

Mack / Volvo Surveillance Panel Meeting

September 26, 2024

David Brass (chair)

Agenda

- Volvo T-13 Reference Oil 823-1 target values
- Volvo T-13 oil consumption testing and parts recommendations
- Volvo T-13 Reference Oil Testing
- Volvo T-13 Test Metrology Measurements
- Volvo T-13 Bearings
- Mack T-12 Reference Testing with Chevron Delo 50/50 Coolant
- AOB

Volvo T-13 Reference Oil 823-1 target values

- External Presentation - Statisticians

Volvo T-13 oil consumption testing and parts recommendations

- External Presentation – SWRI
- Ring Measurements

Volvo T-13 Parts Recommendations

- Liners are currently batched – Liner Batch E order has been placed
- Brazil rings to be used for this test going forward as PNB until batch can be established
 - 88 ring sets from Brazil on hand at TEI (14 kits), more to be ordered as needed
 - 60 ring sets were ordered by SWRI (10 kits) at least 2 kits already used
- Larger ring batch to be bought from Brazil plant
- Pistons to be bought in batch going forward

- Goal is to reference in batched parts (Rings, Piston, Liners) with the introduction of Batch E liners

Volvo T-13 Reference Oil Matrix Testing

Lab A / Stand 1	Lab B / Stand 1	Lab D / Stand 1	Lab G / Stand 1
New Reference Oil	New Reference Oil	New Reference Oil	New Reference Oil
New Reference Oil	New Reference Oil	New Reference Oil	New Reference Oil

Both tests must be conducted in the same stand and run consecutively (no candidates in between)

Current Reference Status

Lab	Stand	Reference Date	Date Reference Expires
A	2	3/5/24	1/16/25
A	4	4/20/23	3/23/24
A	8	8/17/23	6/17/24
B	3	6/3/24	4/3/25
D	1	3/3/25	1/3/25
D	2	5/4/24	3/4/25
G	1	7/4/24	5/4/25
G	2	7/22/23	5/22/24
G	3	5/2/25	3/2/25

Volvo T-13 Test Measurements

- During test development of the Volvo T-13 many metrology measurements were carried over from the Mack T-12 as it was thought to be a possible replacement.
- A request has been made by a panel member to allow for most of these measurements to be made NOT mandatory for Volvo T-13 tests unless requested for that specific test.
- Currently liner surface roughness and piston ratings are NOT mandatory.
- The following parameters have been requested to be added to this list of NOT mandatory measurements:
 - Rod Bearing Weight Loss
 - Main Bearing Weight Loss
 - Ring Weight Loss
 - Ring Gap Measurements
 - Liner Wear Measurements

Volvo T-13 Engine Oil Test Form 2

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NOTE: Reporting of this information is NOT mandatory for T-13 Tests.

Volvo T-13 Rod Bearings

SwRI spare from a 21610676 set
Upper Bearing #: 21610683

PNB-3701 from Kit 890
Upper Bearing #: 24049953
Theoretically from set 24049962 per Impact

PNB-3948 from Kit 932
Upper Bearing #: 23885964
From set 23994963?

