

Your Ref: PR1807035209
Our Ref : CI/BSH18015014/D

20 August 2018

Berkshire Hathaway Specialty Insurance

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**TECHNICAL INVESTIGATION REPORT OF ENGINE OIL LEAKAGE TO AN
UNREGISTERED VOLKSWAGEN GOLF MOTOR CAR**

1. I refer to your request dated 12 July 2018.

Reported Incident

2. On 09 July 2018, a brand new unregistered Volkswagen Golf motor car (herein referred to as "**VW Golf**") was in the process of being driven from the second floor to the ground floor of the building premise of Toll Logistics (17 Tuas Avenue 9) when the engine suddenly stalled due to engine oil leakage.

Damage to The VW Golf

3. The damaged VW Golf was physically inspected by me on 13 July 2018 at the premise of 17 Tuas Avenue 9. It was also hoisted up during the inspection to facilitate checks on the underside. The following paragraphs sets out my observations.
4. The VW Golf was observed to be still wrapped with its protection cover. Upon checking the engine oil dip stick, I had found no engine oil covering the dip stick. This would indicate that there was no engine oil within the engine assembly of the VW Golf.
5. My checks on the underside after the VW Golf was hoisted up revealed a tear/cut mark on the underside of the engine undercover. Upon removal of this engine undercover, a hole/puncture was observed on the underside of the engine oil sump. Engine oil stains were also found, from the hole/puncture at the engine oil sump stretching towards the rear of the VW Golf.
6. Although the engine assembly was not dismantled, the mechanical parts like the piston(s), connecting rod(s) etc, inside the engine assembly were likely to be seized. This was established when attempts to manually turn the crankshaft of the engine was not successful. See photo 1 - 10 below.



Photo 1 shows a general view of the rear left body of the damaged VW Golf during my inspection. The VW Golf was observed to be still wrapped with its protection cover.



Photo 2 shows a general view of the front right body of the damaged VW Golf during my inspection. The VW Golf was observed to be still wrapped with its protection cover. It was also hoisted up during my inspection to facilitate checks to be carried out to the underside.



Photo 3 shows the engine oil dip stick of the VW Golf. I had found no engine oil covering the dip stick (circled). This would indicate that there was no engine oil within the engine assembly of the VW Golf. Subsequent attempts to manually turn the crankshaft of the engine was not successful, indicating that the mechanical parts like the piston(s), connecting rod(s) etc, inside the engine assembly were likely to be seized.



Photo 4 shows the front underside of the VW Golf after it was hoisted up. A tear/cut mark (arrowed) was observed on the underside of the engine undercover. This was slightly towards the right from the centre of the VW Golf.



Photo 5 shows a closer view of the tear/cut mark (circled) that was found on the underside of the engine undercover.



Photo 6 shows the front underside of the VW Golf after its engine undercover was removed. A hole/puncture (arrowed) was observed on the underside of the engine oil sump. The location of this hole/puncture was directly above the location where the engine undercover was torn/cut. Refer to photograph 4 above.



Photo 7 shows a closer view of the hole/puncture that was observed on the underside of the engine oil sump. The entire engine oil within the engine assembly of the VW Golf had leaked from this hole/puncture.



Photo 8 shows a closer view of the hole/puncture that was observed on the underside of the engine oil sump. The engine oil of the VW had leaked from this hole/puncture.



Photo 9 shows the engine oil stain (circled) that was found on the underside, from the hole/puncture at the engine oil sump stretching towards the rear of the VW Golf. This was at the right centre of the VW Golf.



Photo 10 shows the engine oil stain (circled) that was found on the heat shield of the fuel tank. This was towards the left rear of the VW Golf. The undercarriage components at the rear of the VW Golf were also observed to be covered with engine oil stain that had leaked from the hole/puncture at the engine oil sump.

7. From the damage pattern of the engine undercover and engine oil sump of the VW Golf as shown in photograph 4 to photograph 8 above, the front underside of the VW Golf had sustained a single direct impact that was caused by a sharp edge object. The lack of grazed marks found surrounding the area of damage and on the entire underside of the VW Golf would seem to suggest that the impact was not of grazing nature, hence unlikely to be from the VW Golf mounting a road kerb or other similar flat surface type of structure/object. The damage pattern would correspond more to an object, like a stone or rock, where the edge of this object had directly impacted the front underside (single impact) of the VW Golf, causing the tear/cut on the engine undercover and hole/puncture on the underside of the engine oil sump simultaneously.
8. The engine oil stains found from the hole/puncture of the engine oil sump stretching towards the rear of the VW Golf was formed by air flow travelling along the underside of the VW Golf. The flow of air would have to be relatively strong to cause the leaked engine oil to be blown all the way towards the rear of the VW Golf. Common scenarios where there is strong air flow along the underside of a motor vehicle includes when the motor vehicle is being driven at relatively high speed or while it is being towed by normal fork method or by king dolly method, where the air flow along its underside is unrestricted.

