Mack T-13 Teleconference

Tuesday August 14, 2012
1:00 p.m. – 2:00 p.m. Central 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. central standard time.

Membership / Attendance **Riccardo Conti**

Scott Richards, Andy Broff, Jeff Clark, Sean Moyer, Addison Schweitzer, Riccardo Conti, Steve Kennedy, Mike Alessi, Mark Cooper, Jim Moritz, Jim Matasic, Ed Sullivan, Chris Castanien, Bob Salgueiro, Greg Shank, Ken Goshorn, and Allison Athey.

Current Progress of Test Number Three at ExxonMobil **Riccardo Conti**

Previously an action item was proposed by Bob Campbell that sooting take place in a Mack T-11 to verify if increasing soot would induce wear in a Mack T-13 quickly due to PC-11 timeline constraints. Jim Moritz agreed to provide the sooted oil (4.000 – 4.600% soot) from a Mack T-11. Upon agreement, the Mack T-13 test moved forward as test number three performed by ExxonMobil at 3500 PCP. Test number three is a repeat of the 10W-30 utilized in the first test after a preliminary sooting in a Mack T-11 to 4.000-4.600% as verified by TGA soot analysis. Riccardo Conti provided an update via teleconference as the test approached the one hundred hour mark at phase II conditions. A spike in aluminum was noted by Riccardo, this was initially thought to be the result of condensate acids from EGR attacking the intake manifold due to the low mixed air temperature (65˚C). Riccardo mentioned that he had a sample of condensate from the condensate trap analyzed and it returned normal. There was also a noted increase in iron levels as compared to the previous runs. In addition, there were noticeable levels of tin and silicon at one hundred hours of testing. Scott Richards questioned the Boron decrease, Steve Kennedy clarified that under certain conditions this is likely to be seen. Further clarification was requested by Scott Richards, Riccardo stated that there was no presence of coolant or oil filter plugging in chemical analysis or operational data thus far in the test. The EGR fraction of the current test is ~18.5 which was lower than ~22.5 previously seen in the previous two tests. Scott Richards also questioned the air-fuel ratio which was closer to 19:1 on this test as compared to low 18:1 on the previous testing. Riccardo stressed that the boost pressure is the same as previous tests, and further mentioned that the fuel rate does not go much further than 7-9% overrated. Greg Shank and Riccardo Conti agreed to run to the three hundred hour mark of Phase II conditions on the current test.

Action Item:

SwRI was unable to locate the ECM flash currently used by ExxonMobil on the Mack T-13 (sent on 8/9 according to Riccardo). Riccardo Conti agreed to resend the ECM flash to SwRI.

Action Item:

Riccardo Conti is to request Kevin Hendershot to provide him with Vision software monitor capabilities according to Greg Shank (timing, end of injection, etc.)

Action Item:

Greg Shank stated that Kevin Hendershot was running the Mack T-13 using a modified hardware package in order to attempt to make soot. Greg Shank agreed to report back at the conclusion of this week on the amount of soot increase with the new hardware in the Mack T-13.

Schedule for Next Meeting **Greg Shank**

Proposed Mack T-13 teleconference for August 21st, 2012 1:00 PM Eastern Time.

Meeting Adjourned at 2:00 PM Central Standard Time.

Mack T-13 Teleconference

Tuesday August 21, 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**

Scott Richards, Andy Broff, Jeff Clark, Sean Moyer, Addison Schweitzer, Riccardo Conti, Steve Kennedy, Mike Alessi, Mark Cooper, Jim Moritz, Jim Matasic, Greg Shank, Ken Goshorn, and Allison Athey.

Current Progress of Test Number Three at ExxonMobil **Riccardo Conti**

Riccardo Conti classified test number three as an abort at 190 hours due to a loose bolt on the cam gear causing high wear metals. There were no signs of condensation, according to Riccardo, but that the sources of the high levels of Aluminum and fuel rate issues were likely located.

Action Item:

The oil samples and chemical analysis completed by ExxonMobil was agreed to be verified by SwRI.

Action Item:

Greg Shank took as an action item to source sooted oil for run number four and to update on the soot generation attempts at Mack/Volvo Powertrain.

Allison Athey stated that she was ready to ship Vision to Jim Moritz at Intertek. Jim Moritz stressed that the Mack T-13 at Intertek would be mounted 4˚ in the horizontal direction with respect to the engine as SwRI had done.

Industry Stand Installation Progress **Industry**

SwRI mentioned that their Mack T-13 was low on boost and about 2% off on fuel rate. Mack/Volvo Powertrain mentioned that there could be up to a 5% difference in fuel flow with the variability in injectors.

