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M/s MSIG Insurance (Singapore) Pte. Ltd.
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Singapore 048581
(Motor Claims Department)

**AUTOMOBILE TECHNICAL INVESTIGATION REPORT OF ACCIDENT
INVOLVING SLN 4634D AND SJT 9999K ON 4 APRIL 2018**

1. We refer to your letter dated 16 April 2018 and the instructions therein to comment on the damage consistency of the motor car SLN 4634D involved in the captioned accident, in particular to establish whether there was possibly contact between the rear portion of the motor car SLN 4634D and the front portion of the motor van SJT 9999K; and if there was contact, whether the damages on the rear portion of the motor car SLN 4634D is consistent to the accident.
2. The following documents were provided to us for our review and consideration in the preparation of this report:-
 - a) Singapore Accident Statement of the driver of the motor car SLN 4634D (herein referred to as "**Toyota**"), where amongst other information, the circumstances of accident was described together with 7 coloured photographs of the Toyota at the time of reporting;
 - b) Singapore Accident Statement of the driver of the motor van SJT 9999K (herein referred to as "**Nissan**"), where amongst other information, the circumstances of accident was described together with 8 coloured photographs of the Nissan at the time of reporting;
 - c) 26 coloured photographs of the damage to the Toyota taken during the Pre- Repair Survey by LKK Auto Consultants Pte. Ltd.;
 - d) 70 coloured photographs taken during our physical inspection of the Nissan;
 - e) 1 coloured post-accident photograph taken by the driver of the Toyota.

3. In preparation of this report, we had conducted height measurements of the rear portion of the Toyota. We had also conducted a physical inspection and thereafter conducted height measurements of the front portion of the Nissan; both collectively referred herein as "**Involved Motor Vehicles**". An analysis of all the available documents and information gathered was subsequently carried out.
4. We now set out below our detailed findings and analysis.

Nature of Accident

5. From the Singapore Accident Statement of the driver of the Toyota, Mr Yick Yoong Lok Wayne (herein referred to as "**Mr Yick**") he was driving the Toyota on 4 April 2018 at 1410 hours together with 3 female passengers along the AYE towards the MCE. He was travelling on the 1st lane. According to Mr Yick, the vehicle in front of him suddenly came to a stop hence he too applied the brakes and stopped the Toyota. A few seconds later, he felt an impact from the rear. Mr Yick alighted and saw a vehicle bearing registration number SJT 9999K had rear-ended the Toyota.
6. The Singapore Accident Statement of the driver of the Nissan, Mr Jagjit Singh s/o Mal Singh (herein referred to as "**Mr Singh**"), however had stated that on 4 April 2018 at 1410 hours, he was travelling along the AYE towards the MCE on the 1st lane behind the Toyota when the driver of the Toyota stopped suddenly. Mr Singh managed to brake in time with no impact. There was no evident damage to the Nissan or the Toyota. The driver of the Toyota was in a hurry to leave the accident scene after taking several accident scene photographs.

Damage to the Toyota

7. Based on the circumstances of the case contained in the Singapore Accident Statement and photographs which were taken during the accident reporting on the same day as the accident, we note that the Toyota had sustained an impact onto its rear portion, in particular to the rear bumper and boot lid.

8. Our examination of the photographs taken during the Pre- Repair Survey conducted by LKK Auto Consultants Pte. Ltd. 13 days after the accident revealed 2 parallel horizontal indentations on the lower left portion of the boot lid. We observed dents on the bottom portion of the boot lid as well as on the top portion of the rear bumper of the Toyota. The left portion of the rear panel garnish rubber lining had been pressed inwards. We also noticed faint horizontal black marks below the Toyota's left reverse sensor.
9. In general, these physical damages observed on the rear portion of the Toyota indicate that it had sustained an impact directly onto its rear portion. This impact was relatively light as we did not observe any obvious misalignment at the corner edges of the rear bumper. See photos 1 - 8 below.



Photo 1 shows a left view of the rear portion of the Toyota at the time of the Pre- Repair Survey conducted by LKK Auto Consultants Pte. Ltd. taken 13 days after the accident. The damages were concentrated at the lower portion of the boot lid and the top portion of the rear bumper (circled). We did not observe any obvious misalignment at the left corner edges of the rear bumper (arrowed).



Photo 2 shows a right view of the rear portion of the Toyota at the time of the Pre-Repair Survey conducted by LKK Auto Consultants Pte. Ltd. taken 13 days after the accident. The damages were concentrated at the lower portion of the boot lid and the top portion of the rear bumper (circled). We did not observe any obvious misalignment at the right corner edges of the rear bumper (arrowed).



