

Your Ref: TP/IP/10687/2022
Our Ref : CI/TPD22008176/P

8th September 2022

General Investigation Team

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

MECHANICAL INSPECTION REPORT OF ELECTRIC TAXI SHB 1326Z

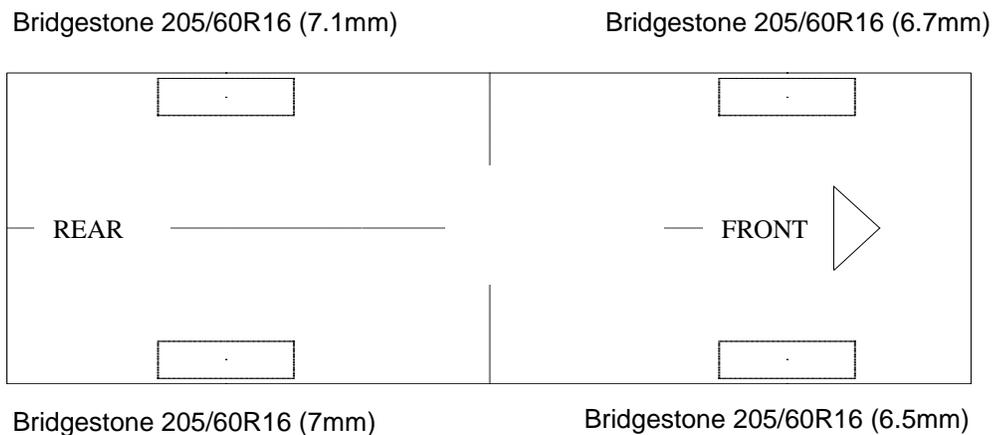
1. I refer to your request on 16th August 2022 to conduct a physical inspection of an Electric Taxi bearing registration number SHB 1326Z (herein referred to as “**Electric Taxi**”), which was involved in a road traffic accident on 4th May 2022.
2. The objective of the inspection is to determine if there was any possible mechanical failure to the Electric Taxi that may have contributed to the accident.
3. Following the request, I had carried out a physical inspection of the Electric Taxi on 7th September 2022 at the premises of Traffic Police vehicle pound, 517 Airport Road Singapore 539942. I now set out below my observations and comments with respect to this inspection.

General Condition

4. The mileage of the Electric Taxi was not recorded as the access to the high voltage batteries to jumpstart the Electric Taxi was blocked and the high voltage electrical wirings to the batteries was also damaged as a result of the accident.
5. The Electric Taxi was observed to have sustained damage at its front portion. Its front bonnet, front body panel and front bumper were amongst the body parts and various electric motor components were damaged as a result of the accident. The Supplemental Restraint System (SRS) was activated as a result of the accident.

Tyres and Wheel Rims

6. The condition of the Electric Taxi's 4 tyres was observed to be in serviceable condition. I 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 4 tyres. The 4 tyres were also observed to be sufficiently inflated for vehicular operation. The tyre brand, tyre size and remaining tread depth of the 4 tyres were recorded as follows:-



7. The 4 tyres were observed to be wrapped around alloy wheel rims that were found to be without any damage. See photo 1 – 11 below.