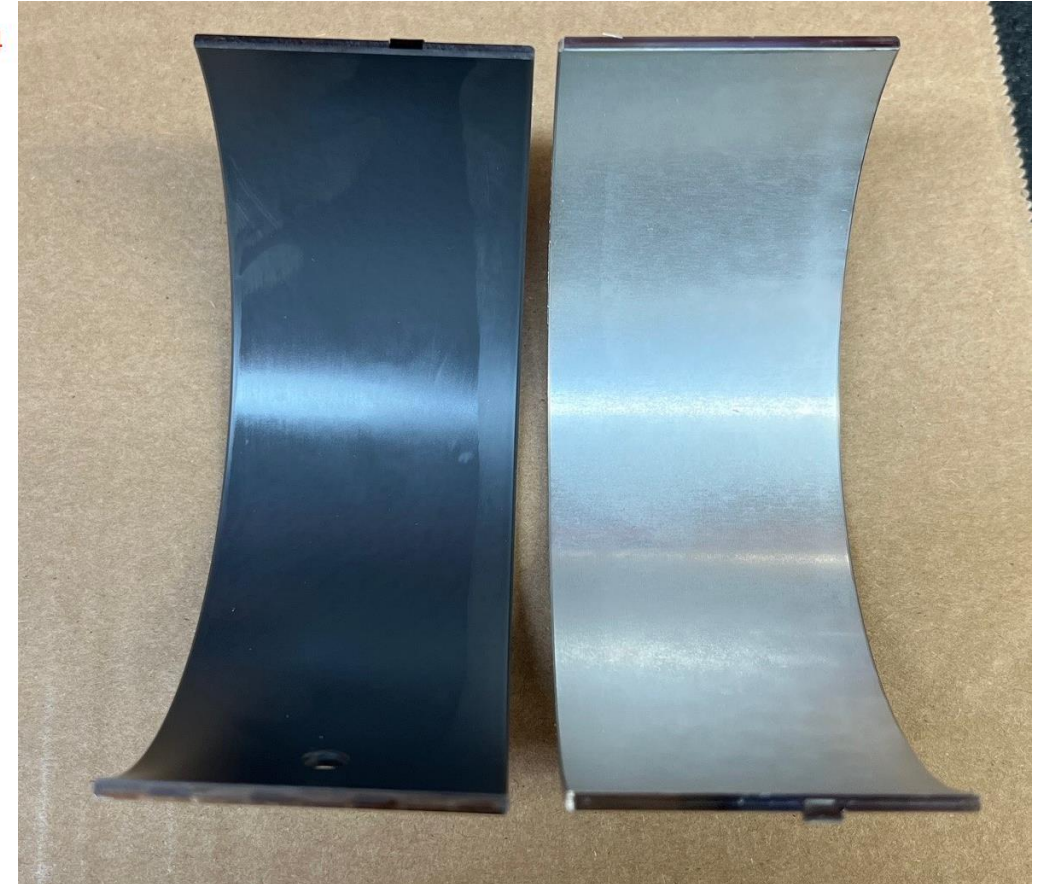


Current Upper Bearings

New Rod Bearings

Upper

Lower



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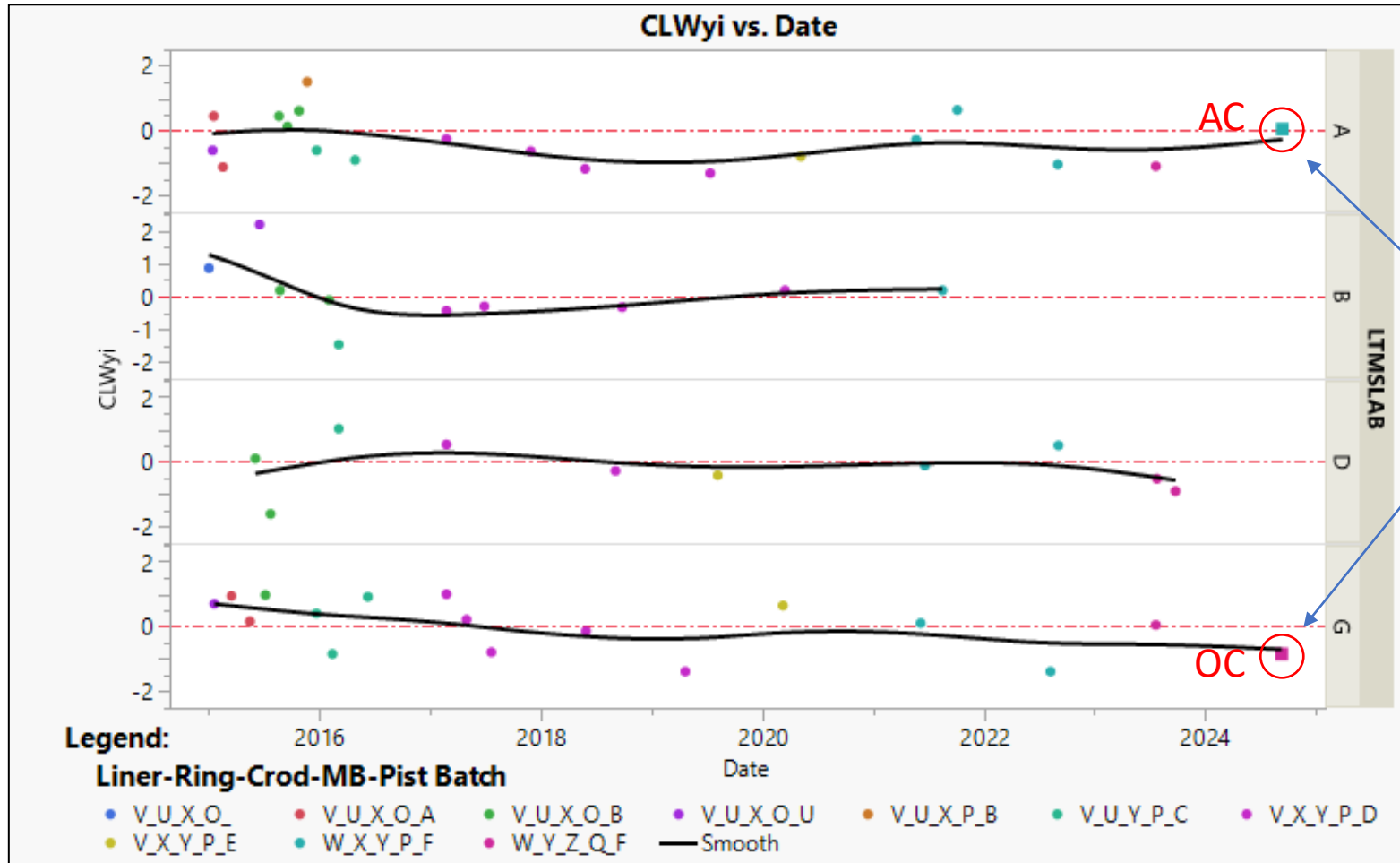
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Mack T-12 Reference Testing with Chevron Delo 50/50 Coolant

- A4 completed acceptable calibration reference using Chevron Delo Extended Life Coolant 50/50 on 9/11/24
- G4 completed out of calibration reference using Chevron Delo Extended Life Coolant 50/50 on 9/9/24

