which falls below the minimum range of 1mm for operational purposes. Hence, concludes that both tyres were not in serviceable condition.

11. The 4 tyres were observed to be wrapped around standard steel wheel rims that were found to be without any significant damage except for some marks of grazing nature on the wheel rims covers, which are commonly associated to grazing against a road kerb. The tyre brand, tyre size and remaining tread depth of the 4 tyres were recorded as follows: - See photo 15 – 22 below.

Dunlop SP 175M
195 R15C (0.2mm)
(Below minimum requirement of 1mm)

Bridgestone RD-613 Steel
195 R15C (2mm)
(Inner core exposed)



Michelin Agilis
195 R15C (0.5mm)
(Below minimum requirement of 1mm)

Dunlop SP 175M
195 / 80 R15 (1.6mm)
(Exposed inner core & tyre cut).

Photo 15 shows the condition of the front right tyre of the Motor Van, which was found to be cut at across the tread pattern of the tyres. However, the tread pattern was still visible (1.6mm) & observed to be inflated for operational purposes.

Photo 16 shows the condition of the front right tyre of the Motor Van. Although the tread pattern was still visible, the inner core of the tyre was found to be exposed at the outer side of the tyres.

Photo 17 shows the condition of the front left tyre of the Motor Van, which was observed not to be in serviceable condition. Although the tread pattern was still visible, the inner cores of the tyre were found to be exposed at the outer side of the tyres.

Photo 18 shows the condition of the front left tyre of the Motor Van, which was observed not to be in serviceable condition. Although the tread pattern was still visible, the inner core of the tyre was found to be exposed at the outer side of the tyres.

Photo 19 shows the condition of the front left tyre of the Motor Van, which was observed not to be in serviceable condition. Although the tread pattern was still visible, the inner core of the tyre was found to be exposed at the outer side of the tyres.

Photo 20 shows the condition of the front left tyre of the Motor Van, which was observed not to be in serviceable condition. Although the tread pattern was still visible, the inner core of the tyre was found to be exposed at the outer side of the tyres.

Photo 21 shows the condition of the rear left tyre of the Motor Van, which was observed not to be in serviceable condition. Although the tread pattern was still visible, its tread depth was found to be (0.5mm) below the minimum range of 1mm.

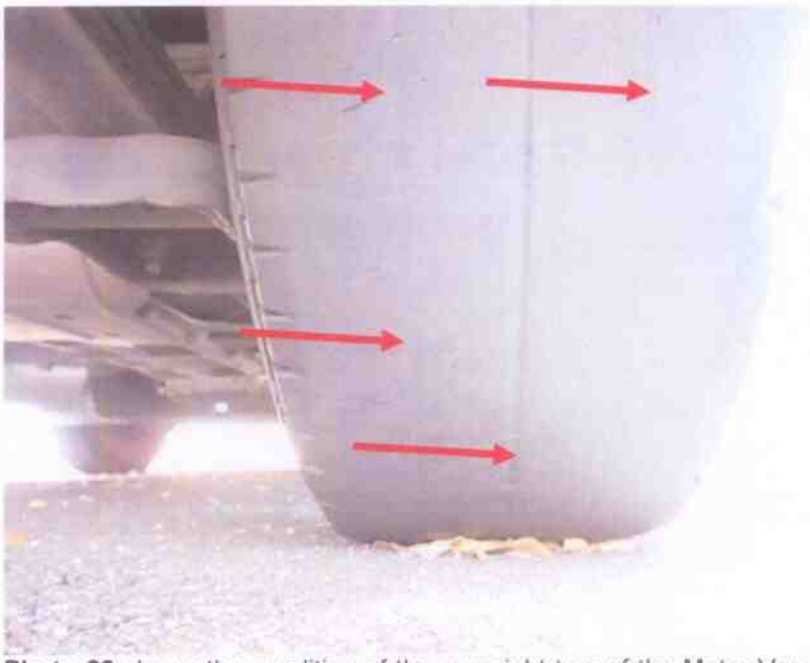


Photo 22 shows the condition of the rear right tyre of the Motor Van, which was observed not to be in serviceable condition. Although the tread pattern was still visible, its tread depth was found to be (0.2mm) below the minimum range of (1mm).

