Richard E. Grundza
Senior Project Engineer
ASTM Test Monitoring Center
6555 Penn Avenue
Pittsburgh PA 15206

Unconfirmed Minutes of the April 8, 2010 Sequence III Conference Call

The teleconference convened at 11:00 a.m. Eastern.

Attendance –Jo Martinez, Dave Glaenzer, Rich Grundza, Mark Mosher, Charlie Leverett, Bruce Matthews, Doyle Boese, Bill Buscher, Chris Castanien, Jason Bowden, Ed Altman, Andy Ritchie, Pat Lang, Greg Seman, Jerry Brys, Jonathan Cales and Dave Caproni. After reviewing the list of voting members, the chair, Dave Glaenzer, determined that 10 of the 17 members were on the call and that a quorum existed. Agenda is included as attachment 1.

The first item of discussion was the suspension of the application of the lower ACLW shewhart limit. During the last conference call the panel elected to suspend this limit for 60 days. A task force created studied reasons for ACLW issues, headed by Charlie. A copy of the report submitted is included as attachment 2. Charlie asked for comments on items that may have been missed by the task force. Dave commented there was some confusion on item 5, cam end play, but that has been ironed out and labs appear to be getting similar results. Recommendations, moved by Charlie and seconded by Greg Seman, were to continue with suspended ACLW lower limit until the May Surveillance Panel Meeting. Discussion on the motion centered on the reasons to await the panel meeting to take further action. Charlie explained it was twofold. One, that additional results would be available for review and two, that the LTMS Task Force may have recommendations for LTMS changes which may impact these limits as well. The motion to continue with the suspended lower ACLW limit was approved unanimously.

Other recommendations were to form a task force to develop handling procedures and measurement environment recommendations prior to the next surveillance panel meeting. A final item was to request the TMC monitor measurement procedure during annual visits.

The topic of reference oil 435-1 was addressed. It was determined during part of the task force that the viscometrics of this oil were different than the original blend. The panel gave the ROBO panel 1 drum of 435-1 for their testing purposes. The performance of this oil was much better (milder) than the previous blend in the ROBO test. It was agreed that the viscometric differences were probably not related to the milder ACLW performance as all oils appear to have been affected. It was decided that the panel will ask for quantities of the reblend, if it is made. Charlie mentioned that there may be a category reference oil made available and this may affect the quantity of 435 the group may need. Dave Glaenzer expressed his concern that we are in dire need of a category oil. There was some confusion on whether a reblend was going to be made of 435, as the panel learned that the ROBO panel was generating limits for 435-1, but this is only a short term fix and they would be looking at another blend. Rich is to discuss quantities with supplier.

A discussion was initiated on the 168 hour limit to conduct MRV tests for the IIIGA method. Dave Glaenzer reminded the panel that he had sent an email detailing this subject back on March 22, to stimulate discussion on this topic. Dave stated that after a review of meeting minutes and other documents, a sound basis for this

requirement was not found. Rich Grundza stated he and Dave had both discussed this and looked into how the 168 hour (1 week) criteria was derived and Rich stated it was agreed at the time that as the samples aged, the results became more severe and there were concerns that if let go too long, viable candidates may fail this parameter because of age. Dave explained that some reasons for lost tests included weather, instrument failures, holidays, etc. One lab supplied data that results change over time. Dave explained he had seen limited data (8 results on two technologies) that suggested that results will change over time. Dave also stated that this is probably not enough data. Charlie Leverett suggested that it may be possible rerun reference results on 438 and 434-1 reference oils. Several labs indicated they may be able to generate this data. It was agreed to use samples less than two months old. Labs are to forward the data to the TMC by May 1.

Under other business, Dave is working on the agenda for the May 12, 2010 meeting, and it appears to be a light agenda, though considerable time may be spent on LTMS. The Stats group will be meeting shortly for two days to finalize the LTMS update. An open forum is planned for May 11, 2010 during Surveillance Panel week. If anyone has any items for the agenda, please forward to Dave Glaenzer.

The conference call adjourned 11:38 est.

Attachment 1

Agenda

1. Review and act on recommendations from ACLW Task Force report (attached.

2. Initiate discussion pertaining to RO435-1. The ROBO group has had a pilot blend of RO435-2 made that may perform closer to RO435 than RO435-1. This will be an agenda item at our May meeting.

3. Initial discussion on Sequence IIIGA time constraints for initiation of MRV testing (currently 168 hours). I sent out a note on this subject on March 22 and have had feedback from a lab indicating they could provide data. Copy of March 22 note attached. Again, there seems to be sufficient interest to discuss this in May.

4. Any other items that may need preparation time prior to our May 12, 2010 meeting.

Report of the Sequence III Cam and Lifter Wear Task Force

Background

The Sequence III Surveillance Panel held a teleconference February 5th to address the mild trend for ACLW. Prior to this call the industry statisticians held one and no firm solution was recommended. During the SP meeting the following motion was made:

Effective Feb. 5, 2010, suspend ACLW lower limit shewhart severity criteria for reference test acceptability, for reference tests completed after Jan. 1, 2010, continuing ACLW SAs as currently implemented. This will continue for a period of 60 days.