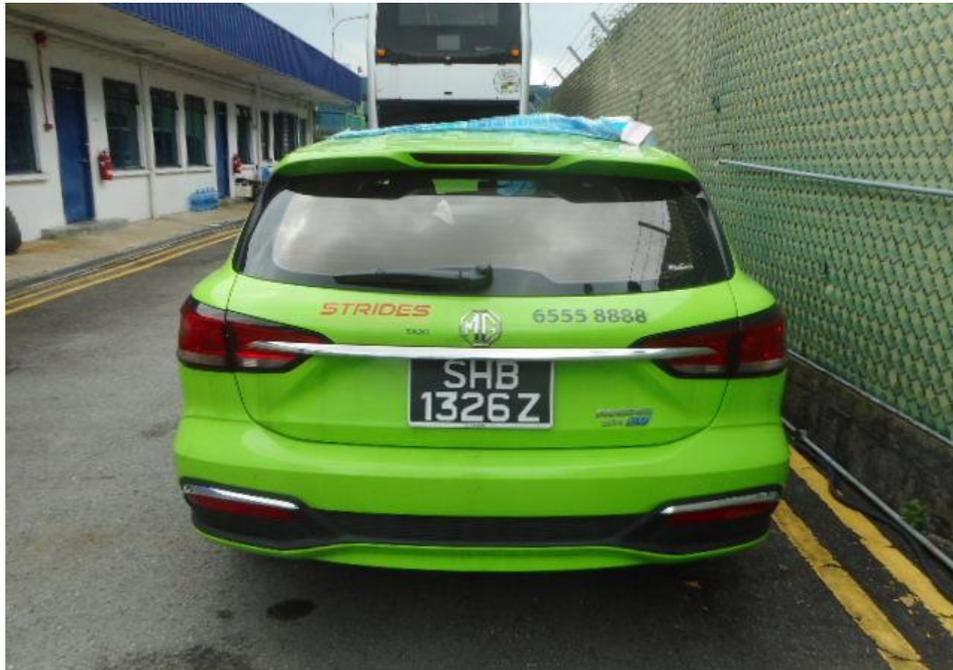


Photo 1 shows the general view of the Electric Taxi's rear body at the time of my inspection. The Electric Taxi rear was observed to be unaffected by the accident.



Photo 2 shows a general view of the Electric Taxi's front body at the time of my inspection. The Electric Taxi was observed to have sustained damage at its front portion. Its front bonnet, front body panel and front bumper were amongst the body parts and various electric motor components were damaged as a result of the accident.



Photo 3 shows the close up view of the Electric Taxi's front body at the time of my inspection. The Electric Taxi was observed to have sustained damage at its front portion. Its front bonnet (circled) were amongst the body parts that were damaged as a result of the accident.

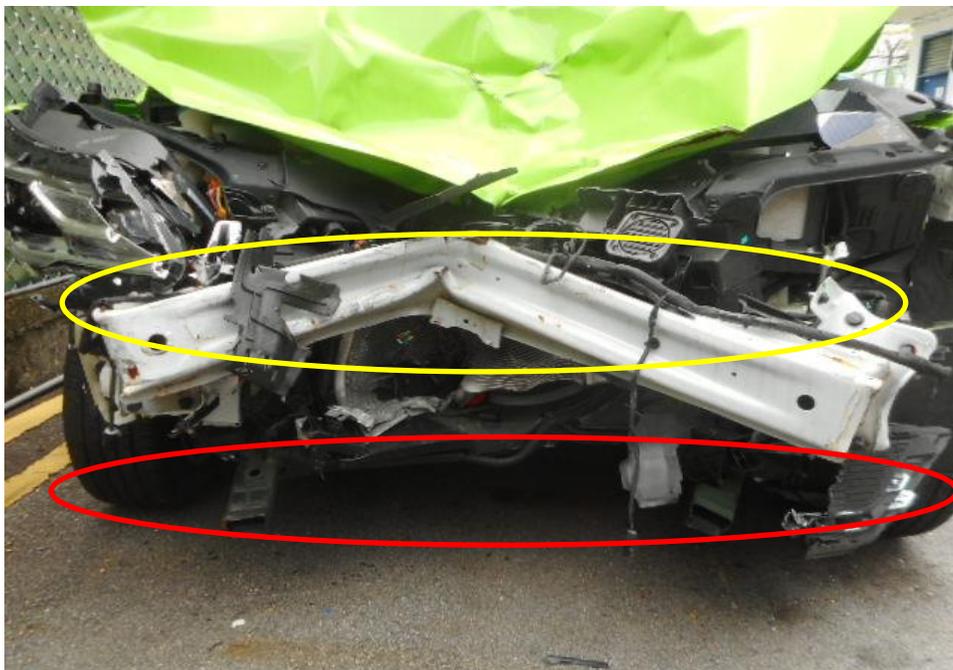


Photo 4 shows the close up view of the Electric Taxi's front body at the time of my inspection. The Electric Taxi was observed to have sustained damage at its front portion. Its front bumper (red circle) and front body panel (yellow circle) were amongst the body parts that were damaged as a result of the accident.

