Sequence VH Surveillance Panel Meeting

Teams

Tuesday, May 20 2025, 1:30 pm – 3:30 pm EDT

1.0) Attendance

Afton:	B. Campbell, B. Maddock, A. Stone
Exxon	L. Salvi
Ford:	M. Deegan, R. Zdrodowski
Haltermann Solutions:	E. Hennessy, I. Mathur
IMTS:	D. Passmore
Infineum:	J. Anthony, T. Dvorak
Intertek:	A. Lopez
Lubrizol:	T. Catanese, G. Szappanos
OHT:	J. Bowden
Oronite:	R. Affinito, J. Martinez, R. Stockwell
SwRI:	D. Engstrom, T. Kostan, P. Lang
TMC:	D. Beck, S. Moyer, W. Venhoff
TEI:	D. Lanctot
Toyota:	V. Deshpande

2.0) Executive Summary

1. M-Batch-2 was rejected.
2. Haltermann to target fuel dilution ≤ 16%.
3. Fuel CofA may be amended after the fuel is approved for use.
4. Haltermann to send 2 small batches of fuel to SwRI for fuel dilution screener tests.

3.0) Approval of Minutes

Minutes from May, 8th 2025 were not available

4.0) M-Batch Fuel Adjustment

4.1) The Chair opened by summarizing the fuel batch options:

1) Accept M-Batch-2

- Pros:
  a. The precision matrix could continue, resulting in the M-Batch fuel being available at the end of July, reducing the amount of time the VH will be unable to due to lack of test fuel
  b. It would save 2 tests in the short term
- Cons:

a. Most of the parameters are on the severe side for both labs and both reference oils. APV is also >1 std severe.
b. The fuel is likely to become more severe as the batch ages, making it difficult for labs to calibrate and possibly making the test unavailable in the future

2) Reject the M-Batch-2 adjustment and ask Haltermann to supply pilot batches of more mild fuel with a target fuel dilution value between 15% and 16%

- Pros:
  a. A fuel that produces results closer to the targets will likely not require Industry Correction Factors.
  b. Starting with a milder fuel batch makes it more likely that the fuel remains usable as it becomes more severe over time.
- Cons:
  a. The industry will likely run out of N-Batch fuel before the M-Batch fuel is approved.
     i. It is estimated that the N-Batch will be depleted by the end of July 2025 and M-Batch will likely be approved in September 2025.

4.2) Discussion to reject M-Batch-2

- J. Anthony asked informally if anyone on the call was for moving forward with M-Batch-2.
  - There were no positive responses.
- J. Anthony brought a motion to reject M-Batch-2
  - T. Catanese seconded the motion
- T. Catanese asked if the direction to Haltermann was to reduce the fuel dilution or reduce the severity
  - J. Anthony confirmed that the SP is requesting Haltermann to reduce the fuel's severity closer to the targets.
- A. Lopez requested more discussion on the matter before taking a vote on the motion.
  - A. Lopez asked A. Stone to show fuel dilution data by fuel batch and severity as a function of fuel dilution.
  - A. Stone also showed historical sludge and varnish test results by fuel batch.
  - Haltermann stated the fuel streams changing over the years makes it difficult to make a direct comparison of fuel dilution results between fuel batches.

Motion by J. Anthony to ask Haltermann to make the fuel less severe.
Motion Seconded by T. Catanese

Chair calls for a vote:

Afton:	B. Maddock	Approve
Exxon:	L. Salvi	Approve
Ford:	M. Deegan	Approve
GM:	T. Cushing	Not present
Haltermann:	E. Hennessy	Waive
IMTS:	D. Passmore	Not present

Infineum:	J. Anthony	Waive
Intertek:	A. Lopez	Approve
Lubrizol:	T. Catanese	Approve
OHT:	J. Bowden	Waive
Oronite:	R. Stockwell	Approve
Shell:	J. Hsu	Not Present
SwRI:	D. Engstrom	Waive
TEI:	D. Lanctot	Waive
TMC:	D. Beck	Waive
Toyota:	V. Despande	Approve

Motion carries with 7 Approve and 6 Waive votes

5.0) Adjusting Certificate of Analysis (CofA) Discussion

Motion by R. Stockwell to negotiate the limits of the CofA values of the M-Batch after the fuel is approved, meaning that the Haltermann may make the required the fuel adjustments and the CofA will be written to match the approved fuel.
Motion Seconded by J. Anthony

