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Your Ref: TP/IP/09701/2018
Our Ref :CI/TPD18010145/Z

16th March 2018

Fatal Accident Investigation Team

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

**MECHANICAL INSPECTION REPORT OF ELECTRIC BICYCLE - PAB (RED) -
TRAFFIC POLICE POUND REPORT NO. 0641/18**

1. We refer to your request dated 07th March 2018 to conduct a physical inspection of an Electric Bicycle (PAB) bearing Traffic Police Pound Report no. 0641/18 (herein referred to as "Electric Bicycle"), which was involved in a fatal road traffic accident on 11th February 2018.
2. The purpose of this inspection is to primarily determine if there was any possible mechanical failure to the Electric Bicycle that may have contributed to the accident.
3. Following the request, we had carried out a physical inspection of the Electric Bicycle on 15th March 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 Electric Bicycle was observed to have sustained minor damages at the right portion. The body parts that were found to have been damaged include its right hand handle, right hand foot pedal & brake lever amongst others as a result of the accident.
5. This was likely due to the consistency of the accident's case facts that the Electric Bicycle rider was cycling along Bedok North Avenue 3. He then cycled across the road from the right to left of a Motor Van's direction. The driver was unable to brake in time and collided onto the cyclist. See photo 1 to 6 below.

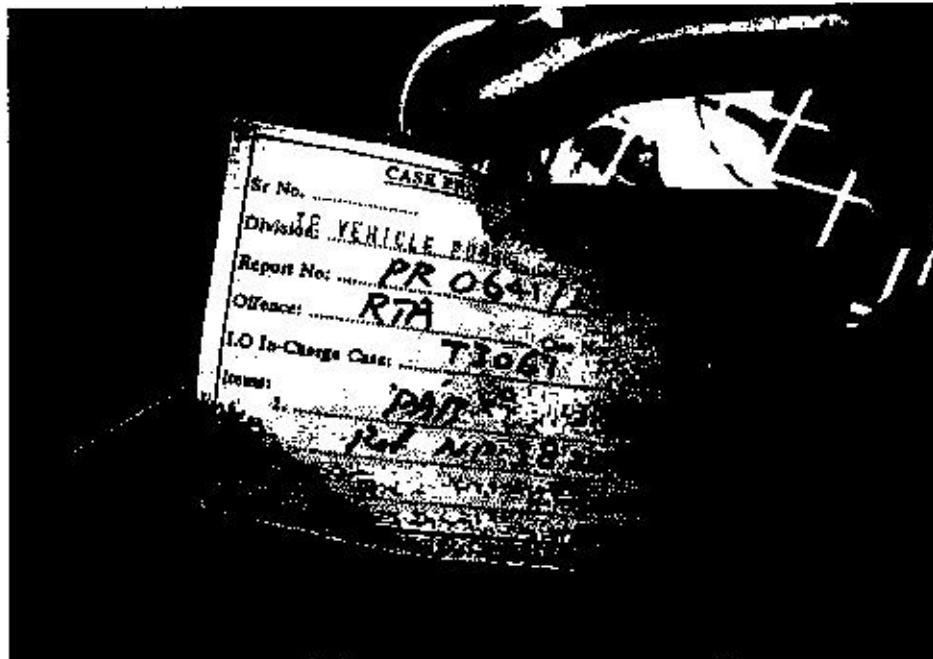


Photo 1 shows the identification of the Electric Bicycle with reference to Traffic Police Pound Report No. 0641/18.

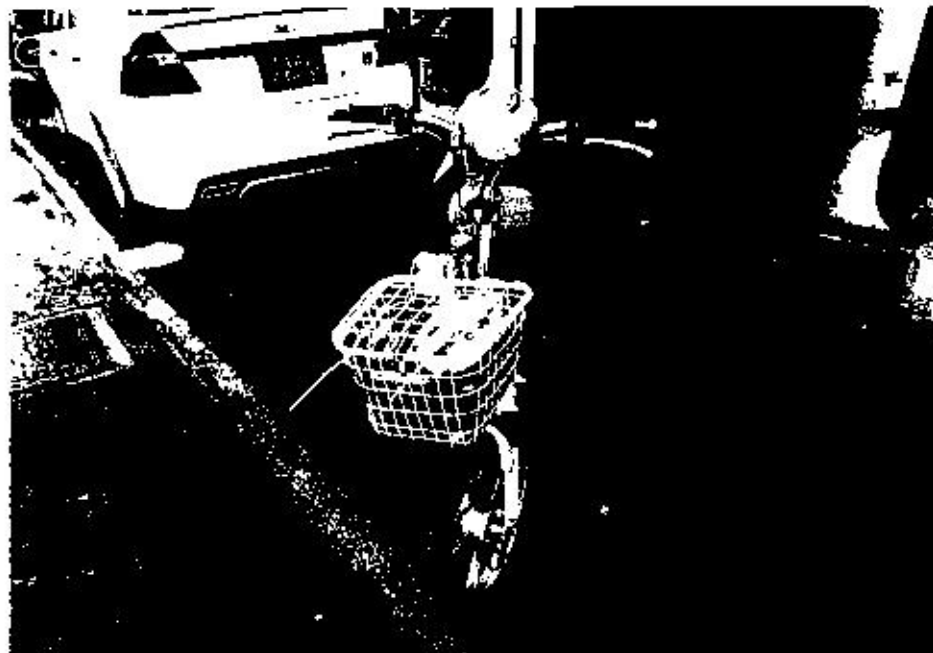


Photo 2 shows the frontal portion of the Electric Bicycle at time of inspection. Damage on the steering system was observed likely due to the accident.



