



COMMITTEE D02 on PETROLEUM PRODUCTS, LIQUID FUELS, AND LUBRICANTS

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SEQUENCE IX SURVELLANCE PANEL

Date: 9 Feb 24

ATTENDANCE

SWRI	Christine Eickstead, Khaled Rais, Pat Lang
INTERTEK	Jason Soto, Al Lopez
LUBRIZOL	George Szappanos, Joe Gleason
AFTON	Jason Lekavich
INFINEUM	Todd Dvorak, Chris Tonstad
TMC	Rich Grundza
ORONITE	Robert Stockwell
SHELL	Jeff Hsu
HALTERMAN SOLUTIONS	Indresh Mathur, Ed Hennessy
HALTERMAN CARLESS	Izabel Gabrel
GM	Brad Cosgrove
FORD	Mike Deegan, Rob Zdrodowski
OHT	Jason Bowden
IMTS	Dave Passmore, Sid Clark
CQA	Mike Kunselman

ATTACHMENTS:

- A: Meeting Agenda
- B: Email from George re. report form corrections

MEETING:

1. Attendance. See table above.

Motion to approve minutes from last SP meeting (17 Aug 23), Khaled. Rich seconds. Approval unanimous.

Action items from last set of minutes:

IMTS pistons – on agenda as its own item

RO224-1 results – will be covered by Rich

Fuel Supplier Report:

Halterman Solutions: Ed Hennesey

Fuel supply is plentiful, consuming at anticipated rate

No anticipated batch change for next 3-5 months

Rich – TMC update

220 reblend is available at some labs, should be available everywhere soon.

Pat – slide with lab individual CUSUMS – two going up and two going down

Rich – not sure what's causing mild trend. Everyone using same clutch? Same version of Indicom (Khaled – no, our lab uses two different versions). (Indicom is an AVL transducer amplifier.)

Rich – are we breaking engines in the same? Khaled – discussed previously – believe A and G are doing the same.

George – following standard procedure, experimented with extended breakings but not typical practice.

Pat – future – going to be all going to non-BB pistons, so introduces another variable....

Rich – Transducers? Getting less sensitive? Going over 300 hr limit? Khaled – what we're looking for [LSPI event] is so huge compared with normal operation, shouldn't matter.

Pat – to Todd – if you guys were asked to look at this data, what would you say? Todd – looking like the VH, two labs going one way, others going the other. But where to look?

ACTION:

Todd – Can Rich generate chart by RO? Rich – yes (action)

Khaled – what happened with the VH? Ben Maddock (leads TF looking into that) – might need build workshop?

Rich – head gaskets?

George – Math from procedure – different methods for dealing with that. Years ago, did a round robin – at the time, everyone agreed within reason. As we bring on board replacement DAC systems, wonder if there is nuance to that that needs to be captured with another round robin. Ben – good idea.

ACTION:

Pat – Khaled volunteers to coordinate an initial call with labs to discuss different things to look at. Might morph into build workshop, etc., but let's start there.

Hardware – Jason presents.

ACTION: – Rich to add new spark plug number to procedure

The procedure does not specify that each new engine use a new head, but labs are doing this anyway.

IMTS pistons – Sid – update: independent labs are both in possession of two sets each, just need to determine how they are going to be evaluated and when we are going to try and do that?

Khaled – we have them, are measuring now. Jason – same.

Sid – will be in town next week, will discuss with both labs.

Jason – since forged, assume will have some differences from cast pistons. What are we targeting? Sid – we targeted AC2 (?) Once the engine is fired up and at temp, should be no difference.

Jason – since no button, what is the thickness of that coating? **ACTION:** Sid – will have to ask.

Note: The IMTS pistons are 2618.

ACTION: Two labs will report back with dimensions, will share with Sid next week.

Pat – Bit down the road – if all dimensions look good, assume we will follow same protocol to bring pistons in (two references).

Down the road, all labs will need difference pistons. Sid – have not given the green light to make more pistons, need these proved out first.

Machined pistons – All labs have at least one set. If need further sets, contact Khaled and we can work out the process. Do the labs anticipate buying pistons (from us) in the near future? No answer... well, there is availability.

New business:

Test report form corrections (email attached).

Oil sampling – After 1 hr break-in sample, will add language to IX procedure and reference information letter.

Ben – Maybe call if “initial” instead of “new oil”, can also add note to data dictionary in “description” field

Motion: To include instructions to take an oil sample in IX procedure after the 1-hr LSPI break-in and do the standard aged oil analyses. Sample will be identified as “initial”.

