Sequence III Surveillance Panel Meeting

Teams
Wednesday February 18, 2026 3:00 – 4:00 PM CST

Agenda

1.0) Attendance

2.0) Approval of minutes

3.1) Minutes from 1/28/2026 Meeting
No objections, approved

3.0) Executive Summary

- IMTS is starting IIIH rebuilt engine 2nd week of March at IAR
- Motion approved for labs to request RO434 for the rebuilt engine prove out tests
- T. Dvorak presented lab hone data requested during previous SP meeting

4.0) IIIH Action Items

4.1) Fuel update, 7 loads available, ~50,000 gallons. Next batch ~ March 10. No issues.

4.2) OHT has 20 seats of oversized pistons 10x +0.007" and 10x +0.008". Rings are being expedited.

4.3) panel met to discuss blocks and piston supply bid. First blocks should be available in March. Need to understand prove out and precision matrix funding. SwRI and IAR will be sent machined engines blocks. Panel is finalizing the parts list.

4.4) IMTS update – S. Clark

- IMTS currently machining 4 blocks.
- IMTS building first oversize engine the 2nd week of March using IMTS parts.
  - Top gap is 0.025 +/-
  - Second gap is 0.035 +/- 0.002"
- Will verify that seasoned block does not move any more.
- Will process lab blocks after the prove out.
- Targeting only grade 3 bearings for mains. B. Campbell asked if enough cranks had been measured to ensure this is sufficient. Seems yes so far. J. Betz (historical comment) said labs could not select fit bearings.
- Some ring gap discussion. G. Szappanos recommended the ring manufacturer cut and clean ends same as production runs. Will target current ring gaps.
- J. Bowden verified that OHT's ring supplier uses that process.
- Prove out data will be shared.

4.5) Group discussed prove-out oil. Motion to allow the use of TMC assigned reference oil in pre-prove out testing by P. Ramirez, seconded by D. Passmore. Motion passed with 14 approve, no negative and 2 waives. Follow up recommendation was to use 434-3 for the first two prove-out tests.

4.6) IIIH hone data presentation by T. Dvorak

- Cylinder Bore Diameter Average Data
    - Lab E and Lab F have small populations, so the focus is on Labs A, B, D, F1 & G
    - Lab D showed higher variation than the other labs
- Cylinder Bore Taper Average
    - The taper is different between the labs
- MR Surface Finish Average
    - Data is similar across labs
- RK Surface Finish Average
    - Data is similar across labs
    - Tightening variation could be considered
- RPK Surface Finish Average
    - Note that most of the data is normally distributed, but the Taper data is skewed
- RVK Surface Finish Average
    - Everyone looks the same, Lab G is tighter than everyone else. Slight skew
- RZ Surface Finish Average
    - RZ has is normal distribution

- B. Campbell asked if the parameters shown are in the procedure.
    - T. Dvorak verified that they are in the test reports, but not sure if the parameter values are in the procedure
    - It was noted that Afton had previously made recommendations for hone specifications, but not sure if they were implemented
    - T. Dvorak commented that the surface finish parameters are interconnected making it difficult to independently control the parameters

- R. Stockwell noted that data from Labs B & D seemed to have 2 different populations for the same parameter and asked if the data could be plotted vs time for the next meeting.
- R. Stockwell commented that the honing machines are supposed to dwell the same and questioned if the labs were all using the same software with the same settings.
    - Labs were asked to share their software versions and machine settings at the next meeting.
    - It was clarified that the reading are in mm, so the variation is very small.

