

Mack / Volvo Surveillance Panel Meeting

October 6, 2022

David Brass (chair)

Agenda

- Volvo T-13 Reference Oil 823-1 Introduction
- Volvo T-13 Liner Batch “D” Introduction
- Low Viscosity Testing in Volvo T-13
- Mack T-11 / T-12 Parts

Volvo T-13 Reference Oil 823-1 Introduction

Volvo T-13 Reference Oil Status

Reference Oil Quantities:

- TMC 823 is almost out (1 drum at TMC, ~1 drum at each lab)
- TMC 823-1 (29 drums received by TMC, per 6/21/2021 TMC-EC meeting minutes)
 - needs coordinated reference testing to introduce

Stand status based on LTMS:

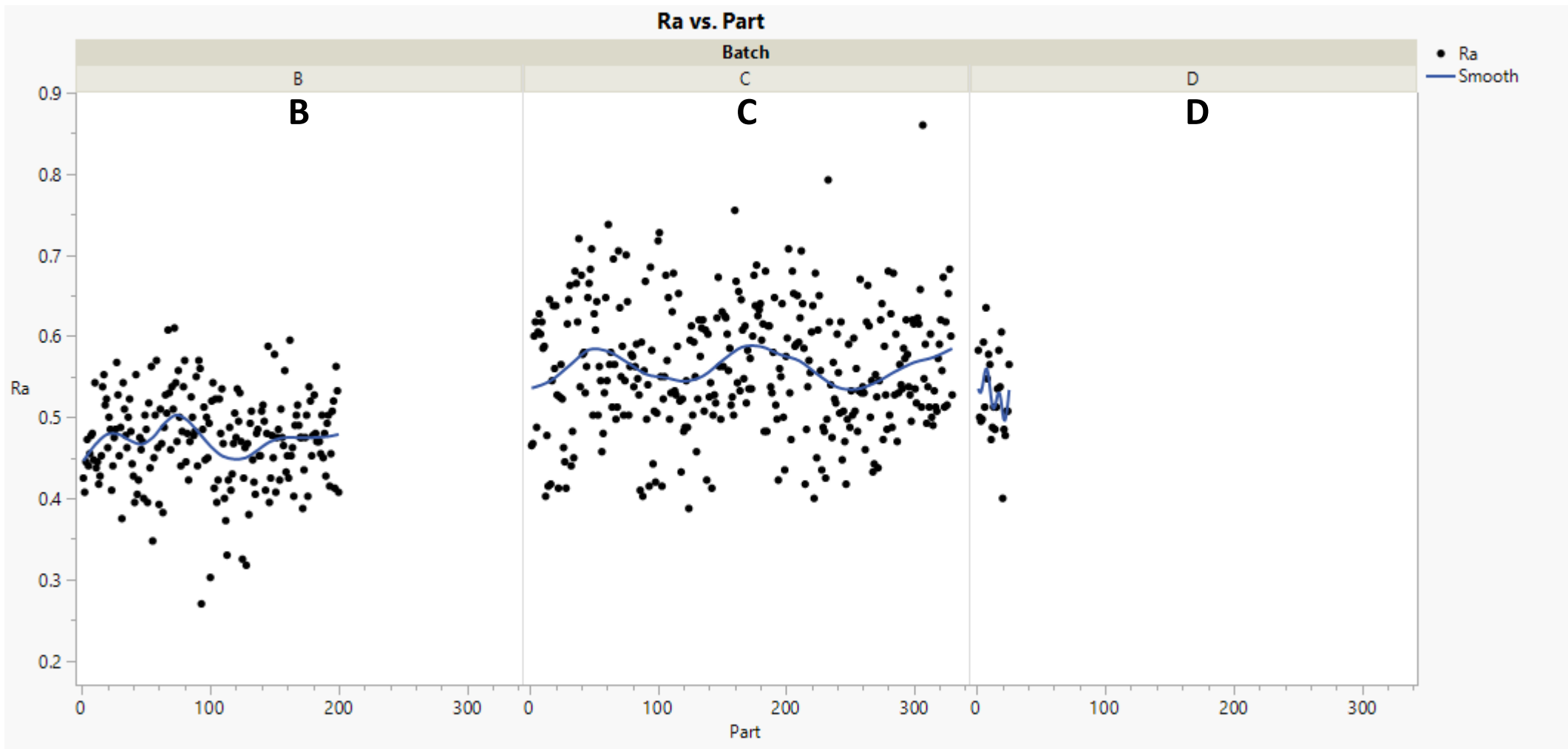
	Lab A	Lab B	Lab D	Lab G
Referenced	1 stand Referenced (expires 4/23/23)		1 stand Referenced (expires 3/13/23)	1 stand referenced (expires 5/3/23)
Referencing	1 stand Referencing Now on 823 (expired 8/31/22)			1 stand Referencing Now on 823 (expired 9/7/22)
Not Referenced	1 stand unreferenced (expired 4/25/22)	1 stand unreferenced (expired 9/4/22)	1 stand unreferenced (expired 5/30/22)	1 stand unreferenced (expired 7/18/22)