Chair calls for a vote:

Afton:	B. Maddock	Approve
Exxon:	L. Salvi	Approve
Ford:	R. Zdrodowski for M. Deegan	Approve
GM:	T. Cushing	Not present
Haltermann:	E. Hennessy	Approve
IMTS:	D. Passmore	Not present
Infineum:	J. Anthony	Approve
Intertek:	A. Lopez	Approve
Lubrizol:	T. Catanese	Approve
OHT:	J. Bowden	Waive
Oronite:	R. Stockwell	Approve
Shell:	J. Hsu	Not Present
SwRI:	D. Engstrom	Approve
TEI:	D. Lanctot	Waive
TMC:	D. Beck	Waive
Toyota:	V. Despande	Approve

Motion carries with 10 Approve and 3 Waive votes

6.0) Fuel Dilution Screener Test Discussion

- Lubrizol has shown that fuel dilution can be determined with screener tests as short as two, 4-hour cycles.
  - Lubrizol offered to run the screener tests.
  - Ford expressed concerns about Lubrizol not having a calibrated stand.
  - Haltermann preferred to run screened tests at SwRI due to closer proximity.
  - Haltermann agreed to send 2 different adjustments to SwRI for fuel dilution screening.

7.0) Test Severity vs. Fuel Dilution Summary

Why Test Severity does not correlate well with Fuel Dilution,

- Historical fuel dilution measurement errors
- Highly variable method to measure fuel dilution
- Fuel components vary between fuel batches

Although it may not be quantifiable, fuel dilution does increase severity,

- **D8256-24**

  14.2.3 ***Fuel Dilution***—Fuel dilution indicates the degree to which the crankcase oil has been diluted with fuel. Fuel dilution of the crankcase oil is necessary to achieve adequate test severity. However, excessive fuel dilution can promote increased sludge severity and component wear. Investigate a higher level of fuel dilution than is normally noted.

- Increased fuel dilution increases test severity two-fold,
  1. Fuel fundamentally promotes sludge production.
  2. Fuel displaces oil, reducing fresh oil added during the test.

8.0) Old Business

9.0) New Business

10.0) Meeting Adjourned

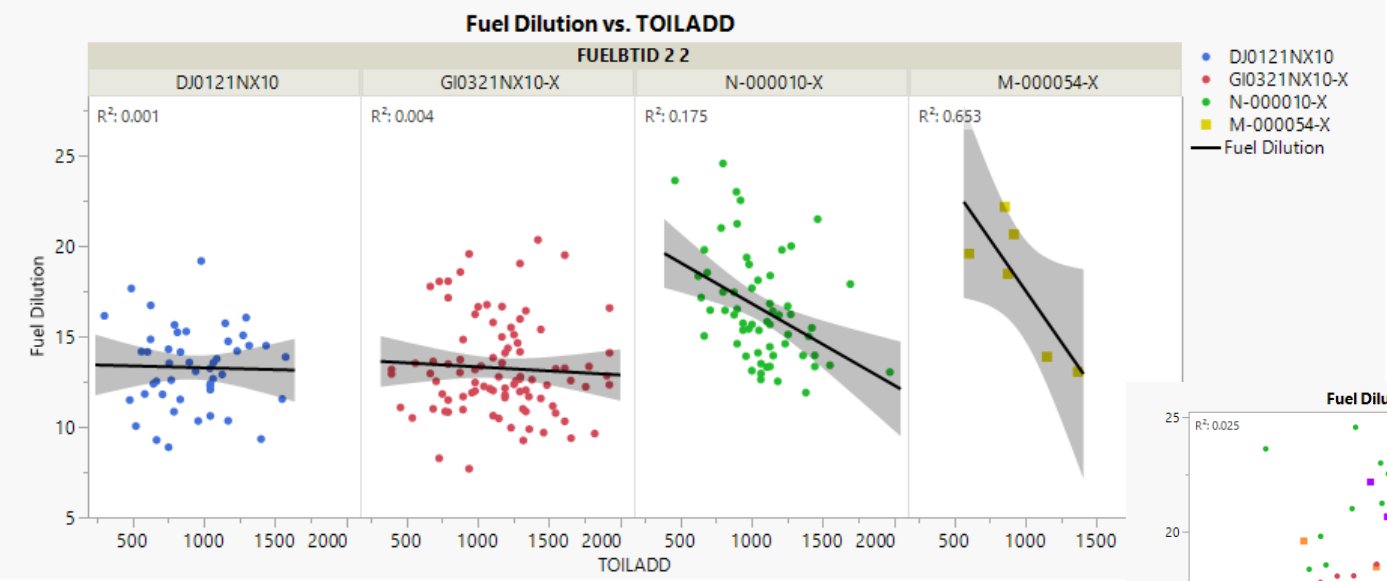
- Meeting adjourned at 2:45 pm EDT
- The next meeting will be scheduled after SwRI has results from the fuel dilution screener tests.

