

Sequence VIII Bearing Task Force Conference Call Notes

Date: January 11, 2016

Members Present:

Clayton Knight, Dan Lanctot/TEI
Gordon Farnsworth/Infineum
Robert Stockwell, Kaustav Sinha/Oronite
Adrian Alfonso, Bill Buscher/Intertek
Jerry Brys, George Szappanos/Lubrizol
Jason and Matt Bowden/OHT
Tim Caudill /Valvoline
Dave Glaenzer/Afton Chemical Co.
Tony Hendrix, Patrick Lang/SwRI
Rich Grundza/TMC

Adrian from Intertek reported the following on testing that was conducted at their lab:

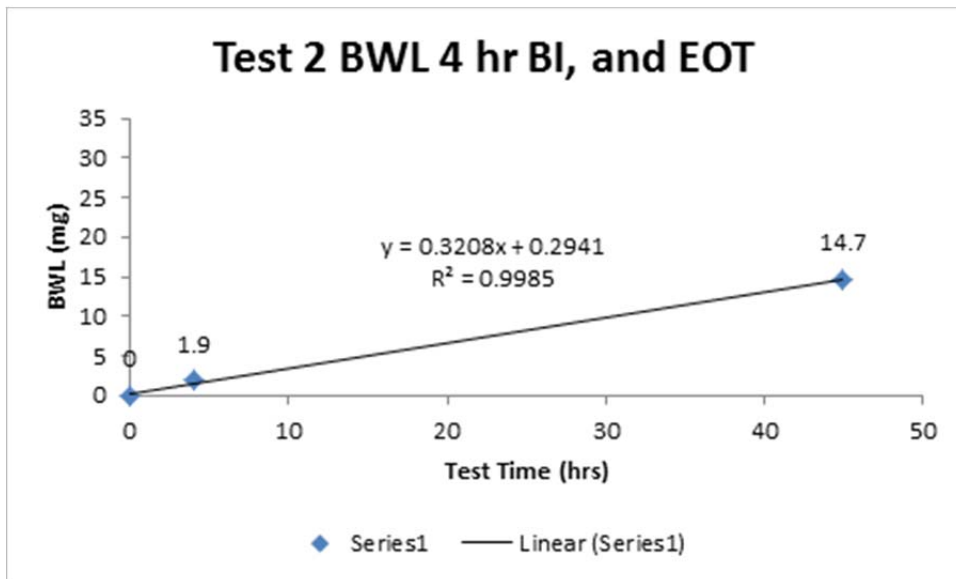
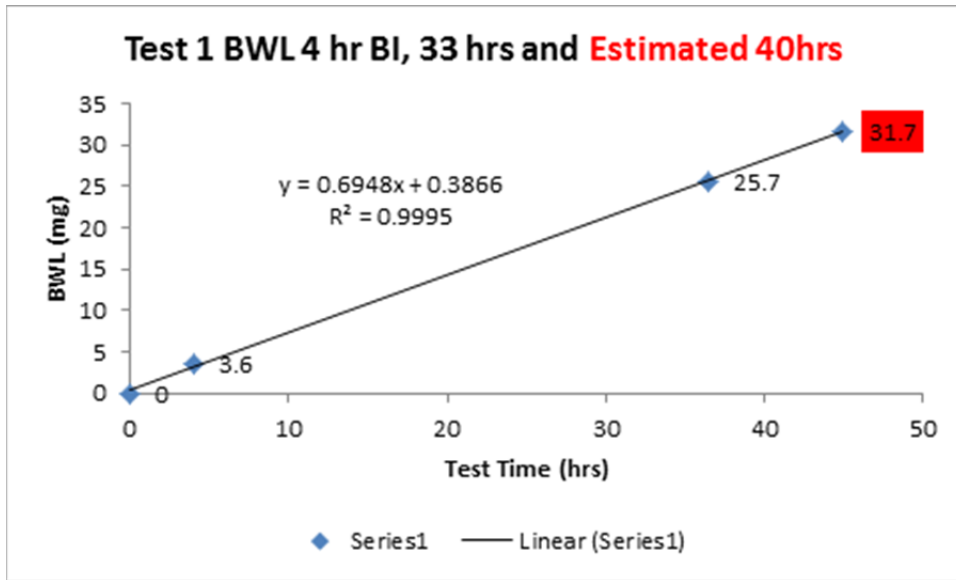
Two tests we completed in a stand that we recently converted from an aviation test to a regular Seq. VIII stand. I would like to mention that this stand has not been calibrated recently since it was being utilized for aviation testing.