Action Item:

The 3800 PCP ECM map was agreed to be sent to SwRI by ExxonMobil.

Action Item:

Jim Gutzwiller requested part numbers from ExxonMobil to begin constructing the engine parts database.

Schedule for Next Meeting **Mike Alessi**

Proposed Mack T-13 teleconference for August 28th, 2012 1:00 PM Eastern Time.

Meeting Adjourned at 1:45 PM Eastern Time.

Mack T-13 Teleconference

Tuesday August 28, 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**

Scott Richards, Andy Broff, Jeff Clark, Sean Moyer, Addison Schweitzer, Riccardo Conti, Steve Kennedy, Mike Alessi, Mark Cooper, Jim Moritz, Jim Matasic, Greg Shank, Ken Goshorn, and Allison Athey.

Update on Aborted Test Number Three at ExxonMobil **Riccardo Conti**

Riccardo Conti stated that the liner measurements were completed and that the remaining measurements would be completed by the following day. The liners exhibited relatively low wear considering the elevated wear metals. The completed EOT measurements were agreed to be discussed in the next meeting.

ExxonMobil received the 3800 PCP ECM flash and provided it to SwRI. ExxonMobil stated that the operation of 3800 PCP would be verified prior to testing the pre-sooted oil. Riccardo agreed to attempt to control the intake manifold temperature at 78˚C and EGR to 160˚C. The 3800 PCP map testing was agreed to begin early the following week by ExxonMobil.

Greg Shank discussed the potential for continuing the Mack T-12 test for soot generated wear. The Mack T-13 made only 0.3% soot in 100 hours.

Industry Stand Installation Progress **Industry**

SwRI was told to change their current set of injectors as it was the likely issue according to Mack/Volvo Powertrain.

Action Item:

The current temperature and pressure taps are to be documented by ExxonMobil to be available to the industry.

Schedule for Next Meeting **Mike Alessi**

Proposed Mack T-13 teleconference for September 4th, 2012 1:00 PM Eastern Time.

Meeting Adjourned at 1:45 PM Eastern Time.

Mack T-13 Teleconference

Tuesday September 4, 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**

Scott Richards, Andy Broff, Jeff Clark, Sean Moyer, Addison Schweitzer, Riccardo Conti, Steve Kennedy, Mike Alessi, Mark Cooper, Jim Moritz, Jim Matasic, Greg Shank, Ken Goshorn, and Allison Athey.

Update on Aborted Test Number Three at ExxonMobil **Riccardo Conti**

Riccardo Conti provided an update on the completed EOT measurements including ring weight loss and bearing weight loss from aborted test number three. RWL was examined to be about half of the wear that was previously seen, with the oil ring weight loss being the worst of the three. The BWL was considerably high for the amount of hours on the test. The oil samples from this abort were expedited to SwRI to verify chemical analysis measurements (KV's, ICP metals, TGA Soot, and Fuel Dilution). Scott Richards stated that the KV's were low after the oil add at 250 hours. Riccardo suggested the possibility of fuel dilution. Oil consumption slowed down considerably also suggesting the possibility of fuel dilution.

ExxonMobil attempted to run the second engine with the 3800 PCP ECM flash which resulted in a software error.

Action Item:

Greg Shank gave Kevin Hendershot the action item to resend the Vision software to ExxonMobil due to a timeout safeguard in place.

Action Item:

Scott Richards was asked to verify if his Vision software had timed out.

Action Item:

Greg Shank agreed to address the injector flow issue at SwRI later in the week.

Action Item:

Scott Richards was asked to follow up on the T-11 sooted oil.

Schedule for Next Meeting **Mike Alessi**

Proposed Mack T-13 teleconference for September 11th, 2012 1:00 PM Eastern Time.

Meeting Adjourned at 1:45 PM Eastern Time.

Mack T-13 Teleconference

Tuesday September 11, 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 **Mike Alessi**

Scott Richards, Andy Broff, Jeff Clark, Sean Moyer, Addison Schweitzer, Steve Kennedy, Mike Alessi, Mark Cooper, Jim Moritz, Jim Matasic, Greg Shank, Ken Goshorn, and Allison Athey.

Current Progress of 3800 PCP Flash at ExxonMobil **Mike Alessi**

Riccardo Conti was unable to make the teleconference; Mike Alessi presented the progress of the 3800 PCP operations verification. The 3800 PCP ECM flash was tested yesterday and the following was noted: torque was short by 5%, fuel rate was short by 3%, and boost was low by 10 kPa. Mike Alessi mentioned that a fault code was noted for high oil temperature and the engine subsequently de-rated. The second engine was currently in build and to be completed by the weekend. The test was stated to start this weekend or on Monday according to Mike. It was unknown at this time if the forecasted start would use the 3800 PCP ECM flash. The Vision report of the operational data was agreed to be reviewed.