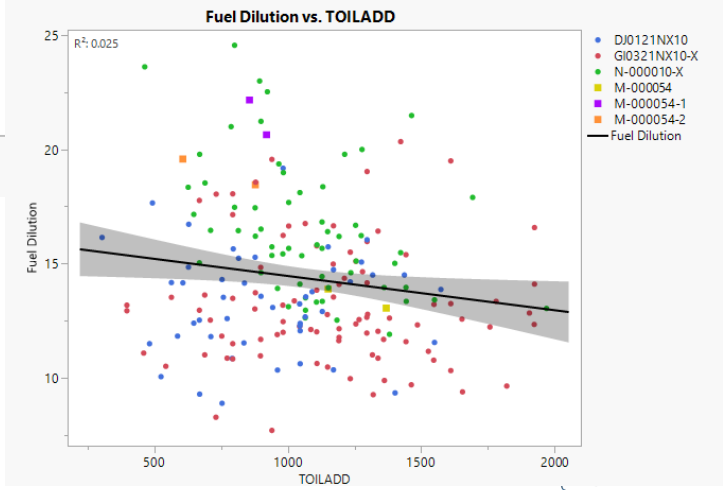
M-000054-X Fuel Batch

May 16, 2025

Passion for Solutions®

Fuel Dilution vs Oil Additions by Fuel Batch





A Fuel Dilution impact on TOILADD is shown in N and M fuel batches.

	Fuel Dilution	TOILADD
FUELBTID 2	Mean	Mean
M-000054	13.461111111	1260
M-000054-1	21.405555556	888
M-000054-2	19.016666667	742

