

Mack Surveillance Panel

Wednesday May 2, 2012
8:00 a.m. – 1:50 p.m.
Southwest Research Institute
San Antonio, Texas
Building 209, Conference Room 103

Mack Surveillance Panel Meeting Notes

The conference convened at 8:00 a.m. Central time, with Mark Cooper acting as Surveillance Panel Chair.

Membership / Attendance

Mark Cooper

Mark Cooper, Addison Schweitzer, Scott Richards, Jim Rutherford, Greg Shank, Ken Goshorn, Bob Campbell, Jim Matasic, Sean Moyer, Jim Gutzwiller, Zack Bishop, Pat Colby, Michael Madalian, Pat Fetterman, Mike Alessi, Roger Gawlt, Joe Franklin, Jim Moritz, Frank Farber, Chris Castanien, Tom Winnfield, Joe Franklin

Approval of Previous Minutes

Mark Cooper

Previous minutes approved

Scope and Objectives

Mark Cooper

Scope

The Mack Test Surveillance Panel is responsible for the Mack T-8, T-8A, T-8E, T11, T-11A, and T-12 test procedures. The Mack Surveillance Panel works with the ASTM Test Monitoring Center and the industry to monitor test operations, test statistics, test severity and test precision for these tests. Overall improvements in the test operation and test monitoring are accomplished with the cooperation of the test developer, the Test Monitoring Center and ASTM Subcommittee B0.02.

Monitor and address critical test parts quality and availability for Mack engine lubricant tests.

Monitor and address fuel quality and availability for Mack engine lubricant tests.

Objectives

Set up system to maintain sufficient supply of critical test parts, test fuels, and reference oils to last the life of Mack engine lubricant tests associated with API CH-4, CI-4, CI-4 Plus, and CJ-4 and ACEA E4, E6, E7, and E9 categories, and Mack EO-N, EO-O Premium Plus and Volvo VDS-3 and VDS-4 genuine oil specifications.

Evaluate revisions to the LTMS system for Mack engine lubricant tests.

Evaluate improved methods of oxidation measurement of engine lubricants.

*Note: See the Word document 120502 Mack SP Scope and Objectives final for a separate copy of the scope and objectives.

CPD / Parts Supply Update

Zack Bishop

Mack T-11/T-12/T-8

Test Kit Hardware Inventory Update

Piston crowns/piston skirts for Mack T-12 have arrived (approximately 5 years for all 4 labs).

Within the October - November time frame the Batch "S" liners projected to be out of stock.

Two Mack T-8 piston assemblies are on hand at a given time at TEI. T-11 & T-8 S rings have approximately 2 years stock at TEI based on historic usage rates.

Measurements are conducted for each kit and are sent by Zack Bishop to test labs.

Ken Goshorn suggested that additional liner availability is possible, further stressing that the liner vender has made 2 new batches prior to Batch "T" Liners.

Inventory of Mack Engine Miscellaneous Parts Mack T-11/T-12 Engine

There are no new engines available and only 1 in stock at TEI. Long block engines come with high flow oil pump (8 tooth). TEI found 10 new low flow oil pumps (9 tooth). These low flow oil pumps are assumed to be the last in the industry. Short blocks are available for purchase to TEI. The Mack T-8 engine block quantity to be verified by Zack Bishop at TEI. Mack T-11/T-12 oil filter housing no longer available, TEI has the last remaining in the industry.

Turbo (small and VGT) 8 turbochargers in stock, (5 years worth)

Connecting Rod Measurement – Proposed

*Note: See Mack Hardware CPD Report May 2 2012 attached.

Connecting Rod Bearing Measurement – New

*Note: See Mack Hardware CPD Report May 2 2012 attached.

Batch "T" Liners – Lifetime supply arrived in April 2012

TEI sent a sample Batch "S" Liner (current batch) and a sample Batch "T" Liner (new batch) out to be analyzed for Metallurgical and Chemical properties. This will be the same analysis that was performed on Kusalava and Batch "R" Liners previously in 2009.

