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BMW Group

VIA CERTIFIED MAIL, RETURN RECEIPT REQUESTED, AND EMAIL

September 26, 2013

Ms. Nancy Lewis
Associate Administrator for Enforcement
National Highway Traffic Safety Administration
1200 New Jersey Ave., S.E.
Washington, DC 20590

Re: Recall Campaign
Vacuum Pump Oil Supply
2012-2014 BMW 3 Series, 5 Series, X1 SAV, X3 SAV, and Z4
Models with 4-cylinder engines

Dear Ms. Lewis:

This notice is sent to you in accordance with the requirements of the National Traffic and Motor Vehicle Safety Act of 1966 and 49 CFR Part 573.

Pursuant to Section 573.6(c), we submit the following information.

1. Manufacturer: Bayerische Motoren Werke AG (BMW AG)

   Designated Agent: Samuel Campbell, III
   Department Head, Safety Engineering and ITS
   BMW of North America, LLC
   200 Chestnut Ridge Rd. (Bldg. 150)
   Woodcliff Lake, NJ 07677

2. Make: BMW

Model Year / Model	Inclusive Dates of Manufacture
2012-14 / 320i/328i, 320i/328i xDrive Sedan	May 2012 – August 2013
2014 / 328i xDrive Sports Wagon	March 2013 – May 2013
2012-13 / 528i, 528i xDrive Sedan	June 2012 – June 2013
2013-14 / X1 sDrive28i, X1 xDrive28i	June 2012 – June 2013
2013-14 / X3 xDrive28i	June 2012 – August 2013
2012-14 / Z4 sDrive28i	June 2012 – June 2013

3. The number of vehicles affected is approximately 76,190 as follows.

Model Year / Model	Production Volume
2012-14 / 320i/328i, 320i/328i xDrive Sedan	37,473
2014 / 328i xDrive Sports Wagon	176
2012-13 / 528i, 528i xDrive Sedan	12,708
2013-14 / X1 sDrive28i, X1 xDrive28i	10,547
2013-14 / X3 xDrive28i	14,517
2012-14 / Z4 sDrive28i	770

Company
BMW of North America, LLC

BMW Group Company

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PO Box 1227
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07675-1227

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4. The percentage of vehicles estimated to contain the condition is less than 0.5%.

5. This recall involves the loss of oil supply to the vacuum pump on the affected vehicles. The vacuum pump is both mechanically driven and supplied with pressurized oil for lubrication and internal sealing purposes from the engine via a port at the end of the intake camshaft. In rare cases, due to an insufficient interference fit, a seal disk in the hollow camshaft core may move during engine operation and potentially block or restrict the pressurized oil supply holes which are necessary for lubricating the vacuum pump. If this were to occur, the vacuum pump could fail over time, ultimately resulting in loss of power assist braking. Even with loss of assist, the service brake control is able to stop the vehicle because affected vehicles meet the applicable FMVSS pertaining to conditions in which there is a loss of power assist braking.

   The name, business address, telephone number, and contact person of the supplier, and country of origin of the camshaft supplier is:

   MAHLE GmbH
   Mr. Frank Dautel
   Dept. EED1S2
   Pragstrasse 26-46
   D-70376 Stuttgart
   Tel.: 49-711-501-13210
   Fax: 49-711-501-12979
   Email: frank.dautel@mahle.com

   Country of Origin: Germany

6. On October 2, 2012, BMW received the first report from the US market pertaining to loss of power assist braking. It was noted that the vacuum pump was not working properly. At that time, it was not evident that a blocking of the oil supply holes in the camshaft was possibly involved, nor that the blocking was due to movement of the seal disk within the camshaft. Therefore, a root cause was not yet identified. BMW initiated a review of the available information. The markets continued to be monitored.

   On December 2, 2012, it was confirmed in relation to the above report, that the camshaft seal disk was blocking the oil supply holes. At that time, the camshaft supplier did not have production process data documents that provided insight regarding the reason that the seal disk was blocking the holes. Also, prior to shipment of the camshaft from the supplier, there was no final inspection of the seal disk position during camshaft production. The engineering review continued, with increased scrutiny of the camshaft manufacturing process in order to determine whether a systematic failure pattern existed.