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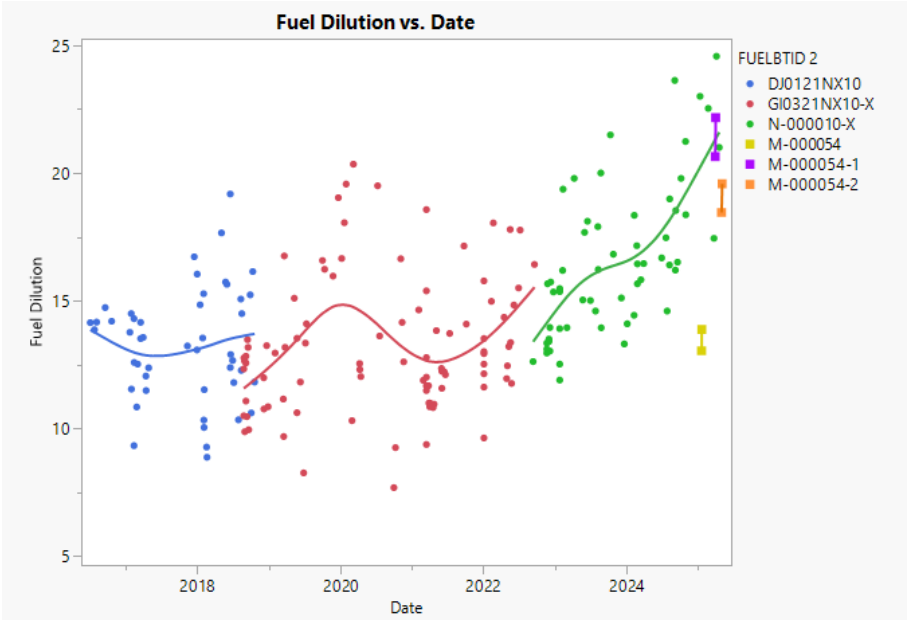
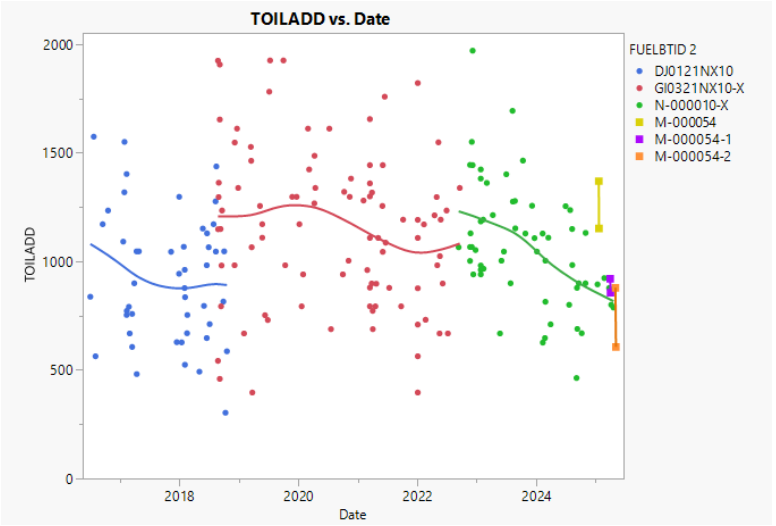
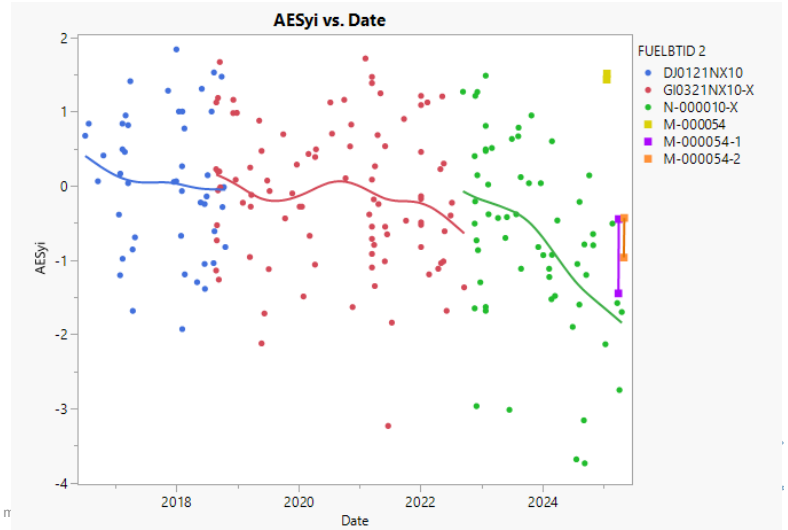
Fuel Dilution and TOILADD Over Time by Fuel Batch







Fuel Dilution is increasing over time in the N batch. Simultaneously TOILADD and AESyi are decreasing over time in the N batch.