Investigations/Comments/Opinions

9. For this case, I was able to gather that the VW Golf was part of a batch of new motor vehicles that had arrived in Singapore by ship on 06 July 2018 (Friday). It was unloaded from the ship and stored at the authorized holding area at the port till 08 July 2018 (Sunday) when it was collected by AJ Towing (S) Pte Ltd, who is the contractor for Toll Logistics.
10. The VW Golf was part of a batch of new motor vehicles that were collected by AJ Towing (S) Pte Ltd and delivered to the premise of Toll Logistics at 17 Tuas Avenue 9 on 08 July 2018 (Sunday). The VW Golf was then stored at the level 2 holding area till 09 July 2018 (Monday) when under the request of Volkswagen, it was driven by an employee of Toll Logistics to the preparation centre at the ground floor of the same building. However, less than 100m from where it was originally parked, the engine of the VW Golf stalled, and the engine oil leakage was discovered.

11. Based on these events that I was able to gather, I had first visited the location where the VW Golf was parked after its delivery to Toll Logistics at 17 Tuas Avenue 9. This was at pillar B on level 2. At this location, a pool of oil stain was observed on the ground. A lesser pool of oil stain was also found on the driveway leading to the exit of level 2, near pillar F. This was where the VW Golf broke down. Faint oil trail was also seen on the driveway between pillar B and pillar F. The approximate distance between pillar B to pillar F was about 50m to 80m.
12. Since the engine oil of the VW Golf was completely empty at the time of my inspection (dip stick not covered in engine oil), any pool of oil stain found on the ground would have to be significant as the VW Golf typically have at least 4 litres of engine oil within its engine assembly. However, the pool of oil stain that was seen on the entire level 2 was very much lesser than 4 litres. From this observation, it can reasonably be determined that the leakage of engine oil had occurred before the VW Golf was parked at the level 2 holding area at 17 Tuas Avenue 9. Also, the entire level 2 did not contain any sharp edge object(s) that could possibly have caused the single impact onto the engine undercover and engine oil sump of the VW Golf. See photo 11 – 15 below.



Photo 11 shows the pool of oil stain that was found on the ground where the VW Golf was parked before it was driven to the preparation centre at the ground floor. This was at pillar B on level 2 of 17 Tuas Avenue 9.



Photo 12 shows a closer view of the accumulation of oil stain that was found on the ground where the VW Golf was parked.



Photo 13 shows a general view of the driveway of level 2, towards the exit. The VW Golf was being driven along this driveway when it broke down, leading to the discovery of the engine oil leakage.



Photo 14 shows some of the oil stain that was found on the ground of the driveway leading to the exit of level 2.



Photo 15 shows the second pool of oil stain that was found on the ground, near pillar F. This was on the driveway leading to the exit of level 2. The VW Golf broke down at this location after being driven for about 50m to 80m, from pillar B to pillar F. Basing on my observations, the oil stain that was seen on the entire level 2 does not seem to indicate that the engine oil leakage to the VW Golf had occurred at level 2.

13. Since the damage to the VW Golf could not have been caused at the level 2 holding area, I had on 20 July 2018, met with AJ Towing (S) Pte Ltd at the premise of 17 Tuas Avenue 9. The same tow truck that was used to deliver the VW Golf from the port to 17 Tuas Avenue 9 was also made available for my inspection.
14. It was observed that the tow truck from AJ Towing (S) Pte Ltd was a flat-bed tow truck. During the delivery, the VW Golf was driven up onto the flat-bed via a ramp. It was secured using chains and belts, and subsequently driven down via ramp upon arriving at 17 Tuas Avenue 9. The VW Golf was then parked at one of the parking lots before it was taken over by employees of Toll Logistics and driven to the holding area at level 2.
15. At one of the parking lots, I had observed a patch of dry oil stain. This was the second lot parking lot adjacent to the guardhouse at 17 Tuas Avenue 9. The location of the patch of dry oil stain relative to the front of the parking lot appears to correspond to the location of the hole/puncture on the engine oil sump relative to the front of the VW Golf. Trail of dried oil stain was also found curved towards the right from this parking lot, which is typically the route taken by employees of Toll Logistics driving newly arrived motor vehicles to the holding area at level 2. See photo 16 – 20 below.



