

Report of Meeting
L-37-1 Surveillance Panel Conference Call
September 30th, 2021

Attendees:

SwRI -	Warden , Kostas
Lubrizol -	Venhoff, Slocum , Bealko,
Afton -	Sangpeal , Bell, Dvorak
Intertek -	Lange , Chadwick
TMC -	Beck
ExxonMobil -	Banas
BASF -	Goyal , Mosher
Dana -	
Meritor -	LaBond, Carter
Army -	Comfort
AAM -	
Oronite -	Martinez

Voting Members in **BOLD**

Notes from myself below and the slides and resolutions from Travis appended.

Slide 6

- Intertek verified ratings and no anomalies in operational data
Ok with removing those results

- Martin ok in excluding them but possibly have a way to code it in the TMC data base to highlight it for future analysis and how to handle in LTMS
- This oil most fail at least one parameter for J2360
- Do we remove all 4. some concern on removing Lab A
 - Leaving Lab A what would that spread look like
- Overall thoughts remove all four but keep in mind Lab A data point in future analysis when we have more data

Slide 7

- Consensus is to reduce data set of nonlubrited

Slide 8 - Limited Data for Lubrited

- May need to understand severity adjustments within a stand and a lab
- Overall thoughts use all lubrited data set
 - Look into hardware severity dependence

Slide 9 - Adjusted Std Dev

- Martin possibly in favor of adjusting limits versus std deviation
- Overall thought one way or the other ok std deviation/limits

Slide 10 - Lab G rippling data

- Remove 152's
- Keep the 134's
- Experiment in the future of combining the rippling and ridging in target setting

Slide 11 - Variability in 134 NonLubrited

- Martin suggests acceptance band on spitting.
- Need to individually go through each ref. oil/hardware create a go/no go acceptance bands
 - No zi/ei charting for this parameter

Slide 12 - No std dev needed if using acceptance bands

- Nonchartable runs used for target setting during industry dedicated runs
- Can those runs be changed to chartable after hardware approval?
 - Can TMC check to see how many runs would be changed to chartable due to hardware approval runs

Respectfully submitted,

Robert Slocum

L-37-1 Surveillance Panel Chairman

L37-1

Target Data Set Review

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FUELS & LUBRICANTS RESEARCH

Statistics Group

- Jo Martinez, Chevron Oronite
- Martin Chadwick, Intertek
- Todd Dvorak, Afton
- Dylan Beck, Test Monitoring Center
- Travis Kostan, SwRI
- Rob Slocum, Lubrizol
- Wes Vehhoff, Lubrizol



Background and Objective

- On August 11, 2021, Surveillance Panel met to discuss the differences between a Zi/Ei LTMS calibration system vs. the current Yi system.
- In order to properly assess the impact on labs, more feedback was needed by the statisticians on the proper data set to include in deriving oil means and standard deviations. Time ran out before these slides could be reviewed on the call, but the SP was asked to review the slides and provide feedback to the extent possible. Lubrizol, Afton, SwRI, and TMC supplied comments, which are included in the presentation.
- The objective of this call would be to discuss the comments and come to a resolution on each of the questions.



Updates to Oil Means and Standard Deviations



The Full Data Set

Statisticians group worked with TMC and labs where necessary to reduce the data set to only operationally valid tests run to the same procedure, which resulted in a total of 128 tests dating back to 01/07/2015.