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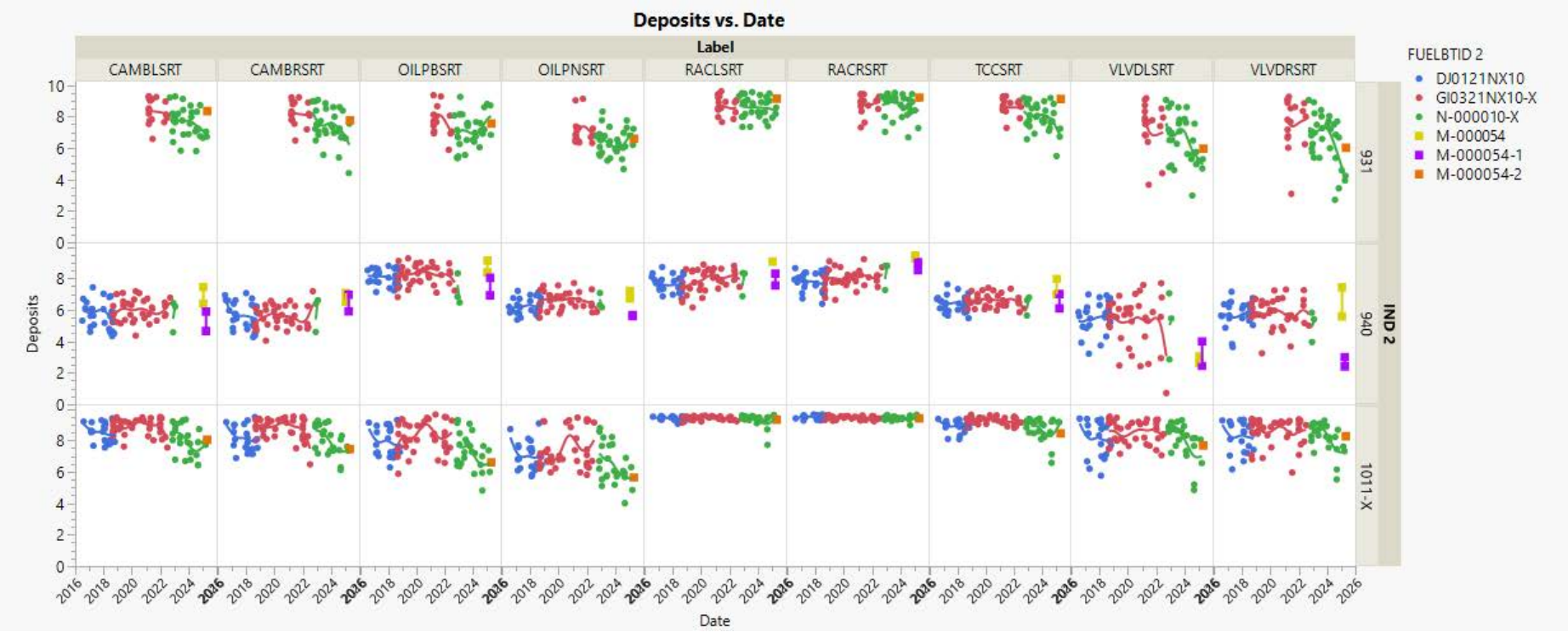
Sludge Deposits Over Time by Fuel Batch



M-000054-2 deposits are starting in a severe position (towards bottom of N batch) in several areas.

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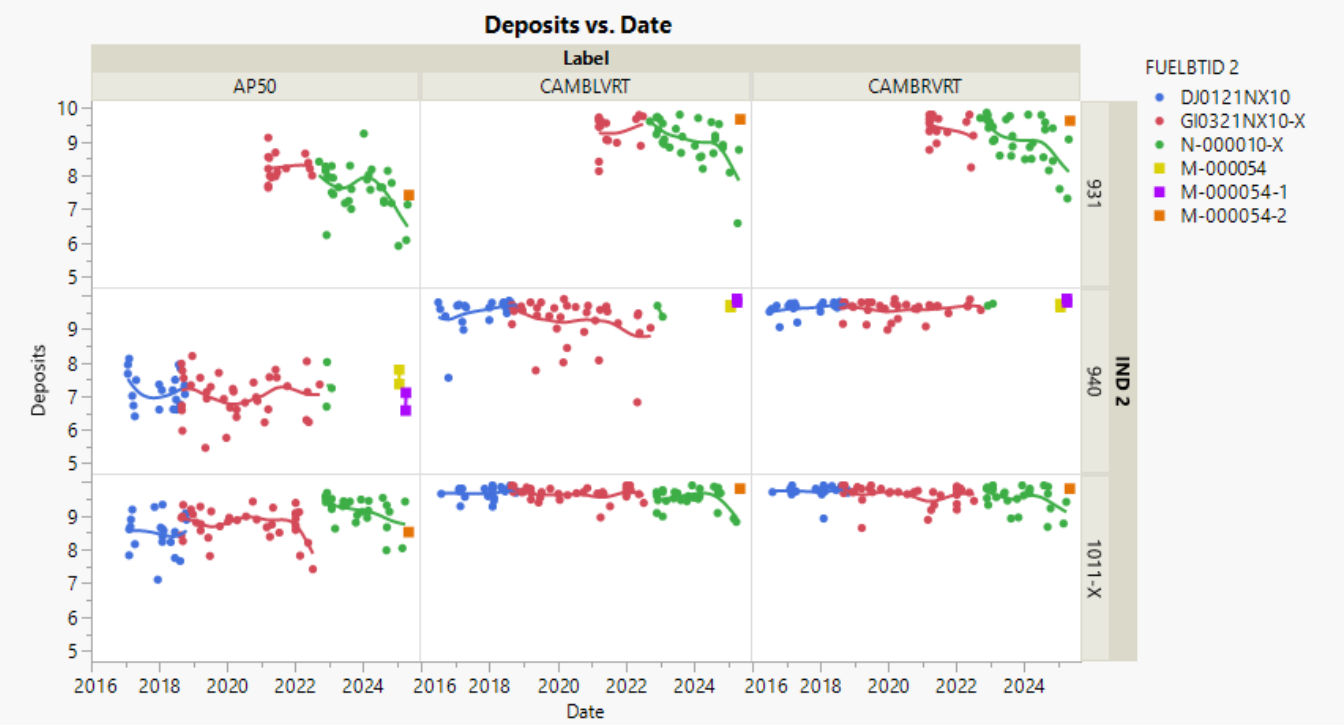
Varnish Deposits Over Time by Fuel Batch