T12 Plots – Pass/Fail Parameters

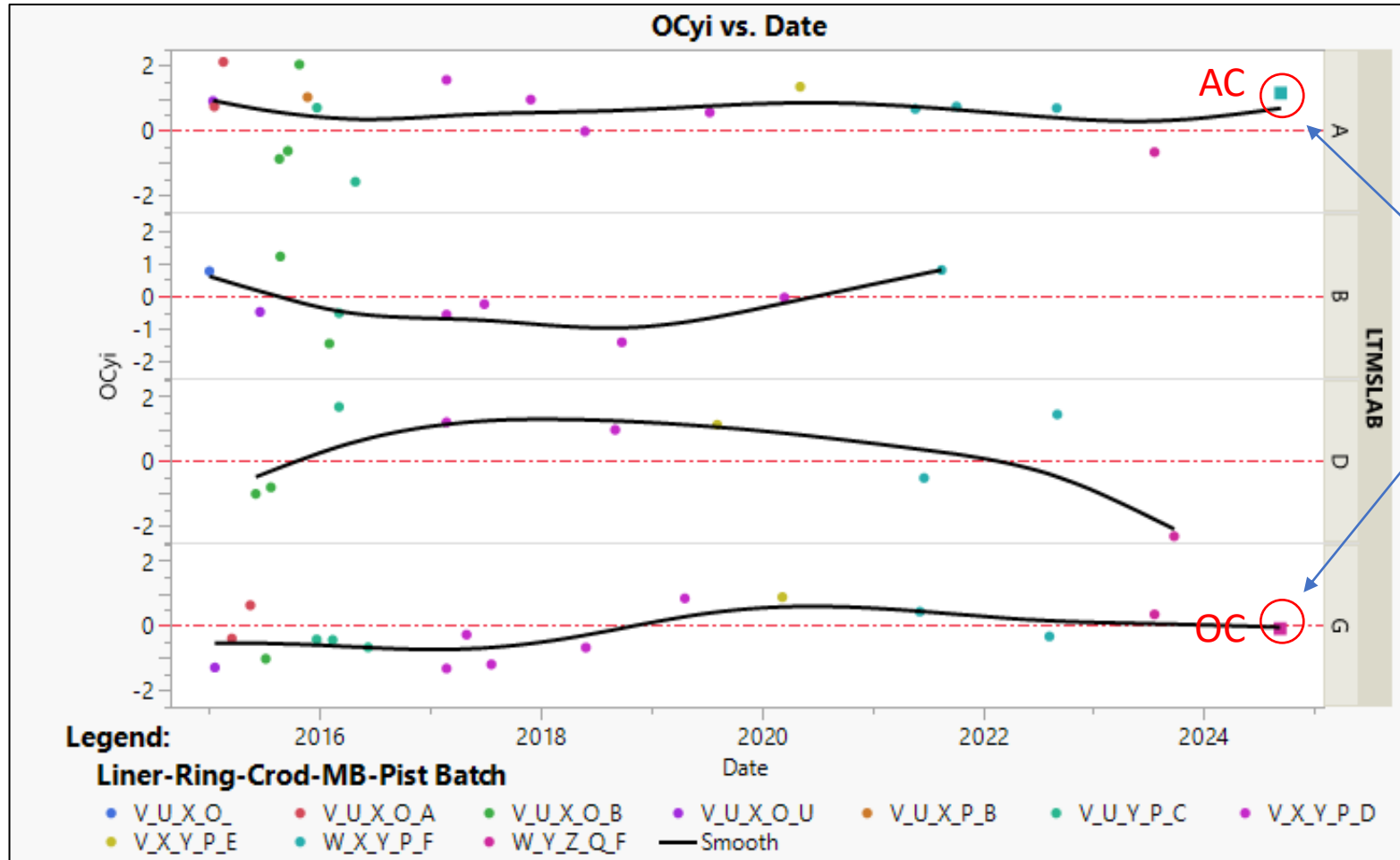
- Cylinder Liner Wear Yi vs. Date



Lab	LTMS Code	Hardware Batch				
		Liner	Ring	ConRod	MainBear	Piston
A (SwRI)	AC	W	X	Y	P	F
G (IAR)	OC	W	Y	Z	Q	F