5.0) <u>Next Meeting</u>

Teams Meeting March 18, 2026 at 2:00 – 3:30 PM CST

6.0) <u>Meeting Adjourned</u>

Meeting Adjourned 4:00 PM CST

IIH Honing Parameter Data Review

By: Todd Dvorak

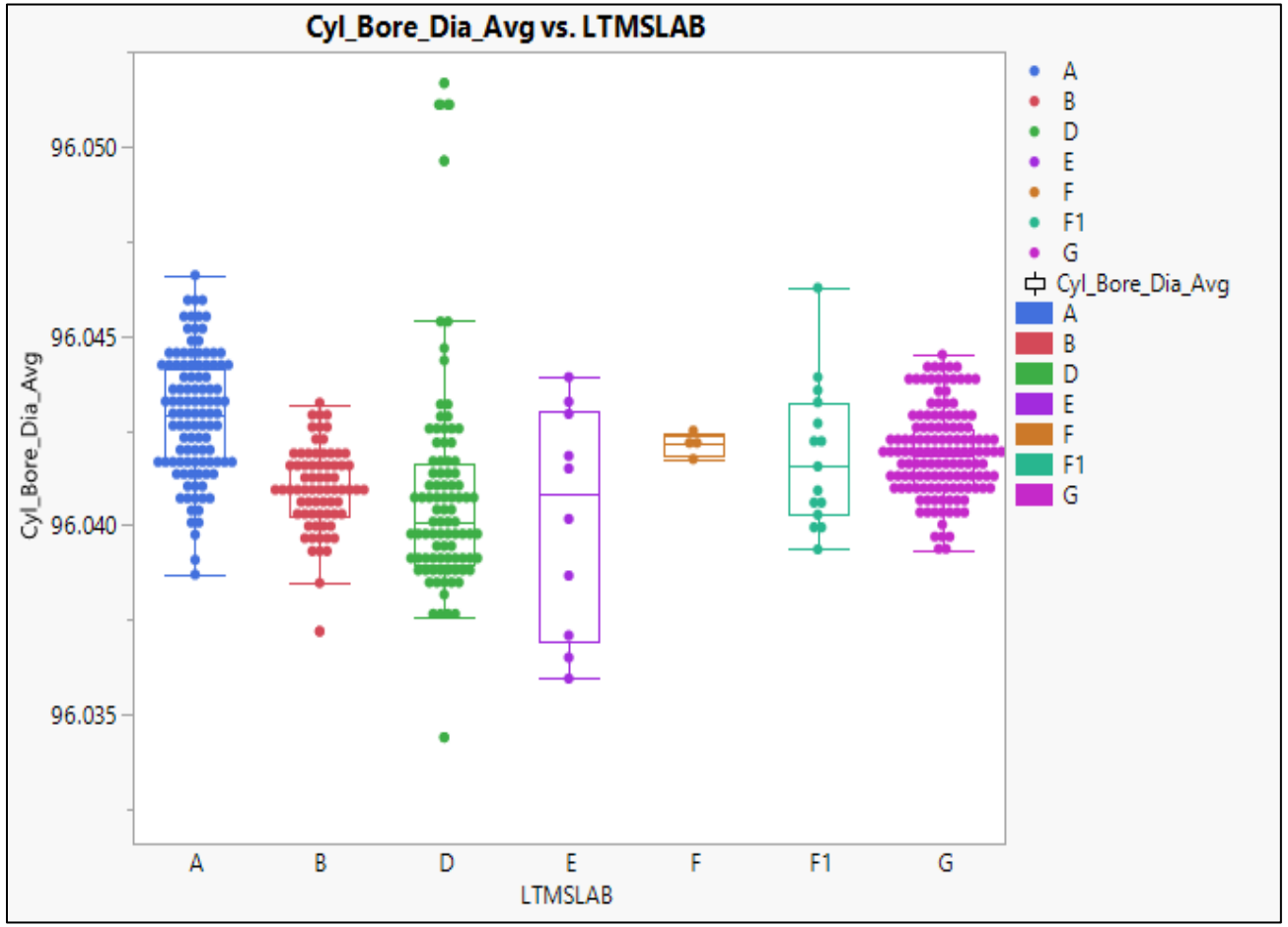
02-13-2026

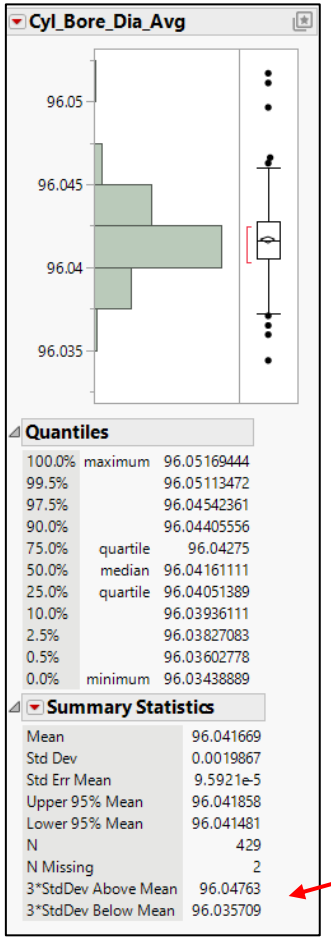
IIIH Honing Parameter Data Review Comments

- Dataset included n = 431 Chart = ‘Y’ results from all labs
- Some data was “cleaned” to correct typos in the dataset
  - Examples:
    - Cylinder bore measurement of 0.038 was corrected to 96.038
    - ’98’ mm bore measurements were changed to ‘96’ mm
    - Etc.
- Each slide summarizes the $\pm$ 3σ limits for each of the honing related parameters

Cylinder Bore Diameter Average

- Includes the average of all longitudinal/transverse & top/bottom measurement data