M-000054-2 deposits are starting in a severe position (towards bottom of N batch) for AP50.

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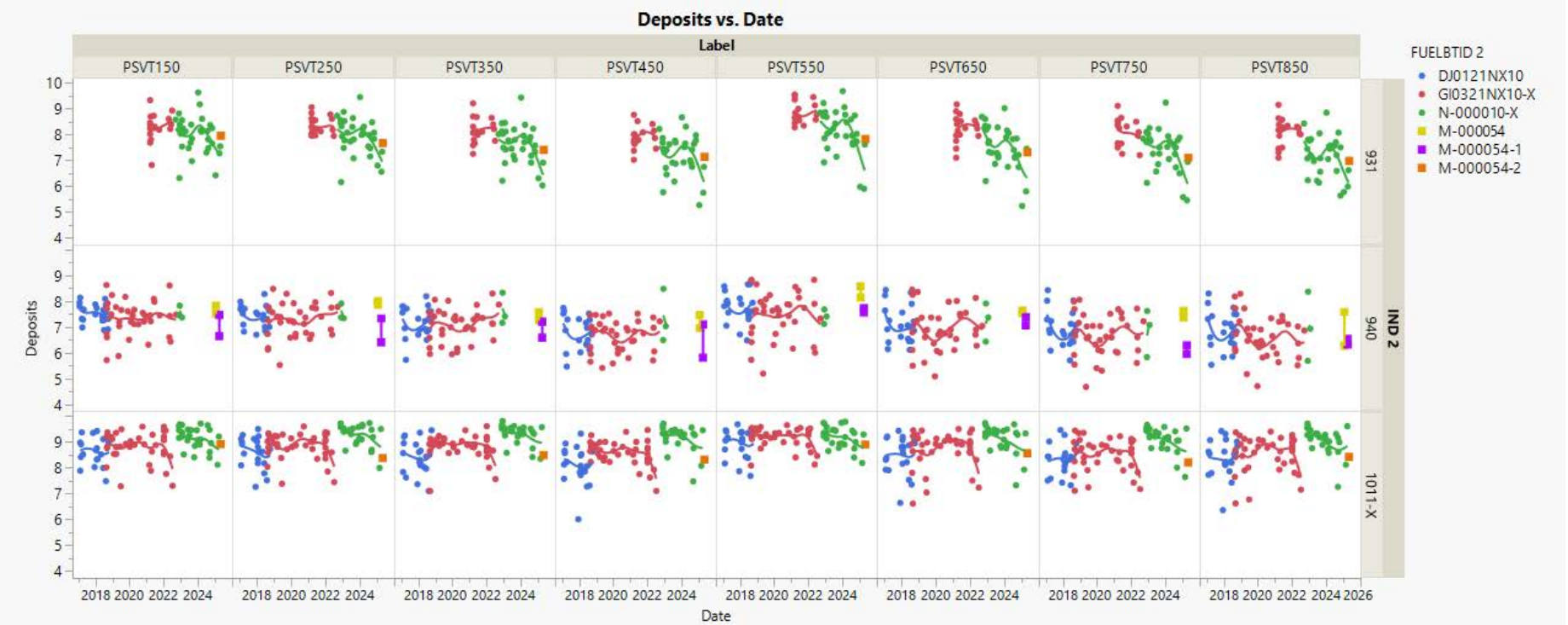
Piston Varnish Deposits Over Time by Fuel Batch



M-000054-2 deposits are starting in a severe position (towards bottom of N batch) in several areas.

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