T12 Plots – Pass/Fail Parameters

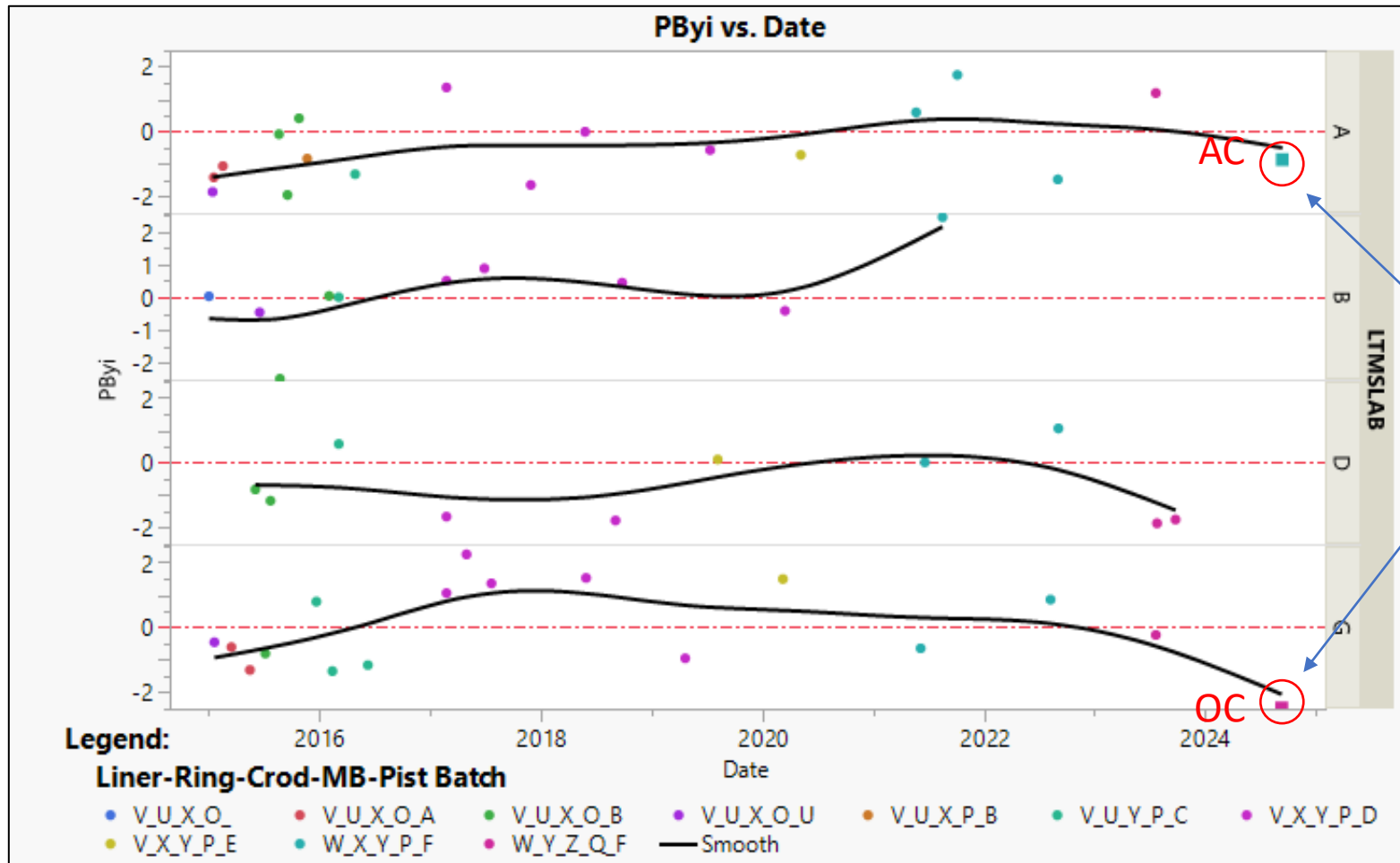
- Oil Consumption Yi vs. Date



Lab	LTMS Code	Hardware Batch				
		Liner	Ring	ConRod	MainBear	Piston
A (SwRI)	AC	W	X	Y	P	F
G (IAR)	OC	W	Y	Z	Q	F

T12 Plots – Pass/Fail Parameters

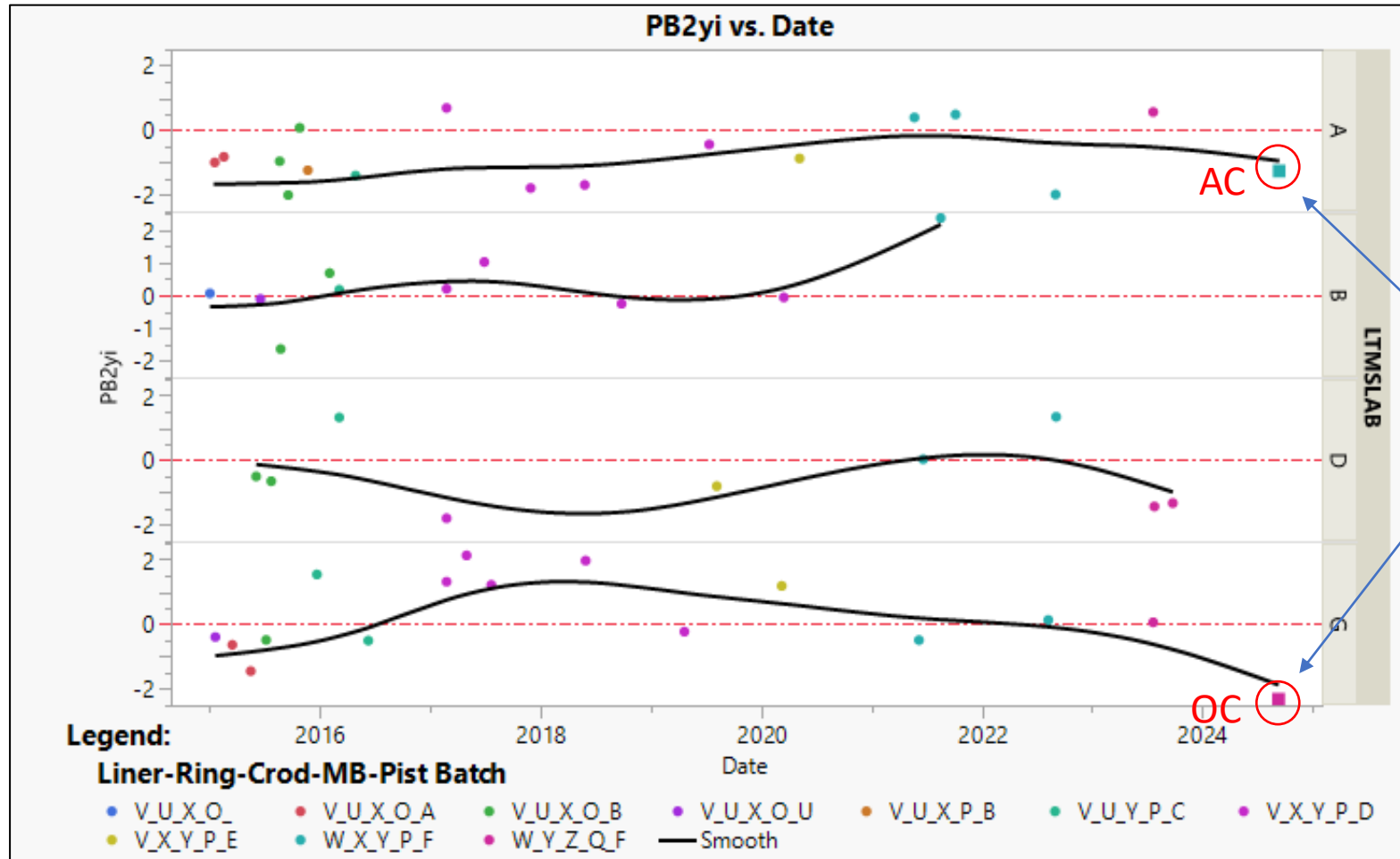
- Pb Yi vs. Date



Lab	LTMS Code	Hardware Batch				
		Liner	Ring	ConRod	MainBear	Piston
A (SwRI)	AC	W	X	Y	P	F
G (IAR)	OC	W	Y	Z	Q	F

