



Your Ref: 4498380060SG
Our Ref : CI/AIG18010367/D

04 June 2018

AIG Asia Pacific Insurance Pte Ltd
78 Shenton Way #08-16
AIG Building
Singapore 079120
(Motor Claims Department)

**TECHNICAL INVESTIGATION REPORT OF TRANSMISSION DAMAGE TO
THE INSURED VEHICLE SLP 2323D**

1. I refer to your request dated 24 May 2018 to conduct an investigation and analysis to determine the cause of damage to the transmission of the insured vehicle SLP 2323D (herein referred to as "**Insured Vehicle**").
2. The following documents/data were provided to me in preparation of this report:-
 - a) A copy of the recorded statement of the driver of the Insured Vehicle;
 - b) A 17sec video clip retrieved from the recording device that was mounted on the front windscreen of the Insured Vehicle.

Reported Incident

3. On 24 March 2018 at about 1350hrs, the Insured Vehicle was travelling along Commonwealth Avenue towards the direction of Leng Kee when it gone over a stone which had rolled out from the underside of a vehicle that was travelling in front of it. There were sounds heard and slight vibrations felt by the driver of the Insured Vehicle, who did not stop the Insured Vehicle but had continued his journey home, which was about 3 minutes drive away. Upon reaching home, the Insured Vehicle was physically checked and there was no visible damage or fluid leakage found.
4. Since there was no visible damage or fluid leakage, the Insured Vehicle was continued to be used mainly for transportation between home and office. Till about 8 days later on 01 April 2018 when a pool of fluid was found on the ground underneath the Insured Vehicle. Upon checking, it was discovered that there was leakage from the undercarriage of the Insured Vehicle. Towing service was activated immediately and the Insured Vehicle was towed to Cycle & Carriage Industries Pte Ltd.

Damage to the Insured Vehicle

5. The Insured Vehicle was physically inspected by me on 01 June 2018 at the premises of Cycle & Carriage Industries Pte Ltd, 188 Pandan Loop, Singapore 128378.
6. The underside of the front bumper and engine undercover at the front of the Insured Vehicle was found to be without any visible damage. The second engine undercover was however found to be torn at a single area. The nature of the tear corresponds to a cut that was caused by a sharp edge object.
7. It was also observed that the drain plug for the transmission fluid was not fully secured/tightened. Droplets of fluid was seen on the drain plug. Upon closer examination, a single cut mark was observed, stretching across the underside of the drain plug. In general, the damage profile of the second engine undercover and cut on the underside of the drain plug correspond to the Insured Vehicle going over an object. See photo 1 – 6 below.
8. Upon turning the key to half crank position, a warning message had appeared on the instrument panel of the Insured Vehicle. The message "without changing gear, consult workshop" had appeared. This indicates a fault in the transmission of the Insured Vehicle. See photo 7 below.



Photo 1 shows a general view of the Insured Vehicle at the time of my inspection.



Photo 2 shows the torn second engine undercover of the Insured Vehicle. The second engine undercover was found to be torn at a single area (circled). The nature of the tear corresponds to a cut that was caused by a sharp edge object.



Photo 3 shows the torn second engine undercover of the Insured Vehicle. The second engine undercover was found to be torn at a single area (circled). The nature of the tear corresponds to a cut that was caused by a sharp edge object.



Photo 4 shows the drain plug (arrowed) for the transmission fluid of the Insured Vehicle. The drain plug was observed to be not fully secured/tightened.



Photo 5 shows a closer view of the drain plug (arrowed) for the transmission fluid of the Insured Vehicle. The drain plug was observed to be not fully secured/tightened.



Photo 6 shows a closer view of the drain plug for the transmission fluid of the Insured Vehicle. Upon closer examination, a single cut mark (circled) was observed, stretching across the underside of the drain plug. The cut on the underside of the drain plug correspond to the Insured Vehicle going over an object.



Photo 7 shows the warning message "without changing gear, consult workshop" that appeared on the instrument panel of the Insured Vehicle after the key was turned to half crank position. This would indicate a fault to the transmission of the Insured Vehicle.

Comments & Opinions

9. Firstly, the damage profile of the second engine cover and drain plug for the transmission fluid of the Insured Vehicle correspond to the Insured Vehicle going over an object(s). However, in such going over object(s) type of incidents, the transmission of the vehicle will not be affected by the vehicle going over the object(s), provided that there was no further operation of the transmission after it had gone over the object(s), and also provided that there was no leakage of transmission fluid.
10. For this case, the drain plug for the transmission fluid was found with cut mark that was caused by the Insured Vehicle going over the stone. It was also found to be not fully secured/tightened at the time of my inspection. The contact with the stone could have caused the drain plug to become slightly misaligned/shifted/loose from the tread groove that secures the drain plug, resulting in minor leakage of transmission fluid that was initially not detected by the driver of the Insured Vehicle.
11. The leak however became more severe when the drain plug started to further misalign/shift/loosen progressively due to vibrations and oscillations of the Insured Vehicle during motion when it was continued to be driven for the next subsequent days after going over the stone, evident from the condition of the drain plug as seen at the time of my inspection and the eventual discovery of fluid leak by the driver of the Insured Vehicle, 8 days after the Insured Vehicle had gone over the stone.
12. Correspondingly, when the drain plug started to further misalign/shift/loosen progressively, the leakage of transmission fluid also progressively increased. The transmission of the Insured Vehicle started to operate with insufficient transmission fluid for lubrication and heat removal purposes whenever the Insured Vehicle was used. The oil film (protection layer) between the mechanical parts inside the transmission was inadequate, resulting in direct contact between these moving/rotating mechanical parts, which may cause overheating of the transmission. The hydraulic pressure that is required to shift the transmission gears would also be affected due to the insufficient transmission fluid.
13. The damage to the transmission of the Insured Vehicle could have thus been avoided if it was not driven for the subsequent days after the incident. Such damage can therefore be considered to be a consequential damage and not a direct damage as a result of the Insured Vehicle going over the stone.

14. During my inspection of the Insured Vehicle at Cycle & Carriage Industries Pte Ltd, I had enquired with the technicians on whether there would be any warning message to alert drivers when the transmission fluid becomes of insufficient level for operating purposes. I was informed that for the transmission fluid, there will not be any warning message. Usually, if there is insufficient transmission fluid, the driver will feel the vehicle lose power, become sluggish as the transmission gears may become difficult or may not shift due to low hydraulic pressure from insufficient transmission fluid.

Conclusion

15. Having carried out a review and analysis of the material evidence, I am of the opinion that the damage to the transmission of the Insured Vehicle was due to operating of the transmission with insufficient transmission fluid for lubrication and heat removal purposes.
16. The insufficient transmission fluid was due to leakage of transmission fluid from its drain plug that became misaligned/shifted/loose upon contact with a stone which the Insured Vehicle had gone over. The continued driving of the Insured Vehicle for the subsequent days after the incident had progressively led to the transmission operating with insufficient transmission fluid, which affected the mechanical parts inside the engine. The damage to the transmission can thus be considered to be a consequential damage and not a direct damage from the Insured Vehicle going over the stone
17. Although there was no fluid leak observed by the driver of the Insured Vehicle initially after going over the stone, and also a lack of any warning message to alert the driver of insufficient transmission fluid, the damage to the transmission of the Insured Vehicle could still have been avoided if the Insured Vehicle was laid up immediately for checks on the true extent of damage after it had gone over the stone instead of being driven subsequent to the incident till the eventual leak was discovered about 8 days later.


Ang Bryan Tani

AMSOE, AMIRTE, AFF SAE, 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.