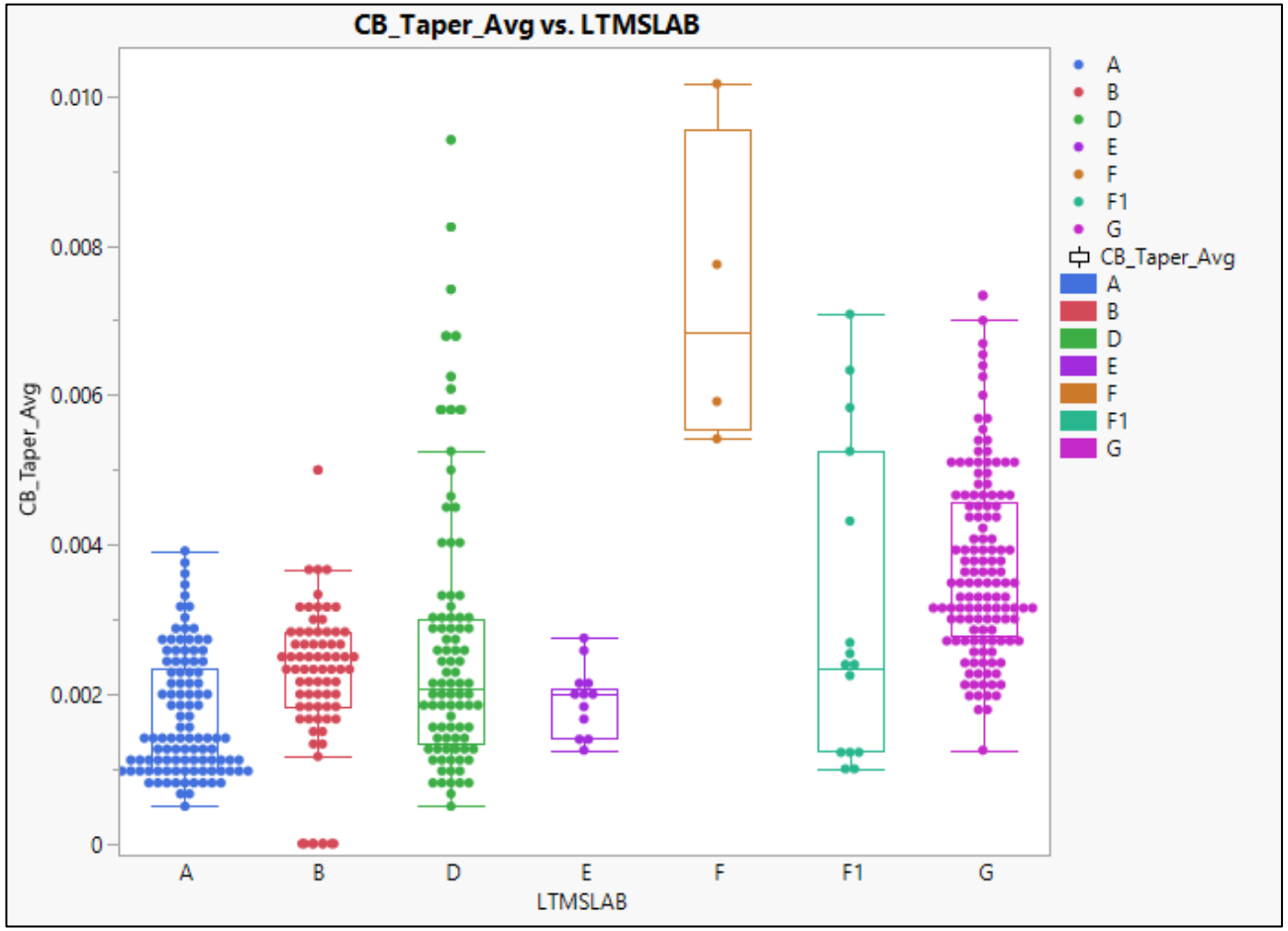


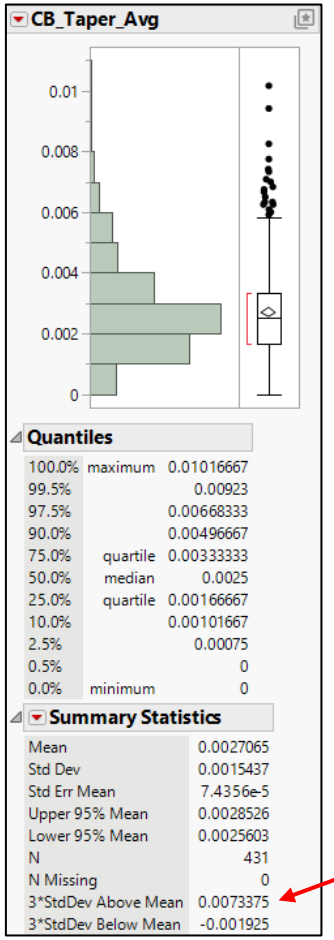


±3 Sigma Limits from Mean	
3*StdDev Above Mean	96.0476
3*StdDev Below Mean	96.0357