T12 Plots – Pass/Fail Parameters

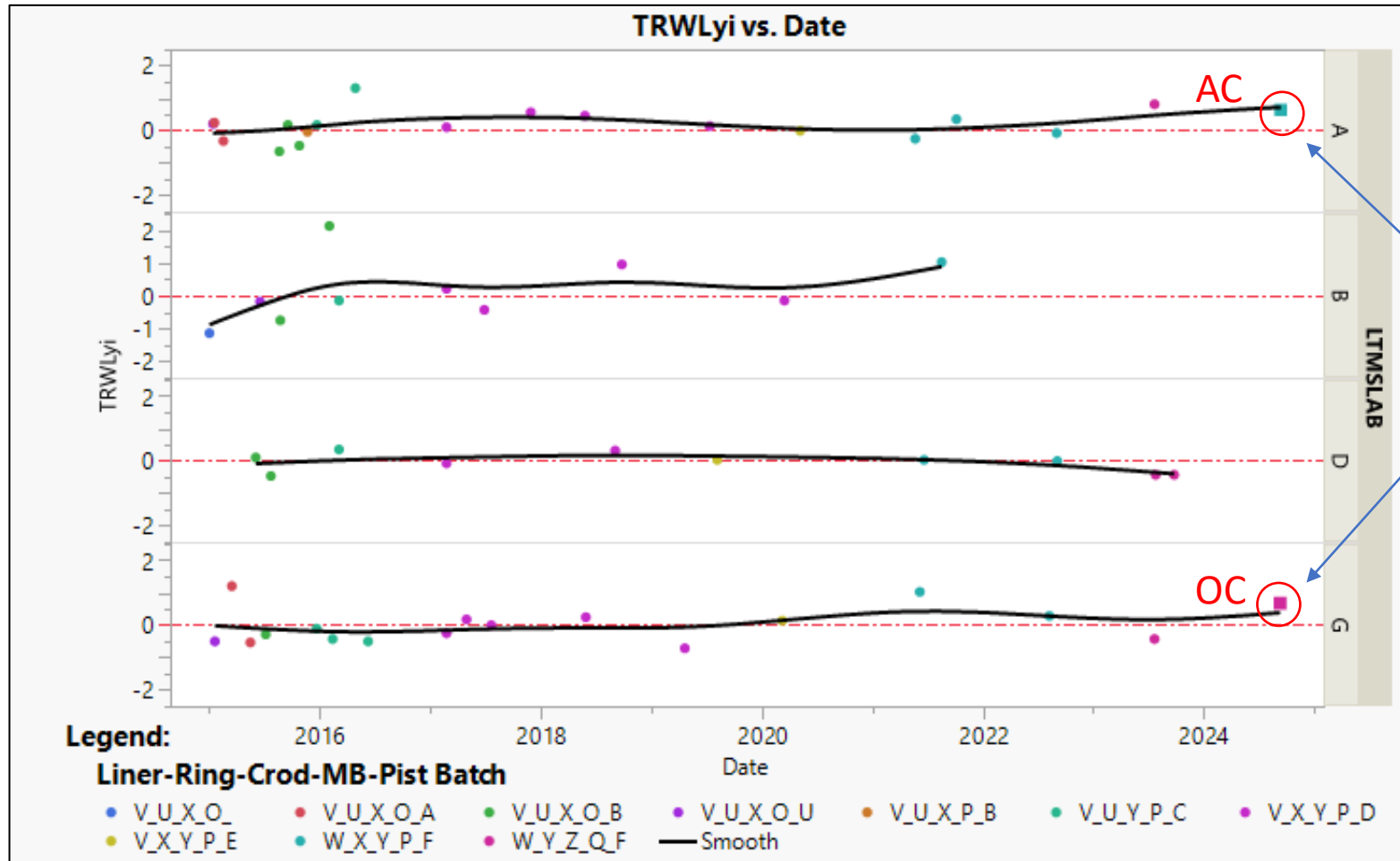
- Pb Yi vs. Date



Lab	LTMS Code	Hardware Batch				
		Liner	Ring	ConRod	MainBear	Piston
A (SwRI)	AC	W	X	Y	P	F
G (IAR)	OC	W	Y	Z	Q	F

