Draft Minutes From:

Sequence IIIH Task Force Conference Call

June 5, 2014 @ 10:00 am CDT

Attendance:

Karin Haumann, Bill Buscher, Sid Clark, Jeff Betz, Haiying Tang, Dave Glaenzer, Ed Altman, Charlie Leverett, Addison Schweitzer, Jason Bowden, Matt Bowden, George Szappanos, Kaustav Sinha, Tracey King

See Attachment 1 for Meeting Agenda

Establish Scope & Objectives

This being the first Task Force meeting a discussion was held to establish the scope and objectives of the task force. Karin submitted a draft as a starting point for discussion. Feedback was that it is a good starting point as is, and can be modified/updated to accommodate additional suggestions in the future. See Attachment 2 for the current Scope and Objectives.

Test Development Update

All test conditions have been finalized with the exception of the test length. Development group is working on determining the final test length to be either 90 or 100 hours. See Attachment 3 for an update of the current status of development.

Shakedown of fixed cam phaser prototypes has been completed. ECU calibration to be used with the fixed phasers has been completed on the older ECU, and is in the process of being updated to be used on the newer ECU that will be used throughout the test. A full test has not yet been completed with the fixed phasers.

A design change in the piston cooling jets implemented during the model year 2013 production was identified. All testing in the future will be on the new cooling jets. A procedure or checks may be needed to ensure consistency in flow and direction.

Hardware Update

Lubrizol's stand installation is complete and confirmed that the parts list from Jeff was complete with the exception of one extra motor mount. Jeff has updated the list. Jeff stated that the final long term storage and preservation plan is now finalized. Chrysler is waiting until final approval of the test before implementing the plan. IMTS has been selected as the cylinder head supplier. Intake valve seats have been ordered, reusable

packaging has been designed and Chrysler is sending cylinder heads for modification to be available in a couple of weeks. Chrysler plans to seed the program with 120 cylinder heads, and Karin and Jeff will confirm that this will be sufficient to supply heads until the labs start returning stock heads from new engines to ITMS.

OHT has a small prototype quantity of fixed phasers on hand, and are waiting to produce a larger quantity until prove out is complete. Delivery of the first engine harness is expected by the end of June with one additional harness arriving per week thereafter. OHT expects to have enough harnesses to cover the industry by the end of July. OHT has jumpers in stock to connect the main harness to the throttle. Modified water pump housing and coolant crossover connectors are in process, and should be complete within a week. The coolant crossover is in process, and is expected in approximately 4 weeks. Oversized pistons have been ordered and 100 engine sets are expected to arrive by the end of July. Rings have not been ordered yet. SwRI has supplied prints for the engine backing plate, exhaust turndown pipes and flywheel adapter plate. Karin inquired about the possibility of OHT providing a stainless steel fuel rail to provide additional safety for the labs. OHT will work with Chrysler to determine the possibility of a new fuel rail. OHT is waiting on confirmation of ring gaps before ordering the rings. Karin will confirm this with the development team.

Karin will provide the labs with the part number for the stress plates purchased from BHJ.

Stand Update

Intertek is finishing its first installation with an expected completion date of mid June. Lubrizol has completed their first stand installation and is undergoing shakedown. Afton is in the process of installing a stand with an estimated completion time of 30 days. SwRI has 4 complete stand installations. Mopar will offer an engine build workshop for the labs to participate in. All necessary build information is in the shop manual provided to the labs by Jeff. Lubrizol would like the wiring harness to be modified to be able to install it over the intake. Lubrizol would also like to eliminate the use of the stock air box. Karin will provide the labs with the oil gallery thermocouple depth.

Procedure Status

Karin is in the process of marking up the current IIIG procedure, and would like to partition the procedure and distribute sections to any volunteers for help.

Action Items

- Jeff Betz will get with the calibration engineer at Chrysler to procure the final ECU calibration with the fixed cam phasers in a format that can be used on the new ECUs.
- Karin will establish a minimum inventory level needed for cylinder heads, and forward it to Jeff.
- Karin will provide an additional print for mirror of exhaust turndown pipe print.

- Karin will send a photo of the front engine mount to the group.
- Karin will send picture of the wiring harness on the engine to the group.
- Karin will provide oil gallery thermocouple depth to the group.
- Karin will get an update for the group on the progress of the engine build manual.
- Karin will Supply the part number for the stress plates purchased from BHJ.
- Karin will send a fuel rail to OHT.

Next Meeting of Task Force

TBD

Attachment 1

Sequence IIIH Task Force
June 5, 2014
10:00 am CDT
Call-in Number: 866-588-1857
Conference Number: 2105226802

Attendance

Establish Scope & Objectives

The group will define the scope and objectives of the task force.