Cylinder Bore Taper Average

- Includes the average of all longitudinal and transverse taper measurement data

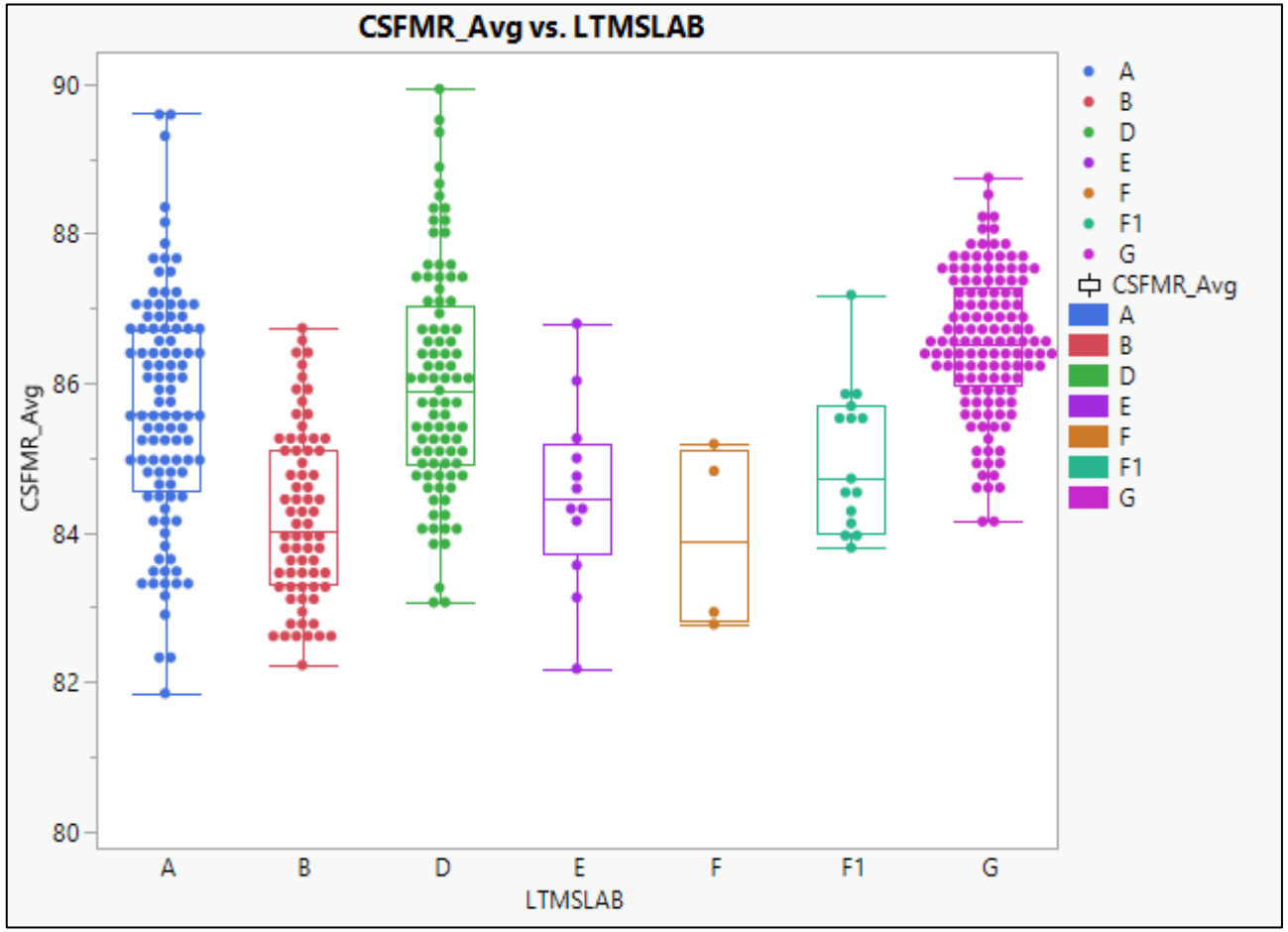


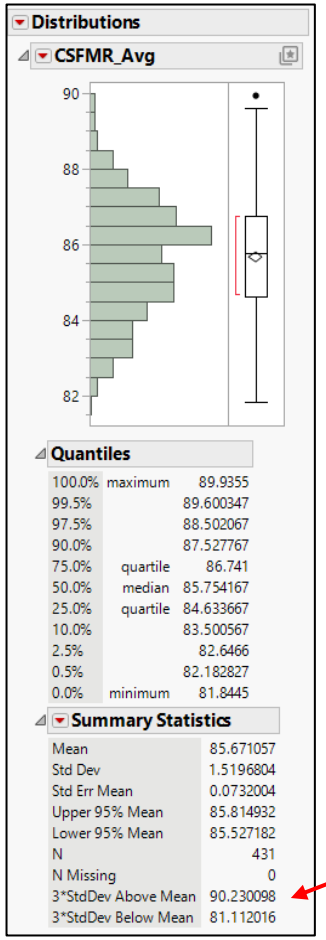


±3 Sigma Limits from Mean	
3*StdDev Above Mean	0.0073
3*StdDev Below Mean	0.0000