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Photo 5 shows a general view of the Electric Taxi's right body at the time of my inspection. The Electric Taxi left was observed to be unaffected by the accident.



Photo 6 shows a general view of the Electric Taxi's left body at the time of my inspection. The Electric Taxi left was observed to be unaffected by the accident.



Photo 7 shows the condition of the front right tyre of the Electric Taxi, which was observed to be in serviceable condition with remaining tread depth of approximately 6.5mm. The tyre, which was wrapped around alloy wheel rim, was also observed to be sufficiently inflated for vehicular operation.

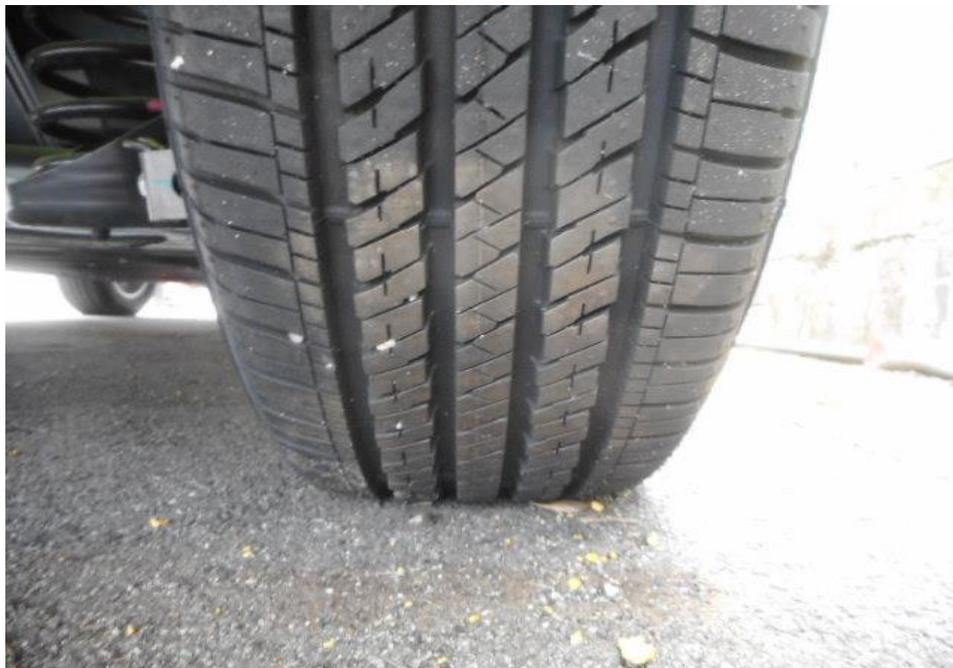


Photo 8 shows the condition of the rear right tyre of the Electric Taxi, which was observed to be in serviceable condition with remaining tread depth of approximately 7mm. The tyre, which was wrapped around standard alloy wheel rim, was also observed to be sufficiently inflated for vehicular operation.



Photo 9 shows the condition of the rear left tyre of the Electric Taxi, which was observed to be in serviceable condition with remaining tread depth of approximately 7.1mm. The tyre, which was wrapped around standard alloy wheel rim, was also observed to be sufficiently inflated for vehicular operation.



Photo 10 shows the condition of the front left tyre of the Electric Taxi, which was observed to be in serviceable condition with remaining tread depth of approximately 6.7mm. The tyre, which was wrapped around standard alloy wheel rim, was also observed to be sufficiently inflated for vehicular operation.



