

# Sequence VH Task Force | MINUTES

Revision Date 09-08-2016 | Revision 1.0

<b>Relevant Test:</b>	Sequence VH
<b>Note Taker:</b>	Chris Mileti
<b>Meeting Date:</b>	09-06-2016
<b>Lubrizol Attendees:</b>	Mileti, Matasic, Brys and O'Malley
<b>Comments:</b>	Sequence VH Task Force conference call to discuss the status of VH prove-out testing at three dependent labs.

## CONFERENCE CALL:

### 1. September AOAP Meeting:

- a. Romano will be providing a single slide update at the upcoming AOAP meeting.
- b. **Topics that need to be included in this update:**
  - i. Standard APV ratings from prove-out tests
  - ii. Modified 50% APV ratings from prove-out tests
  - iii. AEV ratings calculated using the standard APV ratings
  - iv. AEV ratings calculated using the modified 50% APV ratings
- c. This data should be presented in a concise table that allows for an easy side-to-side comparison of the different varnish rating techniques.

### 2. Unusual Varnish Pattern with VH Pistons:

- a. Lubrizol recommended that the Task Force formulate a specific plan for dealing with the "striped" varnish pattern that the San Antonio laboratories discovered on some of the VH pistons.
- b. Intertek offered to coordinate a formal response/recommendation from the Raters.
  - i. This may require a rating round-robin with some of the VH pistons.
  - ii. Intertek will provide examples of pistons with varnish stripes.
  - iii. The Intertek and Southwest raters will perform a smaller round-robin before these parts are distributed to the other labs.

### 3. 50% APV Rating Technique:

- a. The statisticians have not yet compared the two varnish rating methods (full or 50%) to determine which discriminates oils more effectively.
  - i. They have also not yet reviewed how the AEV ratings will change if they are recalculated using the 50% APV values.
- b. Ritchie feels that the 50% APV ratings do offer an improvement in oil discrimination.
- c. Romano feels that the 50% APV ratings are less variable than the standard APV ratings.
- d. Intertek will confirm that all (5) Sequence V laboratories have access to the 50% rating templates.

### 4. Update from Lubrizol on REO940 Prove-Out Test:

- a. Lubrizol is approximately 1-2 weeks behind schedule due to a series of problems with the test stand and the new VH hardware.
- b. Lubrizol is currently using a VG utility engine to try and troubleshoot excessive AFR drift (0.98 to 1.08) with the new Horiba MEXA-730 Lambda meters.
  - i. Intertek and Southwest both stated that the MEXA-730 units need a “clean” ground in order to work correctly.
  - ii. They had to install ground loop isolators on their stands to address this issue.
  - iii. **09-8-2016 NOTE:** *Lubrizol confirmed after the meeting that it does, in fact, have voltage isolators installed on its stand.*

## 5. New Engine Coolant Flow Meters:

- a. **Intertek:**
  - i. Intertek just completed a trial on their 2<sup>nd</sup> VH prove-out stand to confirm that the new Micro Motion flow meter is working correctly.
  - ii. They are pleased with the results.
  - iii. They are currently installing an equivalent unit on their 1<sup>st</sup> VH prove-out stand.
- b. **Lubrizol:**
  - i. Lubrizol has installed a Tiger Mag flow meter on its VG and VH stands.
  - ii. It recently referenced its VG stand with the new instrument.
  - iii. Stage 1 engine coolant flow QI's are now above 0.9.
- c. **Southwest:**
  - i. They will start a shakedown with a Tiger Mag flow meter shortly.

## EMAIL EXCHANGES RELEVANT TO CONFERENCE CALL:

### 1. Email from A. Ritchie [09-06-2016 @ 11:09AM EST]:

- a. Ritchie distributed a slide summarizing all of the 50% APV ratings for REO940, REO1009, REO1006-2 and REO1011.