MR Surface Finish Average

- Includes the average of all cylinder bore MR surface measurement data

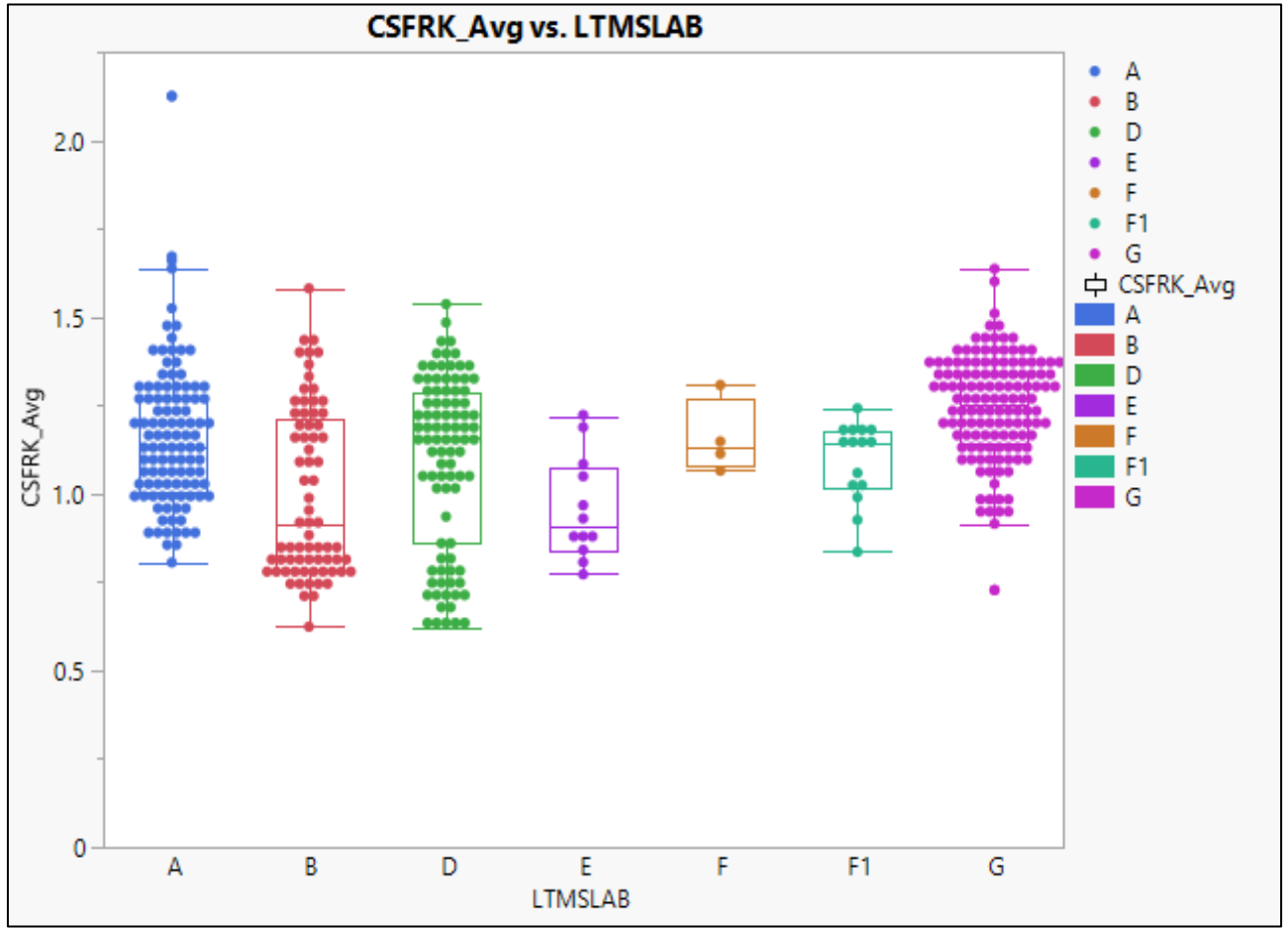


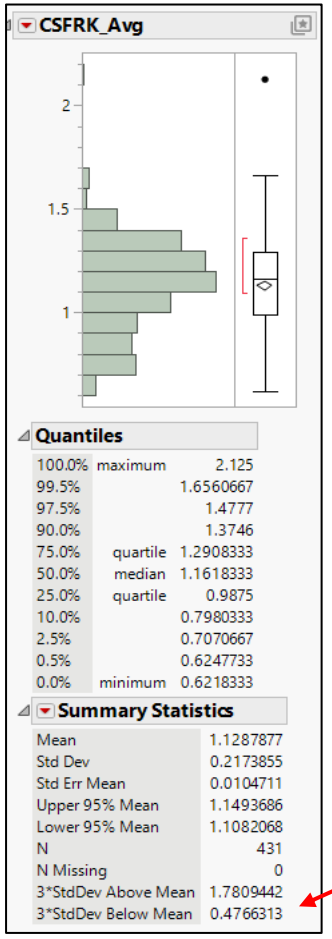


±3 Sigma Limits from Mean	
3*StdDev Above Mean	90.2301
3*StdDev Below Mean	81.1120

