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Our Ref : CI/TPD18011361/Z

30th August 2018

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

MECHANICAL INSPECTION REPORT OF MOTORCYCLE FBL 1917L

1. We refer to your request dated 08th June 2018 to conduct a physical inspection of a motorcycle bearing registration number FBL 1917L (herein referred to as "**Motorcycle**"), which was involved in a fatal road traffic accident on 01st June 2018.
2. The purpose of this inspection is to primarily determine if there was any possible mechanical failure to the Motorcycle that may have contributed to the accident.
3. Following the request, we had carried out a physical inspection of the Motorcycle on 02nd July 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 mileage of the Motorcycle at the time of our inspection was not recorded due to missing speedo meter.
5. The Motorcycle was observed to have sustained relatively extensive damages at the frontal portion, left and its rear portion. The body parts that were found to have been damaged include its rear left hand signal lamp, left side foot rest & gear shift pedal, handle bar, missing speedo meter, damaged ignition system, missing headlamp, broken front wheel rim and seat assembly amongst others. Its front fork assembly was also observed to be severely damaged as a result of the accident.
6. This was likely due to the consistency of the accident's case facts that the Motor Cycle rider was travelling along KJE (PIE) in between lane 1 and lane 2 of 4 lanes road when he lost control & skidded. The motorcyclist fell onto the road and went underneath a moving Motor Lorry which was travelling on lane 2. See photo 1 to 9 below.



Photo 1 shows a general view of the front body of the Motorcycle at the time of our inspection. The Motorcycle was observed to have sustained with severe damages as a result of the accident.



Photo 2 shows a general view of the left side body of the Motorcycle at the time of our inspection. The Motorcycle was observed to have sustained with severe damages as a result of the accident.



Photo 3 shows a general view of the right side body of the Motorcycle at the time of our inspection. The Motorcycle was observed to have sustained with severe damages as a result of the accident.



Photo 4 shows a general view of the rear portion of the Motorcycle at the time of our inspection. The Motorcycle was observed to have sustained with relatively minor impact due to the accident collision. This includes damages on its left signal lamp & rear compartment box.



Photo 5 shows a close-up view of the missing headlamp & missing speedometer of the Motorcycle due to the accident collision.



Photo 6 shows a close-up view of the broken front wheel rim of the Motorcycle due to the accident collision.



Photo 7 shows a close-up view of the crack mark on the fuel tank of the Motorcycle due to the accident collision.



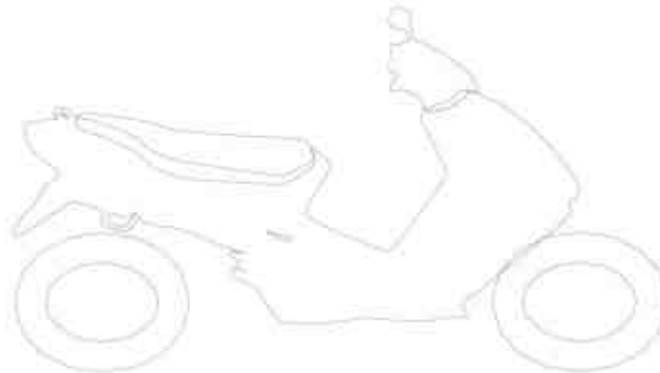
Photo 8 shows a close-up view of the damages on the foot rest & gear shift pedal of the Motorcycle due to the accident collision.



Photo 9 shows a close-up view of the damage seat assembly of the Motorcycle due to the accident collision.

Tyres and Wheel Rims

7. The condition of the Motorcycle's rear tyre was observed to be in serviceable condition. The tread pattern of the rear tyre 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 rear tyres. It was observed to be sufficiently inflated for vehicular operation.
8. As for the Motorcycle's front tyre, it was observed to be dislodged from the broken wheel rim & deflated due to the accident's impact collision. However, 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 as well as across the tread of the rear tyres.
9. The tyre brand, tyre size and remaining tread depth of the 2 tyres were recorded as follows:-



Pirelli Angel CT
140/70 - 17 (4mm)

MRF Nylogrid Zapper FX
100/80 - 17 (4mm)

10. The rear tyre was wrapped around alloy wheel rim that was found to be without any significant damage.
11. As for the front tyre, despite the broken wheel rim due to the accident. It was still observed to be intact, wrapped around the alloy wheel rim. See photo 10 to 12 below.