Second – Deegan

Disapproves: 0, waives: 0, passes unanimously

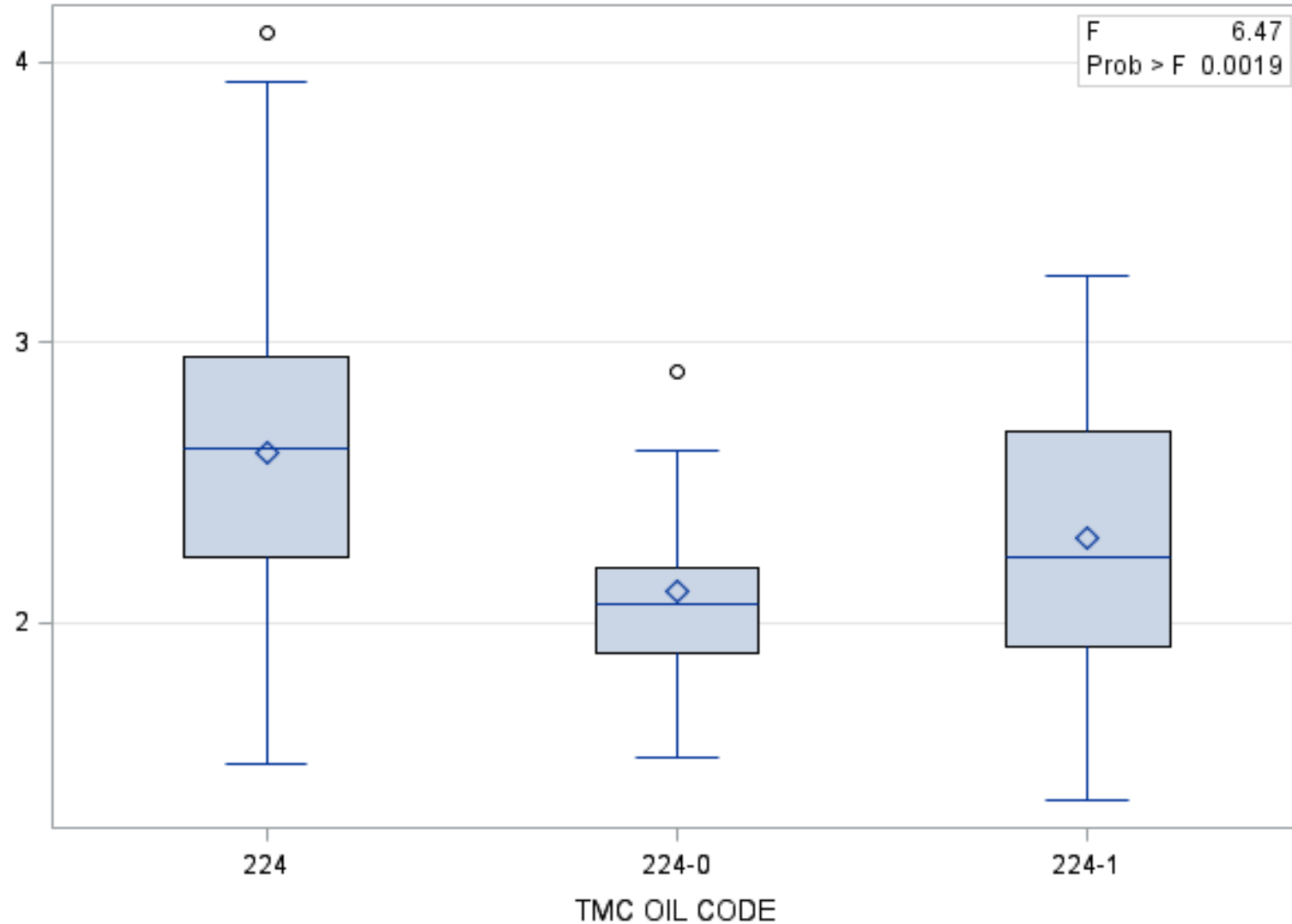
Next call – Maybe a month from now, no urgent need for sooner one.

Sequence IX TMC Items

224-1 Targets, Severity, Oil inventories

Average Preignition Results

Distribution of preignitions



Transformed average number of preignitions.
224-0 is the original target data set. 224 are all chartable results on reference oil 224, exclusive of the original target data. 224-1 contains all the chartable results on that oil.