Action Item:

Mack/Volvo Powertrain will troubleshoot the fault code.

Pending timing and an available solution 3800 PCP was preferred; however 3500 PCP would be used otherwise.

Industry Stand Installation Progress **Industry**

SwRI e-mailed the serial number and trim codes from their engine injectors to Mack Volvo Powertrain.

Andy Broff's design for the EGR coolant temperature control was agreed to be standard for the industry and is currently being utilized at SwRI.

Schedule for Next Meeting **Mike Alessi**

Proposed Mack T-13 teleconference for September 25th, 2012 1:00 PM Eastern Time.

Meeting Adjourned at 1:45 PM Eastern Time.

Mack T-13 Teleconference

Tuesday September 25, 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**

Scott Richards, Andy Broff, Jeff Clark, Sean Moyer, Addison Schweitzer, Riccardo Conti, Steve Kennedy, Mike Alessi, Mark Cooper, Jim Moritz, Jim Matasic, Bob Campbell, Greg Shank, Ken Goshorn, and Allison Athey.

Current Progress of 3800 PCP Flash at ExxonMobil **Riccardo Conti**

Riccardo mentioned that the engine test was online and that it would reach 100 hours in the afternoon. The 100 hour oil sample was described as the EOT sample from the T-11 sooting run. Therefore the 200 hour sample would represent 100 hours of runtime on the Mack T-13. The 3500 PCP ECM flash was used for the current test.

Industry Stand Installation Progress **Industry**

SwRI was currently in the process of confirming that the turbocharger was correct prior to attempting the trim codes for the injectors obtained from Mack/Volvo Powertrain. Information was submitted by SwRI off of both turbochargers on each of their engines and they are currently waiting on a response from Mack/Volvo.

Action Item:

Engine serial numbers are needed by Mack/Volvo Powertrain with the corresponding turbocharger information.

Action Item:

Allison Athey is to verify the turbocharger information internally at Mack/Volvo Powertrain.

Intertek stated that they were not currently ready to run.

Schedule for Next Meeting **Mike Alessi**

Proposed Mack T-13 teleconference for September 29th, 2012 2:00 PM Eastern Time.

Meeting Adjourned at 1:45 PM Eastern Time.

Mack T-13 Teleconference

Tuesday October 2, 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**

Scott Richards, Andy Broff, Jeff Clark, Sean Moyer, Addison Schweitzer, Riccardo Conti, Steve Kennedy, Mike Alessi, Mark Cooper, Jim Moritz, Jim Matasic, Bob Campbell, Greg Shank, Ken Goshorn, and Allison Athey.

Current Progress of Test Number Four at ExxonMobil **Riccardo Conti**

Riccardo stated that the test had passed 250 hours. Steve Kennedy and Riccardo Conti proposed that the test run a 400 hour duration versus a 300 hour duration. Jim Matasic questioned if wear was believed to be exhibited with a longer test duration. Steve Kennedy suggested holding the test at 300 hours for full chemical analysis results. Greg Shank stressed that the test duration be extended to 400 hours. The test is to EOT on Monday.

Industry Stand Installation Progress **Industry**

SwRI was able to obtain more fuel flow with the new trim codes and will try the new turbocharger provided by Mack/Volvo Powertrain later in the week.

Schedule for Next Meeting **Mike Alessi**

Proposed Mack T-13 teleconference for October 12th, 2012 11:00 AM Eastern Time.

Meeting Adjourned at 1:45 PM Eastern Time.

Mack T-13 Teleconference

Monday October 22, 2012
3:30 p.m. – 4:30 p.m. Eastern Time
Dial-in number:
888-272-5498
Access Code:
4069278

Mack T-13 Teleconference Meeting Notes

The conference meeting convened at 3:30 p.m. Eastern time.

Membership / Attendance **Riccardo Conti**

Scott Richards, Andy Broff, Jeff Clark, Sean Moyer, Addison Schweitzer, Riccardo Conti, Steve Kennedy, Mike Alessi, Mark Cooper, Jim Moritz, Jim Matasic, Bob Campbell, Greg Shank, Ken Goshorn, and Allison Athey.

Current Outlook of Mack T-13 **Riccardo Conti**

Greg Shank stressed that the Mack T-13 would be a test to focus on oxidation, lead, and ring wear as pass/fail criteria. The test would also monitor piston deposits as an additional parameter but not as a pass/fail item.