Photo 11 shows the deployment of the Supplemental Restraint System (SRS) airbag in the Motor Car as a result of the accident.

Electric Compartment & Operating Fluids

8. We are unable to open the bonnet of the electric taxi as the lock mechanism was damaged as a result of the accident. However, upon examination of the surroundings of the electric taxi motor compartment, I had observed the coolant radiator and high voltage cables inside the electric taxi compartment to be damaged as a result of the impact from the accident which had pushed the coolant radiator towards the high voltage cables and components in the electric motor compartment and resulting to the sustained damages. The electric motor coolant was observed to be insufficient as a result of the damage to the coolant radiator sustained from the accident. The brake fluid were found to be of sufficient level for operating purposes. Visually, there was also no contamination found to the fluid.
9. Further examination of the electric compartment revealed no sign(s) or indication(s) of fluid leakage and/or fluid stain within the electric compartment of the Electric Taxi.
10. My subsequent checks on the underside of the Electric Taxi also revealed no sign(s) or indication(s) of fluid leak and/or fluid stain(s). Visually, the various undercarriage components of the Electric Taxi were all observed to be intact and without any visible damage. See photo 12 – 18 below.

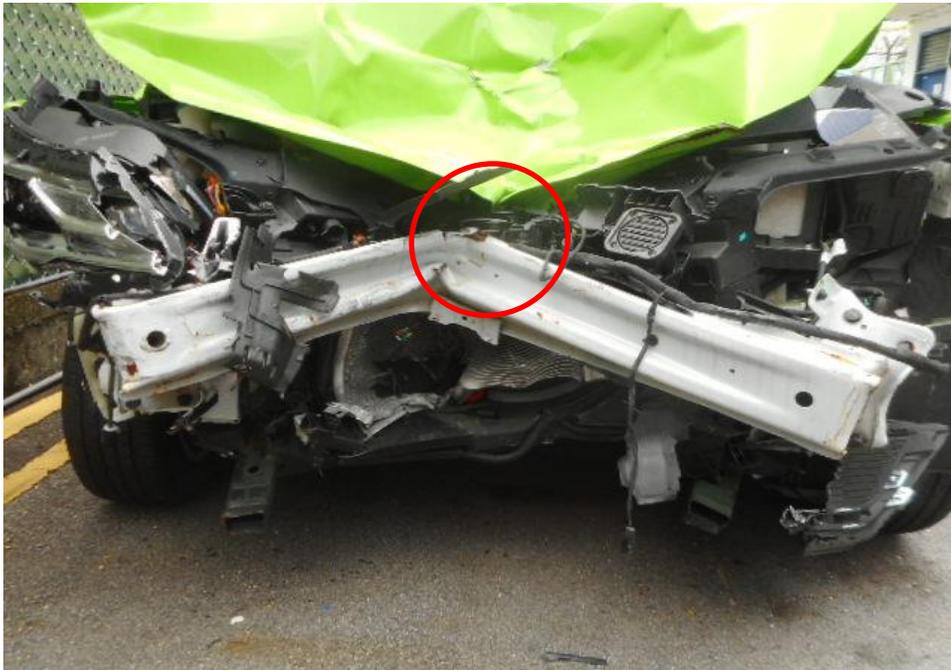


Photo 12 shows a general view of the Electric Taxi's front bonnet. The front bonnet was unable to be opened up as the lock mechanism of the front bonnet was observed to be damaged as a result of the accident.



Photo 13 shows a close up view of the Electric Taxi's front bonnet. The front bonnet was unable to be opened up as the lock mechanism of the front bonnet was observed to be damaged as a result of the accident.



Photo 14 shows the close up view of the surroundings of the electric motor compartment at the time of my inspection. The coolant radiator (circled) and high voltage cables (arrowed) was observed to be damaged as a result of the accident.



