

UNCONFIRMED MINUTES OF THE ASTM MACK SURVEILLANCE PANEL MEETING

**Teleconference
January 12, 1999**

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1. T-9 Results with New Piston Rings

In order to reduce top ring weight loss and liner wear variability, new top piston rings were introduced for the Mack T-9 test. The difference between old and new rings is that the plasma bonding has been improved, which should prevent the plasma from flaking off. Four reference tests, using the new piston rings have been completed. All four tests were run at one laboratory. The top ring weight loss averages of these four tests were : 61, 60, 44, and 70 mg. One of the tests does not meet the acceptance criteria for reference tests, which have been calculated based on results obtained with the old top rings. The latest four reference test results from the same lab, using the old rings were : 94, 125, 92, and 128 mg. This data would suggest a severity shift, requiring recalculation of the reference oil targets.

Another lab completed a reference test using 2 new and 4 old piston rings. The cylinders with the new rings produced both the lowest and the highest liner wear and ring weight loss. It was noted that the new style top ring producing the high wear had a "sharp jagged edge".

A third lab reported having run duplicate tests on a candidate test. The first test with the old rings gave 88 mg top ring weight loss and the second test with the new rings gave 103 mg weight loss. This comparison would suggest that the response to the new rings is oil dependant.

2. Possible Correction Factors

Since the data on the new rings indicates that the ring weight loss severity for the reference oil may have shifted, there was a discussion on how to proceed doing that. After some discussion all panel members agreed to recalculate the reference oil targets for ring weight loss and liner wear when 5 reference test results (at least one from a second lab) are available. Four reference tests, from three different labs, are expected to be run before March 1, 1999. It was agreed that the targets will be recalculated again after completion of each subsequent reference test following the fifth result.

Engineering judgement will be used to declare the recently obtained low wear result (44 mg) on TMC 1005-1 acceptable.

Greg Shank, Mack, will present the data on the old and new rings to the Heavy Duty Engine Oil Classification Panel at the February 16, 1999 meeting. Laboratories having run duplicate tests on candidate oils using both old and new rings are requested to provide these results to Greg.

3. Availability of the New Rings

It has been agreed at the December 1998 meeting that all reference tests started after January 1, 1999 should be run with new rings (and 20° valve seats). The first supply of new rings has been exhausted, but a new supply of the new rings will be available by January 15, 1999.

It is highly recommended (and mandatory after February 1, 1999) to run all candidate tests with the new piston rings.

The new piston rings can be easily identified because they have 2 dots on either side of the gap.

TEI informed the group of a change in the top ring height measurement technique/protocol. The change has resulted in an increase of the ring height of about 0.001 inch. In reality the rings have not changed.

4. Liner Wear Measurements

A liner wear measurement workshop will be organised by Jeff Clark. The intent of this workshop is to compare the Taylor-Hobson talysurf and PDI measuring devices. If, with the correct adjustment settings / measurement protocol the PDI technique would give the same outcome as the Taylor Hobson, several labs could be approved to do the measurements, reducing the amount of liners being shipped for measurement.

5. Pb-Content Transformation

The issue of transforming the used oil Pb-content was brought up. The current transformation is a square root transformation, but it was suggested that an exponential transformation might be more suitable. It was agreed that Jim Rutherford, Oronite, will evaluate the used oil Pb-content data from reference tests on TMC 1005 and TMC 1005-1 separately. If there is a need for changing the current transformation, a conference call will be held to discuss the details.

Footnote (January 14, 1999) : Jim Rutherford reported back that the used oil Pb-content transformation should be done using a square root transformation. This

conclusion was the same for the TMC 1005 data and for the TMC 1005-1 data set.
A note from Jim is attached to this fax.