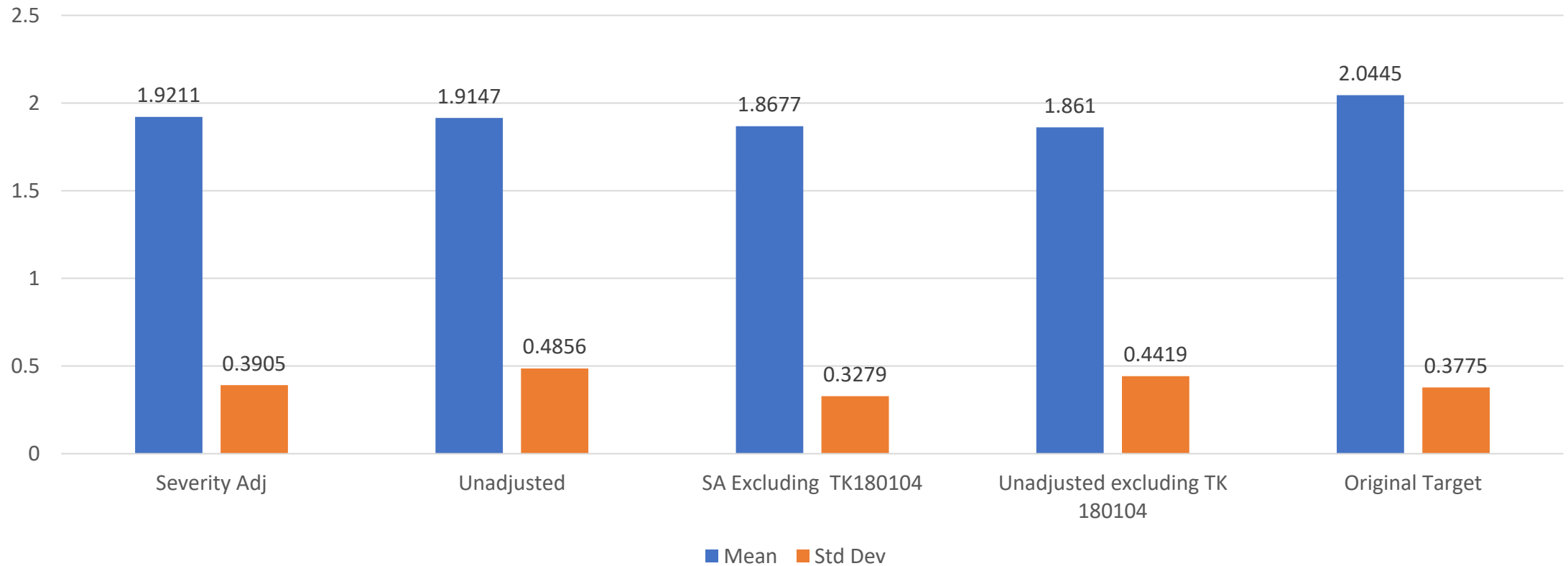
Reference oil 224-1 Results

testkey	ltmslab	testnumber	val	ind	ltmsdate	AVPIEti	SA	adjusted
180104-IX	D	C106A-165-2303-02	OC	224-1	20230512	2.8284	0	2.8284
179874-IX	G	60-678-79-57	AC	224-1	20230525	1.5811	0.2553	1.8364
179872-IX	B	331-59-1019-31	AC	224-1	20230614	2.0616	0.2178	2.2794
179876-IX	A	4-428-60-2	AC	224-1	20230719	1.8708	0.4333	2.3041
180358-IX	D	C106A-178-2305-02	AC	224-1	20230721	2.2913	-0.3214	1.9699
179877-IX	A	2-321-56-3	AC	224-1	20230801	1.8028	0.1885	1.9913
181302-IX	D	C106A-185-2306-01	AC	224-1	20230908	2.2361	0	2.2361
179873-IX	B	331-69-1019-41	OC	224-1	20231006	1.118	0.3316	1.4496
183824-IX	B	331-72-1020-3	AC	224-1	20231014	2.1213	-0.0552	2.0661
179875-IX	G	60-698-86-8	AC	224-1	20231110	2.6926	-0.3552	2.3374
183752-IX	G	62-645-85-40	AC	224-1	20231111	1.5811	-0.0015	1.5796
181303-IX	D	C106A-198-2306-14	AC	224-1	20231116	2.3979	-0.5528	1.8451
183825-IX	B	331-79-1020-10	AC	224-1	20231121	1.8708	-0.0638	1.807
181709-IX	A	4-440-60-14	AC	224-1	20231123	1.5	0.3672	1.8672
183753-IX	G	60-710-86-20	AC	224-1	20240120	2.2913	-0.4799	1.8114
181710-IX	A	1-173-61-1	AC	224-1	20240126	1.5811	0	1.5811
185093-IX	A	4-447-60-21	OC	224-1	20240201	1.2247	0.4381	1.6628
181304-IX	D	C106A-211-2306-27	OC	224-1	20240206	1.4142	-0.2875	1.1267

Testkey 180104 was from an engine that was deemed too severe and never calibrated
Two tests where 224-1 was the first test on the engine were not severity adjusted

