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**Committee D02 on PETROLEUM PRODUCTS AND LUBRICANTS**

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Reply to:

Scott Parke  
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November 4, 2004

To: Single Cylinder Diesel Surveillance Panel

Enclosed are the minutes of the SCOTE Surveillance panel teleconference held October 27, 2004. Please forward any corrections or additions to my attention.

Scott Parke  
Secretary SCOTE Surveillance Panel

Attachments

cc: <ftp://ftp.astmtmc.cmu.edu/docs/diesel/scote/minutes/TELECONFERENCE%202004-10-27.pdf>

distribution: Email

## TELECONFERENCE MINUTES

### SINGLE CYLINDER DIESEL SURVEILLANCE PANEL

HELD OCTOBER 27, 2004

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#### **10:00cdt CALL TO ORDER**

The teleconference began at 10:00 cdt; the participants are listed in attachment 1. The agenda was simply to discuss liner availability and introduction plans for all single cylinder diesel tests. The minutes of the previous teleconference were approved as published.

#### **10:02cdt CURRENT 1N LINER STATUS**

Scott Parke (TMC/secretary) recapped the decisions made for 1N testing in the prior two teleconferences (held May 26 and July 30, 2004). At this point, the plan forward is for the 5 stands whose calibrations expire October 31 to run their next test using oil 1004-3, PC-9 fuel, and new liners.

Chuck Dutart (Caterpillar) summarized delivery status of the latest of the new liners. Up to this point, "form inspection" (checks for straightness, etc.) has been the bottleneck. Those problems have all been cleared up. Correlation between eddy current testing and optical inspection, after some adjustment to the eddy current equipment settings, is now very good. Chuck expects to drop optical inspection in favor of eddy current testing. Stacy Bond (PerkinElmer) said that he would like to see the "known fail" liner that was used to calibrate the eddy current equipment since Chuck said that it had *not* failed eddy current testing at one point. Chuck reassured the panel that the "known fail" liner cleared eddy current testing only prior to adjusting the settings; the "known fail" now reliably fails.

Bob Campbell (Afton Chemical) asked Chuck what the rejection rate was on Cat's inspection for this liner. Chuck said that it has been running as high as 90 to 95%. He expects that none that reach the labs should be rejected.

Bob announced that he will decline to participate in the testing this time around due to a lack of business for the stand. This will reduce the pool of data this time to 4 tests. PerkinElmer and Southwest each committed to running 1 test; Lubrizol to 2. Jim McCord (Southwest/chairman) warned that he planned to run in a different (and new to 1N) stand this time and asked if this would effect the ultimate calibration of the stand. Scott Parke said that this change would not adversely impact the robustness of this particular experimental design.

With that as a basis, then, the panel agreed that each of the 4 runs would begin the week of November 1. When they complete, they will have the current TLHC correction factor applied and

be evaluated against the recently-recomputed 1004-3 targets. Passing tests will be considered calibrated. On November 15, Scott Parke will re-evaluate all correction factors using whatever data is reported at that point.

### **11:00cdt CURRENT 1K LINER STATUS**

Dan Domonkos (Lubrizol) reported that though his stand is calibrated until April of 2005, he is out of old liners to run. Southwest and PerkinElmer still have a few liners (and are also calibrated to spring of 2005). So far, Dan has been able to procure old liners from the labs that still have some. The panel chose to continue running in this mode for the time being. They did, however, decree that the next round of testing will use the new liners.

### **11:30cdt CURRENT 1P LINER STATUS**

Chuck Dutart reported that the 1P liners should be available January 2005. Currently, labs are stocked with liners as follows: SR=40, EG=20, EV=10, MB=2, LZ=10, and 66 at Cat.

Stacy Bond is concerned by the history of erratic test-to-test oil consumption exhibited in the 1P test. He feels that a plateau-honed liner could help or even eliminate that problem.

Jim McCord expects the 1P test to be included in PC-10. The one real impediment to it's inclusion is the unpredictable oil consumption performance.

Chuck said that while Cat understands the sentiments regarding oil consumption, they are very reluctant to make a change to the test that would be likely to significantly alter its precision performance, e.g. introduce plateau-honed liners.

Stacy feels strongly enough about this item that he offered to donate runs to test the impact of plateau-honing. Dan Domonkos offered to do the same.

Chuck was asked if plateau-honed liners are available for the 1Y3700 engine. They are not. Unlike the 1Y73 and 1Y540 engines, there is no production liner that can be used. The liner currently used is peak-honed. In order to ensure no change to the test, all of Cat's efforts thus far have been directed toward obtaining a new peak-honed liner. Chuck has investigated the possibility of using a 1N liner in the 1Y3700 engine. It could be done but would require tooling and design effort that would not likely be worthwhile. Any option other than to continue on the current path of peak-honed liners would delay things past December which is when the decision on PC-10 is scheduled to be made.

Stacy and Dan briefly discussed the possibility of re-honing a peak-honed liner to create plateau-honed liners themselves just for the sake of doing a few proof-of-concept type runs.

Chuck felt that it was unproductive to continue without input from Abdul Cassim (Caterpillar). The panel agreed to reconvene the week of November 1 when Abdul will be available.