Surface finish of a sampling of the new Batch "T" Liners exhibits similar roughness values as found on the majority of the current Batch "S" Liners (ranging from 12 to 16 micro-inch finish).

*Note: See Mack Hardware CPD Report May 2 2012 attached for additional information

Connecting Rod Failure Issues

Group

Motion

Scott Richards motions to investigate the manufacturing/re-manufacturing process through the supplier of the connecting rod to determine the root cause of failure prior to declaring it a critical part to be monitored by TEI. (To be completed by the end of June).

Jim Matasic seconds motion contingent on procedure for inspecting rods.

Action Item

Zack Bishop (with support from Ken Goshorn) takes as an action item to contact Ohio and MRC to set up investigation.

Vote

8 For

1 Opposed

2 Waives

MRC contact information was previously given by Ken Goshorn to investigate the procedure utilized to re-burnish the re-manufacturing rods.

Cylinder pressure suggested as a possible source of failure. Greg Shank and Bob Campbell suggest that SwRI monitor peak cylinder pressures on Mack T-12's.

Additional Connecting Rod Measurements

Zack Bishop / Group

MACK T-12

Bend/Twist/Re-manufacturing process. Zack Bishop to be in contact with MRC to formulate an inspection process for critically claimed connecting rods.

Connecting Rod Supply / Usage

Group

All four test labs agreed that the rod bushing appears to propagate surface cracks within referenced/candidate Mack T-12 testing using the re-manufactured connecting rods from MRC. This prompted the test labs to replace the re-manufactured connecting rods on every test (previously connecting rods were used across multiple tests without an issue). Zack Bishop mentioned that new connecting rods were being manufactured, however Ken Goshorn mentioned that the connecting rods have yet to complete fatigue testing to be certified for use.

Additional Rod Bearing Measurements

Zack Bishop / Group

MACK T-12

TEI is having a fixture manufactured to chuck bearing shell with a nylon stop to inspect being length and arc height. Thickness measurements lead to scratching and has subsequently been stopped (3 places on both sides/12 total). Zack Bishop is to get with Ken Goshorn about specialty tool to measure thickness as well as bearing crush. Ken Goshorn suggests that bearing crush should be measured. This is a non-destructive test that can be performed by applying a specific loading to simulate mounting in a connecting rod.

Methodology for Introducing New Parts Batches

Group

MACK T-12

Upcoming parts batches will initiate an increased amount of reference testing. Around the September timeframe, Zack Bishop suggests that a set of new hardware will be donated for referencing purposes. The correction factors are batch based. Batch sizes are much larger today than previous batches. A reference test will be needed to apply correction factors to the new hardware. Old hardware will be decided upon after the references on the new hardware have been ran later this year. Jim Moritz suggested that old hardware be redistributed.

Zack Bishop at TEI agrees to buy back extra kits from test lab industry to redistribute.

The Surveillance Panel and TMC agreed to extend references one run candidate to accommodate a test on the new hardware.

Pending parts availability this topic will be brought up for discussion for later discussion through a teleconference.

T-8 and T-11 Engine Life and Oil Consumption

Group

MACK T-11

Reduced life issues due to oil consumption on both the T-8 and T-11 were discussed.

Jim Matasic ran 14 Mack T-11 tests on the older hardware, the new hardware

referenced with higher OC, and the first candidate the OC surpassed the limit for OC.

The engine was rebuilt, and the first candidate experienced OC that surpassed the limit.

The engine was rebuilt for a third time and OC is fine on the third candidate.

Bob Campbell is experiencing higher OC than he is used to on the Mack T-11 but not higher than limit of 65 g/hr, however the weigh bucket is going dry regardless.

Jim Moritz had a Mack T-11 that had one candidate before it went out on OC, previous had 4 vs 6, older builds lasted through multiple references.

SwRI has also experienced elevated OC on references after engine rebuild and has seen OC exceed limit after 3-4 candidate runs for the Mack T-11.