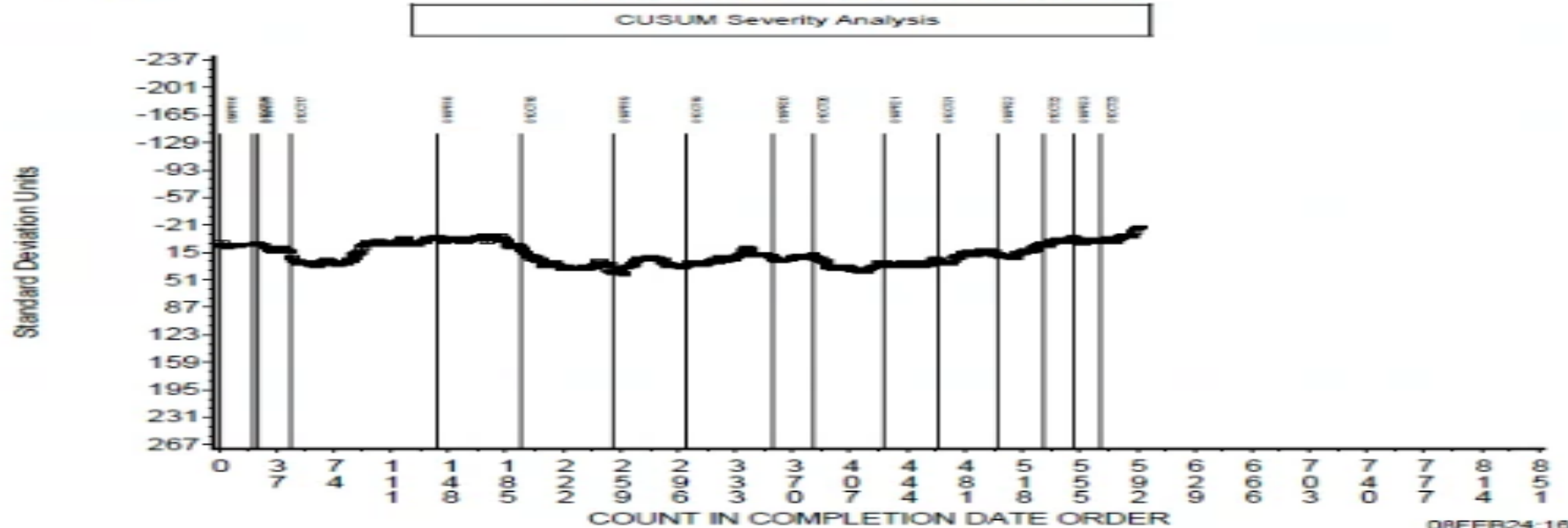
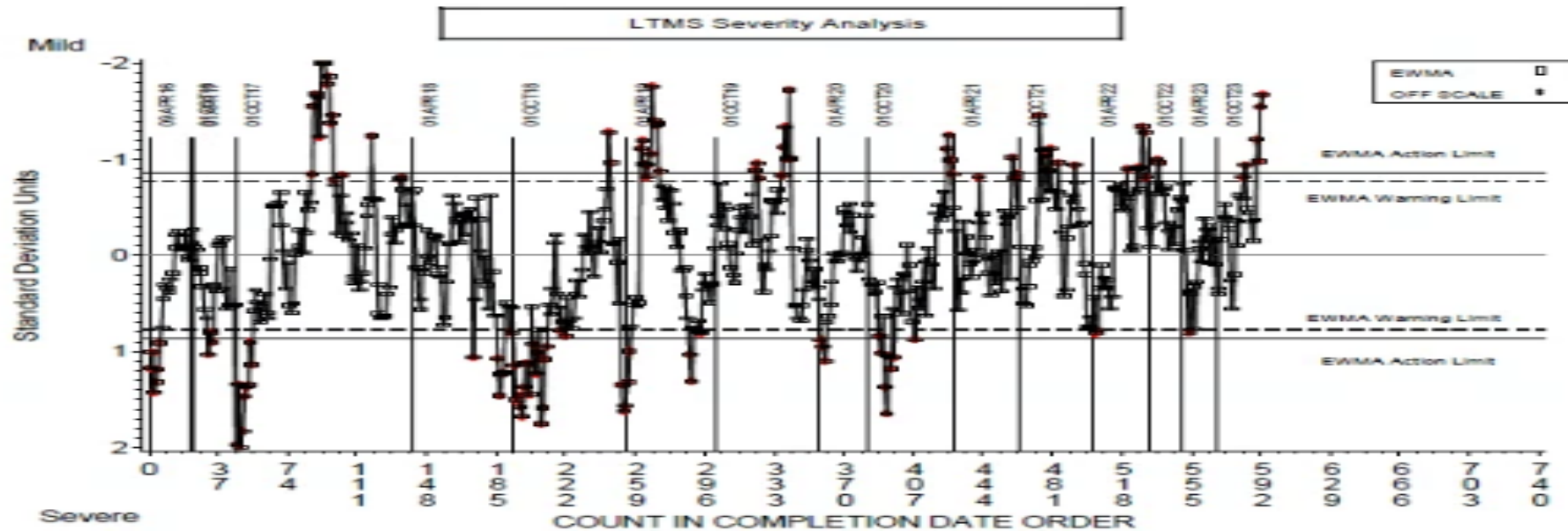
Comparison of Means and Standard Deviations for Reference oil 224-1