RK Surface Finish Average

- Includes the average of all cylinder bore RK surface measurement data

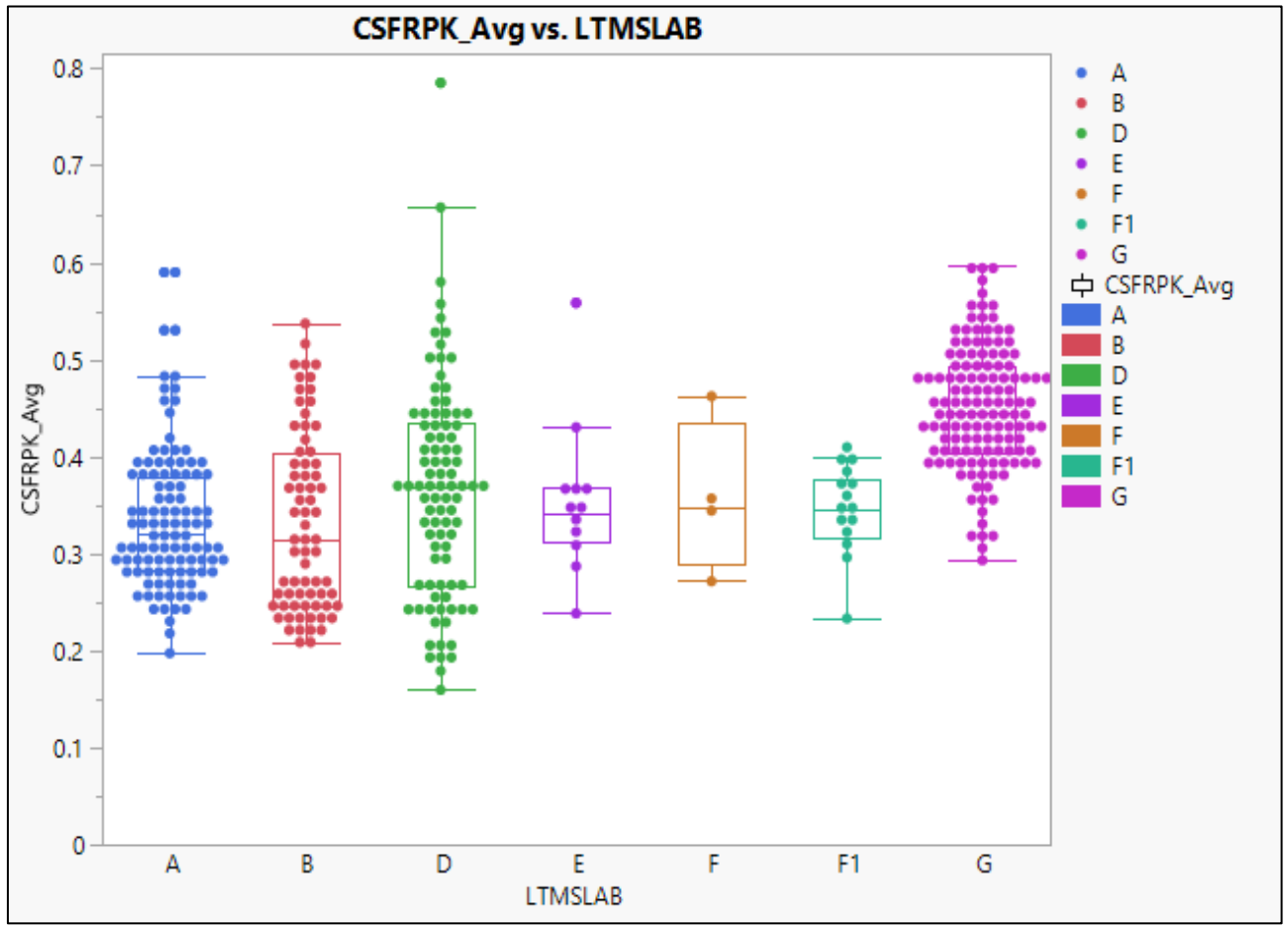


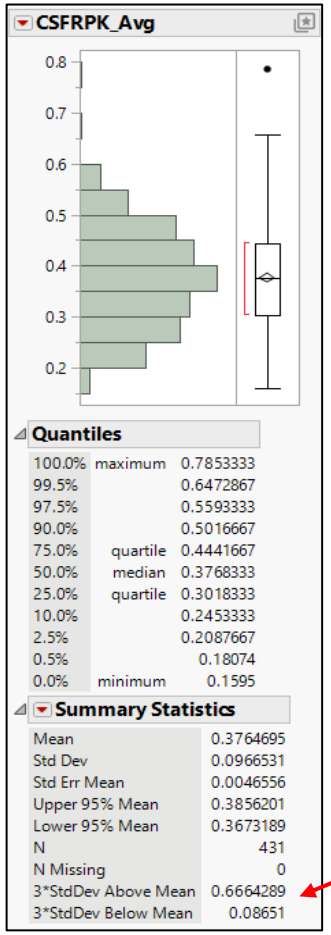


±3 Sigma Limits from Mean	
3*StdDev Above Mean	1.7809
3*StdDev Below Mean	0.4766

RPK Surface Finish Average

- Includes the average of all cylinder bore RPK surface measurement data

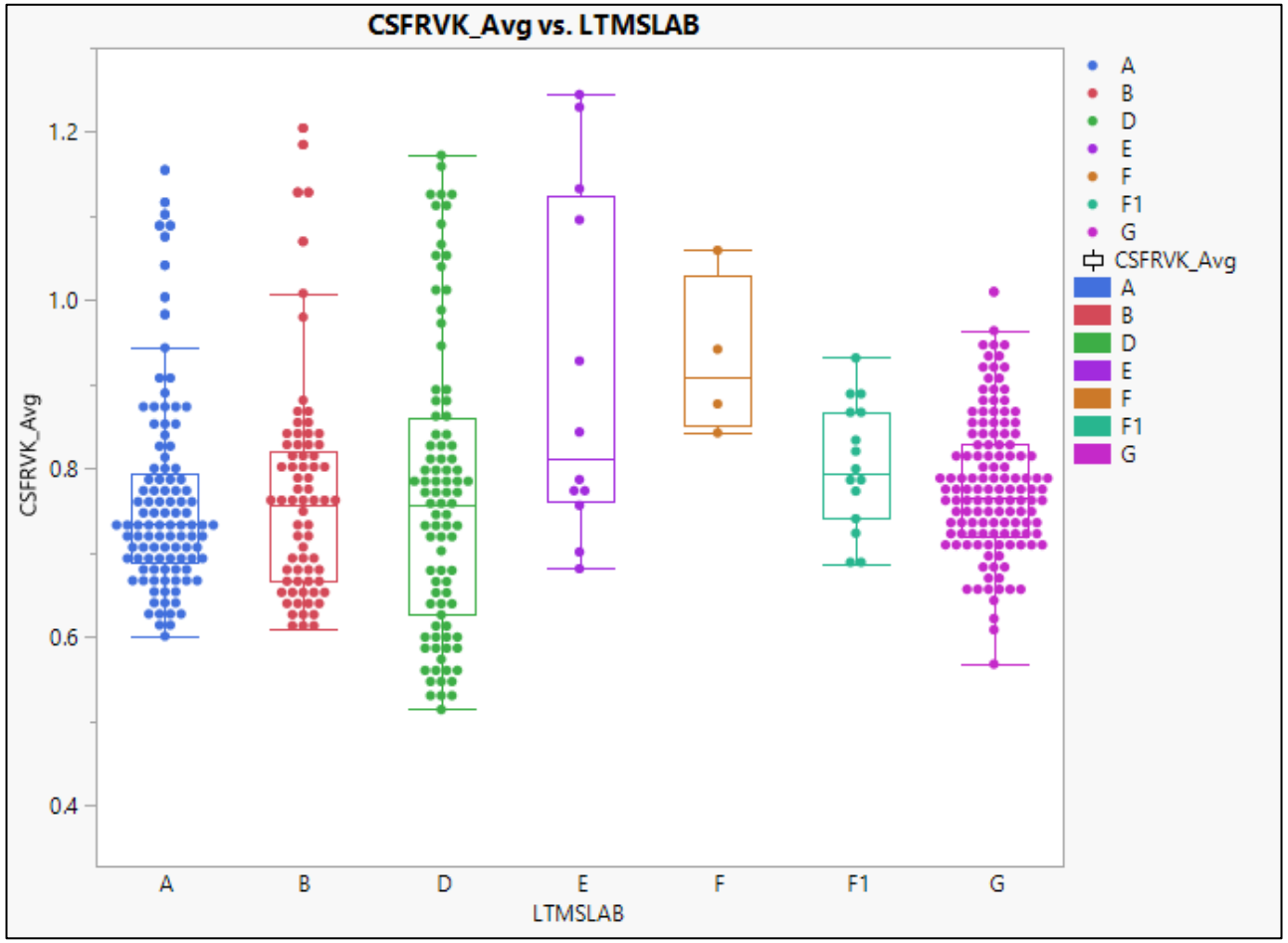


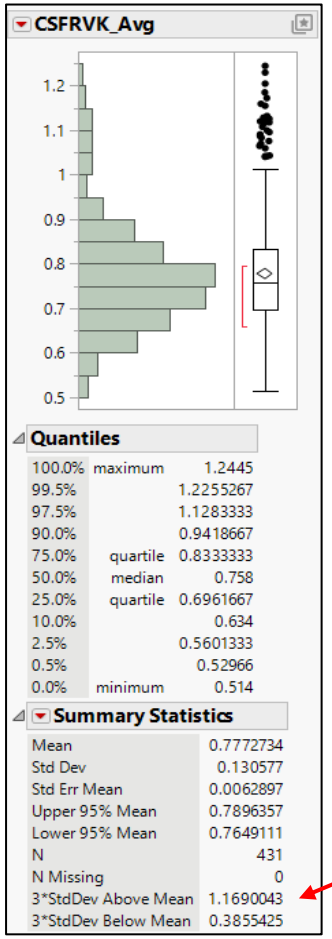


±3 Sigma Limits from Mean	
3*StdDev Above Mean	0.6664
3*StdDev Below Mean	0.0865

RVK Surface Finish Average