### 2. Email from E. Afton (Afton) [09-06-2016 @ 3:49PM EST]:

- a. Afton's first VH prove-out test has been running for approximately 118HRS.
- b. Both the left-side and right-side cylinder head pressures are very low, and this is making it difficult to maintain the Stage 1 oil temperature set point of 68°C.
- c. **Afton has tentatively eliminated the following items as causes of the low cylinder head oil pressure:**
  - i. Faulty oil pump
  - ii. Leak between chain tensioner spacer plate and cylinder head
  - iii. Excessive fuel dilution
- d. **Questions that Afton presented to the other labs:**
  - i. What oil pressure deltas do you see on each stage?
  - ii. What is your coolant temperature delta?
  - iii. What torque and fuel flow do you see on each stage?
  - iv. There is no fuel return. How are you controlling fuel pressure, and at what pressure? We're using a bypass regulator at about 265Kpa.
  - v. What coolant are you using? Can we use the Shell Zone?

### 3. Email from A. Ritchie [09-07-2016 @ 6:41AM EST]:

- a. Ritchie distributed a presentation that would be used to provide the Sequence VH summary at the upcoming 09-08-2016 AOAP meeting.

**4. Email from Cole Hudson (Southwest) [09-07-2016 @ 3:59PM EST]:**

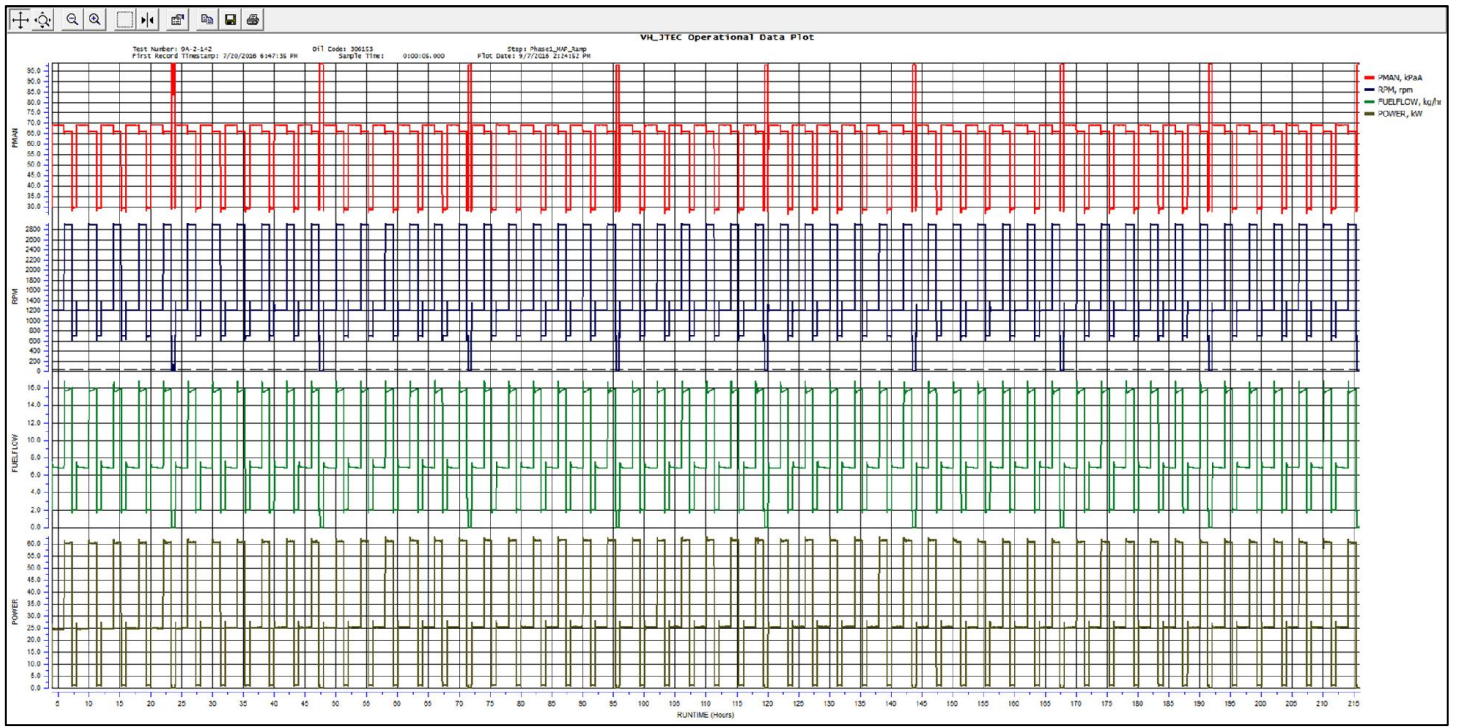
a. Southwest provided plots in response to the 09-06-2016 questions from Afton.