T12 Plots – Pass/Fail Parameters

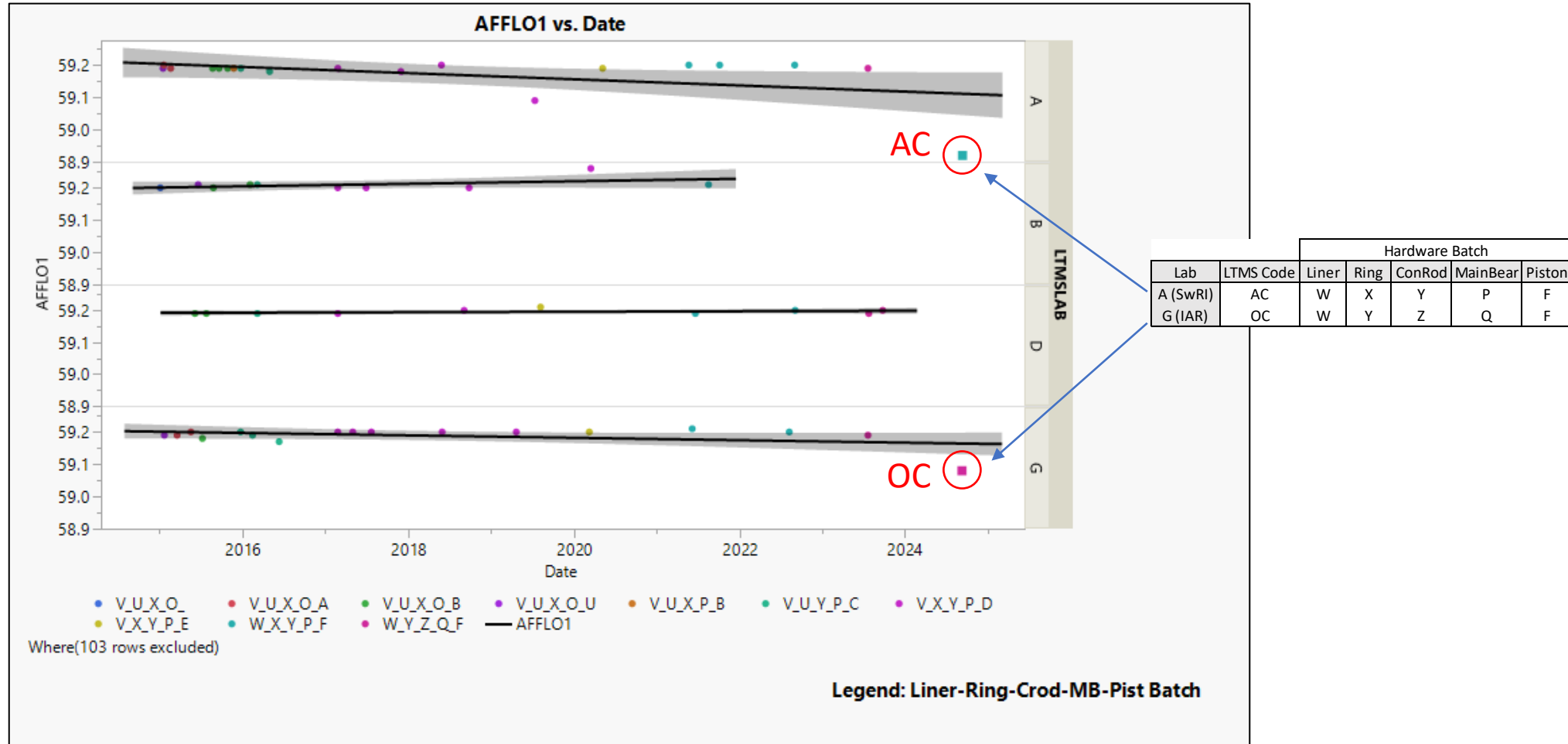
- Top Ring Weight Loss Yi vs. Date



Lab	LTMS Code	Hardware Batch				
		Liner	Ring	ConRod	MainBear	Piston
A (SwRI)	AC	W	X	Y	P	F
G (IAR)	OC	W	Y	Z	Q	F