Photo 15 shows the coolant reservoir of the Electric Taxi motor at the time of my inspection. The coolant fluid was observed to be of insufficient level (arrowed) due to the damaged radiator as a result of the accident.

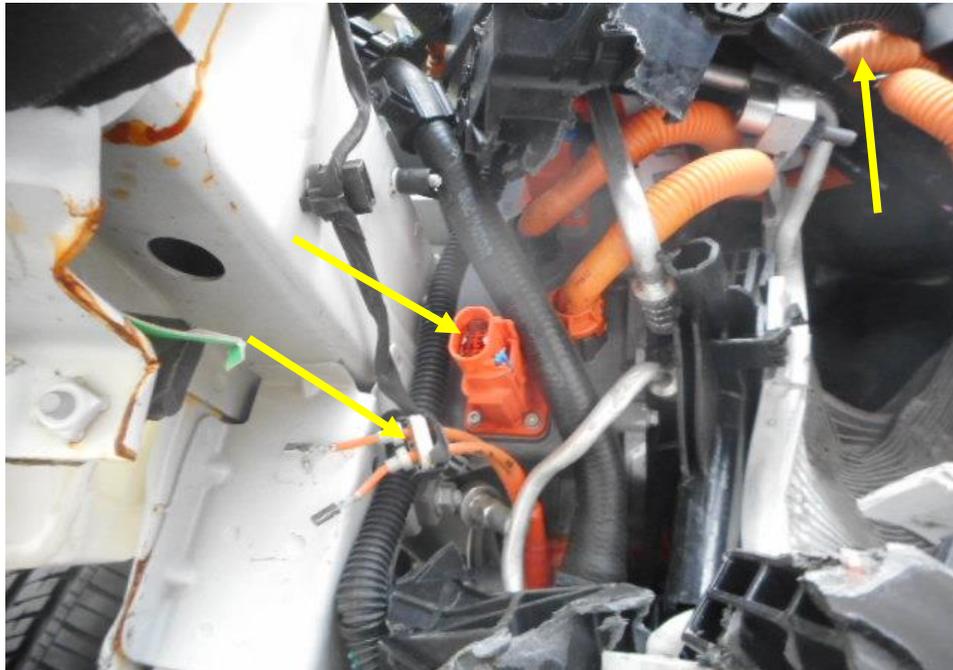


Photo 16 shows the close up view of the surroundings of the electric motor compartment at the time of my inspection. The high voltage cables (arrowed) was observed to be damaged as a result of the accident.