Chart Title

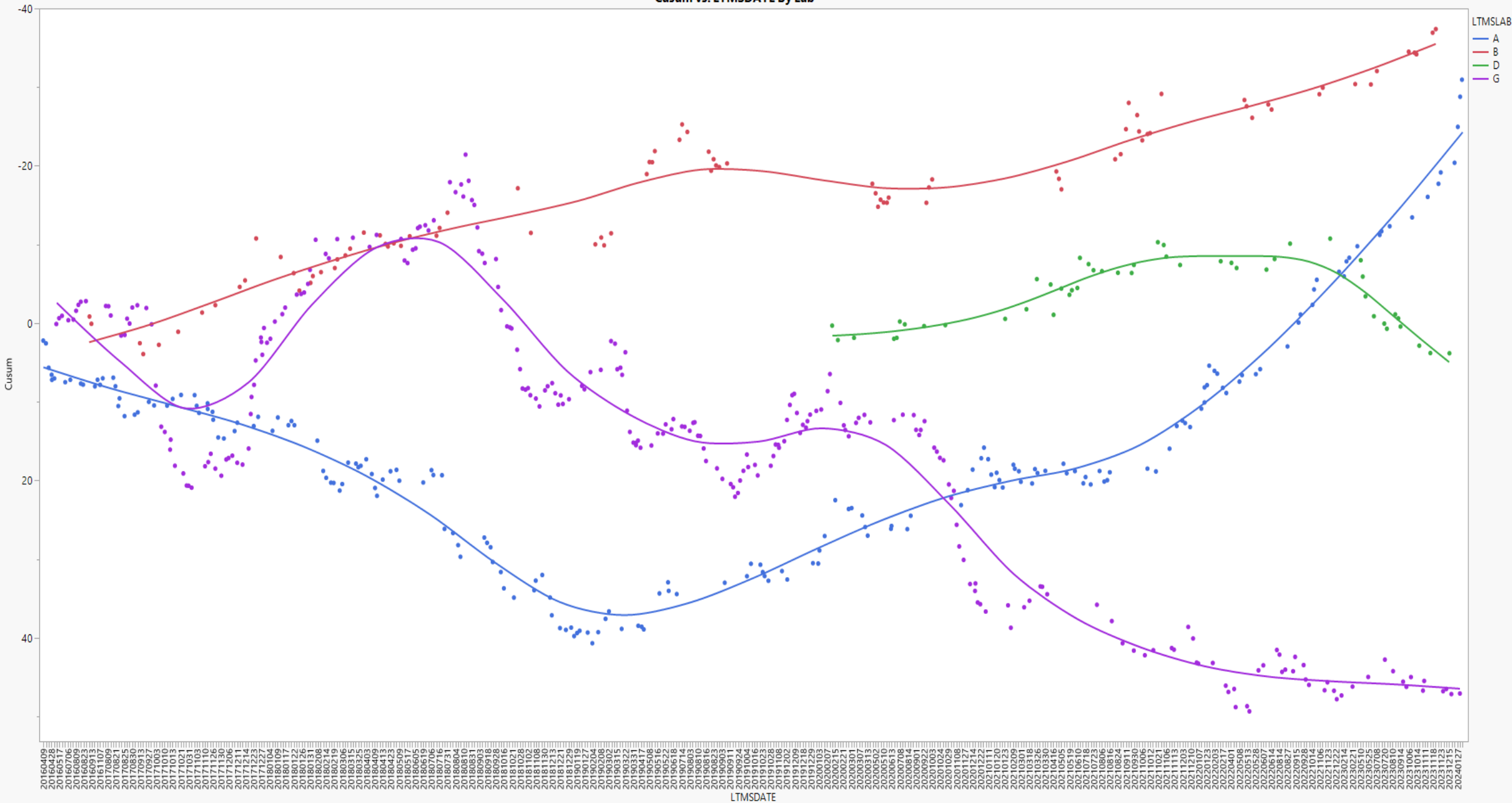


Testkey 180104 was the first test on a stand engine that never calibrated

