

You're Ref: TP/IP/31296/2022
Our Ref: CI/TPD22013012/P

4th April 2023

Fatal Accident Investigation Team

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

MECHANICAL INSPECTION REPORT OF POLICE CAR QX 505H

1. I refer to your request on 13th December 2022 to conduct a physical inspection of a Police Car bearing registration number QX 505H (herein referred to as "**Police Car**"), which was involved in a road traffic accident on 19th November 2022.
2. The objective of the inspection is to determine if there was any possible mechanical failure to the Police Car that may have contributed to the accident.
3. Following the request, I had carried out a physical inspection of the Police Car on 29th March 2023 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

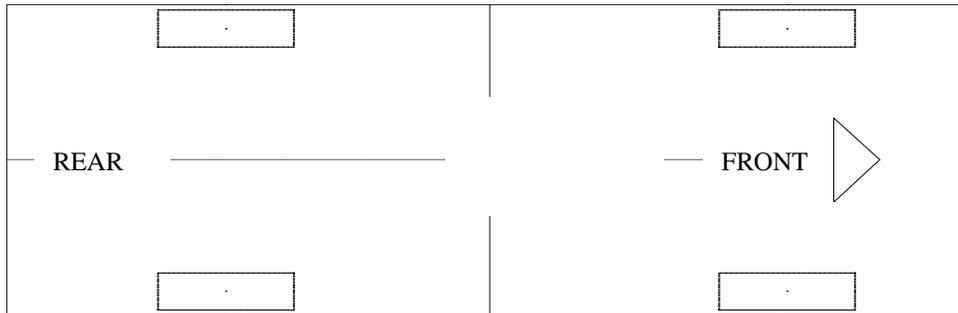
4. The mileage of the Police Car at the time of my inspection was 182,450km.
5. The Police Car was observed to have sustained damage at its left portion. Its left door, left rear view mirror and front left fender was the body parts that were damaged as a result of the accident.

Tyres and Wheel Rims

6. The condition of the Police Car'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:-

Falken 195/65R15 (4.3mm)

Falken 195/65R15 (4.3mm)



Falken 195/65R15 (4.3mm)

Falken 195/65R15 (5mm)

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



Photo 1 shows the mileage of the Police Car at the time of my inspection. The mileage observed was 182,450km.



Photo 2 shows a general view of the Police Car's front body at the time of my inspection. The Police Car front body was observed to be unaffected by the accident.



Photo 3 shows a general view of the Police Car's left body at the time of my inspection. The left portion of the Police Car was observed to have sustained damage. Its left door, left rear view mirror and front left fender was the body parts that were damaged as a result of the accident.



Photo 4 shows a close up view of the Police Car's left body at the time of my inspection. The left portion of the Police Car was observed to have sustained damage. Its left door (yellow circle) and left rear view mirror (red circle) was the body parts that were damaged as a result of the accident.



Photo 5 shows a close up view of the Police Car's left body at the time of my inspection. The left portion of the Police Car was observed to have sustained damage. Its front left fender (circled) was the body parts that were damaged as a result of the accident.



Photo 6 shows the general view of the Police Car's right body at the time of my inspection. The Police Car right body was observed to be unaffected by the accident.



Photo 7 shows the general view of the Police Car's rear body at the time of my inspection. The Police Car rear was observed to be unaffected by the accident.



Photo 8 shows the condition of the front right tyre of the Police Car, which was observed to be in serviceable condition with remaining tread depth of approximately 5mm. The tyre was also observed to be sufficiently inflated for vehicular operation with no tear, cut or burst mark(s).



Photo 9 shows the condition of the rear right tyre of the Police Car, which was observed to be in serviceable condition with remaining tread depth of approximately 4.3mm. The tyre was also observed to be sufficiently inflated for vehicular operation with no tear, cut or burst mark(s).