Photo 3 shows the right portion of the Electric Bicycle at time of inspection. Damage on the battery compartment & the foot pedal was observed likely due to the accident.



Photo 4 shows the rear portion of the Electric Bicycle at time of inspection. It was observed to be in good condition without any damage.

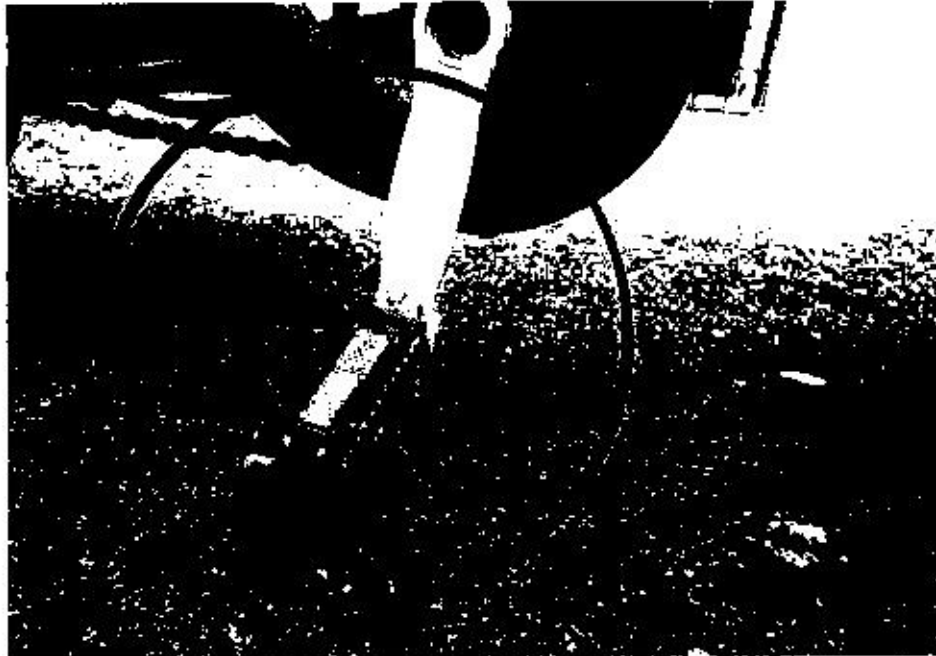


Photo 5 shows the right portion of the Electric Bicycle at time of inspection. Damage on the right hand foot pedal was observed likely due to the accident.



Photo 6 shows the right portion of the Electric Bicycle at time of inspection. Damage on the right hand portion was observed likely due to the accident.

Tyres and Wheel Rims

6. The condition of the Electric Bicycle's front tyre was observed to be in serviceable condition. The tread pattern of the front tyre was clearly visible.
7. As for the rear tyre, it was observed to be bald in the middle section. The tread pattern was only visually observed at both ends. However, we did not find any tear, burst mark(s) and/or punctured hole(s) on the sidewalls as well as across the tread of the 2 tyres. The 2 tyres were both observed to be sufficiently inflated for vehicular operation. The tyre brand, tyre size and remaining tread depth of the 2 tyres were recorded as follows:-



Jiluer 16 X 2.125(0mm)
(Bald in the middle section)

Jiluer 16 X 2.125(1mm)

8. The tyres were wrapped around alloy wheel rim that was found to be without any significant damage. See photo 7 & 8 below



Photo 7 shows the rear tyre of the Electric Bicycle at the time of our inspection. The centre portion tread pattern of the tyre was not visible. However, we did not observe any tear, burst mark(s) and/or punctured hole(s) on the sidewalls.



Photo 8 shows the front tyre of the Electric Bicycle at the time of our inspection. The tread pattern of the front tyre was clearly visible. We did not observe any tear, burst mark(s) and/or punctured hole(s) on the sidewalls.

Drive Train

9. The gear chain of the Electric Bicycle was found to be intact but found misaligned. It was observed to be dented inwards likely due to the accident. Free play tension test was conducted but found that the tension was very tight. There was no free play on the gear chain to say that it was in operational condition. See photo 9 to 11 below.