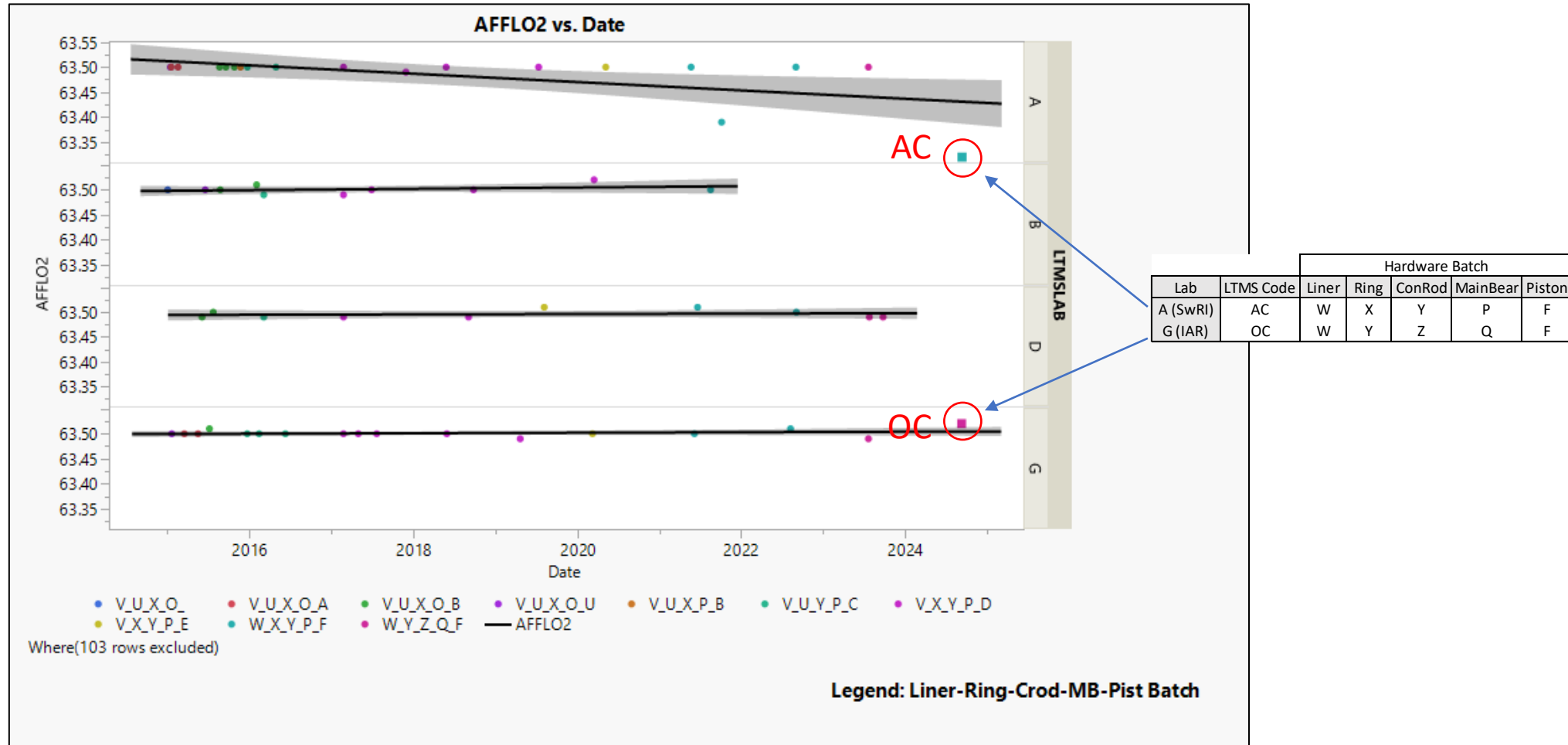
T12 Plots – Operational Parameters

- Average Fuel Flow (Stage 1) vs. Date
 - Lower for New Coolant Test Results



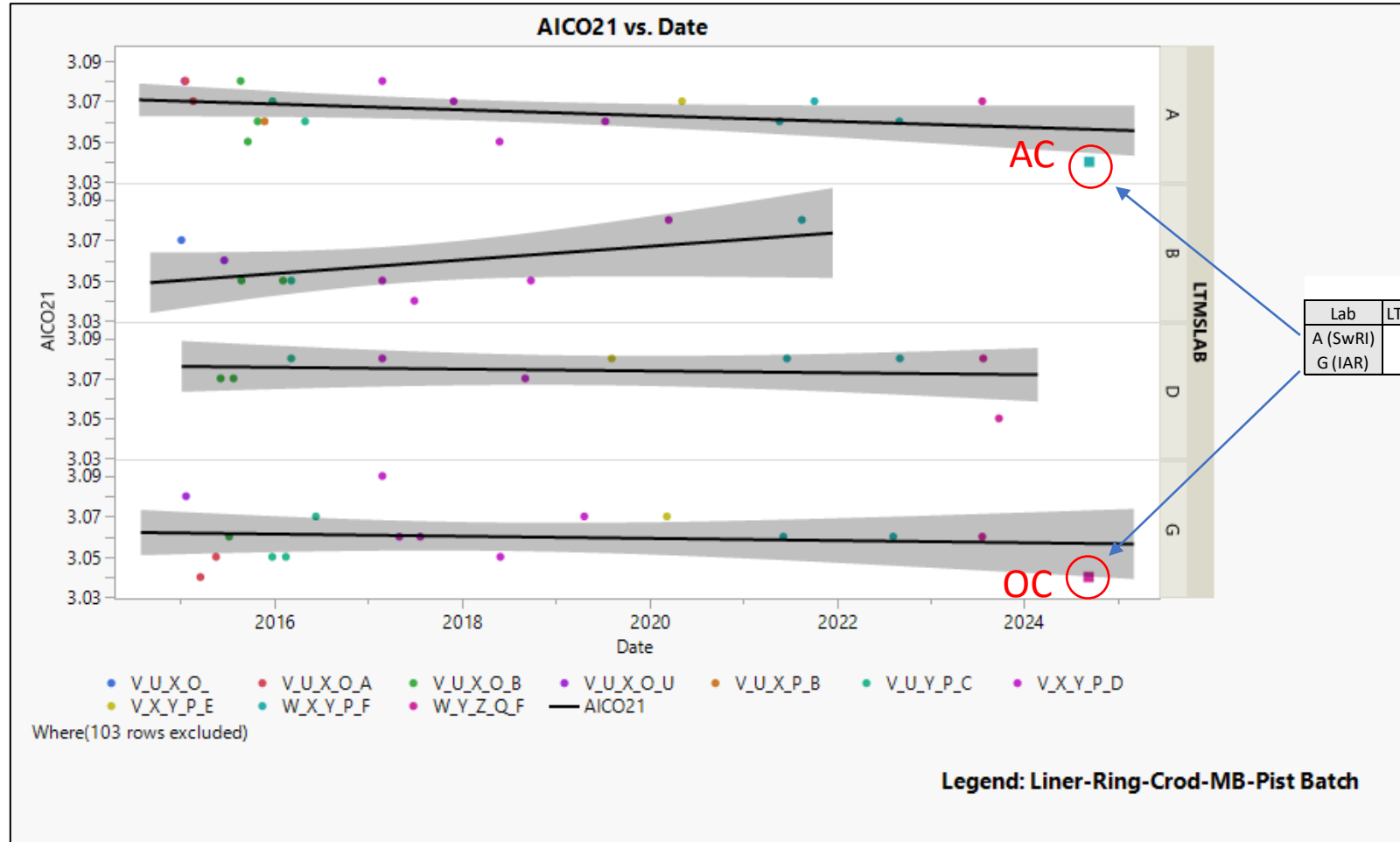
T12 Plots – Operational Parameters

- Average Fuel Flow (Stage 2) vs. Date
 - Lower / on target for new Coolant Test Results