Can coordinated referencing be planned for in next reference cycle in 1Q2023?

Volvo T-13 Liner Batch “D” Introduction

Volvo T-13 Cylinder Liners

- 13 kits of Batch “C” liners remain at TEI
- We need to bring in Batch “D” liners
 - Comparison of liner measurements on next slides
- Batch “C” liners were previously brought in as a rolling change based on a letter from the Chair dated Nov 22, 2021.
- Proposal would be to bring in Batch “D” liners as a rolling change.

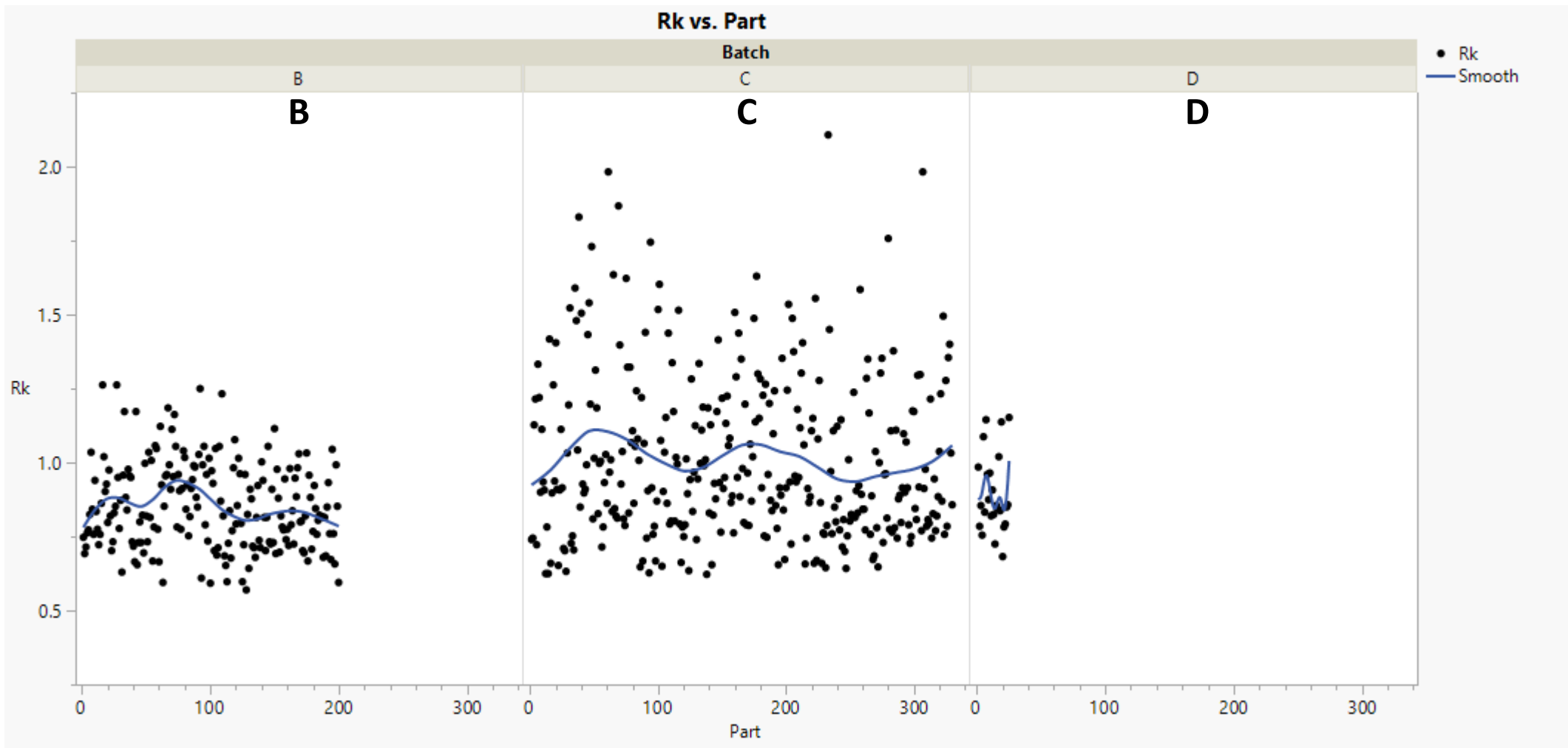


Average

Ra = 0.47

Ra = 0.56

Ra = 0.53

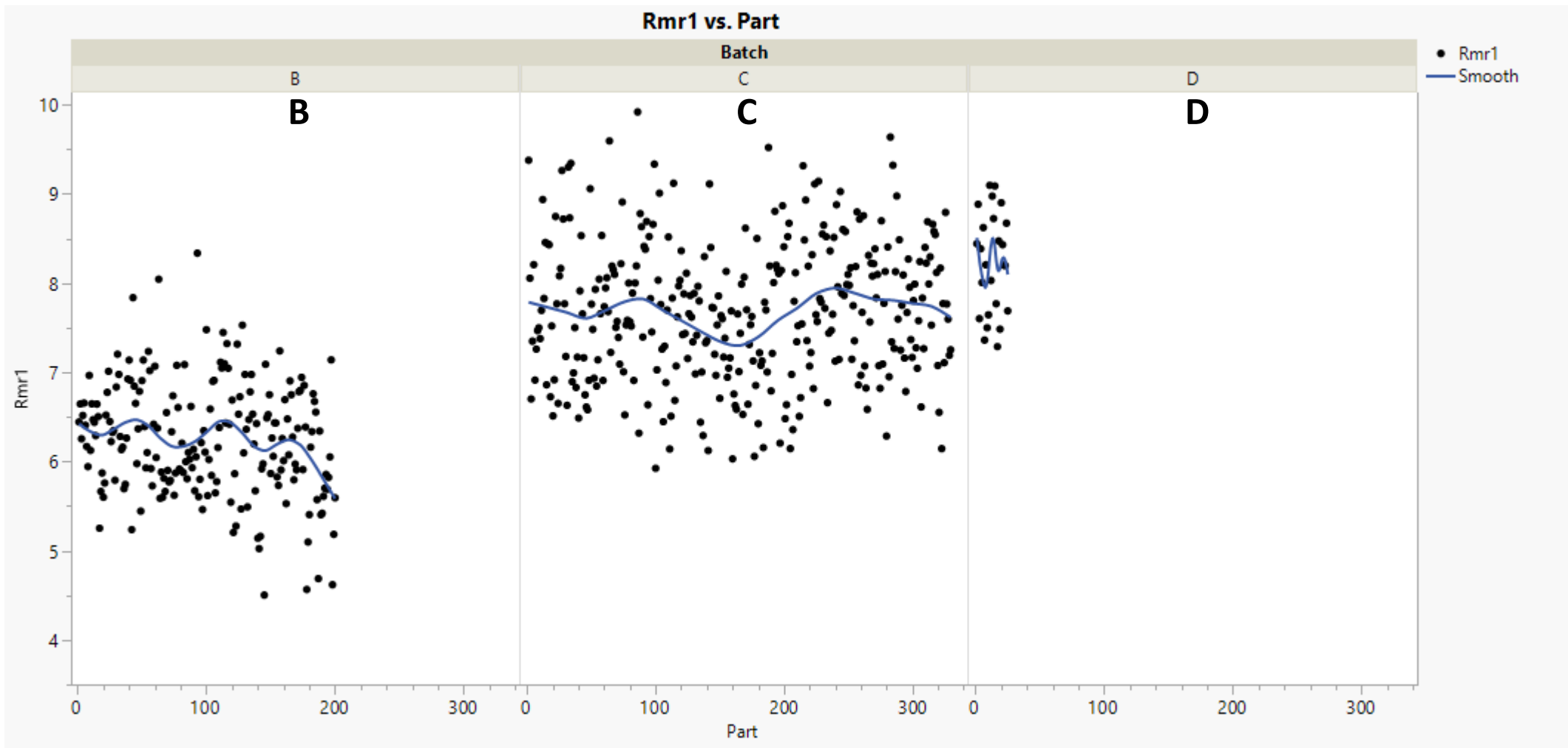


Average

Rk = 0.85