Photo 16 shows a general of parking lot 2 (arrowed), which was the second parking lot adjacent to the guardhouse at 17 Tuas Avenue 9. A patch of dry oil stain was found on the ground of this parking lot.



Photo 17 shows a closer view of the patch of dry oil stain (circled) that was found on the ground at parking lot 2. The location of the patch of dry oil stain relative to the front of the parking lot appears to correspond to the location of the hole/puncture on the engine oil sump relative to the front of the VW Golf. Refer to photograph 4 above.



Photo 18 shows a closer view of the patch of dry oil stain that was found on the ground at parking lot 2.



Photo 19 shows a dry oil trail (arrowed) curved towards the right from parking lot 2. The same oil trail was also found on the driveway that employees of Toll Logistics would use when driving newly arrived motor vehicles to the holding area at level 2.



Photo 20 shows a dry oil trail (arrowed) along the driveway of 17 Tuas Avenue 9. This oil trail had commenced from parking lot 2 onto this driveway which is typically the route taken by employees of Toll Logistics driving newly arrived motor vehicles to the holding area at level 2.

16. My observations of dry oil stain outside of level 2 but within the premise of 17 Tuas Avenue 9, would seem to indicate that the engine oil of the VW Golf had already leaked prior to its arrival at 17 Tuas Avenue 9. Given the timeline that I was able to establish from Toll Logistics (refer to paragraph 9), the engine oil leak would have most probably occurred between the time that the VW Golf was unloaded from the ship to its arrival at 17 Tuas Avenue 9. The following paragraphs discusses this timeline.
17. My inspection of the flat-bed tow truck that was used to deliver the VW Golf to 17 Tuas Avenue 9 revealed no sharp edge object(s) or body part(s) that could possibly cause the single point of impact damage that was seen on the engine undercover and engine oil sump of the VW Golf. See photo 21 – 23 below.



Photo 21 shows the flat-bed tow truck that was used to deliver the VW Golf to 17 Tuas Avenue 9. The company that collected the VW Golf from the port and carried out the delivery was AJ Towing (S) Pte Ltd. The VW Golf was secured on the flat-bed (arrowed) during the delivery.

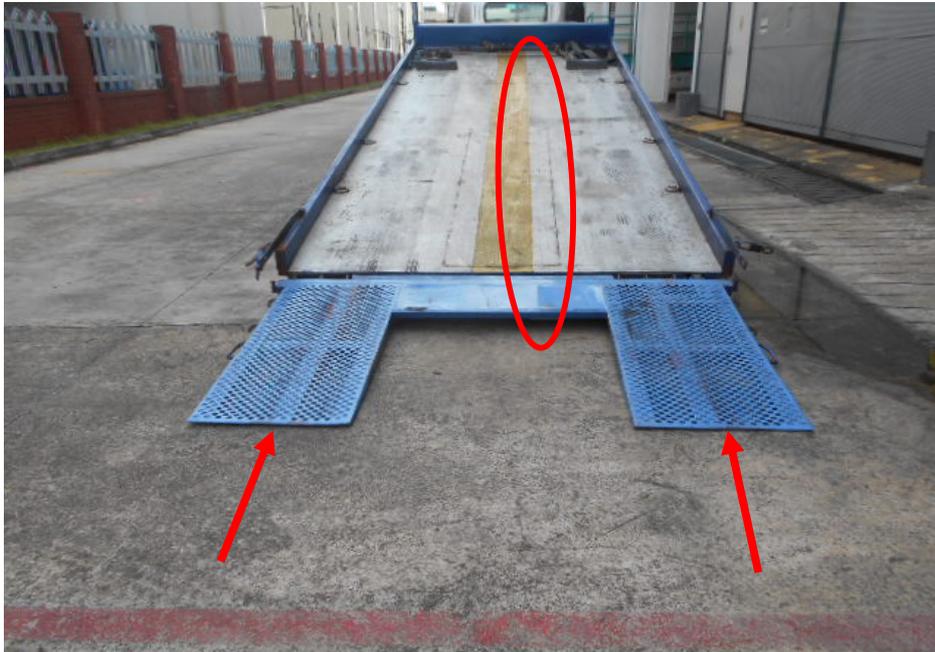


Photo 22 shows the flat-bed tow truck that was used to deliver the VW Golf to 17 Tuas Avenue 9. During the delivery, the VW Golf was driven up onto the flat-bed via a ramp (arrowed). Given the area of damage to the VW Golf (slightly towards the left from the centre), any sharp edge object(s) or body part(s) on the flat-bed tow truck that could possibly cause the single point of impact damage to the VW Golf would be located at or around the area highlighted by the red circle.