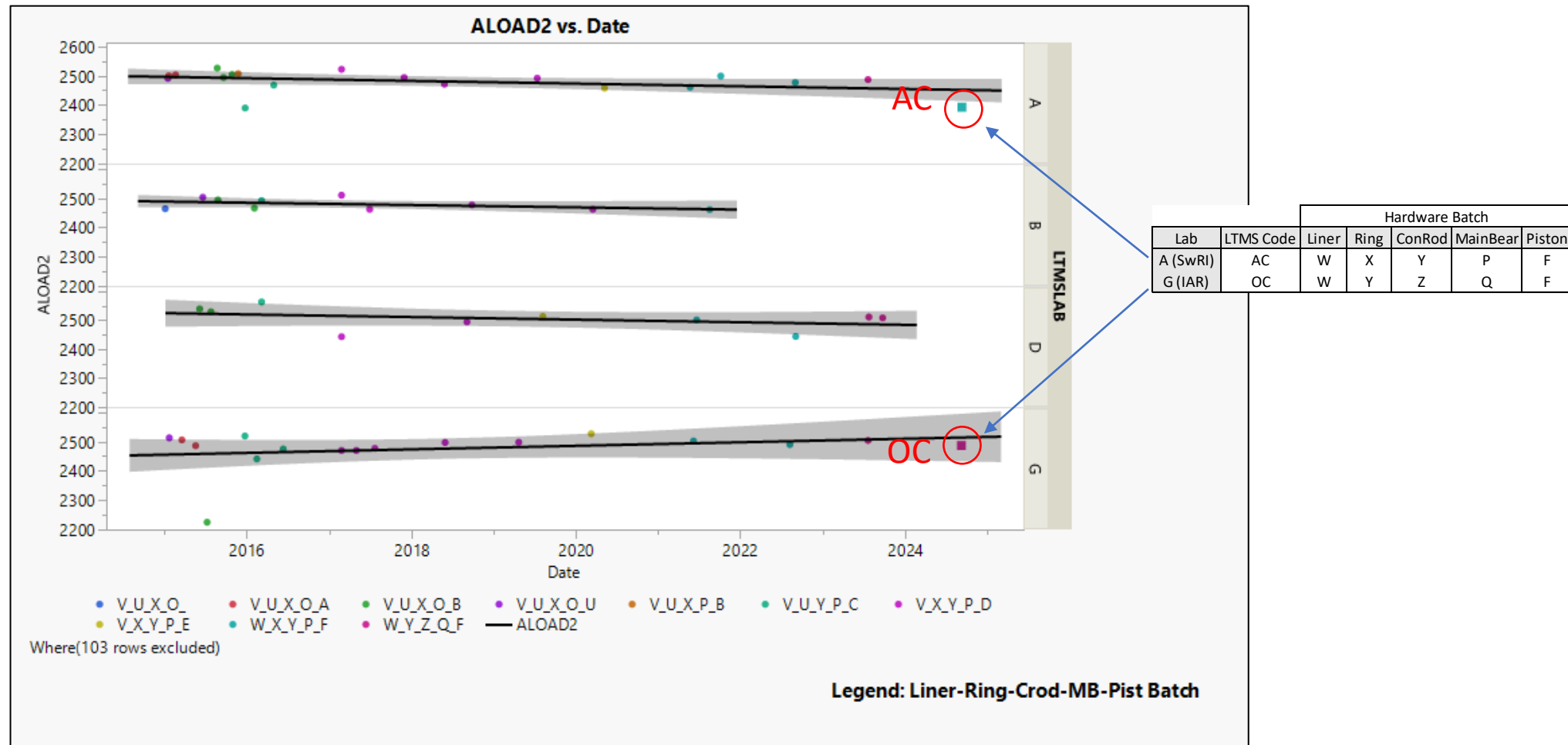
T12 Plots – Operational Parameters

- Stage 1 Average Intake CO2(Stage 2) vs. Date
 - Lower for Coolant Test Results



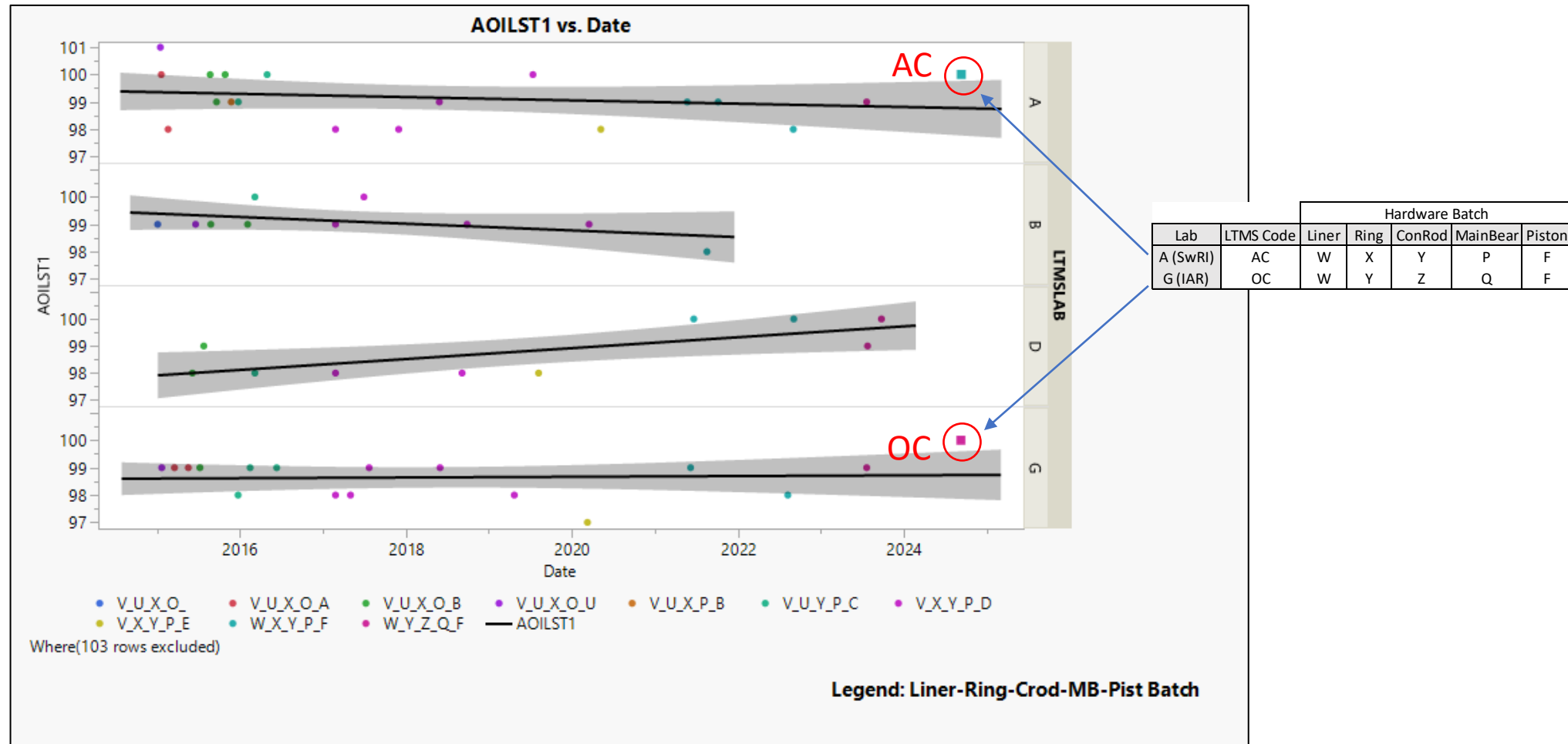
T12 Plots – Operational Parameters

- Stage 2 Average Load (Stage 2) vs. Date
 - Slightly Lower for new Coolant Test Results



T12 Plots – Operational Parameters

- Stage 1 Average Oil Temperature vs. Date
 - Slightly higher with new Coolant Test Results



T12 Plots – Operational Parameters

- Yi Delta Pb @ EOT vs. Date
 - Slightly lower with new Coolant Test Results