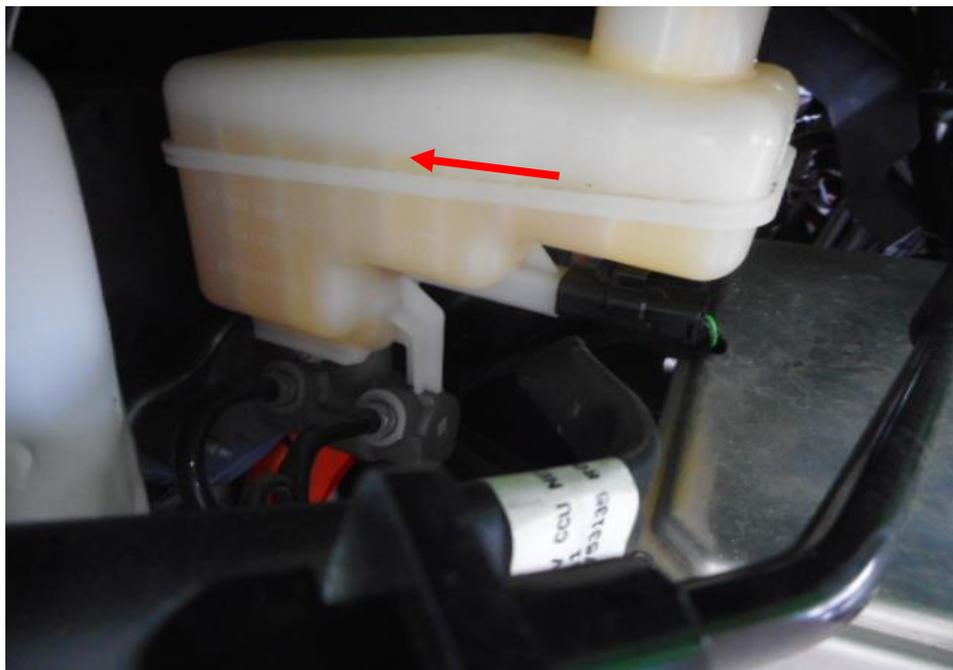


Photo 17 shows the brake fluid reservoir of the Electric Taxi at the time of my inspection. The brake fluid was observed to be of sufficient level (arrowed) and without any visible contamination.



Photo 18 shows the undercarriage of the Electric Taxi, at the area where the electric motor housing and transmission housing are located. I did not find any sign(s) or indication(s) of fluid leak and/or fluid stain(s) on the underside of the Electric Taxi.

Braking System & Steering System

11. For this inspection, I was not able to conduct any static brake and steering tests on the steering and braking system of the Electric Taxi due to both of the electric power steering (EPS) and braking system requiring the Electric Motor to be started up however, the access to the batteries is blocked and the high voltage cables being damaged as a result of the accident.
12. My visual examination of the various steering and braking components of the Electric Taxi which had included the rack and pinion, tie rods, tie rod ends and ball joints, brake hoses and brake pipes had revealed that these components were all generally intact. See photo 19 - 24 below.



Photo 19 shows the brake hose/pipe (arrowed) at the rear right wheel of the Electric Taxi. No leakage of brake fluid was observed. Visual examination of the various components of the braking system like the drum brake, brake booster, brake pedal etc. had revealed all to be intact and without visible damage.

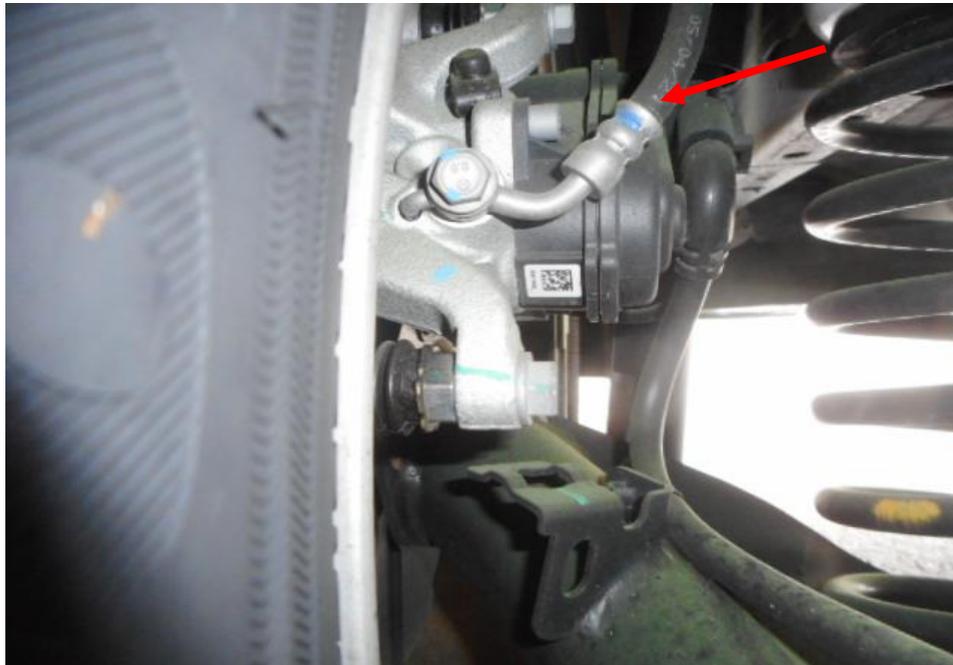


Photo 20 shows the brake hose/pipe (arrowed) at the rear left wheel of the Electric Taxi. I did not observe any leakage of brake fluid at the time of my inspection of the Electric Taxi. The undercarriage components of the Electric Taxi were also all found to be intact and without any visible damage.