- Includes the average of all cylinder bore RVK surface measurement data

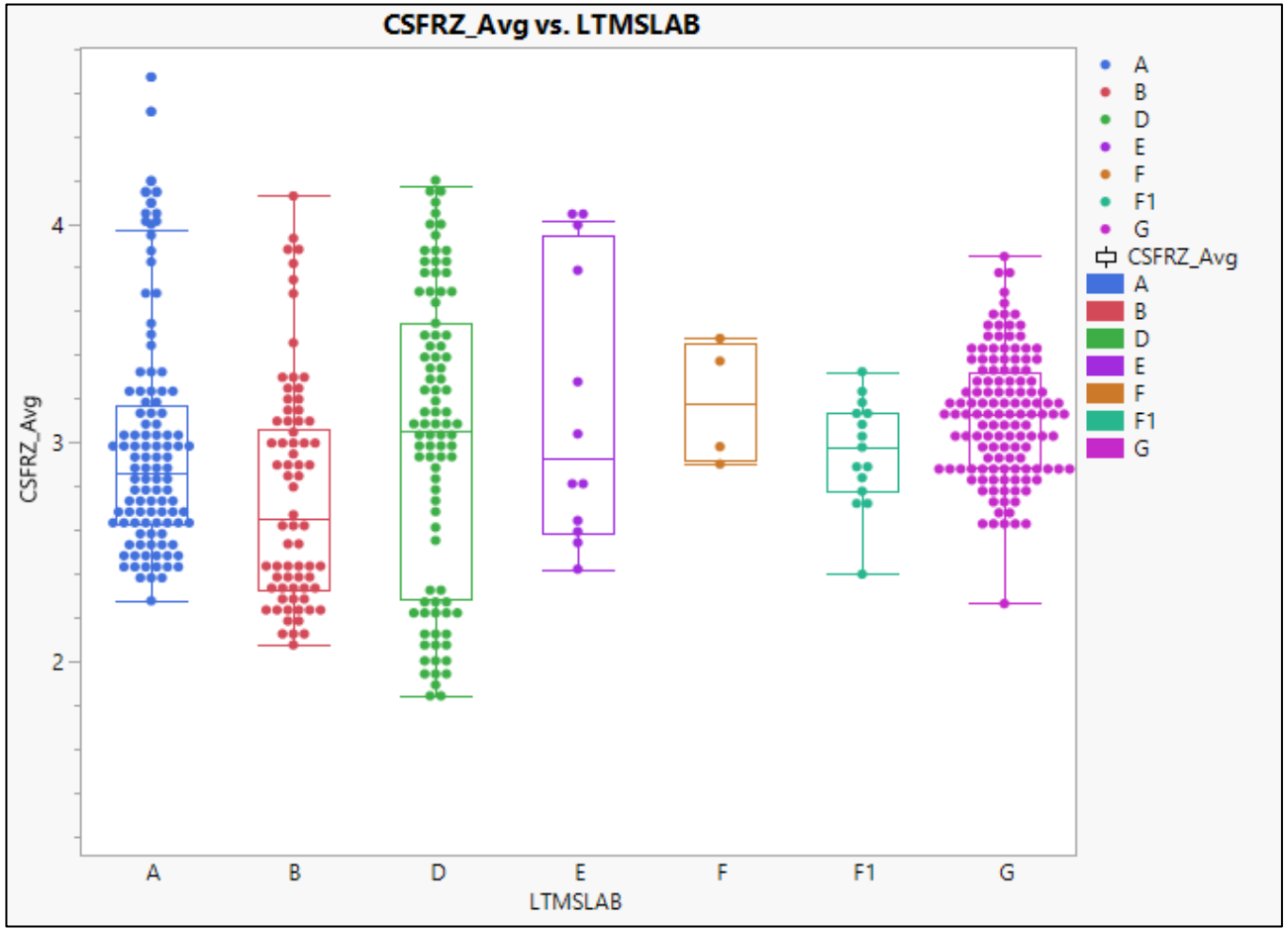


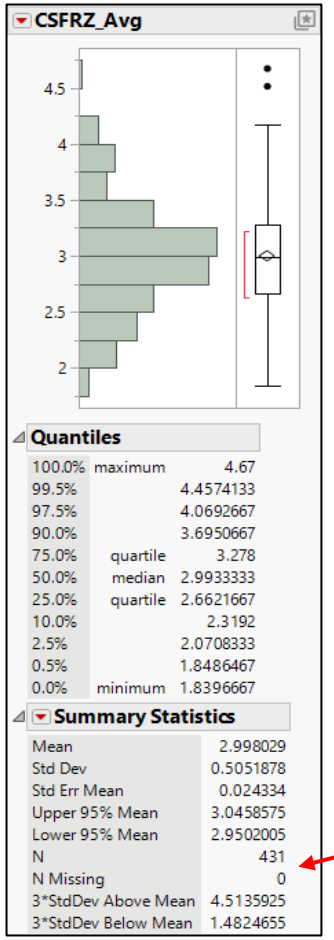


±3 Sigma Limits from Mean	
3*StdDev Above Mean	1.1690
3*StdDev Below Mean	0.3855

RZ Surface Finish Average

- Includes the average of all cylinder bore RZ surface measurement data





Quantiles

100.0%	maximum	4.67
99.5%		4.4574133
97.5%		4.0692667
90.0%		3.6950667
75.0%	quartile	3.278
50.0%	median	2.9933333
25.0%	quartile	2.6621667
10.0%		2.3192
2.5%		2.0708333
0.5%		1.8486467
0.0%	minimum	1.8396667