   On December 14, 2012, an end-of-line quality inspection was implemented at the camshaft supplier. This inspection was implemented to ensure that the seal disk was correctly positioned, and at the appropriate depth, within the camshaft. The inspection consisted of a visual examination of the seal disk location. On January 16, 2013, the inspection process was updated to include the use of an alignment pin. On February 18, 2013, the inspection process was again updated from a manual process to an automated process. The markets continued to be monitored, and by the end of January, four (4) reports in total from the US market had been received.

In March 2013, BMW received the first report pertaining to a damaged vacuum pump in which the camshaft was produced after the implementation of the end-of-line inspection. Further engineering analyses were necessary, since the end-of-line inspection should have identified any camshafts in which the seal disk was in the wrong location. Therefore, it was unclear at the time if the end-of-line inspection was insufficient, or, if some other mechanism was occurring that would allow the seal disk to cover the camshaft oil supply holes.

In April 2013, after further engineering analyses and testing, it was determined that the seal disk could move within the camshaft during engine operation; however it was not yet clear as to the phenomenon inducing the movement. Consequently, further engineering analysis and testing was required.

As of May 15, 2013, BMW had received 30 reports in total from the US market which pertained to vacuum pump failure possibly related to this condition.

On May 22, 2013, an engine production change was implemented whereby the seal disk was positioned deeper within the hollow camshaft core. At this revised location, the internal camshaft diameter is reduced compared to the original location of the seal disk. It was believed that this would eliminate the possible movement of the seal disk within the camshaft.

As of June 15, 2013, BMW had received 40 reports in total from the US market. Due to the increasing number of reports, an internal Task Force was assigned in late June to understand, address and resolve the issue as expeditiously as possible. The Task Force was chartered to determine the root cause of this issue. Their actions included:

- Analyses of possible inadequate process controls at the camshaft supplier involving the insertion of the seal disk into the hollow camshaft core, and measurements of the disk insertion force;
- X-rays of the camshaft seal disk to determine if the disk was properly inserted into, and positioned within, the camshaft core;
- Comparisons of the seal disk position from field vehicles in which the disk had moved to the position on new production camshafts;
- Reviews of production lot information to determine production date ranges for conditions possibly affecting seal disk position within the camshaft.

On July 11, 2013, an additional engine production change was implemented involving a modification to the camshaft end-flange geometry. The end-flange, which is inserted into the end of the camshaft core, and is located between the end of the camshaft core and the vacuum pump, was lengthened within the core. It was believed that this change, in combination with the prior change of placing the seal disk deeper within the camshaft core, would doubly preclude seal disk movement and the resultant blockage of the oil supply holes.

By August 1, 2013, BMW had received 53 reports in total from the US market pertaining to this issue. No reports have been received for vehicles produced with camshafts after the May 22, 2013 engine production change.

Additional vehicle and component production and manufacturing records were examined in order to determine the number, and production range, of potentially affected vehicles.

On September 19, 2013, BMW decided to conduct a voluntary recall.

BMW is aware of three minor accidents in the US market involving single vehicles. There were no confirmed injuries.

By the time of the decision date, BMW had received, from the US market, a total of 61 field reports, approximately 23 consumer complaints, and 105 warranty claims that were thought to be related to this issue. Notably, in the vast majority of cases, the issue occurs within the first few months of vehicle service and several hundred miles of vehicle use. In other words, it is an early failure condition.

7. Not applicable.

8. On affected vehicles, a locking ring will be inserted into the camshaft in order to retain the camshaft seal disk in its proper location.

   BMW expects to begin dealer and owner notification in November 2013. BMW expects to complete dealer and owner notification in December, at the time the remedy becomes available.

9. Not applicable.

10. A copy of the Service Bulletin will be submitted when available. A draft copy of the owner notification letter will be submitted when available.

11. Not applicable.

Sincerely,

BMW of NORTH AMERICA, LLC

Sam Campbell
Department Head
Safety Engineering and Intelligent Transportation Systems