Engine Compartment & Operating Fluids

12. The engine compartment of the Motor Van was severely affected by the collision. Almost all the parts and components inside the engine compartment were badly damaged. Parts like the air intake system, radiation system, exhaust manifold, fuse box and control modules amongst others were found to be damaged.

13. Leakage of the operating fluids such as the brake fluid was visible due to the damages sustained on the braking system. Other operating fluids such as engine coolant, power steering fluid and engine fluid were not able to be access due to the extent of damages sustained. Given the extent of damages to the engine compartment, the leakages were likely due to the accident. The engine undercarriage was however visually observed to be without any leakage of fluid. There were no visible fluid stains at the engine undercarriage observed at time of our inspection. See photo 23 & 24 below

Photo 23 shows the close up view of the brake fluid reservoir that indicates empty likely due to the accident impact.

Photo 24 shows the close up view of the radiator undercarriage was observed to be unaffected by the accident.

Steering System & Braking System

14. We were not able to conduct any tests on the steering system and braking system of the Motor Van. This was due to the leakage of brake fluid, as well as damage to several mechanical components of the steering system and braking system. See photo 25 - 34 below.

Photo 25 shows the close up view of the brake booster that was observed to be damaged likely due to the accident impact.

Photo 26 shows the close up view of the hand brake that was observed to be damaged likely due to the accident impact

Photo 27 shows the close up view of the gear knob for transmission control that was observed to be damaged likely due to the accident impact

Photo 28 shows the close up view of the steering wheel rod that was observed to be damaged likely due to the accident impact

Photo 29 shows the close up view of the brake pedal & acceleration pedal that was observed to be damaged likely due to the accident impact

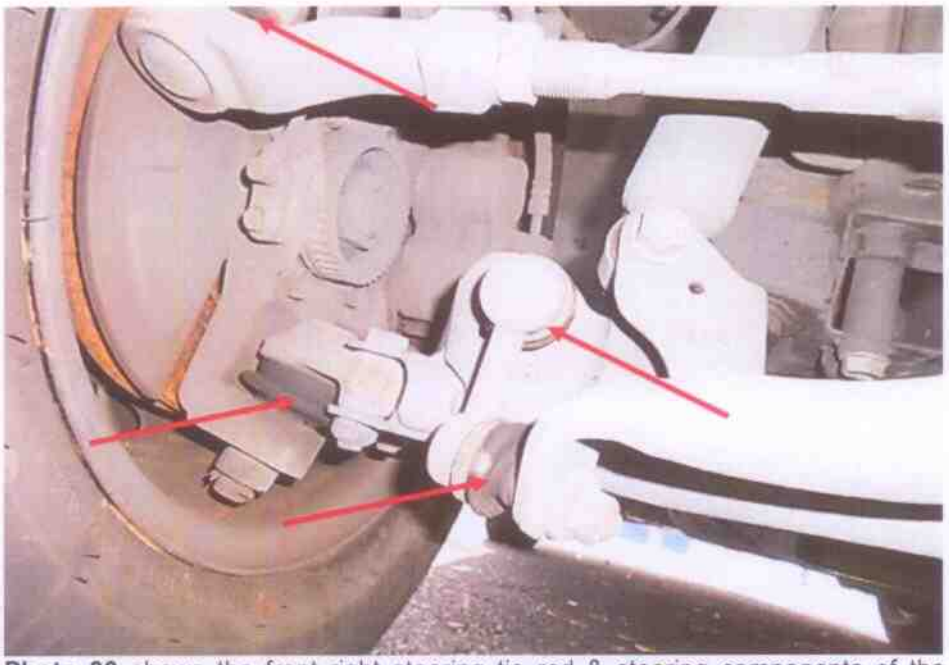


Photo 30 shows the front right steering tie rod & steering components of the Motor Van. It was observed to be unaffected by the accident.