Photo 10 shows the condition of the rear left tyre of the Police Car, which was observed to be in serviceable condition with remaining tread depth of approximately 4.3mm. The tyre, which was wrapped around alloy wheel rim, was also observed to be sufficiently inflated for vehicular operation. The 4 tyres of the Police Car were wrapped around standard alloy wheel rims.



Photo 11 shows the condition of the front left tyre of the Police Car, which was observed to be in serviceable condition with remaining tread depth of approximately 4.3mm. There was also no tear, cut or burst mark(s) on the outer and the inner sidewalls as well as across the tread of the Police Car's 4 tyres.

Engine Compartment & Operating Fluids

8. Upon examination of the engine compartment of the Police Car, I had observed all the parts and components inside the engine compartment to be intact and unaffected by the accident. The brake fluid and engine coolant were all found to be of sufficient level for operating purposes. Visually, there was also no contamination found to these fluids. However, the engine oil was observed to be insufficient level.
9. Further examination of the engine compartment revealed no sign(s) or indication(s) of fluid leakage and/or fluid stain within the engine compartment of the Police Car.
10. My subsequent checks on the underside of the Police Car had revealed engine oil leakage at the undercarriage of the Police Car which had contributed to the insufficient engine oil as shown on the engine oil dipstick. However, there no sign(s) or indication(s) of fluid leak and/or fluid stain(s) to other various undercarriage components of the Police Car and were all observed to be intact and without any visible damage. See photo 12 – 16 below.



Photo 12 shows a general view of the Police Car's engine compartment. The various parts and components inside the engine compartment were unaffected by the accident. There was also no sign(s) or indication(s) of fluid leakage and/or fluid stain within the engine compartment.



Photo 13 shows the brake fluid reservoir of the Police Car at the time of my inspection. The brake fluid was observed to be of sufficient level (arrowed) and without any visible contamination.

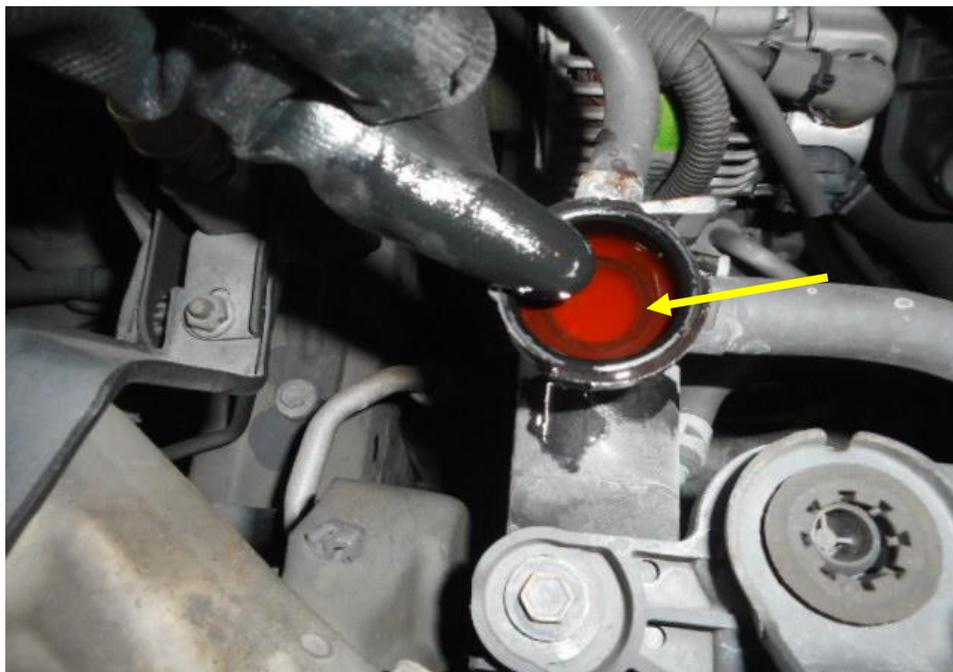


Photo 14 shows checks being carried out to the engine coolant of the Police Car at the time of my inspection. The engine coolant was observed to be of sufficient level (arrowed) and without any visible contamination.



