

Mack T-13 Teleconference

Wednesday December 19, 2012
1:00 p.m. – 2:00 p.m. Eastern Time

Dial-in number:

888-272-5498

Access Code:

4069278

Mack T-13 Teleconference Meeting Notes

The conference meeting convened at 1:00 p.m. Eastern time.

Membership / Attendance

Riccardo Conti

Zack Bishop, Addison Schweitzer, Scott Richards, Riccardo Conti, Steve Kennedy, Mike Alessi, Mark Cooper, Jim Rutherford, Sean Moyer, Bob Campbell, Jim Moritz, Jim Matasic, Greg Shank, and Ken Goshorn.

Current Progress of Test Number Five at ExxonMobil

Riccardo Conti

Riccardo began the discussion by stating that the Mack T-13 test on TMC 821 reference oil was terminated at 248 hours and 31 minutes, just shy of the intended 250 hour target, due to unstable torque delivery and loss of coolant in the external system. Riccardo had issues with oil temperature around 150 hours; oil consumption also exhibited issues and was ~29 g/hr for this test. The coolant dilution appeared in the soot level between 150 and 200 hours. Scott Richards stated that the elevated soot rate was explained by the oxidation increase. The 200 hour chemical analysis data showed an obvious increase in sodium and potassium levels. Riccardo Conti mentioned that the coolant that has been utilized in Mack T-13 testing thus far was DELO Extended Life 50/50 blend.

Action Item:

Greg Shank agreed to have Allison Athey send the analysis of DELO Extended Life 50/50 blend conducted by Mack/Volvo Powertrain to Riccardo Conti of ExxonMobil.

Scott Richards questioned if any filter plugging was shown in the operational data, Riccardo answered that there was no signs of filter plugging. It was suggested by the group that the 200 hour oil sample be analyzed for percent coolant dilution. Riccardo mentioned that he saw ~1 liter loss of coolant from the sight glass. Further analysis upon engine teardown revealed that cylinder four had scuffed and heavy varnish was present. It was questioned if the coolant system showed aeration during the test due to the engine showing scuffing. Riccardo stressed that there were no signs of coolant aeration in the sight glass, but that cavitation pitting was seen on the outside of the liner on cylinder 4. In addition, scuffing was seen on the skirt of the piston. Ken Goshorn explained that Garfal (graphite-like coating) is present on the skirt for lower frictional properties while a manganese phosphate coating is on the piston itself. Riccardo Conti described the scuffing as from the top ring reversal zone down completely over the liner on cylinder 4. According to Ken Goshorn, the pitting caused by cavitation on the liner should be 2-3 cm wide down the thrust axis. It was questioned by the group if separating the EGR loop was a possible cause of the scuffing issue.

Action Item:

Riccardo Conti was to take as an action item to photograph the piston, ring, and liner from cylinder four and send them to Ken Goshorn of Mack/Volvo Powertrain.

Other concerns were expressed by Scott Richards about the high connecting rod bearing weight loss on cylinder 1 (2037.3 mg UBWL, 125.1 LBWL) which was supported by the EOT photographs. Ken Goshorn stated that the part numbers for the rod bearings were as follows: 20508264 upper rod bearing, and 20530094 lower rod bearing. It was questioned by the group as to whether the crankshaft stays with the engine. Riccardo stressed that this crankshaft had run before and summarized the testing thus far: Tests 2, 4, and 5 were the one engine; Tests 1 and 3 were the other engine. Bob Campbell suggested backing off on peak cylinder pressure. Ken Goshorn established that Mack/Volvo Powertrain has not seen rod bearing weight loss like ExxonMobil with similar PCP. However ExxonMobil ran the oil temperature at 135°C whereas Mack/Volvo Powertrain operated around 120°C. Currently ExxonMobil operates the coolant system at 115°C with 15 pounds of head pressure. Ken Goshorn stressed further that the hardware was easily rated for 3400 PCP. The next test at ExxonMobil could begin the week of January 7th and would be utilizing a new block that has not been tested according to Riccardo Conti. Greg Shank and Ken Goshorn suggested backing the oil temperature back to 130°C and the coolant temperature to 110°C for the next test. Greg Shank stated that 50 ppm of lead would be a target for test completion/severity for the Mack T-13. Oil sampling was discussed by Steve Kennedy and there was foreseen to be no issues with taking a 100 g sample every 25 hours.

Action Item:

Greg Shank took as an action item to request 10 gallons of TMC 821 from TMC for Riccardo Conti of ExxonMobil.

Action Item:

Riccardo Conti was to take as an action item to add the oil codes to all of the spreadsheet updates.

Action Item:

Greg Shank took as an action item to establish a limit for Oxidation Peak and Area for the Mack T-13 test type.

Industry Stand Installation Progress**Industry**

SwRI stated that the replacement injectors were received and were being installed.

Intertek stressed that they would be completed with the stand installation by January 9th in time for the face to face meetings.

Schedule for Next Meeting**Riccardo Conti**

The next proposed Mack T-13 teleconference is on January 3rd, 2013 at 11:00 a.m. Eastern time.

Meeting Adjourned at 1:50 p.m. Eastern Time.