Photo 21 shows the brake hose/pipe (arrowed) at the front right wheel of the Electric Taxi. I did not observe any leakage of brake fluid at the time of my inspection of the Electric Taxi. The undercarriage components of the Electric Taxi were also all found to be intact and without any visible damage.



Photo 22 shows the brake hose/pipe (arrowed) at the front left wheel of the Electric Taxi. No leakage of brake fluid was observed. Visual examination of the various components of the braking system like the brake caliper (circled), brake booster, brake pedal etc had revealed all to be intact and without visible damage.

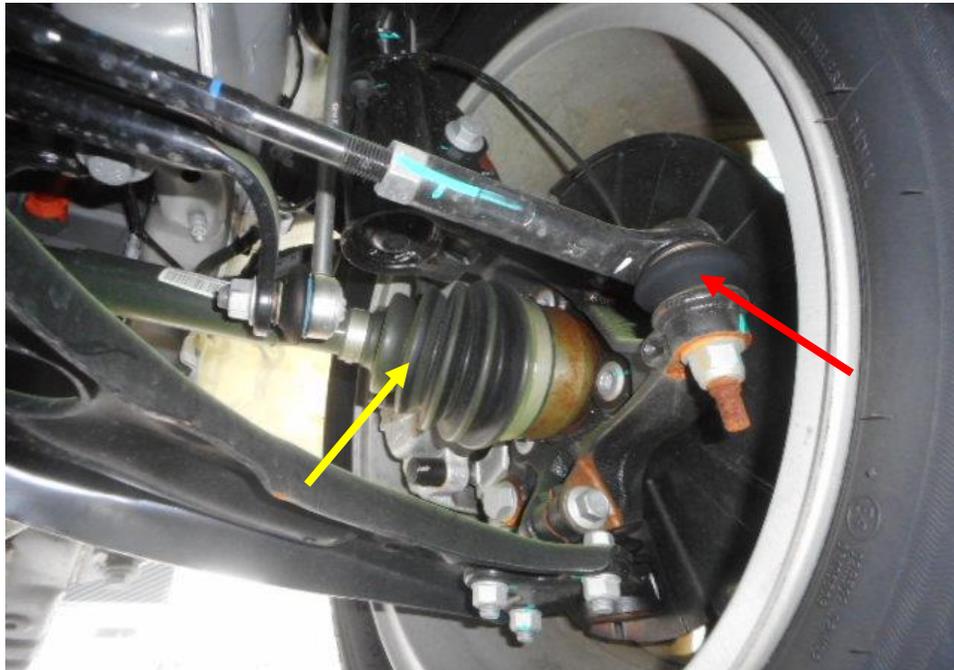


Photo 23 shows the various undercarriage components at the front right wheel of the Electric Taxi, in particular the steering tie rod (red arrow) and its driveshaft (yellow arrow). The various steering components were all found to be intact. There was also no sign of fluid stain observed on the various undercarriage components at the front right wheel of the Electric Taxi.



Photo 24 shows the various undercarriage components at the front left wheel of the Electric Taxi, in particular the steering tie rod (red arrow) and its driveshaft (yellow arrow). The various steering components were all found to be intact. There was also no sign of fluid stain observed on the various undercarriage components at the front left wheel of the Electric Taxi.

Electronic Safety / Warning Indicators

13. The Electric Taxi's automatic self-test of the functionality of its electronic operating systems was not conducted as it was unable to be started up due to the damages the coolant radiator and high voltage cables had sustained as a result of the accident.