MACK T-8

Jim Moritz had OC at 198 hours surpass the validity limit 0.304 g/kW-hr and had to terminate reference test. Upon inspection, Jim mentioned that the liners appear to have bad polishing with low hours.

SwRI has also experienced elevated OC on references after engine rebuild and has seen OC surpass the limit after 2 - 3 candidate runs for the Mack T-8.

Ken Goshorn states that the liners are peak honed which is more severe on OC than plateau honing (used today on modern engine platforms). Piston deposits on the top land can drive OC increase. Scott Richards suggests that the issue could be resolved by addressing the top ring. Hardness specification of the current batch of liners is 40 - 53 HRC Rockwell Hardness.

LTMS was reviewed and the data supports elevated Oil Consumption for both the Mack T-8/T-11.

Motion

Jim Moritz motions to allow complete rebuilds between references for MACK T-11 test type.

Scott Richards seconds motion.

Vote

9 For

None Opposed

2 Waives

*Note: The motion will go into effect (5/2/2012) due to non controversial meeting discussion. Information letter will be issued by TMC in the near future.

Motion

Jim Moritz motions to allow partial (piston, ring and liner) rebuilds between references for MACK –T-8A/T-8/T-8E without adjusting timing or the removal of the injection pump in addition to re-running the break-in.

Scott Richards seconds motion.

Vote

8 For

None Opposed

3 Waives

*Note: The motion will go into effect (5/2/2012) due to non controversial meeting discussion. Information letter will be issued by TMC in the near future.

Supply and replacement of Oil 1005-3 (T-8 / T-8E)

Sean Moyer

The issue that exists is that the supplier can no longer provide this particular reference oil (cannot be re-blended). There is an estimated 1 year supply remaining. This reference oil affects CAT-1P, 1R, EOAT, RFWT, and T-8/E test types. ACC will be solicited to provide a reference oil.

Action Item

Action item for Mark Cooper to prepare a letter to address ACC for the reference oil.

*Note: See B02 SemiAnnualReport – April 2012 – sam – abbreviated attached for additional information.

Supply and replacement of Oil 820-3 (T-11, T-10A)**Sean Moyer**

A potential replacement for oil 820-3 was suggested. Current supply of reference oil 820-3 is low. TMC has an inventory of approximately 55 gallons remaining. There will be no more shipments from TMC at this time.

The supplier of 820-3 has proposed a replacement reference oil. The proposed new oil is CJ-4 versus CI-4, both use Group II base oil. The proposed new oil is low SAP vs high SAP content of 820-3.

The initial test results (single run) were presented as follows:

*Note: See T11 Replacement Info attached for additional information.

Motion

Greg Shank initiated motion made to utilize this oil in place of 820-3. Four or Five Mack T-11 references will be needed to certify oil as a reference oil. Sean Moyer and Jeff Clark will establish a timeframe in which to accomplish this task.

Jim Moritz seconds this motion.

Vote

9 For

None Opposed

2 Waives

PC-11 Reference Oil**Greg Shank**

PC-11 reference oils with lower HTHS values were suggested by Greg Shank.

Mack T-11 backwards compatibility was decided to be discussed at a later date.

Old Business / New Business**Mark Cooper**

Replacing the MACK T-8 with the Mack T-11 was discussed and the Surveillance Panel decided that supporting data would be needed to move forward (not feasible at this time, to be discussed at a later date).

Jim Rutherford proposed a future teleconference pertaining to the addressing the current correction factors on the Mack T-12 test type. (Proposed date: May 16th 2012 9:30 AM Central Time)

Mike Alessi proposed chair for MACK T-13 Task Force. Face to face meeting proposed for July 2012. Addison Schweitzer was chosen as the secretary of the Mack T-13 Task Force.

Sean Moyer to replace Jeff Clark as the voting member and TMC representative to the panel (also includes the T13).

Next Meeting**Mark Cooper**

Proposed teleconference Surveillance Panel Meeting for May 16th 2012 9:30 AM Central Time.

Meeting Adjourned at 12:32PM Central time at SwRI Conference Room 103 at Building 209.