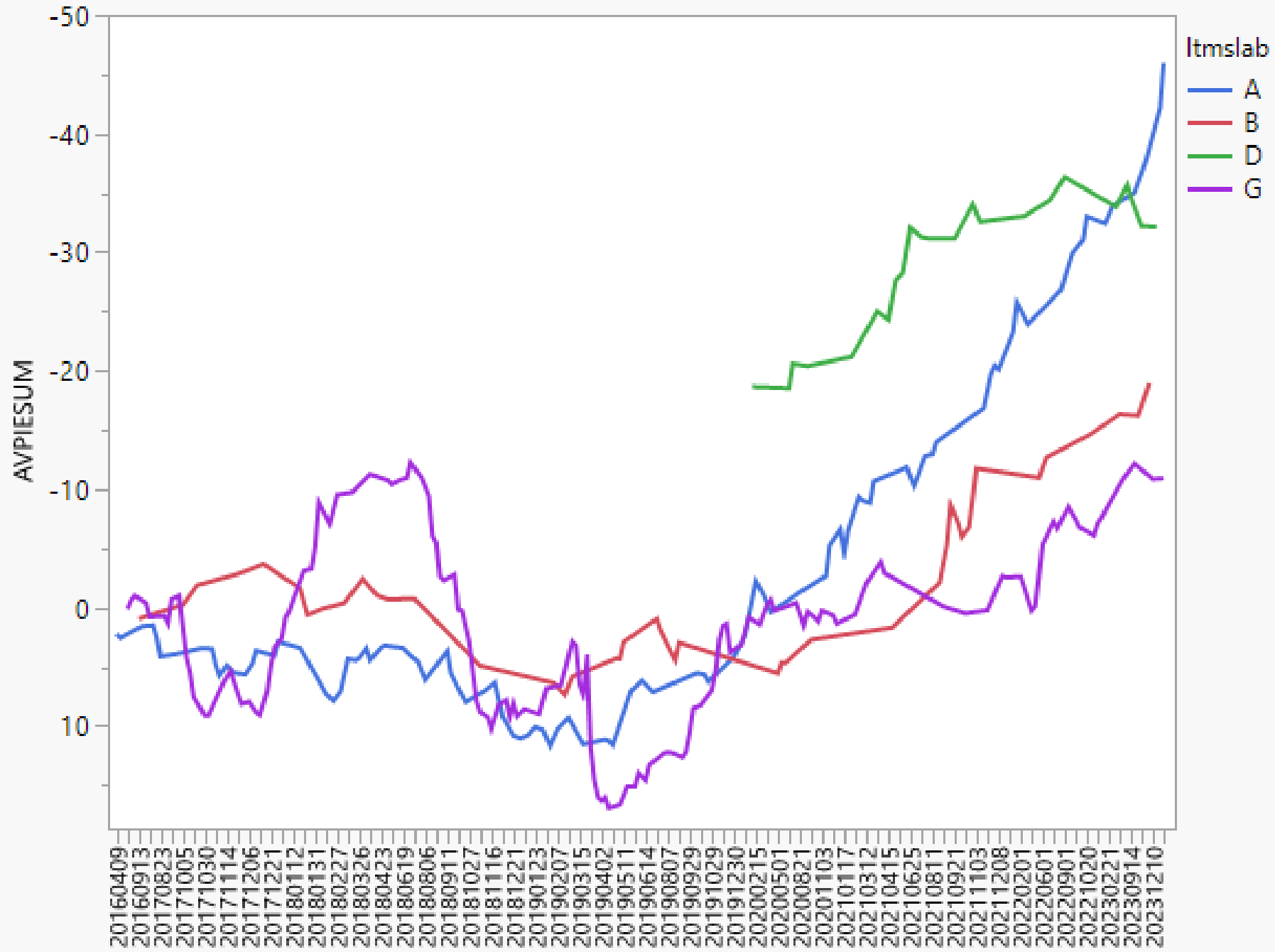
SEQUENCE IX INDUSTRY OPERATIONALLY VALID DATA
 AVERAGE NUMBER OF PREIGNITIONS FROM VALID ITERATIONS