Seat Belts

14. The front right seat belt of the "Motor Car" was worn and the front left was not worn at the material time of accident as the respective pre-tensioners that were fitted at the side of each seat was activated upon the material time. See photo 25 and 26 below.

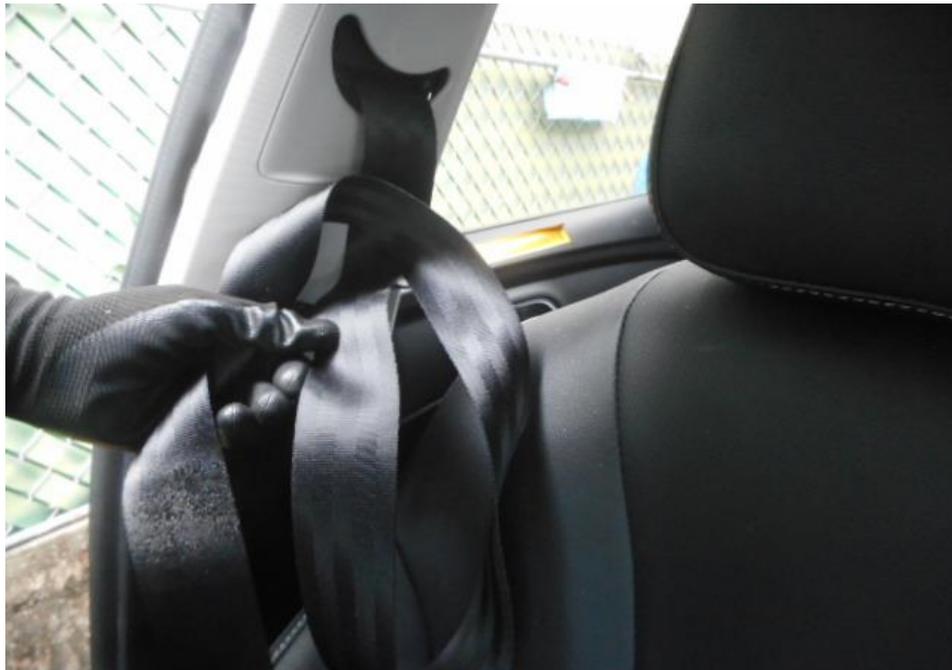


Photo 25 shows that the seat belt on the right seat was worn at the material time of accident as the safety pre-tensioners was activated at the moment of impact and caused the seat belt to be locked into the last position.



Photo 26 shows that the seat belt on the left seat was not worn at the material time of accident as the safety pre-tensioners was activated at the moment of impact and caused the seat belt to be locked into the last position.

Operational Behaviour of the Electric Taxi

15. An operational test by driving the Electric Taxi to primarily determine whether there was any abnormality to the electric system and steering system of the Electric Taxi was not conducted given the extent of damage that it had sustained to its coolant radiator and high voltage cables was unable to start up had prevented me from carrying out any operational test(s) in these systems.
16. However, we were able to conduct a short operational test to the handbrake and braking system of the Electric Taxi, in which I had conducted, did not produce any sign(s) or symptom(s) to suggest that there was any abnormality to its handbrake and its braking system as the Electric Taxi was able to stop when the handbrake and braking system was engaged.

Conclusion

17. For this particular case, I was unable to determine whether there was any possible mechanical failure to the Electric Taxi that may have contributed to the accident. The extent of damage that it had sustained had prevented me from carrying out any operational test(s) and/or static test(s) to its electric motor system, braking system, transmission system, steering system and suspension system.

18. Our visual inspection of the mechanical components of the Electric Taxi's steering and braking system components were all generally intact and unaffected by the accident and there was no leakage found at the steering and braking components of the Electric Taxi.
19. The 4 tyres of the Electric Taxi were also found to be in serviceable condition. I 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 4 tyres. The 4 tyres were also observed to be sufficiently inflated for vehicular operation with remaining tread depth of approximately 6.5mm to 7.1mm.

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