Rk = 1.01

Rk = 0.89

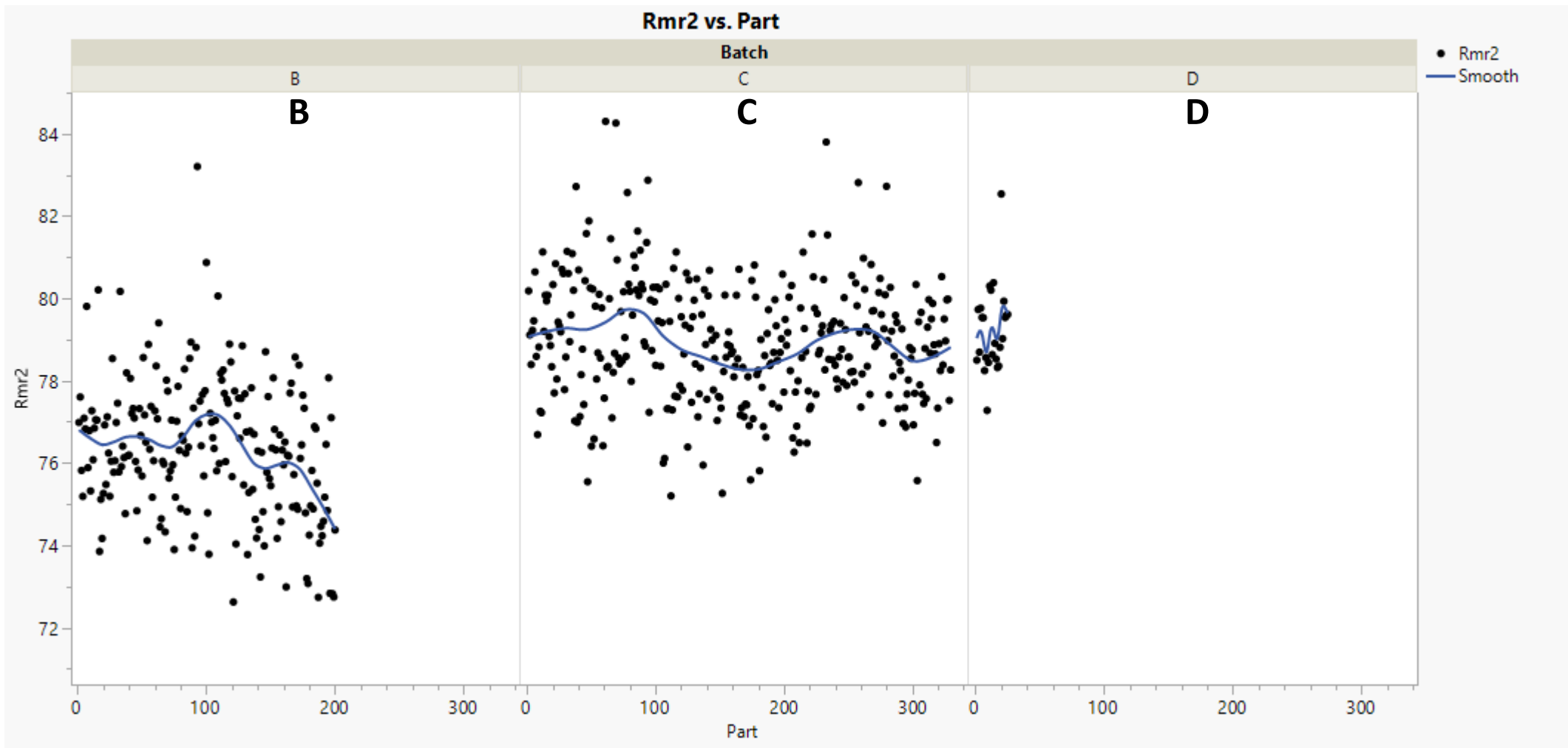


Average

Rmr1 = 6.25

Rmr1 = 7.68

Rmr1 = 8.23

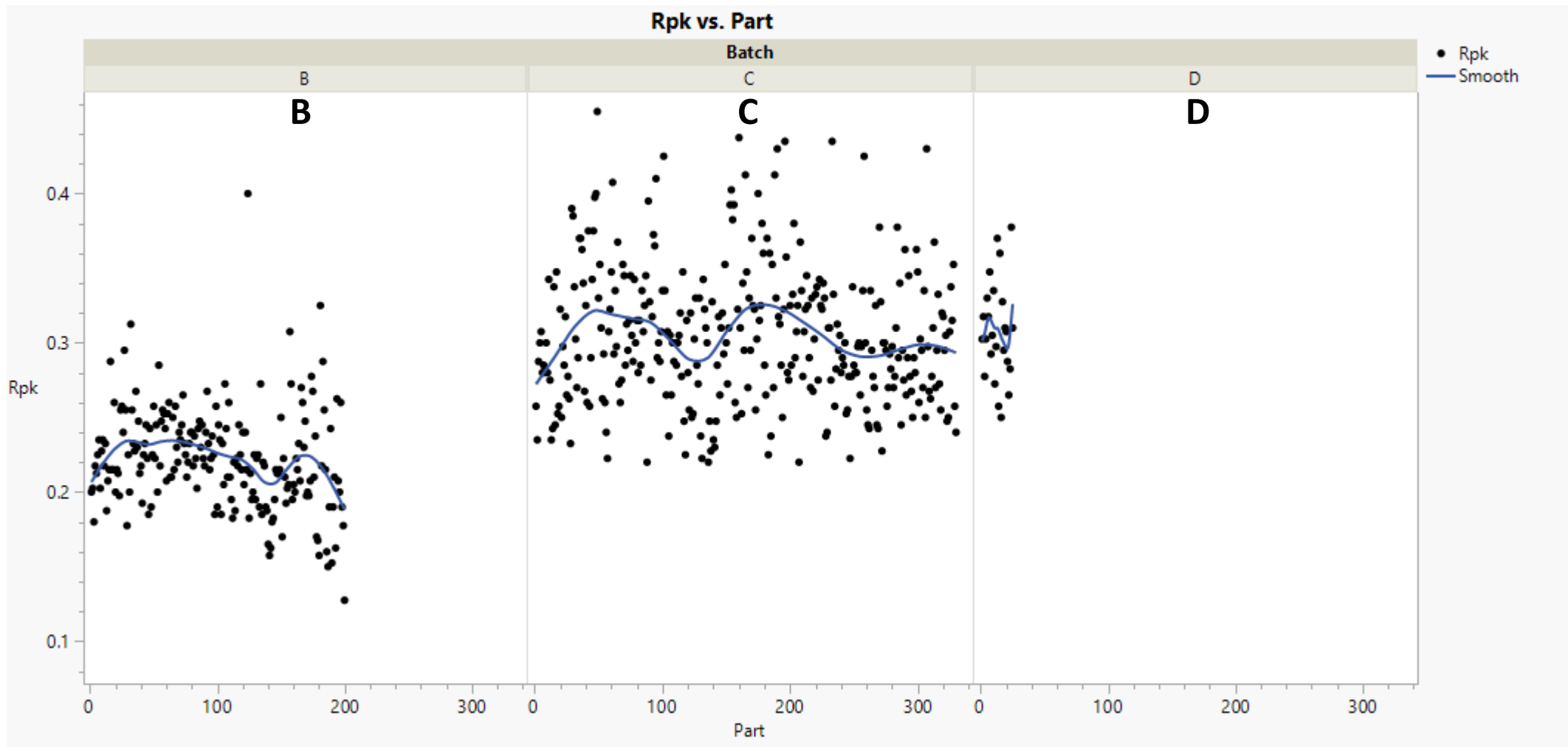


Average

Rmr2 = 76.32

Rmr2 = 78.93

Rmr2 = 79.24

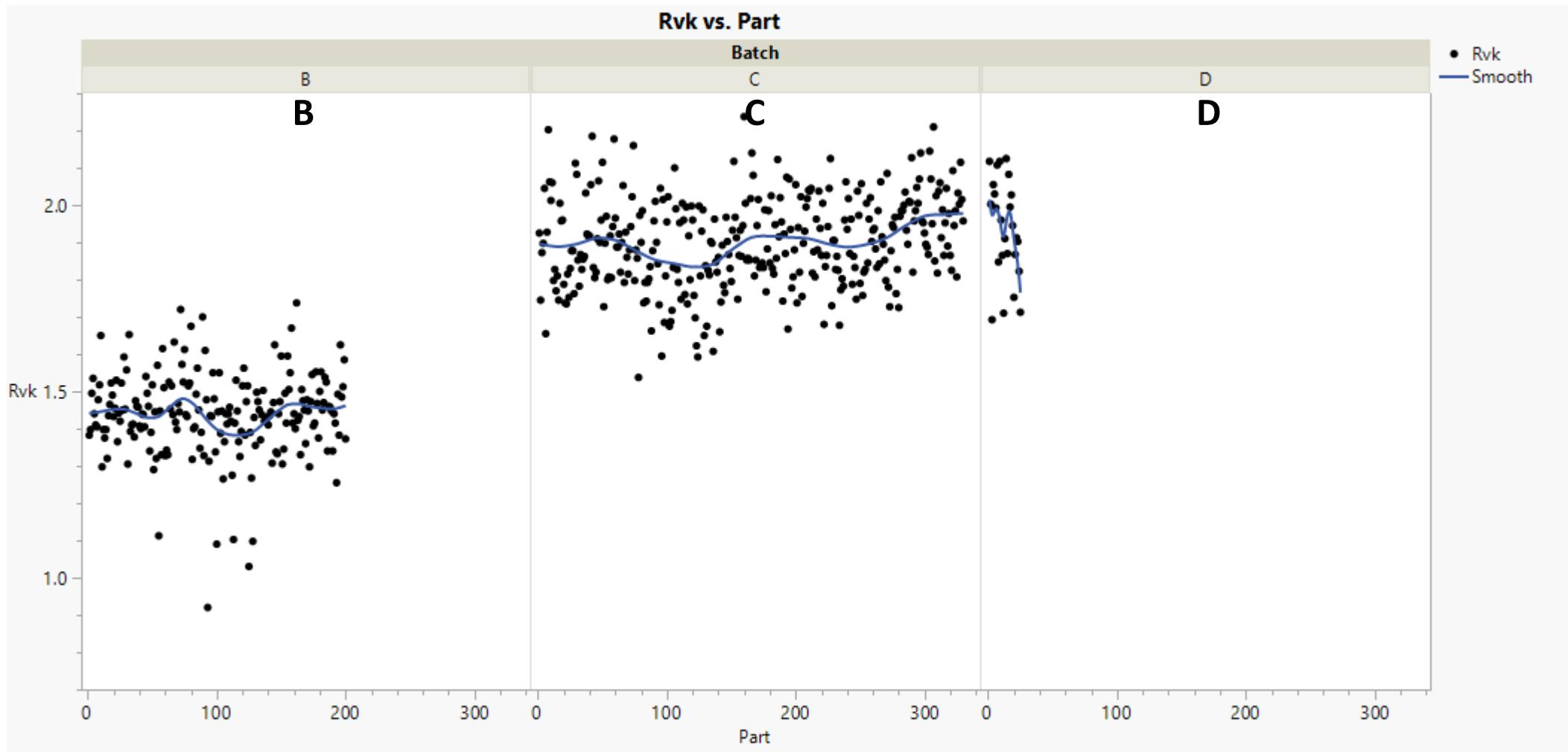


Average

Rpk = 0.22

Rpk = 0.30

Rpk = 0.31

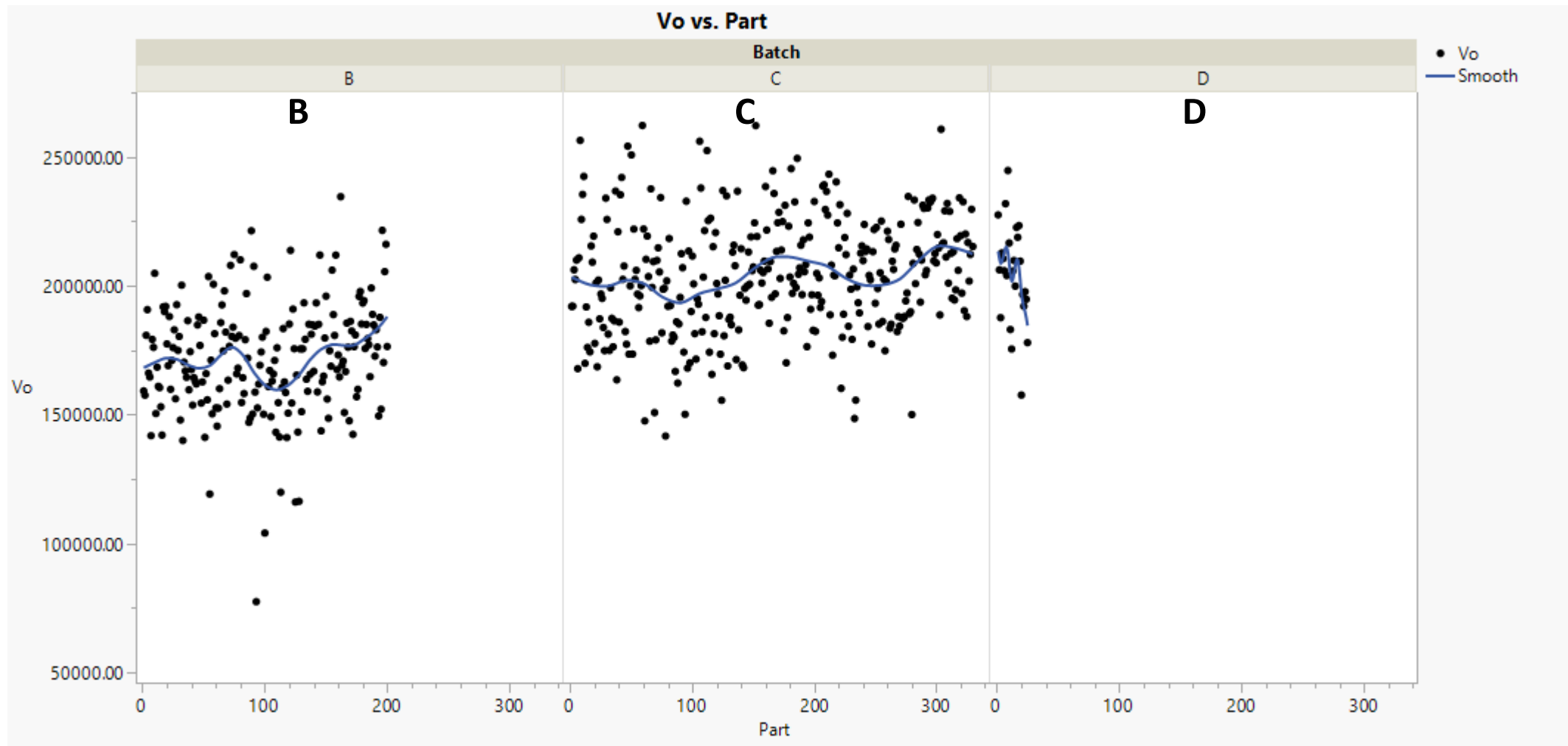


Average

Rvk = 1.44

Rvk = 1.90

Rvk = 1.94



Average

$$Vo = 1.72 \times 10^5$$

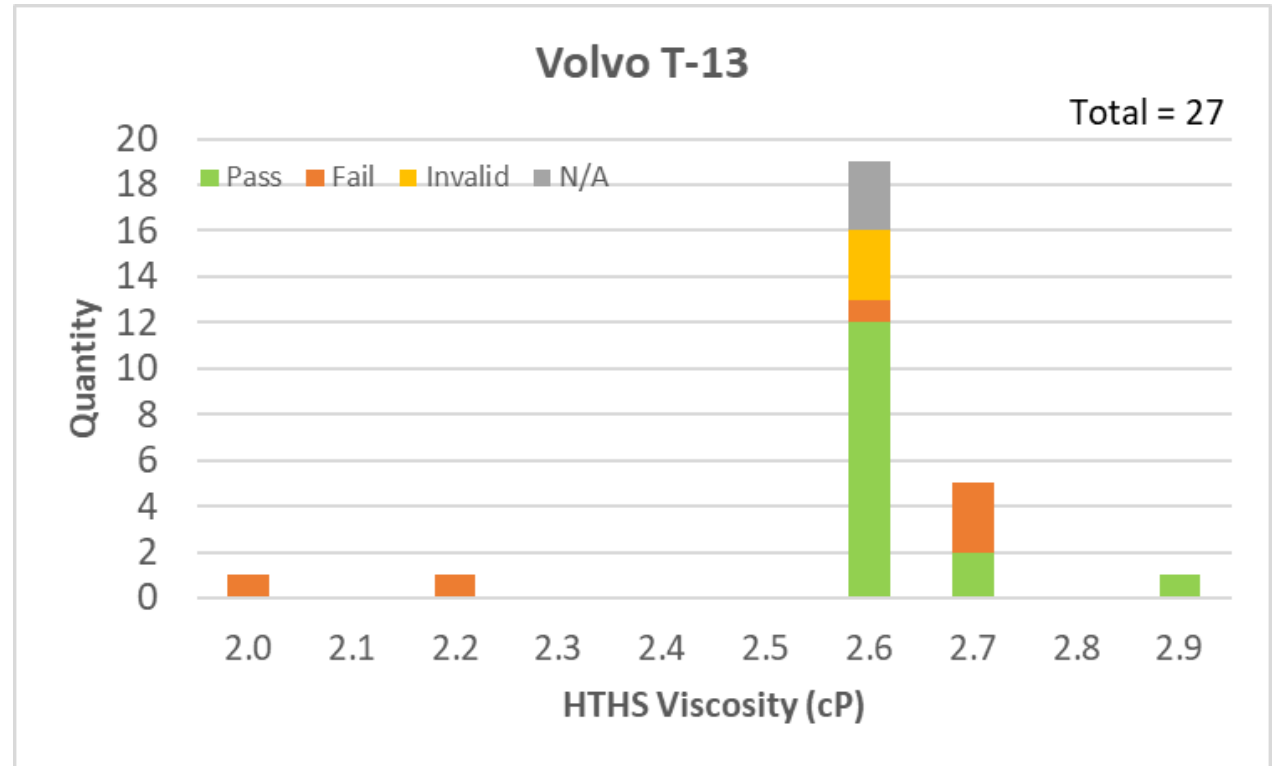
$$Vo = 2.04 \times 10^5$$

$$Vo = 2.05 \times 10^5$$

Low Viscosity Testing in Volvo T-13

Low Viscosity Testing in Volvo T-13 Test