To sum up, the dilemma is as follows: The main obstacle to 1P being included in PC-10 is the sometimes-unpredictable oil consumption performance. It is reasonable to think that changing from peak-honed to plateau-honed liners could reduce the incidence of oil consumption "flyer" tests. On the other hand, Cat has made a considerable investment in developing new peak-honed liners trying not to change the test and the earliest Chuck would be able to provide a plateau-honed liner is mid-January which is too late to make the December 6 PC-10 deadline.

Bob Campbell suggested that, at this point, the best strategy might be to promise the Heavy Duty Class panel that a change to plateau-honed liners was in the offing and that the change would reduce the oil consumption “flyer” problem. That would perhaps be reassurance enough to persuade the Class panel to include 1P in PC-10.

Stacy and Dan still plan to get together to discuss “homemade” plateau-honed liners.

#### **12:02cdt CURRENT 1M-PC LINER STATUS**

The several options for a replacement 1M-PC liner were discussed, including a move to production liners. Chuck Dutart said that Cat was not interested in further involvement with 1M-PC.

Bob Campbell asked how many liners were out in industry inventory available for testing. None are available at any Cat dealers. Bob was perplexed because he was under the impression that Abdul Cassim had recently committed to 5 more years of 1M-PC support. Chuck clarified that that excluded liners. The supplier that Cat has been working with for liners has said that a minimum order for 1M-PC liners would be 250. Chuck suggested that the testing industry could perhaps arrange to purchase liners directly from that supplier. He would be willing to provide information to do so but Cat will not procure the liners themselves.

Stacy Bond and Bob were upset at this development because they were certain that they had heard Abdul commit to 5 more years at the last HD Class panel meeting. Chuck read the letter stating Caterpillar’s position that had been distributed to industry (attachment 2) and served as the basis for Abdul’s report to the Class panel.

Chuck reported that 121 production liners for the 1Y73 are available in dealer inventories. They are liners that have been on hand since 1989. There were 45 1Y3995 liners in dealer stock as of July 1.

Chuck asked the labs to compile a list of parts that they expected to need over the next 5 years and he will report how many of each part are left at Caterpillar.

#### **12:40cdt NEXT TELECONFERENCE**

The panel agreed to reconvene the week of November 1 to get Abdul’s input on 1P liners and again the week of November 15 to review the available 1N data.

The teleconference ended at 12:42cdt.

## Attendance:

Representative	Organization
Chuck Dutart	Caterpillar
Dan Domonkos	Lubrizol
Jerry Brys	Lubrizol
Jim McCord	Southwest Research
Mark Sutherland	Chevron
Bob Campbell	Afton Chemical
Chris Mazuca	PerkinElmer
Stacy Bond	PerkinElmer
Tom Franklin	PerkinElmer
Jim Gutzwiller	Infineum
Scott Parke	Test Monitoring Center

August 10, 2004

To Members of the Heavy Duty Engine Oil Classification Panel (HDEOCP):

This letter is being sent for your information and in preparation for discussion at the next HDEOCP meeting on September 29, 2004.

Issues and Options for continued support of the Caterpillar 1M-PC SCOTE engine.

Caterpillar has identified that there is a manufacturing and supply issue with the current 1M-PC cylinder liner (1Y3995). The tooling for the manufacture of this liner is no longer functional and continued supply will require new tooling. The cost to manufacturers for new tooling will be in the range of \$150,000 to \$300,000. It is likely that ASTM will require the new liners to be referenced, which is also a cost that will have to be addressed.

The oil categories supported by the 1M-PC engine test includes the API CF and CF-2 categories, mainly in support of pre-chamber diesel engines and 2-stroke Detroit Diesel engines. Other markets that use the 1M-PC engine or API CF category include the Automotive, Railroad, Japan and older Marine engines.

Caterpillar has identified three possible solutions and would like to state that no matter which course of action the industry takes, Caterpillar will support this engine for a maximum of five more years.

Work with the HDEOCP/EMA/ASTM/CPD or outside companies to fund the purchase of a lifetime supply of liners to cover tests over the next five years. It is estimated that the total investment required by manufacturers would be about \$ 600,000, which includes tooling and procurement. The price of the finished liners would be determined by who ever agrees to pay for the tooling and purchase of the liners. The industry would also have to work through funding for any reference testing required. Caterpillar would continue to supply other 1M-PC parts.

2. Use a current production part 5H5657, which is available from any Caterpillar Dealer. The referencing and conformity of these parts will be entirely relying on the production manufacturing process. The cost of this liner is in the region of \$132 per liner.
3. Caterpillar stops supporting the 1M-PC test on January 1, 2005.

Under options 1 and 2 listed above, Caterpillar would not supply the 1Y3995 liner but would continue to support the 1M-PC with other parts in inventory for an estimated five-year period, after which the remaining parts would be sold or scrapped thus bringing to an end the support of this engine by Caterpillar. No more parts will be manufactured except consumables, pistons and rings. Caterpillar estimates a five-year life for parts between what is in inventory and what can be cannibalized from existing engines.

Caterpillar asks that the HDEOCP debate and recommend which of the three above options its members favor. Caterpillar welcomes any suggestions from members of the HDEOCP, EMA, ASTM, CPDs and test laboratories in the resolution of the 1M-PC liner issue. We will require an answer no later than October 15, 2004, after which our only option will be to stop supporting the 1M-PC test.