Photo 10 shows the rear tyre of the Motorcycle was observed to be in serviceable condition with remaining tread depth of approximately 4mm. The tyre was also observed to be sufficiently inflated for vehicular operation. There was no significant damage observed on the rear wheel rim & tyre.



Photo 11 shows the Motorcycle's front tyre, it was observed to be dislodged from the broken wheel rim & deflated due to the accident's impact collision. However, 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 as well as across the tread of the rear tyres



Photo 12 shows the Motorcycle's front wheel rim, it was observed to be broken due to the accident's impact collision. However, 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 as well as across the tread of the rear tyres

Engine & Drive Train

12. Upon examination of the Motorcycle's engine area, we had observed that the various engine related parts and components were intact with no visible damage. There was also no sign(s) or indication(s) of fluid leak observed around the engine area of the Motorcycle.
13. The gear chain of the motorcycle was found to be intact without any misalignment. It was also adequately lubricated for operating purposes. Free play tension test was also conducted & found adequately acceptable. See photo 13 – 16 below.



Photo 13 shows the engine underside view. There was also no sign(s) or indication(s) of fluid leak observed around the engine area of the Motorcycle.



Photo 14 shows the engine area view. There was also no sign(s) or indication(s) of fluid leak observed around the engine area of the Motorcycle.



Photo 15 shows the general view of the gear train (arrowed) of the Motorcycle, which was observed to be intact with no misalignment. It was also adequately lubricated for operating purposes.



Photo 16 shows the general view of the gear train (arrowed) of the Motorcycle, which was observed to be intact with no misalignment. It was also adequately lubricated for operating purposes. Free play tension was also observed & found adequately acceptable.

Steering System & Braking System

14. For this case, we were not able to conduct any test(s) on the steering system of the Motorcycle due to the damage on its front fork. Its front fork assembly was observed to be severely damaged as a result of the accident.
15. The brake system of the Motorcycle was of a semi-hydraulic type, where hydraulic (brake fluid) pressure controls the brake for the front wheel while the brake for the rear wheel is controlled by mechanical means (cables and springs).
16. For the front brake, our visual examination of the various components in the brake system, like the brake calliper, brake pad and hand brake lever, revealed all to be intact and without damage. There was also no visible tear or cut observed on the connecting hoses and cables except for the brake disc that was found to be corrugated due to the accident's impact. As for the rear brake components such as foot brake pedal, cables & springs were observed to be in a serviceable condition unaffected by the accident's impact collision.

17. Further investigation on the front brake fluids from the brake fluid reservoir found that it was contaminated and insufficient. Upon dismantling of the front brake reservoir cover, a sludge like substance noted to be filling the brake fluid reservoir.
18. Hydraulic brake discs feature a closed system of hoses and reservoirs containing special hydraulic brake fluid to operate the brakes. When the lever is activated, a plunger pushes the fluid through the hoses and into the calliper where the pads are pushed onto the rotor, stopping the Motorcycle.
19. However, this contamination was likely due to moisture developing in the system after a period of time. Heat element might contribute to this reaction. Hence, conclusively the front brake was likely not in serviceable condition prior the material time of the accident.
20. Static brake test for the front brake was conducted on the Motorcycle. It was found that there was no resistance felt (spongy like feel) upon gripping the hand brake lever. This would indicate that there's evidence of abnormalities occurred while performing static brake test on the front brake of the motorcycle.
21. Static brake test however was conducted on the Motorcycle rear brake had appeared to indicate that it was in serviceable condition. There was some resistance felt (spongy like feel) upon stepping on the rear brake foot pedal. This would indicate that there were no abnormalities in the rear brake system mechanical parts.
22. For this case, we was not able to carry out any operational tests to the steering system and brake system of the Motorcycle due to the damage of its front fork & the contaminated front brake fluid, which had rendered the Motorcycle's abnormality for the operational tests. See photo 17 - 22 below.



Photo 17 shows the front fork was observed to have sustained with severe damages as a result of the accident. Hence, we are not able to conduct any tests on the steering system of the Motorcycle.