- PC-12 NCDT is trying to determine if the tests from PC-11 are capable of running at viscosities down to 2.6 cP HTHS
- A survey collected data for each test type to determine the experience level in these tests around 2.6 cP HTHS
- The data collected for the Volvo T-13 is shown to the right.
- PC-12 NCDT has asked this Surveillance Panel if this data is enough to suffice for proving that the Volvo T-13 is capable of running at this viscosity grade.



- Volvo T-13 was able to complete a test down to 2.2 cP HTHS
- Note: There were 3 invalid tests that did not complete the 360 hrs:
 1. Terminated early due to excessive oxidation
 2. Intake Valve Failure
 3. No comment with submission

Low Viscosity Testing in Volvo T-13 Test

Questions from NCDT

- Is the test capable of running to completion on low viscosity oils? **Yes**
- Would low viscosity oils be expected to contribute to a higher than normal rate of invalid/uninterpretable tests? **No**
- Would low viscosity oils require any modification to the procedure with respect to either hardware or test cycle? **No**
- Would low viscosity testing contribute to an increase in consumption of test parts compared to high viscosity testing? **No**
- What level of prove-out testing would the SP recommend to provide confidence in running the test at low viscosity? **Enough testing already completed, through experience provided.**
- Does the test sponsor support the capability of the test running on low viscosity?
- Any additional comments or suggestions for proceeding with evaluating low viscosity capability.

Mack T-11/T-12 Parts

Mack T-11 / T-12 Parts

Current Parts Batch

	Mack T-11	Mack T-12
Top Ring	W	X
2 nd Ring	W	X (limiting part)
Oil Ring	W	X
Piston Crown	E (limiting part)	FsubE
Rod Bearing	Y	Y
Main Bearing	P	P
Liner	W	W
Skirt	B	B
Kits left at TEI as of Oct 2022	4	22