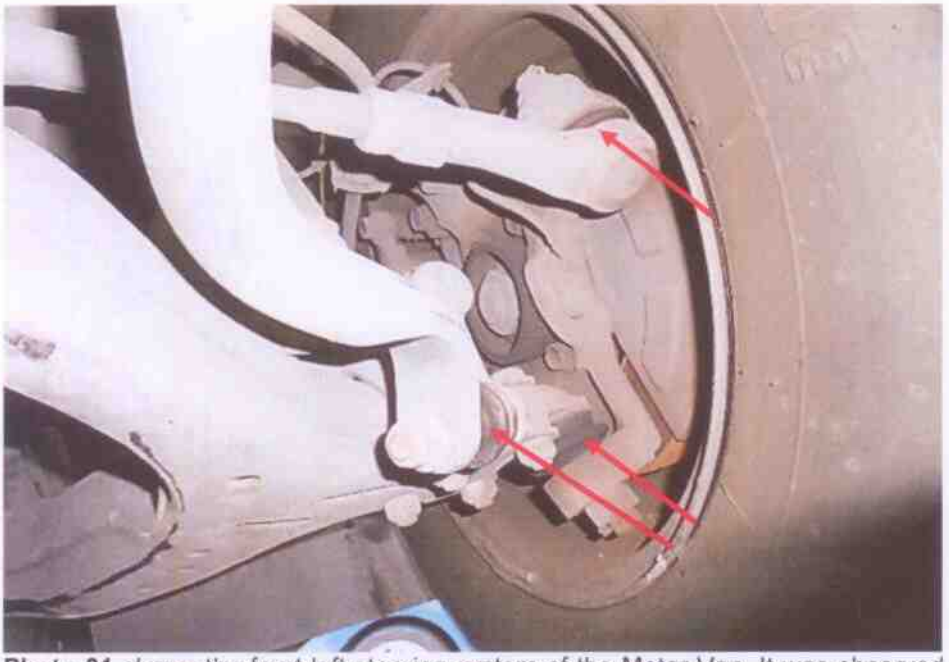


Photo 31 shows the front left steering system of the Motor Van. It was observed to be unaffected by the accident.

Photo 32 shows the braking components at the rear right wheel of the Motor Van. We did not observe any leakage of brake fluid at the time of our inspection of the Motor Van.

Photo 33 shows the braking component at the left right wheel of the Motor Van. We did not observe any leakage of brake fluid at the time of our inspection of the Motor Van.

Photo 34 shows the engine transmission of the Motor Van. It was observed to be in good condition at the time of our inspection of the Motor Van.

Electronic Safety / Warning Indicators

15. The Motor Van'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 Van.

16. The Supplemental Restraint System (SRS) of the Motor Van was however likely to be in normal operating condition at the material time of the accident. The evidence of the deployed driver's airbag indicates that the impact sensors and control module of the Motor Van's SRS were all in serviceable condition at the material time of accident. See photo 35 below.

Photo 35 shows the Supplemental Restraint System (SRS) of the Motor Van was however likely to be in normal operating condition at the material time of the accident. The evidence of the deployed front passenger's airbag indicates that the impact sensors and control module of the Motor Van's SRS were all in serviceable condition at the material time of accident.

Operational Behaviour of the Motor Car

17. No operational test to primarily determine whether there was any abnormality to the engine system, transmission system and braking system of the Motor Van could not be conducted given the extent of damage that it had sustained.

Conclusion

18. For this particular case, we were unable to determine whether there was any possible mechanical failure to the Motor Van that may have contributed to the accident. This was mainly due to the extent of damage that it had sustained. Its engine system, transmission system, steering system and braking system were all damaged as a result of the accident.

19. Further investigation reveals that the 4 tyres of the Motor Van were all found not to be in serviceable condition. Although the tread pattern was still visible for all 4 tyres of the Motor Van, the inner cords of the tyres were found to be exposed at the outer side for both front left & front right tyres. For both rear left & rear right tyres, their tread depths were found to be falling below the minimum requirement range of (1mm).

20. For this particular case, the conditions of the 4 tyres could have contributed to the accident. As the tyres would have unlikely been able to provide adequate friction grip/ traction between the road surface and the Motor Van during braking/ cornering. The stopping distance of the Motor Van would hence be longer.

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

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