Photo 23 shows a closer view of the flat-bed. I did not find any sharp edge object(s) or body part(s) on the flat-bed tow truck (circled) that could possibly cause the damage to the VW Golf.

18. Earlier in paragraph 7, I had commented that the damage to the VW Golf was unlikely to be caused by the VW Golf mounting a road kerb or other similar flat surface type of structure/object given that there were no marks of grazing nature found on the underside of the VW Golf. The possible area on the flat-bed tow truck (shown in photograph 23) was noted to be of flat surface type, hence the damage pattern to the VW Golf does not seem to suggest that the damage was caused during the delivery of the VW Golf from the port to 17 Tuas Avenue 9.
19. The engine oil stains that were found on the underside, from the hole/puncture at the engine oil sump stretching towards the rear of the VW Golf would seem to also support my comment that the damage to the VW Golf was not caused during the delivery. During the delivery, the VW Golf was secured on the flat-bed. The air flow (wind) generated by the movement of the flat-bed tow truck during the journey would bypass the underside of the VW Golf as the front cabin of the flat-bed tow truck would block the air flow, causing the wind to flow along the sides of the VW Golf. See photo 24 below.



Photo 24 shows the view of the front from the flat-bed of the tow truck. The front cabin (arrowed) of the flat-bed tow truck would block the wind generated from movement of the flat-bed tow truck. The air flow (wind) during the journey would bypass the underside of the VW Golf due to blockage from the front cabin of the flat-bed tow truck. The air flow (wind) would instead flow along the sides of the VW Golf.

20. Further to paragraph 19, since it was not possible for the engine oil stains on the underside of the VW Golf to be formed during the delivery process as the air flow (wind) would bypass the underside of the VW Golf due to blockage from the front cabin of the flat-bed tow truck, it is then likely that the engine oil stains were formed before the VW Golf was collected at the port. The damage to the VW Golf was then likely to be caused before it was collected by AJ Towing (S) Pte Ltd.
21. Basing on the discussions from paragraph 9 to paragraph 20, it would appear that the VW Golf was damaged during the time of unloading from the ship. The damage could not have occurred before its arrival in Singapore as the engine oil would have been extensively drained or completely drained from leakage during the long voyage to Singapore. The fact that the engine of the VW Golf was still able to be started at 17 Tuas Avenue 9 before it stalled suddenly indicates that there was still some minimal engine oil within the engine assembly after its arrival at 17 Tuas Avenue 9.
22. There was also no feedback received by Toll Logistics from the port regarding any issues with the VW Golf during their handling (unloading from ship to storing at the authorized holding area at the port). The engine of the VW Golf was able to be started and thereafter unloaded by driving from the ship to the authorized holding area, as per normal handling procedure at the port. It could be that sometime during this driving, the VW Golf ran over a stone and/or object causing the tear/cut mark on the underside of the engine undercover and hole/puncture on the underside of the engine oil sump. The leaked engine oil was then blown all the way towards the rear of the VW Golf by relatively strong air flow (wind) along its underside during this driving of the VW Golf within the premise of the port.

Conclusion

23. Having carried out an analysis of the material evidence/information gathered during the course of my investigation, I am of the opinion that the underside of the VW Golf had sustained a single impact which resulted in a tear/cut to its engine undercover and hole/puncture on the engine oil sump.

24. Basing on the timeline of events pertaining to the VW Golf, from its arrival in Singapore on 06 July 2018 to its sudden stalling at 17 Tuas Avenue 9 on 09 July 2018, as gathered in the course of my investigations, the most likely time of damage was during the unloading of the VW Golf from the ship, where it was driven from the ship to the authorized holding area, within the premise of the port.
25. The damage pattern and physical condition of the VW Golf seen at the time of my inspection (no engine oil within the engine assembly and engine oil stains stretching to the rear) does not correspond to the damage being cause during the delivery (towing) by AJ Towing (S) Pte Ltd and/or after it had arrived at Toll Logistics at 17 Tuas Avenue 9. In other words, the damage was not caused whilst the VW Golf was in the possession of Toll Logistics and/or AJ Towing (S) Pte Ltd.

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