

Chrysler IIIH Task Force
Conference Call Minutes
October 8, 2014

Attendees

Chrysler: Haiying Tang, Jeff Betz

SwRI: Karin Haumann, Pat Lang, Cole Hudson

Intertek: Addison Schweitzer, Charlie Leverett

Lubrizol: George Szappanos

Afton: Ed Altman, Raymond Smart

Ashland: Amol Savant

Oronite: Jerry Wang, Kaustav Sinha

Shell: Jeff Hsu

OHT: Jason Bowden, Matt Bowden

TMC: Rich Grundza

Halterman: Tracy King

Karin opened the meeting with a review of the new action items. She is looking for a part number for the fuel rail fitting. Lubrizol will check to see what size fuel line they are running.

The stand updates started with Intertek with a focus of clarifying any open items that would prevent Intertek from starting their prove-out run.

1. There was discussion about what brand of coolant to use for the prove-out tests and the matrices. Intertek prefers to use Shell Zone to prevent having to stock an additional fluid in the lab. Karin expressed the concern that all of the development data was generated using Havoline. The group agreed to use Havoline for the prove-out testing to prevent any question about variability and switch to the Shell Zone prior to the start of the Matrix. Shell Zone will be specified as a required fluid in the procedure.
2. Addison got clarification from the group that we were using a 3 k Ω resistor for the ECT, and that he should run his prove-out test using this resistance value for the entire test. This will result in an ECT temperature from the ECU of 55 deg C.

Intertek stated they had enough information to start their prove-out test, and the meeting turned toward the list of items generated from meetings in San Antonio that were conducted to ensure the labs had everything they needed to start their prove-out runs.

1. There was much discussion about the possibility of running the prove-out tests to 90 hours, rating the pistons and reassembling the engine to run for an additional 10 hours. Concerns were expressed about the validity of viscosity results due to a potential loss of oil when the engine is taken apart. Charlie expressed concern that the last 10 hours may not be valid. Ed stated that Afton would conduct this experiment on all of their tests regardless, and that it would be optional for the group.
2. A suggestion was made at the meeting in San Antonio that the blowby T be turned down rather than up to prevent lab and/or seasonal variability due to varying ambient conditions contributing to the amount of condensation that will drain back into the crankcase. Charlie moved that we turn the T downward, and Ed seconded. Jeff Betz expressed concern about this affecting blowby suggesting that changing the configuration now would potentially introduce more variability that would be prevented by making the change. In the interest of consistency for the prove-out runs, Karin suggested that the group keep the blowby gasses vented upward for the prove-out tests. Charlie withdrew his motion and the group decided to turn the T downward from the matrix onward to minimize variability.
3. There was much discussion about the procedure mandating type E thermocouples. Both Ed and George suggest there is no difference between the two types and that the procedure should allow for both type E and J. Jeff Betz insisted type E be used to be consistent, noting that all thermocouples used in the Chrysler dyno lab were type E. This item was tabled for a future meeting.
4. There was discussion about specifying a type of coolant flow meter along with the minimum performance requirements in the procedure rather than a specific brand and model number. The group agreed the procedure should specify a coriolis meter with minimum specs that match the model that was originally in the procedure, and use the model number in the procedure as a model that has been found suitable.
5. The group previously agreed to allow the use of cooling fans for the exhaust. Discussion on this topic included specifying a minimum distance between the axis of the driveline and the inside edge of the fan to be 14 inches.
6. The group agreed to continue the prove-out tests using the Havoline brand coolant that has been used on all of the development tests to date. At the start of the matrix the Shell Zone brand will be used. The procedure will be changed to permit the labs to either purchase premixed coolant or mix the concentrate in the lab with verification via refractometer.
7. It was determined during the lab inspections that an exhaust probe should be used rather than a static wall tap. A change to the procedure was agreed upon by the group.
8. Discussion about cleaning the block after honing led to the suggestion that the block be cleaned in the ultrasonic cleaner. There was debate among the group as to whether or not this will create another step in the process. The group agreed to modify the procedure to include cleaning the block in the ultrasonic washer.
9. It was recommended in the San Antonio meetings that the procedure for cleaning the oil cooler include a specified minimum amount of time to air dry the cooler. There was discussion about fabricating a rig for the cooler to dry on, and the length of time that would be required. Ed suggested 30-60 minutes. The group agreed to change the procedure to include a minimum time of 45 minutes.
10. There was discussion about the need for the quarterly fuel analysis. Charlie suggested the data was rather meaningless due to the fact that the fuel is generally consumed so quickly that any issues would not be caught prior to the majority of the fuel being consumed. Pat suggested that while the analysis is required in the IIF/G there is no corrective action taken based on the results of the analysis. The group agreed to omit the fuel analysis from the procedure.

11. In the meetings in San Antonio George described an oil priming procedure whereby he draws a vacuum on the oil sample line to fill the oil pump prior to starting the engine. The group debated the need, and agreed to modify the procedure to allow this as an optional item at the discretion of the lab to prevent wear on the starter as long as the procedure doesn't result in any loss of the initial oil charge.
12. During the lab visit it was established that labs had installed oil sample lines of various lengths. In order to prevent an insufficient oil purge the labs will work to standardize the line length and size.
13. Bob Campbell suggested in the San Antonio meeting that the raters spray the pistons with solvent prior to rating them rather than wiping them as is in the IIF/G procedures. It was suggested this would be a time saving measure for the raters. Karin commented that discussion of this topic with the raters at SwRI indicated concern that spraying the pistons would perhaps lengthen the process rather than shortening it. This item was tabled in order for labs to get feedback from their raters as to which would be preferred.
14. The IIF/G procedures require the engine be torn down within 12 hours of EOT. Discussion about this time limitation revealed that historically the tear down was time sensitive due to the effects of leaded fuel on the piston deposits. The group agreed to extend the time limit to 24 hours after EOT.
15. It was suggested that the load cell temperature be specified as an expected operating condition range rather than a setpoint as is written in the Sequence VI procedure. The group agreed to adopt similar language in the procedure.
16. It was requested at the San Antonio meeting that the throttle pedal be made optional, and the procedure be written to allow a drive by wire system in its place. There was discussion that this would perhaps increase throttle control. George submitted a schematic to the group to reflect what was done at his lab, and the group agreed to add it to the procedure as a suggested method to control the throttle.
17. During the lab inspection it was noted there was some degree of variability in the location of the intake air pressure transducers from stand to stand and lab to lab. The group agreed to add a tolerance of ± 1 cm to the procedure to accommodate such small differences.

The discussion turned to the modification of the coolant pumps by OHT. Jason asked for the group to confirm the hose size for the oil cooler coolant. He is suggesting to weld a $\frac{1}{2}$ " NPT for a #8 AN fitting.

The group discussed potential times for lab visits to Lubrizol and Afton. The first week of November was suggested to allow a week between the Surveillance Panel meetings and the lab visits to make traveling easier. The group agreed that 2 mornings in a row would be ideal to accommodate both labs in a minimal amount of time.

The group moved for adjournment.

Action Items:

- 1) Labs will verify the minimum oil sample line needed to safely locate the oil sample valve away from the engine.
- 2) Labs to verify the size of the oil cooler line for OHT.

This is a compilation from notes recorded during the call, with comments from member participants during the Draft Review. Certain subjects may not necessarily be in exact order; however, they are believed to represent an accurate account of the call. If anyone feels changes or additional content may be necessary, please contact Sid Clark @ 586-873-1255 or Sidney.Clark@swri.org

Thanks, Sid