**b. Fuel Pressure Control:**

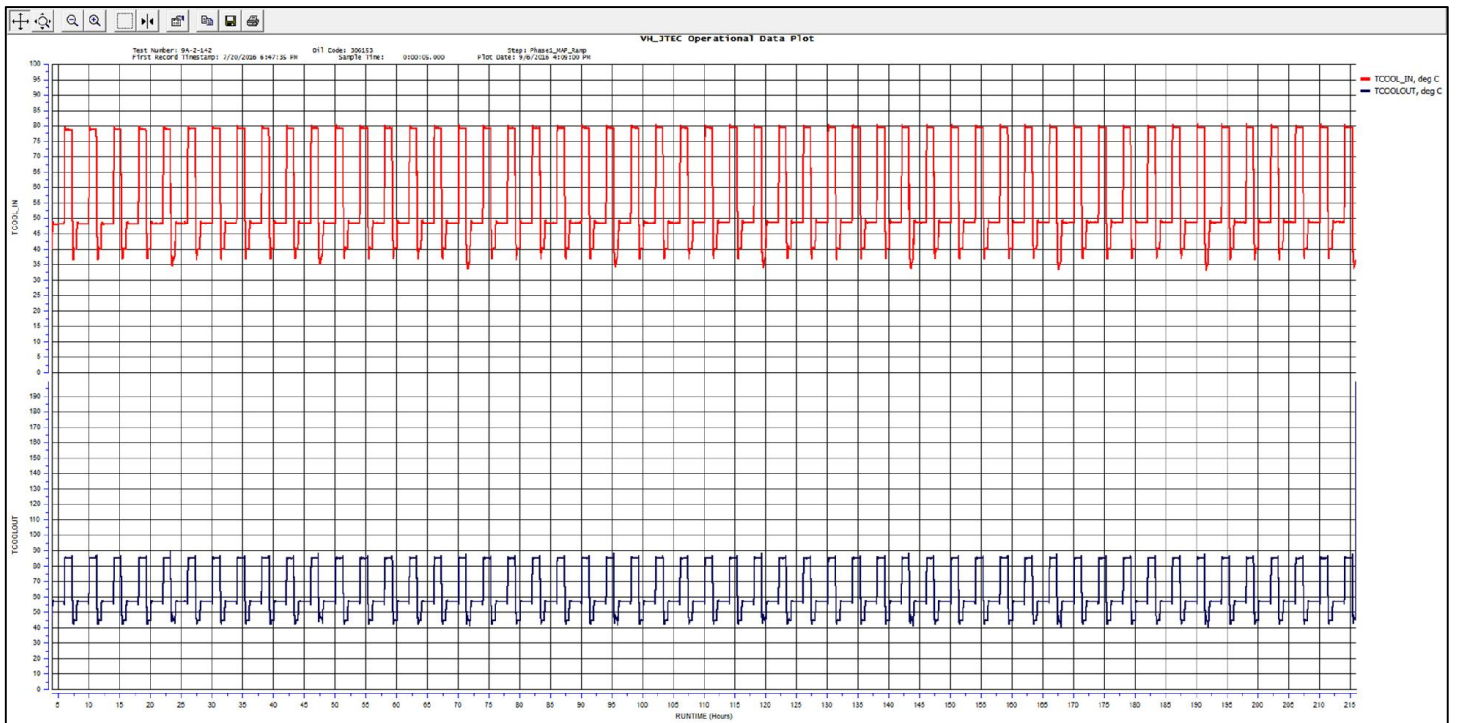
i. They use a regulator upstream of the fuel pump.

ii. This regulator is adjusted to achieve 270kPa at the fuel rail in Stage 1.