An item of discussion prior to the vote was :

Dwight Bowden asked what the action plan going forward would be. Dave Glaenzer will form a task force to continue investigating the mild trend. The 60 day sunset period was included to keep the panel's motivation at a high level. Once discussion concluded, the motion was called.

The motion passed 11-0-1. There was also unanimous consent to waive the two-week waiting period.

Charlie Leverett volunteered to chair the task force and the first conference call was held February 11th.

Task Force Scope & Objectives

Scope

The Sequence IIIG Surveillance Panel held a conference call February 5, 2010 to discuss the mild average cam and lifter wear (ACLW) trend occurring in this test type on reference oils. During this call a motion was made and passed to suspend ACLW lower limit criterion for reference test acceptability (Shewhart Severity Criteria) for reference tests, but continue ACLW severity adjustment (lab EWMA Severity) as currently implemented. This motion was determined to be a temporary measure for a time period no longer than 60 days to allow a Task Force to review the occurrence and try to establish a root cause and forward a recommendation to the Surveillance Panel to resolve the issue prior to April 6, 2010.

Objective

Review reference & candidate test data in an attempt to determine the root cause for the current mild ACLW trend in the Sequence IIIG.

Membership of this Tank Force included:

Bruce Matthews & Matt Snider GM
Dave Glaenzer & Ed Altman - Afton
Greg Seman & Jerry Brys - Lubrizol
Pat Lang & Sid Clark - SwRI
Dwight, Jason, Matthew & Adam Bowden - OHT
Rich Grundza - TMC
Bob Olree & Charlie Leverett (Task Force Leader) – Intertek
Mark Mosher & Bill Maxwell - ExxonMobil
Tim Caudill – Ashland

Action Items cover in this task force:

Action Item 1: Labs to review retained EOT camshafts for changes wear track location. **Conclusion: Most reported no change over time and one lab noted that they had seen an occurrence where the wear pattern was on the low side of the lobe**.

Action Item 2: OHT to determine availability of old lifter material for analysis of dimensions and hardness. **Conclusion: All material was in the specified range.**

Action Item 3: Lubrizol to check hardness of retained EOT lifters and review initial height measurements taken prior to use in engine testing. **Conclusion: the Lubrizol measurements showed the hardness to be out on the low side, OHT returned these parts to their vendor and they were in the specified range once measured in the same manner as normal done for quality control.**

Action Item 4: Bruce Matthews/GM to review block data for any shifts. **Conclusion: Bruce and Matt reviewed blocks produced in 2006 and compared to blocks produced in 2009 and did not find any deviations.**

Action Item 5: Labs to review camshaft end play data. **Conclusion: Range is 0.015-0.03 within the industry.**

Action Item 6: Labs to document camshaft handling procedures from time of receipt to installation into test engine. **Conclusion: Most were similar but the TF agreed we should come up with a better procedure.**

Action Item 7: TMC to review reference oil viscosity data for any shifts. **Conclusion: the viscosity on 434 and 434-1 differ by 1.83 cst @ 40 C and on 435 vis. 435-1 3.13 cst @ 40 C.** ***This difference is also being looked at by the ROBO panel. This difference needs further discussion at the SP level.***

Action Item 8: Determine when solvent change occurred **Conclusion: This was done in 2005 so it is not considered a possible cause.**

Action Item 9: Conduct a measurement round robin on one new IIIG test camshaft and a set of test lifters. Following the completion of this exercise this group decided it would also be a notable to do a post test measurement, Lubrizol agreed to run this hardware in their next reference. **Conclusion: There is a summary of the pre and post test measurements shown in Attachment #1. This group believes the results are within the repeatability of these measurements.**

Action Item 10: Labs to review candidate data. This exercise was setup for labs to determine their prospective of the cam severity by the batch code using reference and non reference test results. **Conclusion: Afton, Lubrizol and Intertek had similar results but these were not in and acceptable statistical analysis by the whole group.**

Action Item 11: Lifter radius was reviewed, OHT send an audit set to their vendor and once returned to Intertek. SwRI and Intertek also did some random samples. **Conclusion: All hardware measured by all the above parties was in the specified range.**

Action Item 12: Phosphate coating review **Conclusion: GM, Intertek and Afton reported on their findings in this review along with OHT. The OHT response was:**

Full analysis and review of process controls and camshaft sample material, including magnified images of material provided by General Motors, and was conducted at both the vendor and chemical supplier. These analyses confirmed the parts meet specifications. No change has occurred in either the phosphate process or materials. Visual differences of the phosphate coating do occur and are a function of the inherent variability in the process and underlying camshaft metallurgy

Conclusion of this task force is:

We believe we have done a detailed study of the current mild severity trend but have not determined a root cause, our recommendations going forward are shown below.

Recommendation from the Cam and Lifter Wear Task Force

1.) Continue with the current motion below until the May 2010 SP meeting, recent data indicated the trend is not as mild at this time;

Suspend ACLW lower limit shewhart severity criteria for reference test acceptability, for reference tests completed after Jan. 1, 2010, continuing ACLW SAs as currently implemented. This will continue until the May SP meeting at which time the SP can discuss.

2.) Camshaft handling procedures – TBD by this task force, we will present this at the May SP meeting.

3.) Request TMC to review cam and lifter measurements on their annual Lab visits to determine if anything being done is different within the Industry.