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Our Ref :CI/TPD18001480/Z

25th January 2018

Fatal Accident Investigation Team

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

**INSPECTION REPORT OF ELECTRIC BICYCLE - PAB (RED) - TRAFFIC
POLICE POUND REPORT NO. 3545/2017**

1. We refer to your request dated 08th January 2018 to conduct a physical inspection of an Electric Bicycle (PAB) bearing Traffic Police Pound Report no. 3545/2017 (herein referred to as "**Electric Bicycle**"), which was involved in a fatal road traffic accident on 17th August 2017.
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 17th January 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.



Photo 1 shows the identification of the Electric Bicycle with reference to Traffic Police Pound Report No. 3545/2017.



Photo 2 shows the frontal portion of the Electric Bicycle at time of inspection. Damage on the right hand handle & right hand foot pedal was observed likely due to the accident.



Photo 2 shows the right portion of the Electric Bicycle at time of inspection. Damage on the right hand handle & right hand foot pedal was observed likely due to the accident.



Photo 2 shows the left portion of the Electric Bicycle at time of inspection. It was observed to be in good condition without any damage.



Photo 2 shows the rear portion of the Electric Bicycle at time of inspection. It was observed to be in good condition without any damage.



Photo 3 shows the right portion of the Electric Bicycle at time of inspection. Damage on the right hand handle, brake lever & right hand foot pedal was observed likely due to the accident.



Photo 4 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.

Tyres and Wheel Rims

5. The condition of the Electric Bicycle's 2 tyres was observed to be in serviceable condition. The tread pattern of the 2 tyres was clearly visible. 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. The tyre brand, tyre size and remaining tread depth of the 2 tyres were recorded as follows:-



Kenda E-Bike 76-305 16 X 3.0 (1mm)

Kenda E-Bike 76-305 16 X 3.0 (1.6mm)

6. The tyres were wrapped around alloy wheel rim that was found to be without any significant damage. See photo 8 & 9 below



Photo 8 shows the rear tyre of the Electric Bicycle at the time of our inspection. The tread pattern of the 2 tyres was clearly visible. We did not observe any tear, burst mark(s) and/or punctured hole(s) on the sidewalls.



Photo 9 shows the front tyre of the Electric Bicycle at the time of our inspection. The tread pattern of the 2 tyres was clearly visible. We did not observe any tear, burst mark(s) and/or punctured hole(s) on the sidewalls.

Drive Train

7. The gear chain of the Electric Bicycle was found to be intact without any misalignment. Free play tension test was also conducted & found adequately acceptable. It was also observed to be in operational condition. See photo 10 & 11 below.



Photo 10 shows the general view of the gear train (arrowed) of the Electric Bicycle, which was observed to be intact with no misalignment.



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 also conducted & found adequately acceptable. It was also observed to be in operational condition.

Steering System & Braking System

8. Our checks on the various steering components of the Electric Bicycle had revealed that its steering system was in serviceable condition & its front fork was found to be intact and undamaged.
9. However, on further observation we had found an abnormality on the Electric Bicycle's handle bar operational movement. It was found to be hindered by an additional child seat handle bar that was installed in the middle section of the Electric Bicycle's body. Hence, disrupting the normal operating sequence for the Electric Bicycle's steering system. The normal operating sequence for the Electric Bicycle is to be able to turn the handle bar to the fullest left & fullest right without any obstruction from any foreign material.
10. The braking system of the Bicycle was controlled by mechanical means (cables, callipers and springs). Our visual examination of the various components in the brake system, like the hand brake lever (left & right), brake callipers (front & rear), revealed some of the components sustained damages.
11. Further examination revealed that the right hand brake lever for front brake was observed to be bent; it was also found to be stuck likely due to the accidents impact.

12. 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. The left hand brake lever was then gripped in order to stop the spinning rear tyre. The result was satisfactory. It stopped after gripping the left hand brake to the fullest. It shows that the rear brake calliper was responding to the gripping action. This had appeared to indicate that the rear brake was in a serviceable condition.

Operational Test

13. We were able to carry out an operational test to the steering system and braking system of the Electric Bicycle partially. Which were includes pushing the Electric Bicycle manually forward and backward & also applying only on the rear brake, simulating movement of the Bicycle, for the operational tests.
14. However, operational test such as turns the handle bar to the full left & full right was of unsatisfactory result. We were not able to turn the handle bar to full left & full right. This is likely due to the additional child seat handle bar that hinders the normal operational sequence for the Electric Bicycle's steering system. For the front brake, we were unable to test due to the damages sustained as a result of the accident. See photo 13 – 18 below.



Photo 13 shows the handle bar of the Electric Bicycle while trying to turn to the fullest right. It was hindered by an additional child seat handle bar that was installed in the middle section of the Electric Bicycle's body. Hence, disrupting the normal operating sequence for the Electric Bicycle's steering system.

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Photo 14 shows the handle bar of the Electric Bicycle while trying to turn to the fullest left. It was hindered by an additional child seat handle bar that was installed in the middle section of the Electric Bicycle's body. Hence, disrupting the normal operating sequence for the Electric Bicycle's steering system.



Photo 15 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. The hand brake lever was then gripped in order to stop the spinning front tyre. The result was satisfactory. 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 rear brake was in a serviceable condition.



Photo 16 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 stop the spinning front tyre. The result was unsatisfactory. It didn't stop after gripping the hand brake to the fullest.

Conclusion

15. At the time of our inspection of the Electric Bicycle, its front brake could not be tested (due to damages as a result of the accident). Its rear brake was however found to be in serviceable condition based on the static brake test conducted at time of inspection.
16. The steering system was found to be in a serviceable condition. However, our observation had found an abnormality on the Electric Bicycle's handle bar operational movement. It was observed to be hindered by an additional child seat handle bar that was installed in the middle section of the Electric Bicycle's body. Hence, disrupting the normal operating sequence for the Electric Bicycle's steering system. The normal operating sequence for the Electric Bicycle is to be able to turn the handle bar to the fullest left & fullest right without any obstruction from any foreign material. Anyway, looking at the accidents case facts that the Electric Bicycle was travelling on a straight road at the time of accident. This may not likely to cause and/or contributes to the accident.

17. The condition of the Electric Bicycle's 2 tyres was observed to be in serviceable condition. The tread pattern of the 2 tyres was clearly visible. 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.
18. Our findings were based partially on a static, operational and visual inspection of the Electric Bicycle's steering system & braking system. We did not find any evidence(s) to suggest that there was possible mechanical failure to the Electric Bicycle that may have caused and/or contributed to the accident.



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