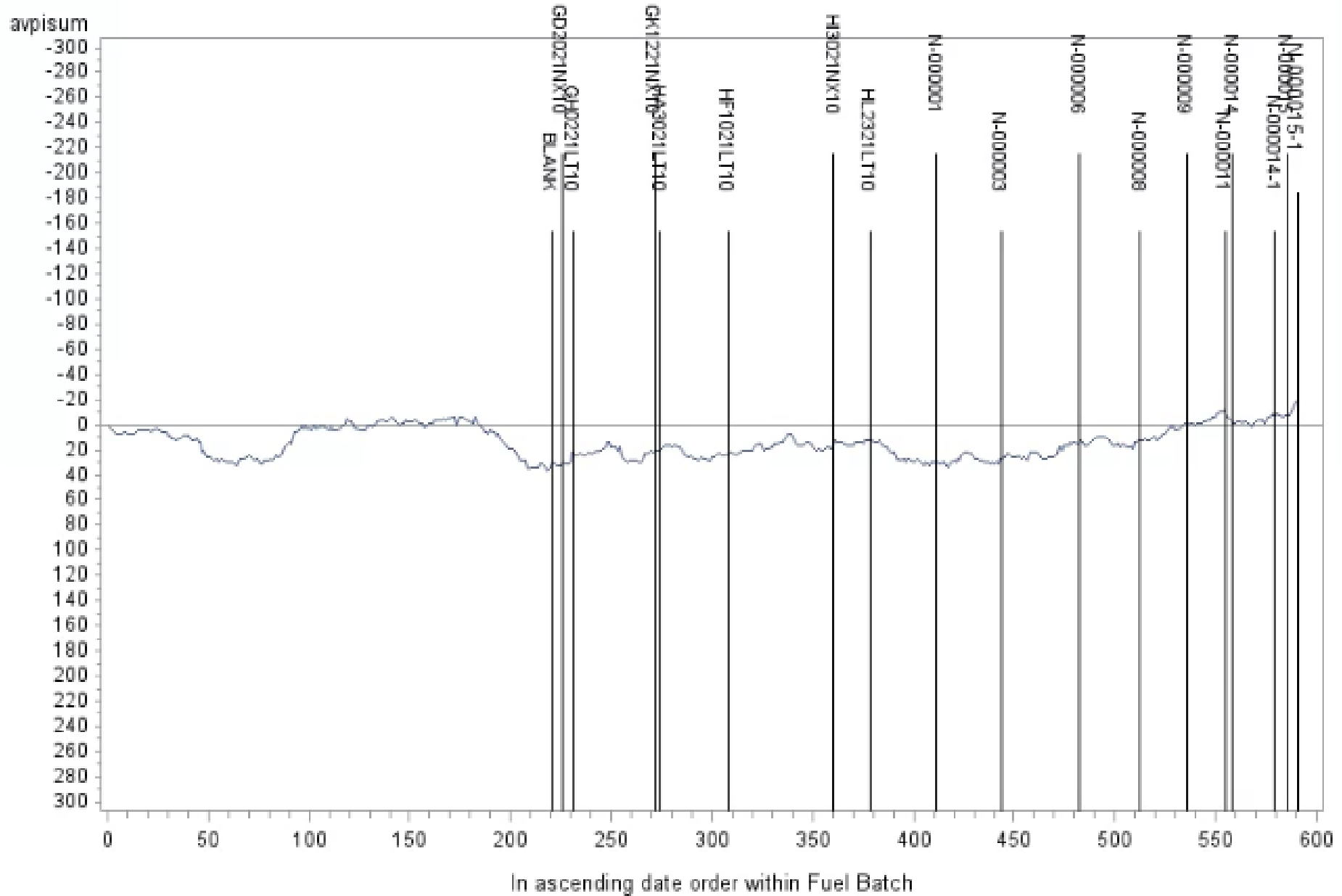
Cusum vs. LTMSDATE By Lab



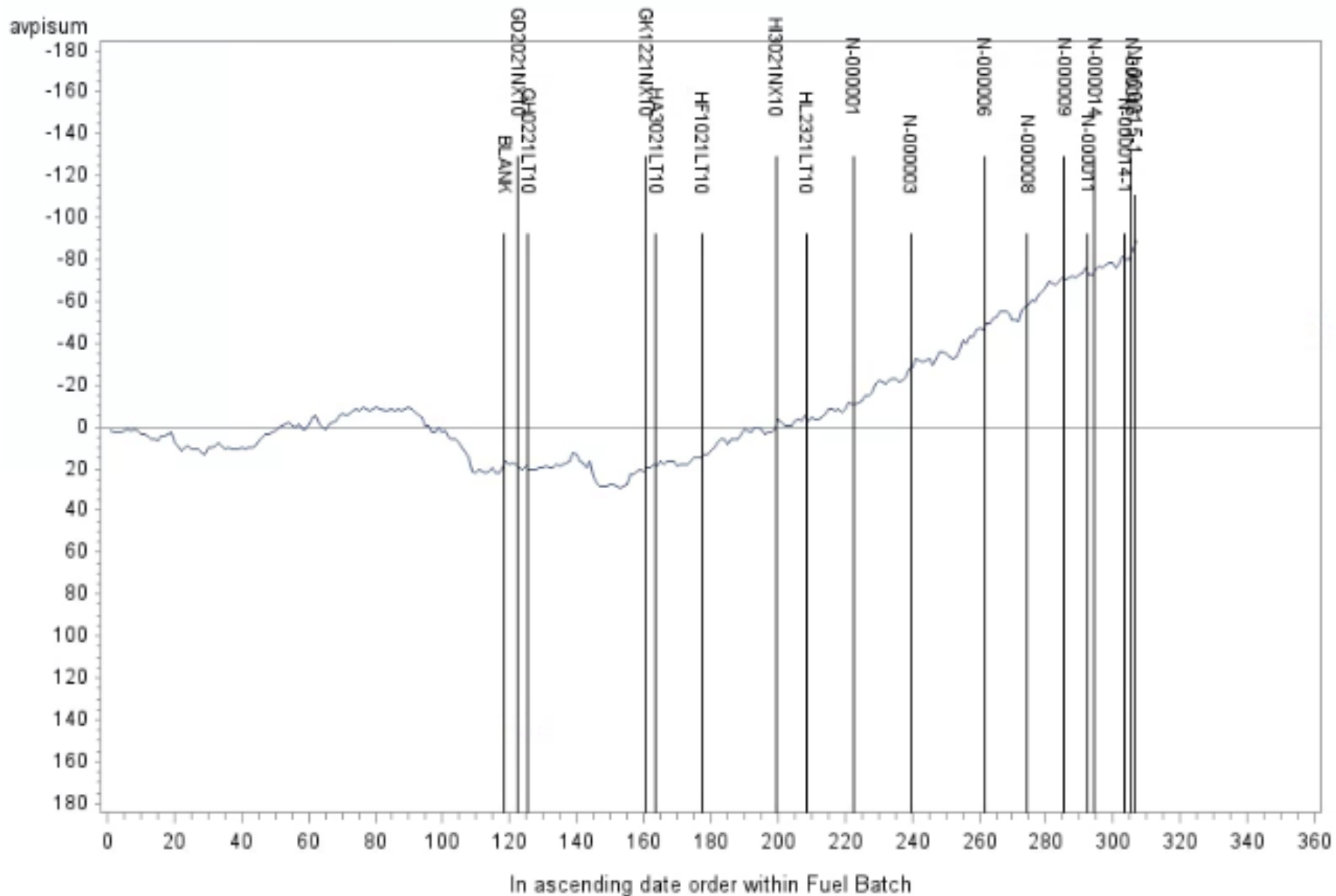
AVPIESUM vs. Itmsdate Oil 221



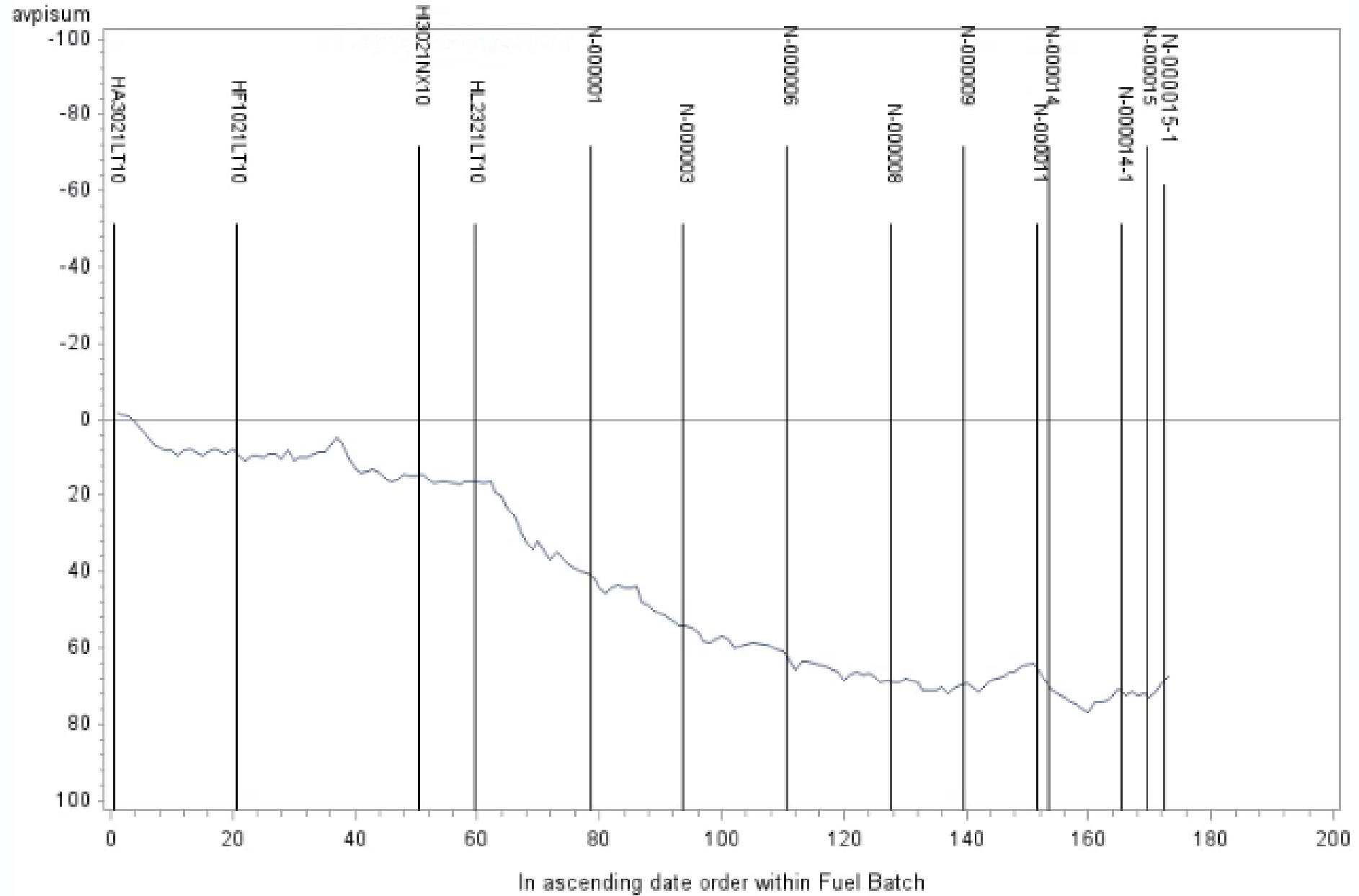
Sequence IX
Plot Of Average Pre-ignition Cusum by Fuel Batch



Reference oil 221
 Plot Of Average Pre-ignition Cusum by Fuel Batch



Reference oil 224 Blends
Plot Of Average Pre-ignition Cusum by Fuel Batch



Oil Availability

- Reference oil 220 has been depleted at the TMC, a reblend has been obtained and has been shipped to several labs. This oil is used for break in only. It is now available in several labs.
- Reblends of API01 and API02 have been obtained and are available in two labs. The original blends were ~ 200 gallons. Reblends are 500 gallons each. Several labs will need to conduct their next reference on a reblend.