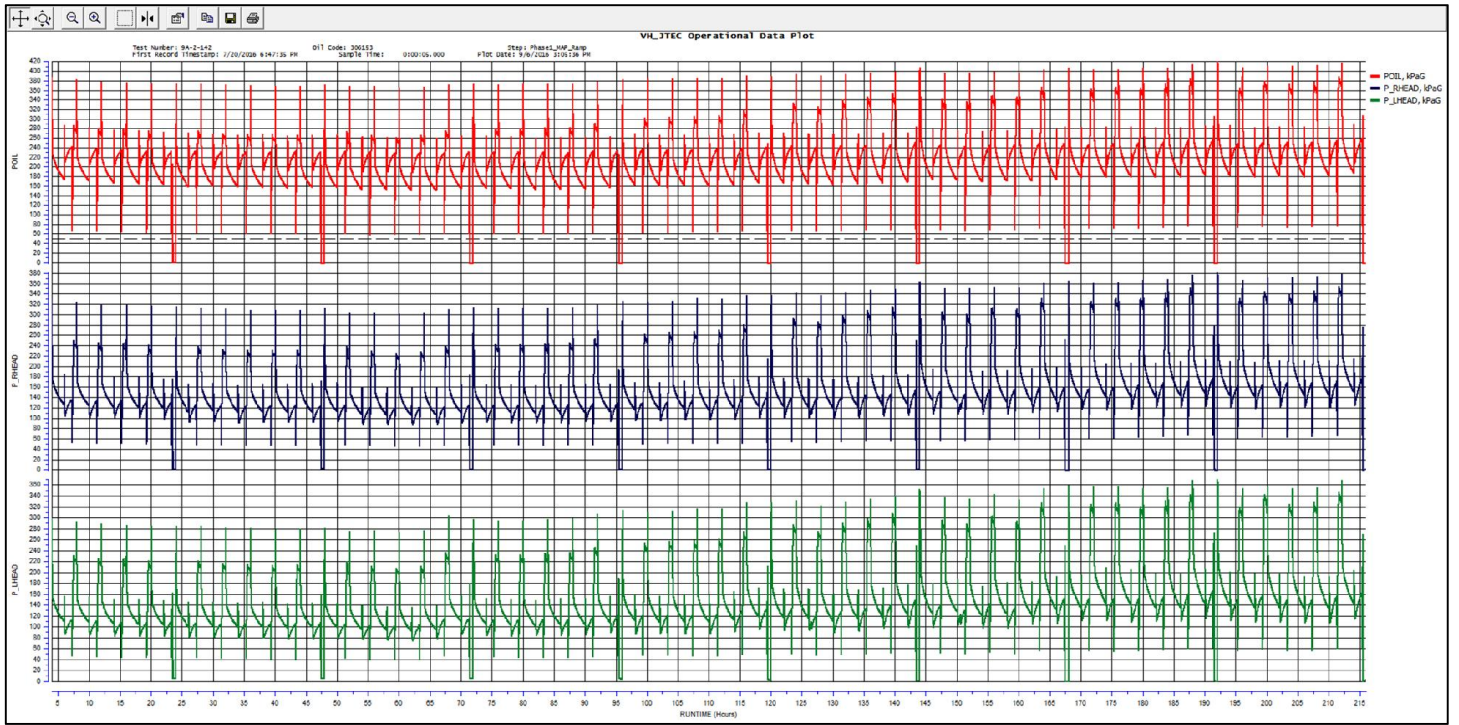
**c. Graph for Power, Fuel Flow, RPM and Intake Manifold Pressure:**



**d. Graph for Coolant Temperatures:**



**e. Graph for Oil Pressures:**



Action Items	Person responsible	Completion Date

Follow-up Notes/Updates:	Initials	Date Added