

Mack Surveillance Panel Meeting

Teleconference, October 8th, 2014

Attendees:

Afton - Bob Campbell, Christian Porter, Alston Rhodes
ExxonMobil – Mike Alessi, Riccardo Conti
Intertek – Jim Mortiz, Luiz Garcia
Infineum – Bob Salgueiro (Secretary), Pat Fetterman, Jim Gutzwiller, Elisa Santos
Lubrizol – Kevin O'Malley, Jim Matasic
Oronite - Mark Cooper (Chairman), Jim Rutherford
SwRI – Bob Warden, Jim McCord
TEI – Mark Sutherland
TMC – Sean Moyer
Volvo/Mack – Greg Shank, Chris Caulley

Agenda: The Surveillance Panel met to discuss the completion of the Mack T-12 reference test at SwRI with new V-batch Top rings.

Mark Cooper, Chairman, called the meeting to order at 10:07AM.

OIL CONSUMPTION

The recent reference test had an uncorrected Phase II oil consumption of 90.7 g/hr. The high oil consumption was similar to recent values suggesting that the changes in piston, liner and top ring did not impact oil consumption as hoped. TEI confirmed that these V-batch rings were manufactured by a different manufacturer (Federal Mogul vs. MAHLE) and have a different coating than the original rings which had a plasma coating. The reason for using a different coating was because Federal Mogul had confirmed to TEI earlier that they were unable to provide the original plasma coating used by MAHLE. Federal Mogul suggested that the 2nd ring could impact oil consumption. The Surveillance Panel initially thought the top ring would have the most impact on oil consumption, but now we need to explore all possible options. The ring gap on this recent test was a little greater than what has been seen normally. The ring crown was cut on the high side of the spec of the drawing, based on geometry of S-batch rings. **TEI will request from Volvo the drawings of the Mack T-12 2nd ring and oil control ring. TEI will send the drawings and samples of the current 2nd ring and oil control ring to Federal Mogul. SwRI to take photos of the EOT ring faces and the corrosion on the underside (lower flank) of the rings from the recent V-batch reference test, so TEI can give them to Federal Mogul.**

TOP RING WEIGHT LOSS & LINER WEAR

The liner wear was very low, averaging 1.0 microns, uncorrected. Overall Ring weight loss was normal. Top ring weight loss was as expected at 59 microns, uncorrected. Volvo, thought the V-batch rings may have too low liner wear numbers to be useable. TEI confirmed that the minimum number of another batch of rings Federal Mogul will manufacture is 250. **TEI will follow up with Federal Mogul and see if they can suggest changes to the ring design that would increase liner wear.**

PISTONS

Piston availability is running short. Available options are to purchase more of the new reduced tolerance pistons, purchase more production pistons, or revisit the rejected pistons TEI has in inventory now. The production pistons used different forgings. Some pistons had nice round chamfers in the piston crowns and those are the pistons now in use. The rejected ones have almost no chamfer (sharp edges of the piston bowl). The tolerances on the new pistons are almost half, much tighter than the original production

pistons. It is expected that the new pistons would be more repeatable and precise. It takes 6-8 weeks to get another small batch of the new pistons made. The new pistons are about \$538, while production pistons are about \$300 (but only about \$250 without any screening). Mark confirmed the rejection rate on the new pistons about zero. Timing between getting a new batch of pistons made vs available inventory will be very close to running out. **The Surveillance Panel decided to purchase a big batch of the reduced tolerance pistons. The Surveillance Panel decided to use up the current screened production pistons and then switch to the new reduced tolerance pistons. The Surveillance Panel also agreed that the introduction of the pistons should be a running change and does not have to be tied to reference testing.**

A question was raised by SwRI if the Surveillance Panel could use these V-batch rings in the Mack T-11, assuming that it is liner wear that is driving higher oil consumption in the T-11. The T-12 Stage 1 oil consumption was in the 30s with the V-batch rings. If so, V-batch rings might help. But Lubrizol had a Mack T-11 which had developed high oil consumption. Lubrizol took it apart and observed piston deposits and sticking rings. After changing them, the oil consumption returned to normal suggesting that it is not liner wear that is controlling oil consumption in the Mack T-11.

The meeting was adjourned at 10:55AM.