Photo 15 shows the engine oil level dipstick of the Police Car at the time of my inspection. The engine oil was observed to be of insufficient level.



Photo 16 shows the undercarriage of the Police Car, at the area where the engine housing and transmission housing are located. I noticed engine oil leak and fluid stain on the engine oil sump (arrowed) on the underside of the Police Car.

Braking System & Steering System

11. Static brake tests conducted on the Police Car revealed no abnormality. The brake booster had responded well to the various tests conducted. There was also no abnormal movement of the brake pedal when it was depressed. In general, the static brake tests had suggested that there was no internal leakage of pressure/vacuum in the braking system of the Police Car. The braking system of the Police Car was likely to be in serviceable condition at the material time. This was taking into consideration that the brake fluid was of sufficient level, and also that there was no sign(s) of brake fluid leakage along the brake hoses and brake pipes.
12. Static test on the steering system of the Police Car also revealed no abnormality to the steering system. I did not experience any abnormal free play and/or other resistance when turning the steering wheel left and right to full lock positions. My visual examination of the various steering components which had included the steering rack and pinion, tie rods, tie rod ends and ball joints revealed that these components were all generally in good condition. See photo 17 - 23 below.



Photo 17 shows the brake hose/pipe (arrowed) at the rear right wheel of the Police Car. 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 18 shows the brake hose/pipe (arrowed) at the rear left wheel of the Police Car. I did not observe any leakage of brake fluid at the time of my inspection of the Police Car. Static tests of the Police Car's braking system had indicated that there was no internal leakage of pressure/vacuum. The undercarriage components of the Police Car were also all found to be intact and without any visible damage.



Photo 19 shows the brake hose/pipe (arrowed) at the front right wheel of the Police Car. I did not observe any leakage of brake fluid at the time of my inspection of the Police Car. Static tests of the Police Car's braking system had indicated that there was no internal leakage of pressure/vacuum.



Photo 20 shows the brake hose/pipe (arrowed) at the front left wheel of the Police Car. 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 21 shows the front right wheel of the Police Car turned to its full left. During my steering system test, I did not experience any abnormal free play and/or resistance when I had turned the steering wheel towards the left and right. This would suggest that the steering system of the Police Car was likely to be in serviceable condition at the material time of accident.



Photo 22 shows the various undercarriage components at the front right wheel of the Police Car, in particular the steering tie rod (red arrow). The various steering components were all found to be intact, suggesting that the steering system of the Police Car was likely to be in serviceable condition at the material time of accident. There was also no sign of fluid stain observed on the various undercarriage components at the front right wheel of the Police Car.