Photo 3 shows a close up view of the 2 parallel horizontal indentations on the lower left portion of the Toyota's boot lid (arrowed).



Photo 4 shows a close up view of the dents on the bottom portion of the Toyota's boot lid (circled). We also noticed faint horizontal black marks below the Toyota's left reverse sensor (arrowed).



Photo 5 shows a close up view of the dents on the top portion of the Toyota's rear bumper (circled).



Photo 6 shows a close up view of the faint horizontal black marks below the Toyota's left reverse sensor (circled).



Photo 7 shows a view of the Toyota's rear panel garnish. The left portion of the rear panel garnish rubber lining had been pressed inwards (circled).



Photo 8 shows a close up view of the rear panel garnish rubber lining of the Toyota had been pressed inwards (circled).

Physical Inspection of the Nissan

10. The Nissan was physically inspected on 19 April 2018 at the premises of Civic Ambulance Services Pte. Ltd. located at 106 Braddell Road, Singapore 359912.
11. The mileage recorded was 258, 890km.
12. At the time of our inspection, we observed that the Nissan had sustained numerous damages on its front portion as a result of past accidents as mentioned by Mr Singh who was present during the physical inspection. We observed numerous black graze marks on the right portion of the front bumper. Paint graze marks were found on the lower left portion of the front bumper. We noticed that the Nissan's front number plate was distorted. Upon closer examination, we found that the top half of the left portion of the front number plate had been pushed inwards. There were 2 slight horizontal dents across the front number plate. There were whitish marks on the alpha- numeric letterings. The front bumper was misaligned at its corner edges. See photos 9 – 17 below.



Photo 9 shows the general view of the front portion of the Nissan at the time of our physical inspection. We observed that the Nissan had sustained numerous damages on its front portion as a result of past accidents as mentioned by Mr Singh who was present during our physical inspection.



Photo 10 shows the numerous black graze marks observed on the right portion of the Nissan's front bumper (circled).



Photo 11 shows the paint graze marks found on the lower left portion of the Nissan's front bumper (circled).



Photo 12 shows a close up view of the paint graze marks found on the lower left portion of the Nissan's front bumper (circled).



Photo 13 shows the Nissan's front number plate which was observed to be distorted. There were whitish marks found on the alpha-numeric letterings.



Photo 14 shows a closer view of the whitish marks found on the Nissan's front number plate alpha-numeric letterings.



Photo 15 shows upon closer examination, we found that the top half of the left portion of the front number plate had been pushed inwards (circled). There were also 2 slight horizontal dents across the front number plate (arrowed).



Photo 16 shows a close up view of the right corner edge of the front bumper of the Nissan. We observed that there was a slight misalignment at the corner edges (arrowed).



Photo 17 shows a close up view of the left corner edge of the front bumper of the Nissan. We observed that there was a slight misalignment at the corner edges (arrowed).

Accident Scene Photograph and Technical Analysis

13. For this case, we were able to obtain from Mr Yick a photograph which was taken at the accident scene. It shows the final position of the Toyota at the accident scene. The Nissan was observed to be directly behind the rear of the Toyota based on the silhouette of the Nissan's front portion which can be seen from the rear portion of the Toyota, in particular off the reflection from the tail door trunk lid chrome cover of the Toyota. We observed the same 2 parallel horizontal indentations and dents on the boot lid as well as the dents and faint horizontal black marks on the rear bumper of the Toyota as per the pre- repair survey photographs of the Toyota. We also noticed circular- shaped black marks on the lower centre portion of the Toyota's boot lid, below the rear number plate.
14. Our analysis of the documents that were made available to us in preparation of this report and our observations following the physical inspection of the Nissan would appear to suggest that the left blinker light as well as the Nissan's front emblem and grille had contacted onto the rear portion of the Toyota. Reasons for which are set out below.

15. Firstly, the 2 parallel horizontal indentations as well as the rectangular indentation on the lower left portion of the Toyota's boot lid were caused by an object that is of a similar shape, pressing onto the rear portion of the Toyota. If one was to consider the rectangular shape and size of the left blinker light and front grille, it would then appear that these indentations were caused by the left blinker light and the front grille of the Nissan.
16. Secondly, the circular black marks on the lower centre portion of the Toyota's boot lid, below the rear number plate were most likely caused by an object that is of a similar shape, pressing onto the rear portion of the Toyota. If one was to consider the circular shape and size of the Nissan's front emblem, it would then appear that these circular black marks were caused by the front emblem of the Nissan.
17. In the event of any contact, the blinker lights, front emblem and grille of the Nissan would have come into contact with the rear portion of the Toyota as these were the most protruded body parts at the frontal portion of the Nissan. See photo 18 below.