Test Development Update

Karin will provide an update on the current status of the test development.

Hardware Update

Jeff Betz and Jason Bowden will provide an update on the current status of the hardware procurement.

Stand Updates

Labs will provide an update on the status of test stand installations.

Procedure Update

Karin will provide an update on the status of the test procedure.

Attachment 2

ASTM Sequence IIIH Task Force

Scope and Objectives

Scope

This Task Force has been assembled by the Sequence III Surveillance Panel to assist the Test Sponsor and development team in preparing the IIIH test for ASTM precision matrix testing and API acceptance into the GF-6 category. This will include monitoring and advising on parts procurement, laboratory stand installations and testing procedures. The task force will meet periodically to evaluate the progress of the test development, advise on potential improvements to the test and assist in preparing the test to be presented to the industry in an acceptable ASTM format.

Objectives

Evaluate the status of the test development, and establish the remaining work to be done for test acceptance.

Karin Haumann, Chair

Attachment 3

Chrysler IIIH Development Status

June 4, 2014

Summary

- Currently the test conditions are locked with the exception of test length.
- Ideal severity level has been the focus to maintain:
  - Separation of oils
  - Precision
  - Tie back to GF-5

Recent Changes

- Reduction of intake air temperature
  - From 38° C to 35° C
- Reduction ring gaps to reduce blowby flow rate
  - Reduced ring gaps from 30/40 to 25/35 thousandths of an inch
  - Average blowby is down approximately 5 L/min from the mid 30s L/min
- Introduction of oil adds
  - From 0 to 6 ounces per 20 hours
- Possible reduction in test length
  - From 100 to 90 hours

Oil Adds

- This test has been running with oil additions at every 20 hour oil level for the last 10 tests.
- Initial oil add was 4 ounces, and was increased to 6 ounces after runs on 434-1 and REO2.
- The differences between 4 and 6 ounces does not appear to affect the severity.

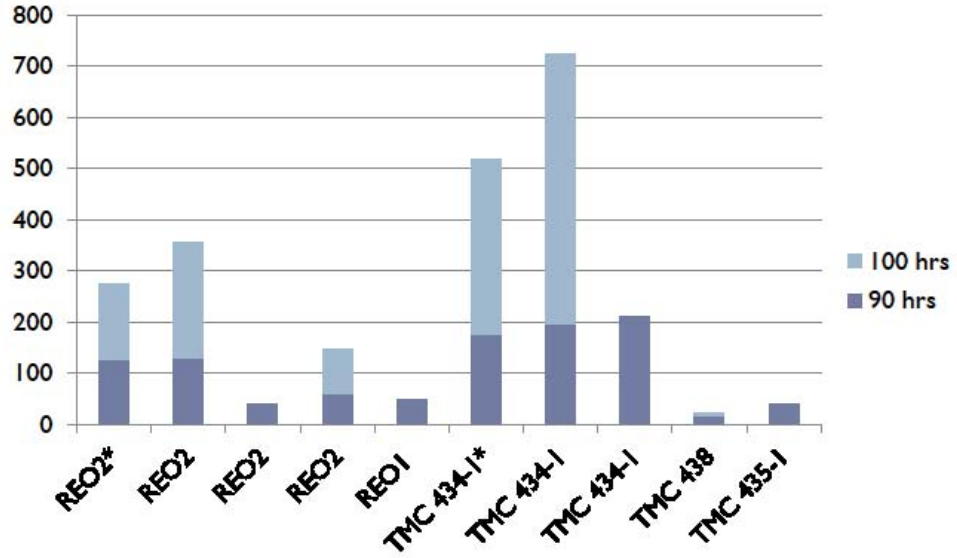
Data

Oil	Pvis (%)		WPD (merits)	
	90 Hours	100 Hours	90 Hours	100 Hours
REO2*	125.9	274.5		3.46
REO2	129.5	355.8		3.49
REO2	40.4	--	5.89	
REO2	60.7	147.2		3.95
REO1	48.6	--	5.7	
TMC 434-1*	177.8	517.4		3.39
TMC 434-1	195.6	723.8		3.36
TMC 434-1	211.2	--	5.59	
TMC 438	17.8	23.8		3.98
TMC 435-1	38.6	--	4.84	

*4 ounce oil adds

__ newer cooling jets

Viscosity at 90 vs 100 Hours



Conclusions

- PVis variability is reduced at 90 hours, but with less separation of oils.
- WPD appears to drop by ≈2 merits during the additional 10 hours. Separation of oils based on WPD is reduced at 100 hours.
- Test stands are available, and feedback from test users based on performance vs. expectations is welcome.