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Unconfirmed Minutes of the April 6, 2010 Sequence III ACLW Task Force Conference Call

The teleconference convened at 10:00 a.m. Central.

Attendance -Ed Altman, Jason Bowden, Rich Grundza, Charlie Leverett, Mark Mosher, Greg Seman, Matthew Snider, Adam Bowden, Matthew Bowden, Dwight Bowden, Bruce Matthews, Bob Olree, Jerry Brys, Art Andrews, Tom Hitchner, Sid Clark

There were no comments received on the 03/4/10 Minutes posted on the web. A copy of the conference call agenda is included as attachment 1

Action items from previous meeting were reviewed. The only open action item pertained to camshaft endplay measurements. Charlie stated he had received data from 3 labs. A fourth stated they would forward data shortly. Ed Altman hadn't sent data to Charlie, but did indicate that typical endplay values were in the 0.015 – 0.020” range. Charlie indicated one lab reported data in the 0.020 – 0.028” range. Greg Seman indicated that his lab had typically seen results in the 0.015-0.030” range. When asked, Pat Lang commented he didn't have the results in front of him and committed to forwarding to Charlie soon.

Measurement round robin end of test data was reviewed by all members of the panel and is included as part of the agenda, attachment 1. Dave Glaenger commented that the data appeared to be very normally distributed. Charlie had forwarded this information to some of the industry statisticians and at least one responded that results looked reasonable. No further action was planned for this item.

The report to the Surveillance panel was reviewed and no comments were noted. The report is included as attachment 2. Recommendations to the panel were to continue to evaluate reference tests without applying shewhart limits to ACLW, develop a more detailed procedure for the handling and cleaning of camshafts, develop “soak time” to allow cam temperatures to “normalize” before measurement and that the use of reference oil 435-1 be reviewed by the panel, with an eye towards getting another blend of 435, which might be available shortly. Finally, it was recommended that the TMC review cam and lifter measurement techniques during lab visits.

Dwight Bowden asked if the round robin cam and lifters should be stored at OHT. It was pointed out that the procedure requires parts be kept for a minimum 1 year. The group agreed that storing them at OHT would not be a problem, procedurally. Dwight also suggested that labs closely monitor the parts received as service parts through the dealership network. Dwight felt that these may be causing problems the panel is not aware of.

Meeting was adjourned at 10:33 CST

Sequence III G Cam Wear Task Force

Tuesday April 6, 2010

Call in #: 800-391-9177

Conference Code #: 4875645502

1. Roll Call, current members are:

Bruce Matthews & Matt Snider GM

Ed Altman - Afton

Greg Seman - Lubrizol

Pat Lang & Sid Clark - SwRI

Dwight, Jason, Matthew & Adam Bowden - OHT

Rich Grundza - TMC

Bob Olree & Charlie Leverett – Intertek (Task Force Leader)

- Intertek

Mark Mosher & Bill Maxwell - ExxonMobil

Tim Caudill – Ashland

2. Approve minutes from last conference call.

3. Review of Task Force Action Item List from Conference Call

Action Item 1: Labs to review retained EOT camshafts for changes wear track location. **Completed**

Action Item 2: OHT to determine availability of old lifter material for analysis of dimensions and hardness. Available lifter(s) to be measured at Lubrizol.
Completed

Action Item 3: Lubrizol to check hardness of retained EOT lifters and review initial height measurements taken prior to use min engine testing. **Completed**

Action Item 4: Bruce Matthews/GM to review block data for any shifts. **Completed**

Action Item 5: Labs to review camshaft end play data. **Inproces**

Action Item 6: OHT to modify Intertek Y_i chart to include dateline representing implementation of enhanced packaging procedure. **Completed**

Action Item 7: Labs to document camshaft handling procedures from time of receipt to installation into test engine. **Completed**

Action Item 8: TMC to review reference oil viscosity data for any shifts. **Completed**

Action Item 9: Determine when solvent change occurred **Completed**

Action Item 10: Conduct a measurement round robin on one new IIIG test camshaft and a set of test lifters. (Note: Round robin hardware delivered by OHT to Lubrizol on 2/12/2010) **Completed**



Cam_Wear_Summary_Corrected.pdf

Action Item 11: Labs to review candidate data. Charlie Leverett to distribute data selection process used by his laboratory. **Completed**

4. New Business

- 1.) Review of cam and lifter wear Phase II data
- 2.) Discussion of Draft Report and any recommendation(s) to the SP

5. Meeting/Conference Call Schedule

1. Next meeting

6. Adjournment

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 III 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 0.0015-0.003 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 IIG 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.