- We are starting to get low on parts for both the Mack T-11 and Mack T-12 at TEI, need to start thinking about steps to keep these tests active

Mack T-11 / T-12 Parts

Future Parts Batch

	Mack T-11/T-12	Part As of Aug 2022	Projected Good Parts	Projected Good Kits	Parts Used in Current Kits	Projected Available Kits
Top Ring	Y	2120	2120?	353		353
2 nd Ring	Y	2000	1860	310		310
Oil Ring	Y	2000	1920	320		320
Piston Crown	F (subgroup TBD)	1998 (sub A excluded)	1958	326	28 kits	298
Rod Bearing	Z	2000	1900	317		317
Main Bearing	Q	450 kits	360 kits	360		360
Liner	W	2264	2038	340	28 kits	312
Skirt	B	2064	1961	327	28 kits	299

- Current Purchase Rate is 50-60 kits from TEI per 12 months.
- There is currently 5-6 years of parts left at TEI for Mack T-8/T-11/T-12

Mack T-11 / Mack T-12 Reference Status

Stand status based on LTMS:

	Lab A	Lab B	Lab D	Lab G
Referenced	Stand 4 Referenced on 9/2/22 (expires 7/2/23)		Stand 1 Referenced on 9/4/22 (expires 7/4/22)	Stand 4 Referenced on 8/9/22 (expires 6/9/23)
Not Referenced	Stand 9 (Expired) Referenced on 10/6/21	No Referenced Stands since 2020		

Is there enough hardware available to get through this reference period?

Can coordinated referencing be planned for in next reference cycle in 2Q2023?