The next test on the Mack T-13 at ExxonMobil would be utilizing the Mack T-12 reference oil 820-3.

Action Item:

SwRI and ExxonMobil were asked to compare data to diagnose the difference existing in operational data between the labs by Mack/Volvo Powertrain.

Industry Stand Installation Progress **Industry**

Going forward, the test lab industry would like to have controlled EGR, fuel rate, and intake/exhaust CO_2 to verify AFR and EGR rate, The targeted temperatures for test were as follows: oil gallery = 135˚C, coolant out temperature = 120˚C, intake manifold = 78˚C, and an EGR gas out temperature = 115˚C. The PCP was decided to be 3300 going forward.

Schedule for Next Meeting **Mike Alessi**

Proposed Mack T-13 teleconference for October 29th, 2012 2:00 PM Eastern Time.

Meeting Adjourned at 4:15 PM Eastern Time.

Mack T-13 Teleconference

Thursday November 8, 2012
10:00 a.m. – 11:00 a.m. Eastern Time
Dial-in number:
888-272-5498
Access Code:
4069278

Mack T-13 Teleconference Meeting Notes

The conference meeting convened at 10:00 a.m. Eastern time.

Membership / Attendance **Riccardo Conti**

Scott Richards, Andy Broff, Jeff Clark, Sean Moyer, Addison Schweitzer, Riccardo Conti, Steve Kennedy, Mike Alessi, Mark Cooper, Jim Moritz, Jim Matasic, Bob Campbell, Greg Shank, Ken Goshorn, and Allison Athey.

Current Outlook of Mack T-13 and Test at ExxonMobil **Riccardo Conti**

The previous meeting was postponed due to Hurricane Sandy for November 8, 2012 at 10:00 a.m. Eastern time.

The oil gallery temperature of the test at ExxonMobil was at 135˚C, EGR gas out temperature was at 120˚C. Riccardo further discussed that there was now a separate coolant loop to control the VGT temperature and that the throttle output was at 92% which left room for controllability.

Bob Campbell stressed the need to dial down the ECM to prevent any unintended movement of controls independent of manual adjustments.

Riccardo Conti voiced that fuel flow should be controlled going forward, however there was an argument that engine power should be utilized for control to verify the benefits of lower viscosity oils for fuel economy while avoiding penalizing them. It was decided that moving forward a constant fuel rate would be controlled according to Greg Shank.

Industry Stand Installation Progress **Industry**

The industry requested that Mack/Volvo Powertrain enable the test labs with control of the engine ECM for fuel flow, timing, EGR valve positioning, VGT positioning, and to flatten the ECM maps for controllability.

Action Item:

Greg Shank agreed to discuss the possibility of granting internal controls within the ECM with Mack/Volvo Powertrain.

Schedule for Next Meeting **Mike Alessi**

Proposed Mack T-13 teleconference for November 14th, 2012 1:00 PM Eastern Time.

Meeting Adjourned at 11:00 AM Eastern Time.

Mack T-13 Teleconference

Thursday November 14, 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**

Scott Richards, Andy Broff, Jeff Clark, Sean Moyer, Addison Schweitzer, Riccardo Conti, Steve Kennedy, Mike Alessi, Mark Cooper, Jim Moritz, Jim Matasic, Greg Shank, Ken Goshorn, and Allison Athey.

ECM Controllability of Mack T-13 **Riccardo Conti**

Mack/Volvo Powertrain stated that if boost and EGR were fixed that not too many parameters would affect torque fluctuations. Jim Moritz questioned if a fixed resistor could be utilized in the place of an engine sensor. Mack/Volvo Powertrain believed that there would be no issue when using a fixed resistor in the place of an engine sensor. The flash file could contain ambient conditions to assist in test standardization. Ambient temperature could affect EGR flow, according to Mack/Volvo Powertrain, and test cell temperature fluctuations should be taken into account. In addition to that, high altitude torque reductions also exist in the ECM.

Action Item:

TMC was asked to obtain reference oil for Paulsboro.

Action Item:

Riccardo Conti is to try the new ECM flash and start the test the week before Thanksgiving.

Action Item:

Greg Birke, of Mack/Volvo Powertrain, is to look into barometric pressure and ambient temperature conditions in the ECM.

Schedule for Next Meeting **Mike Alessi**

Proposed Mack T-13 teleconference for November 14th, 2012 1:00 PM Eastern Time.

Meeting Adjourned at 1:45 PM Eastern Time.