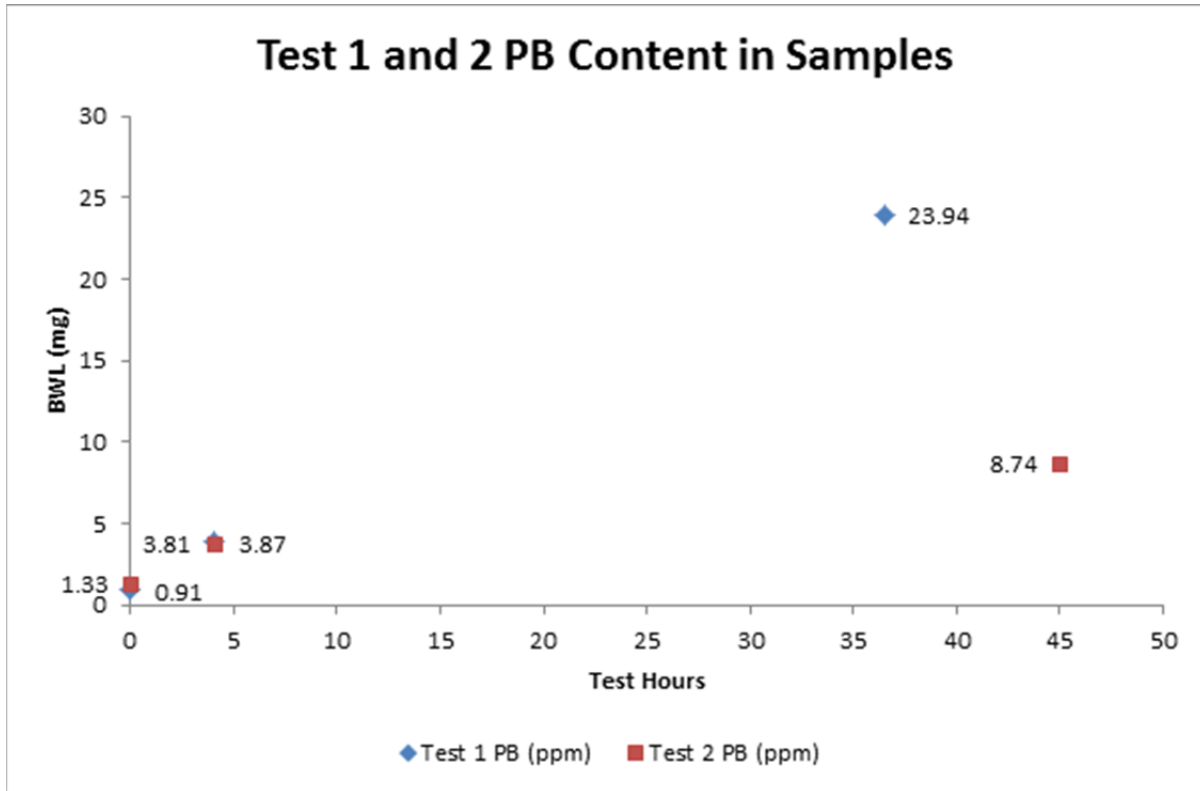
The main purpose of this experiment was to understand how is the BWL increasing during test for the new bearings (08-15); is it happening during BI or is it actually corrosion?

The experimental runs were conducted as follows:

- New built engine with new bearings and oil 1006-2
- Bearings were measured at SOT (standard procedure)
- New oil sample taken for analysis
- Test ran 4 hrs BI
 - o Bearings were removed, measured and reinstalled
 - o Oil sample collected for analysis
 - o Test re-started
- Test ran to EOT
 - o The first test was terminated do to stand issues approximately 7 hours before EOT time, second test ran full length. Please note the last value for the first test was estimated assuming a BWL linear trend

- Oil samples were collected at EOT for analysis
- Bearings were measured at EOT





- As expected the BWL gradually increase as the test advances
- Minimal BWL during BI
- Results of the 2nd test were milder than test 1
- BWL for both tests seem to increase linearly, which may indicate the BWL is due to corrosion and not mechanical wear

Pat Lang reported to the group that a short conference call was held with a group of industry statisticians to discuss the possibility of generating an industry correction factor. That group recommended the following additional testing:

Intertek: 1 additional test on 1006 and one additional test on 704-1

SwRI: two additional tests on oil 1006

SwRI reported that they conducted a visual inspection of 5 sets of 08-15 bearings under a low power microscope. No differences between the bearings were observed. However, a visual difference between an 08-15 and an 09-10 was observed when put under the microscope simultaneously (see photo in attachment 1). Federal Mogul has been asked to comment (FM was not able to make this call).

Action Items:

1. SwRI and Intertek to conduct the additional two tests at each lab as requested by the stats group.
2. SwRI to conduct SEM analysis on USED (EOT) bearings to see how the 09-10 and 08-15 batches compare.

Attachment 1: Photo of surface of 08-15 and 09-10 bearing surface.

08-15 Bearing (New)

09-10 Bearing (New)