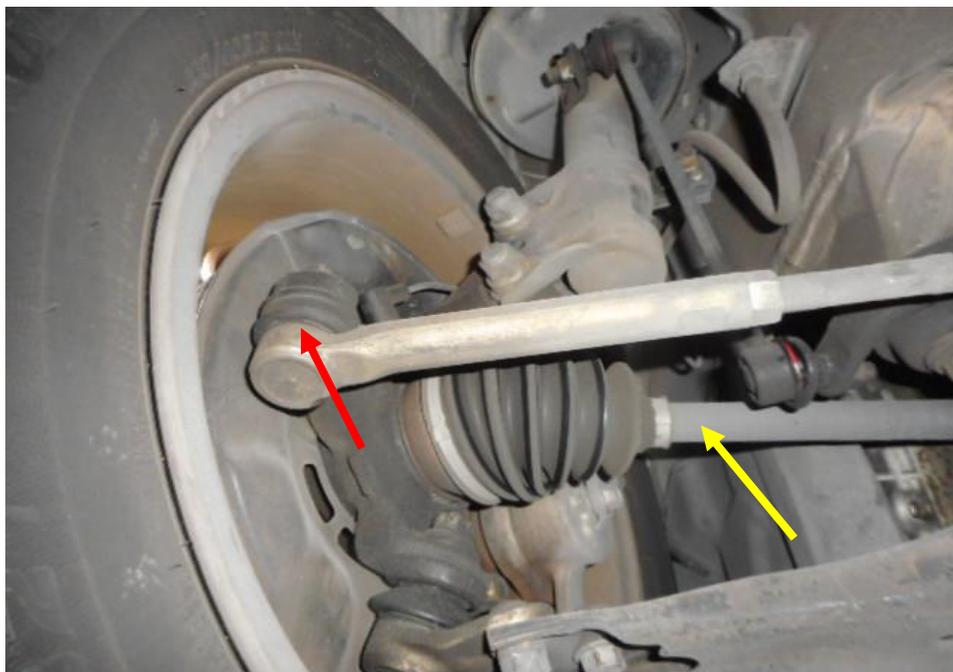


Photo 23 shows the various undercarriage components at the front left wheel of the Police Car, which had included the steering tie rod (arrowed) and in particular the drive shaft (yellow arrow). The various undercarriage components of the Police Car were all found to be intact without any visible damage.

Electronic Safety / Warning Indicators

13. Police Car 's automatic self-test of the functionality of its electronic operating systems like the Anti-Lock Brake System (ABS) and Supplemental Restraint System (SRS) during cranking of the engine had indicated that the system were in working condition and without abnormality. This can be established from the warning lights disappearing from the instrument panel after the self-test. See photo 24 & 25 below.



Photo 24 shows the warning light for Anti-Lock Brake System (ABS) and Supplemental Restraint System (SRS) (arrowed) appearing on the instrument panel of the Police Car during the self-test of its various electronic operating systems when its engine was cranked.



Photo 25 shows no warning lights illuminated on the instrument panel of the Police Car after the engine was cranked. This would suggest that there was no abnormality to the electronic operating system of the Police Car, like the ABS and SRS etc.

Seat Belts

14. The Front right, front left, rear right and rear left seat belts of the “Police Car” were tested and all the seat belts were able to be fastened securely into the respective pre-tensioners that were fitted at the sides of each seat.

Operational Behaviour of the Police Car

15. A short operational test of the Police Car, to primarily determine whether there was any abnormality to its various operating systems like its engine system, its transmission system, steering system and braking system was subsequently carried out. The test was conducted by driving the Police Car forward, stopping, before reversing and coming to a stop again.
16. During the operational test, the transmission system of the Police Car was able to be shifted to drive mode and reverse mode without any difficulty. There was no abnormal sounds heard and/or abnormal behaviour of the Police Car’s engine system. It was able to move forward and backward normally. The braking system was also found to be in working condition as the Police Car was able to slow down and come to a complete stop upon depressing of the brake pedal. (Refer to photo 2 & 21)

Conclusion

17. From my physical inspection of the Police Car, it appears that its engine system, transmission system, steering system and braking system were all in serviceable condition. I did not find any evidence(s) to suggest that there was possible mechanical failure and/or abnormal behaviour to the Police Car that may have caused and/or contributed to the accident.
18. A short operational test of the Police Car, which I had conducted, did not produce any sign(s) or symptom(s) to suggest that there was any abnormality to its engine system, its transmission system and braking system.
19. The 4 tyres of the Police Car 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 4.3mm to 5mm.



Sherwin Beh
Technical Investigator



Ang Bryan Tani
AMSOE, AMIRTE, AFF SAE, M.MATAI, AFF.Inst.AEA
Senior Technical Investigator
Technical Investigation & Reconstructionist (SAE-A)

DISCLAIMER OF LIABILITY TO THIRD PARTIES: - This Report is made solely for the use and benefit of the Client named on the front page of this Report. No liability or responsibility whatsoever, in contract or tort, is accepted to any third party who may rely on the Report wholly or in part. Any third party acting or relying on this Report, in whole or in part does so at his or her own risk.