Photo 18 shows the front brake calliper, front brake disc and front brake hose of the Motorcycle (arrowed), which are all part of the components in the front brake system of the Motorcycle. Our visual checks of these various components had revealed that only the brake disc was damaged due to the accident. No leakage of brake fluid was also observed.

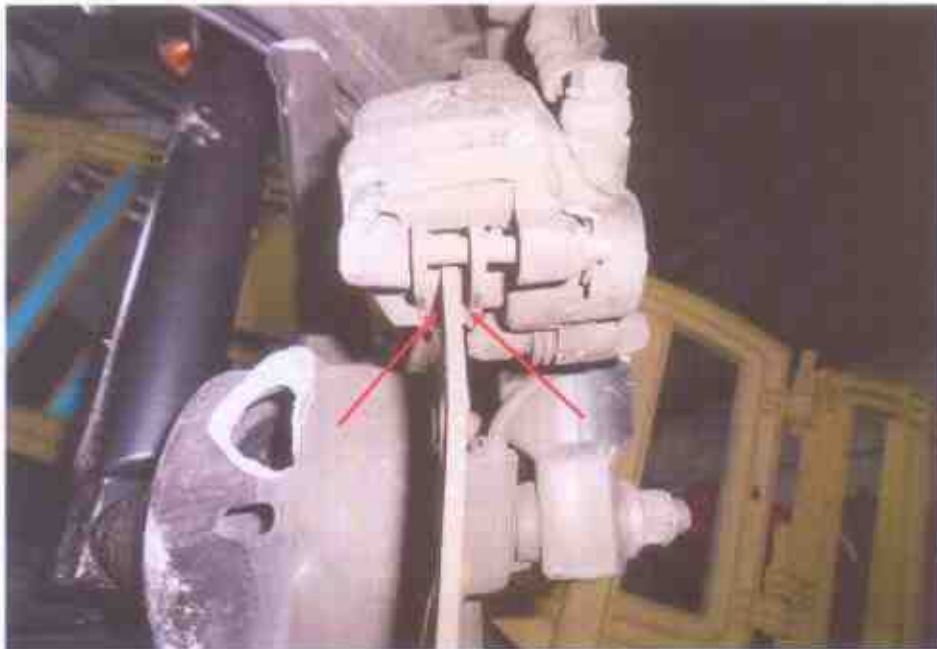


Photo 19 shows the front brake pad of the Motorcycle (arrowed). Our visual checks of the front brake pad had revealed that it is in serviceable condition.



Photo 20 shows after opening of the front brake fluid reservoir of the Motorcycle (arrowed). We found that the brake fluid turned into sludge like substance. Hence, indicates it had been contaminated prior to the accident.



Photo 21 shows the front brake static test. It was observed to be not in serviceable condition at time of our inspection. The brake lever was found to be without resistance (spongy like feel). However, no brake fluid leakage was observed at time of our inspection.



Photo 22 shows the rear brake static test of the Motorcycle. The type of brake system for the rear wheel was of mechanical type, controlled by the brake foot pedal of the Motorcycle. Our static brake test revealed that the rear brake system of the Motorcycle was in serviceable condition without damage.

Conclusion

23. At the time of our inspection of the Motorcycle, its steering system could not be tested (due to damage as a result of the accident). Its rear brake system was however found to be in serviceable condition. As for the front brake fluid, it was found to be contaminated at time of our inspection.
24. For this particular case, we are of the opinion that the front brake fluids contamination was likely due to moisture developing in the system after a period of time. Heat element might contribute to this reaction and caused contamination to the brake fluid turning it into sludge like substance. Hence, conclusively the contaminated front brake fluids could have contributed to the accident by means of chocking the braking system and making it ineffective at the material time of the accident.
25. The tyres of the Motorcycle were found to be in a 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 tyre. It was sufficiently inflated for vehicular operation with remaining tread depth of approximately 4mm each.
26. Our findings were based solely on a static and visual inspection of the Motorcycle. No operational test(s) could be carried out to the Motorcycle due to the damages of its front fork (as a result of the accident), & the contaminated front brake fluid, which had rendered the Motorcycle's abnormality for the operational tests.



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