# UNAPPROVED MEETING MINUTES OF THE

# Cummins ISB Task Force

# Held via Teleconference

# March 30, 2004



## 1. Action Items

(1) Cummins to send information to group regarding the plugging of the air compressor coolant passages prior to the next teleconference

(2) PE to recommend external oil cooling system components

(3) TEI to manufacture and distribute oil cooler bypass plates per SwRI design

(4) PE to recommend calibrated dipstick design

(5) SwRI to perform pre-soak experiment using EF-411 on tappets

(6) TEI send new and used cams to LZ, Ashland, PE, and SwRI for possible development of alternate to Adcole machine for cam wear measurements

(7) Cummins send out dynamometer info to labs

## 2. Call To Order/Membership/Approval of Minutes

**Mark Sarlo called the meeting to order at 1:00 pm (CST). The minutes of the previous meeting were approved as circulated. Mark had distributed a copy of the proposed agenda via email prior to the meeting. Ron Buck agreed to take minutes since Joe Huang was unavailable for the teleconference.**

## 3. Old Business

**a. Stand Installation Status**

**Each lab provided current status of stand installation progress. SwRI and PE are in process. Lz should have an installation timeline by the next teleconference. Ethyl is not sure of start date. EM may start in June**

**b. Flywheel Housing and Flywheel**

**Mark reviewed the flywheel and flywheel housing part numbers he had distributed with the agenda. Flywheel housing is part number 3959813 and flywheel part numbers are 3936821 or 3936822. Either flywheel will work with the housing but have different teeth patterns and therefore require different starters. SwRI is using the 3936822 flywheel with an air starter on the flywheel end**

**c. Thermostat Blocking**

**Prior to the meeting Jim Moritz had distributed a recommended procedure for blocking open the thermostat along with a photo. All agreed to Jim's proposal.**

**d. Air Compressor Coolant Passages**

**Warren agreed to provide to the group a recommendation on whether or not to plug the coolant passages for the air compressor (which is removed) prior to the next teleconference.**

**e. Pre-profiled Camshafts**

**Warren has requested quotations from the camshaft supplier to provide pre-measured cams in lots of 50 or 100 to be used for test development and PC-10 matrix testing.**

**f. Other Valve Train Wear Components**

**Cummins will provide all valve train wear components for test development matrix in a kit form through TEI. Engines will also be available if needed**

**g. Oil Filters**

**Cummins plans to have a single batch of oil filters for the test development matrix and PC-10 matrix. The filters will be made in one batch and will be of current production filter media**

**h. Oil Charge**

**Initial oil charge was confirmed as 20 quarts (~16.34 kg). Subsequent oil charges will vary depending on the number of flushes and procedure used for makeup oil during the test**

**i. Oil Sump Temperature and Oil Cooler**

**It was generally felt that some type of external oil cooler was needed in order to control sump temperature. Concern had also been raised regarding the production cooler and its affect on the test due to the copper in the oil cooler passages. Suggestions were made to either pacify the cooler prior to use or bypass the cooler and use an external stainless oil cooler. SwRI has manufactured a bypass plate that when used in conjunction with an external cooler results in good oil temperature control. After lengthy discussion it was decided to use the SwRI design for bypassing the oil cooler and standardize on the external cooler and line lengths. Jim Moritz agreed to develop a recommendation for the external components. Warren suggested that TEI manufacture the bypass plate per the SwRI design for distribution to the labs. SwRI agreed to release their design to TEI for manufacturing and distribution**

## 4. New Business

**a. Cycle Length**

**Warren confirmed test cycle length at 28 seconds**

**b. Oil Consumption Affect on Soot Calculations**

**There was a significant amount of discussion regarding soot corrections for oil consumption and whether there should be forced adds using an external sump arrangement or fill to full using some type of calibrated dipstick. Jim Moritz agreed to come up with a recommendation to present to the group**

**c. Parts Measurement Round Robin**

**Mark mentioned some experiments they had performed regarding tappet measurements and the affect pre-soaking had on the results. He agreed to do some more work using EF-411 as a soak medium and report results back to the panel. He suggested that some type of round robin should be performed on all of the measured parts to establish repeatability and reproducibility between labs**

**d. Alternative Cam Profiling**

**Possible measurement procedures other than the Adcole were discussed. Warren agreed to send new and used cams to labs interested in providing alternate proposals. TEI will send cams to Lz, Ashland, PE, and SwRI.**

**e. Flushing Techniques and Flush Oil**

**The need for standardizing engine flushing between tests was agreed by all. Items that need to be addressed are:**

**Intial oil fill – pressure fill or some other method?**

**Break-in requirement?**

**Number of times to flush and when?**

**What oil should be used?**

**The Sequence IV-A procedure will be looked at as a possible model for future discussions on this subject.**

## 5. Other

**a. Aftercooler – SwRI and PE plan to use the Modine aftercooler that is used for the M-11 EGR and Mack tests**

**b. Data Collection Intervals – Due to the nature of the test it will be very difficult to collect operational data. Discussion centered around the possibility of using snapshot data at various test intervals or possibly some type of charting. It was agreed to discuss this further at a later date**

**c. Dynamometer – Since dyno inertia will impact the ability of labs to meet the cycle times for the test, there was considerable discussion on this topic and whether a standard dyno should be agreed upon. Warren stated that if a lab can meet the cycle time requirements then it should not matter which dyno they use. He will let the group know which dyno Cummins uses since it is considered a low inertia dyno. SwRI plans to use a Shenck WT470 low inertia dyno.**

## 6. Additional Business/Next Meeting

**The next teleconference will be April 14 at 2:00 pm CDT**