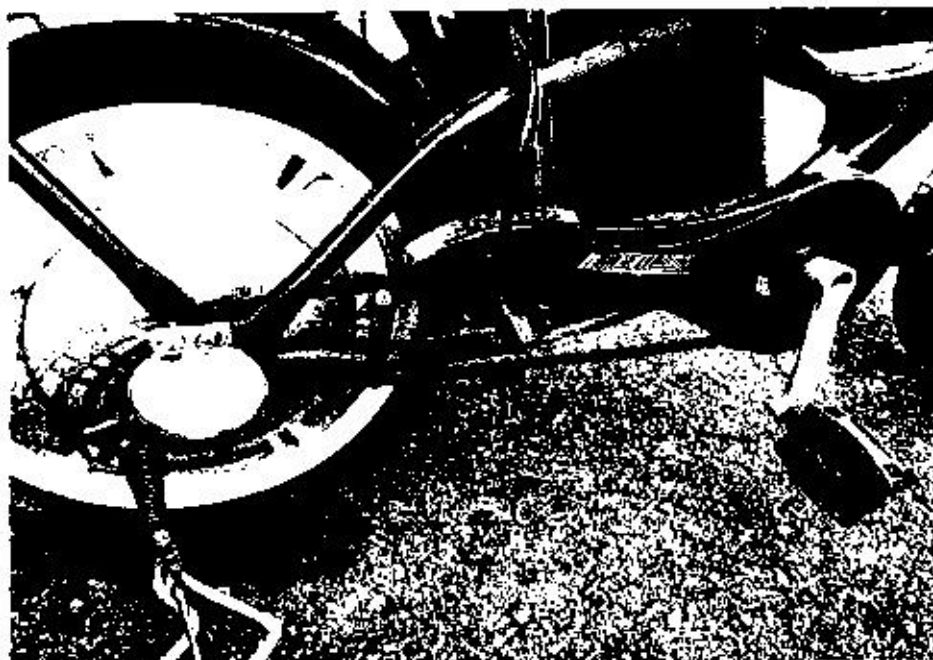


Photo 9 shows the general view of the gear train (arrowed) of the Electric Bicycle, which was found to be intact. However, it was observed to be dented inwards likely due to the accident's impact.

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Photo 10 shows a close-up view of the rear chain of the Bicycle at the time of our inspection. Free play tension test was also conducted & found adequately acceptable. It was also observed to be in operational condition.



Photo 11 shows a close-up view of the rear chain of the Bicycle at the time of our inspection. Free play tension test was conducted with unsatisfactory result. It was observed to be dented likely due to the accident..

Steering System & Braking System

10. Our checks on the steering components of the Electric Bicycle had revealed that its steering system was not in serviceable condition; its front fork was found to be misaligned likely due to the accident's impact.
11. The braking system of the Bicycle was controlled by mechanical means (cables, drum and springs). Our visual examination of the various components in the brake system, like the hand brake lever (left & right), brake drums (front & rear), revealed to be in tact without any damage unaffected by the accident's impact.
12. A static brake test was conducted only on the Bicycle's both front & rear brake. The test was conducted by lifting the front tyre above ground & applies a little spinning action to it. The right hand brake lever was then gripped in order to stop the spinning front tyre. The result was satisfactory. The same sequence applied to the rear tyre. The result was satisfactory too. It stopped after gripping the left & right hand brake to the fullest. It shows that the front & rear braking system was responding to the gripping action. This had appeared to indicate that the both brakes were in a serviceable condition. See photo 12 & 13 below.



Photo 12 shows a static brake test was conducted only on the Bicycle's rear brake. The test was conducted by lifting the rear tyre above ground & applies a little spinning action to it. It stopped after gripping the left hand brake to the fullest. It shows that the rear brake clamps was responding to the gripping action. This had appeared to indicate that the both brakes were in serviceable condition.



Photo 13 shows a static brake test was conducted only on the Bicycle's front brake. The test was conducted by lifting the front tyre in the air & applies a little spinning action to it. The hand brake lever was then gripped in order to the stop the spinning front tyre. The result was satisfactory. It stop after gripping the hand brake to the fullest.

Operational Test

13. We were not able to carry out operational test on the steering system of the Electric Bicycle due to the damages on the steering system due to the accident's impact.



Conclusion

14. Based on our inspection of the Electric Bicycle, the steering system was found to be damage due to the accident's impact collision. Its braking system however was found to be in serviceable condition based on the static brake test conducted at time of inspection.
15. The condition of the Bicycle's front tyre was observed to be in serviceable condition. The tread pattern of the front tyre was clearly visible. As for the rear tyre, it was observed to be bald in the middle section. The tread pattern was only visually found at both ends. However, we did not observe any tear, burst mark(s) and/or punctured hole(s) on the sidewalls as well as across the tread of the 2 tyres. The 2 tyres were both observed to be sufficiently inflated for vehicular operation.
16. For this particular case, the conditions of the rear tyre could have contributed to the accident. As the rear tyre would have unlikely been able to provide adequate friction grip/ traction between the road surface and the Electric Bicycle during braking. The stopping distance of the Electric Bicycle would hence be longer.
17. Our findings were based partially on a static and visual inspection of the Electric Bicycle's steering system & braking system. No operational test could be carried out to the Electric Bicycle given the extent of damages that it had sustained as a result of the accident.

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