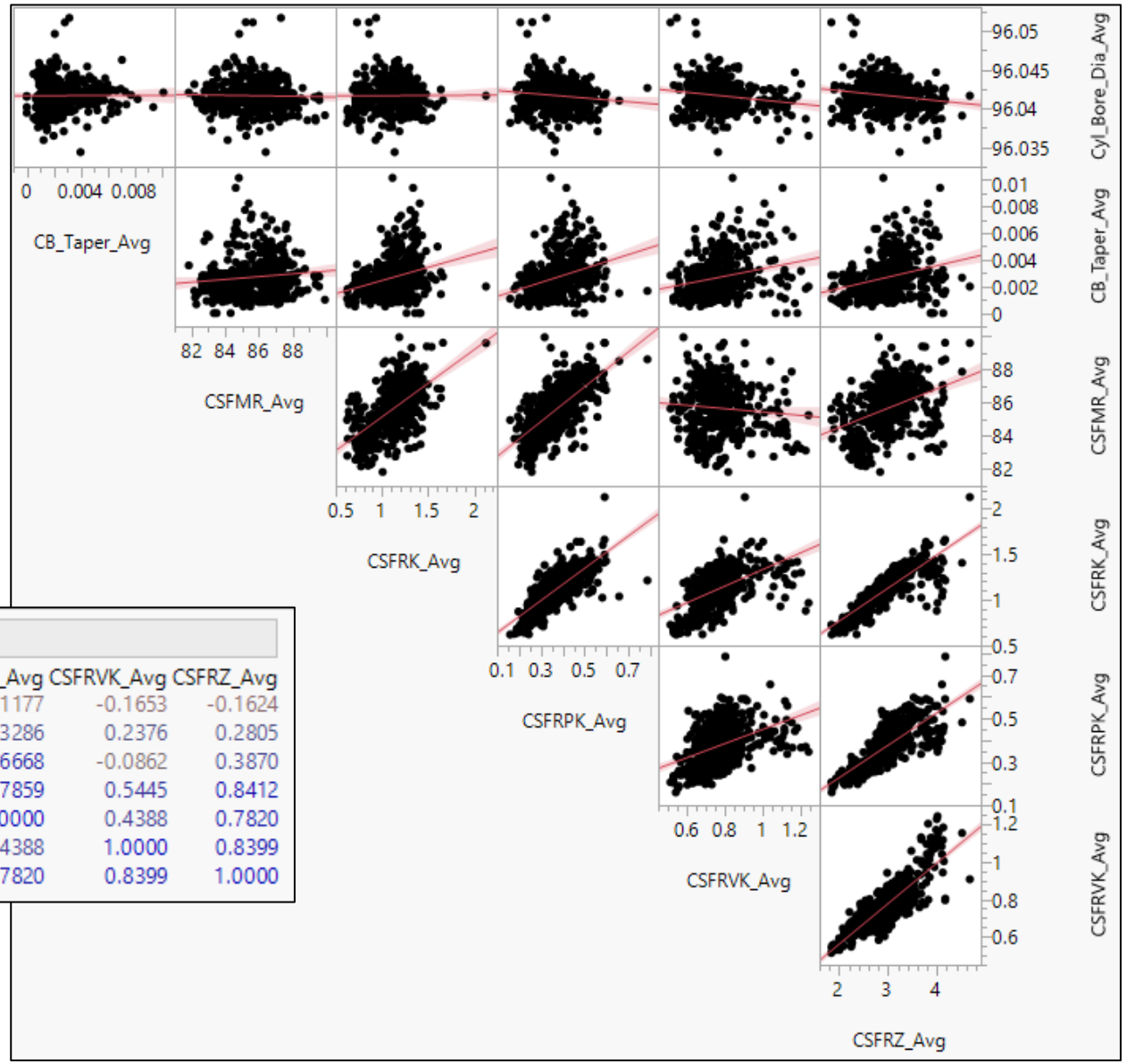
Summary Statistics

Mean	2.998029
Std Dev	0.5051878
Std Err Mean	0.024334
Upper 95% Mean	3.0458575
Lower 95% Mean	2.9502005
N	431
N Missing	0
3*StdDev Above Mean	4.5135925
3*StdDev Below Mean	1.4824655

±3 Sigma Limits from Mean	
3*StdDev Above Mean	4.5136
3*StdDev Below Mean	1.4825

Appendix A

Matrix Plot of Honing Related Parameters



Correlations

	Cyl_Bore_Dia_Avg	CB_Taper_Avg	CSFMR_Avg	CSFRK_Avg	CSFRPK_Avg	CSFRVK_Avg	CSFRZ_Avg
Cyl_Bore_Dia_Avg	1.0000	0.0019	-0.0264	0.0075	-0.1177	-0.1653	-0.1624
CB_Taper_Avg	0.0019	1.0000	0.1032	0.2787	0.3286	0.2376	0.2805
CSFMR_Avg	-0.0264	0.1032	1.0000	0.5790	0.6668	-0.0862	0.3870
CSFRK_Avg	0.0075	0.2787	0.5790	1.0000	0.7859	0.5445	0.8412
CSFRPK_Avg	-0.1177	0.3286	0.6668	0.7859	1.0000	0.4388	0.7820
CSFRVK_Avg	-0.1653	0.2376	-0.0862	0.5445	0.4388	1.0000	0.8399
CSFRZ_Avg	-0.1624	0.2805	0.3870	0.8412	0.7820	0.8399	1.0000

ASTM Sequence III Surveillance Panel (19 Voting members) date: 2/18/2026

Name | Email | Signature: RJ Stockwell

Present - Voting Members:		Votes:			
___ Jorge Agudelo	jorge.agudelo@bp.com	___	___	___	___
✓ Joseph Anthony	Joseph.Anthony@Infineum.com	Y	___	___	___
✓ Dylan Beck	djb@astmtmc.org	Y	___	___	___
✓ Jason Bowden	jhbowden@ohtech.com	Y	___	___	___
___ Michael Deegan	mdeegan@ford.com	___	___	___	___
✓ Seth Demel	samuel.demel@shell.com	W	___	___	___
✓ Venkat Deshpande	venkat.deshpande@toyota.com	W	___	___	___
✓ Ed Hennessy	ehennessy@jhaltermann.com	Y	___	___	___
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✓ Dave Passmore	dpassmore@imtsind.com	Y	___	___	___
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✓ Michael Roguski LVLA	michal.roguski@exxonmobil.com	Y	___	___	___
✓ Andrew Rohlfing	Andrew.Rohlfing@AftonChemical.com	Y	___	___	___
___ Amol Sawant ?	acsawant@valvolineglobal.com	Y	___	___	___
✓ Robert Stockwell	robert.stockwell@chevron.com	Y	___	___	___
✓ George Szappanos	george.szappanos@lubrizol.com	Y	___	___	___
✓ Haiying Tang	haiying.tang@stellantis.com	Y	___	___	___

PASS

Vote TAC via for one-more unit

ASTM Sequence III Surveillance Panel (19 Voting members) date: 2/18/26

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ASTM Sequence III Surveillance Panel (19 Voting members) date: 2/18/26

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Other Attendees:

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