Photo 18 shows the final position of the Toyota at the accident scene. The Nissan was observed to be directly behind the rear of the Toyota based on the silhouette of the Nissan's front portion which can be seen from the rear portion of the Toyota, in particular off the reflection from the tail door trunk lid chrome cover of the Toyota (yellow arrow). We observed the same 2 parallel horizontal indentations and dents on the boot lid as well as the dents and faint horizontal black marks on the rear bumper of the Toyota as per the pre-repair survey photographs of the Toyota (red arrows). We also noticed circular-shaped black marks on the lower centre portion of the Toyota's boot lid, below the rear number plate (circled).

Height Measurement

18. We had conducted a height configuration test to determine whether the damages observed on the rear portion of the Toyota corresponds to the front portion of the Nissan.
19. In order to determine this, we had measured the height above ground level of the rear portion of the Toyota, at the area where the various damages were found. We had thereafter compared this measured height against the front portion of the Nissan. See photos 19 & 20 below.



Photo 19 shows the height measurement being conducted on the rear portion of the Toyota. The height above ground level of the lower portion of the Toyota's boot lid, at the area where the highest horizontal indentation was found was measured to be approximately 81cm. The height above ground level of the centre portion of the Toyota's rear bumper below the left reverse sensor, at the area where the faint horizontal black marks were found was measured to be approximately 52cm. The damages on the rear portion of the Toyota were between the ranges of 52cm to 81cm above ground level.



Photo 20 shows the height measurement being conducted on the front portion of the Nissan. The blinker lights, front emblem and front grille of the Nissan are within the 52cm to 81cm height range.

20. We now set out below the findings that we had gathered following the height measurements that was conducted:-

- a) the height above ground level of the lower portion of the Toyota's boot lid, at the area where the highest horizontal indentation was found was measured to be approximately 81cm;
- b) the height above ground level of the centre portion of the Toyota's rear bumper below the left reverse sensor, at the area where the faint horizontal black marks were found was measured to be approximately 52cm;
- c) the damages on the rear portion of the Toyota were between the ranges of 52cm to 81cm above ground level;
- d) The blinker lights, front emblem and front grille of the Nissan are within the 52cm to 81cm height range;
- e) the height measurements appear to support the findings of possible contact between the rear portion of the Toyota and the front portion of the Nissan because the point of contact to the rear portion of the Toyota would have been from the left blinker light, front emblem and front grille of the Toyota given that these was the most protruded body parts at the front portion of the Nissan as per our discussions set out in paragraph 17, and also the height range of these body parts above ground level had corresponded to the height above ground level of the damages found on the rear portion of the Toyota.

Conclusion

21. Having investigated and technically analyzing the material evidence available at the time of writing this report, we are of the opinion that the damages sustained to the rear portion of the Toyota were likely to be caused by the front portion of the Nissan as a result of the contact at the material time of accident.

22. The impact force from the contact was relatively minor and had occurred when the Nissan had hit the rear portion of the Toyota while coming to a sudden halt along the 1st lane of the AYE. The impact of the contact may have caused the dents on the rear portion of the Toyota.

23. Although there was damage observed on the Toyota, it is still possible for the Nissan to sustain no visible damage. The lack of visible damage to the front portion of the Nissan is due to the impact force acting onto the Nissan being not significant enough to have stretch past the yield point of the material strength of the Nissan's front portion. In the same context, the Toyota was exposed to impact force that was significant enough to have caused visible damage to its rear portion.
24. The magnitude of the impact force acting onto the Toyota was greater than the magnitude that was acting onto the Nissan. In other words, because the Nissan was in motion, it had generated forces as compared to if it was in a stationary position (zero forces). Upon collision, the forces were dissipated to the rear portion of the Toyota, which had largely absorbed the magnitude of the forces, resulting in visible physical damage to its rear portion. However as the motion of the Nissan was relatively slow (coming to a stop), the magnitude of the reaction forces dissipating back to the Nissan was not significant enough to cause visible damage to the front portion of the Nissan.
25. The contact was of relatively low speed impact which was insufficient to create any permanent visible damage to the front of the Nissan. The damage to the rear portion of the Toyota was also relatively minor as can be seen from the photographs showing the rear portion of the Toyota.
26. We are further of the view that the energy forces generated from the impact was not significant enough to have dissipated and affected body parts that were beyond the rear portion of the Toyota.



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