- 87 Nonlubrited
 - 39 with “04-2014” hardware
 - 24 with “06-2018” hardware
 - 24 with “12-19” or “01-20” hardware
- 41 Lubrited
 - All on “04-2014” hardware
- Reference oils included 134, 134-1, 152-2, and 155-1

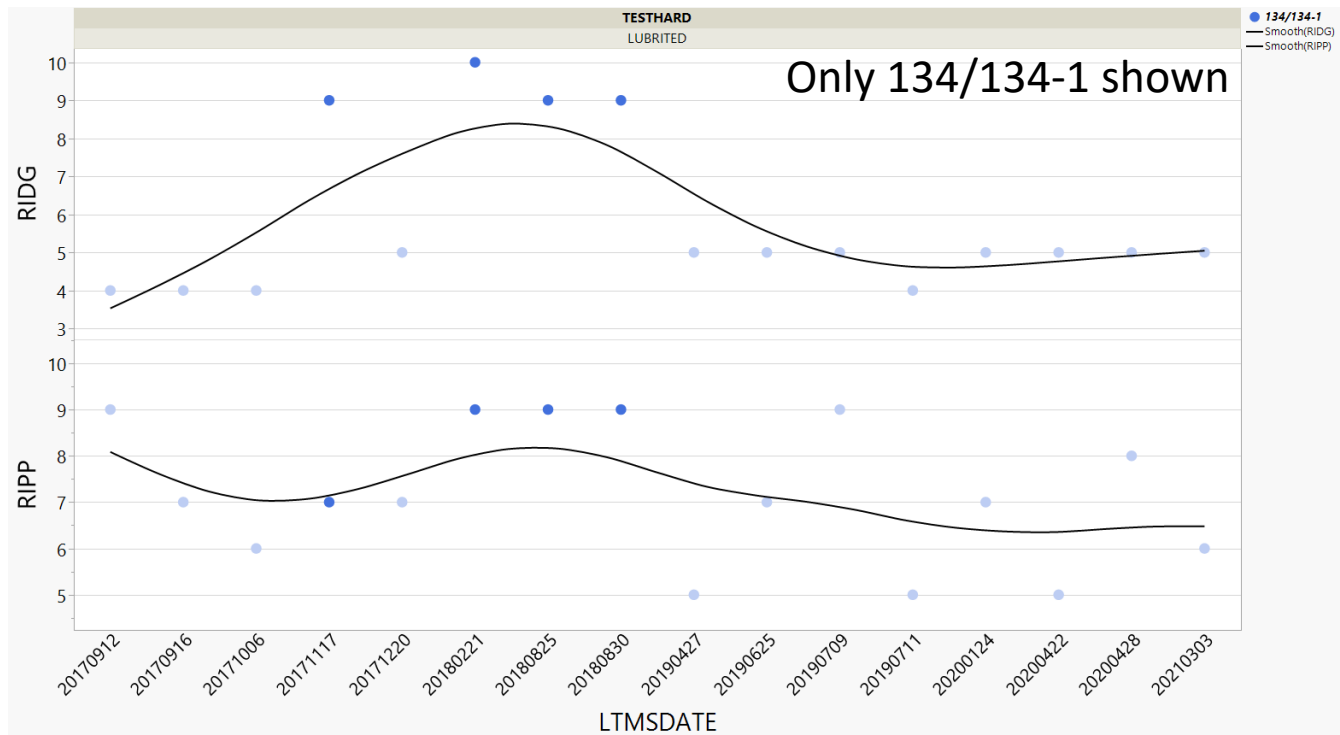


High 134-I Ridging Results

The plots below show some older 134 results which have been included in previous target setting data.

Should results like these be passing calibration tests? If not, can they be removed from target setting for 134-1?

TESTKEY	LTMSLAB	Date	WEAR	RIDG	RIPP	SPIT
114308-L371	A	11/17/2017	7	9	7	9.9
129857-L371	G	2/21/2018	8	10	9	9.9
133018-L371	G	8/25/2018	8	9	9	9.9
133019-L371	G	8/30/2018	8	9	9	9.9



Comments

Afton - Need more information on what caused the outlying result
 Lubrizol - Ok with eliminating 4 tests
 TMC - Ok with these test being removed. Seems to agree with the data set reduction recommendation in slide 26 (Next Slide; #26 from August presentation)
 SwRI - I think we should look at what Rippling was doing for those tests. A lot of time we'll see one or the other below and not both (the rippling could be covering the ridging)

Resolution

Remove all 4 points for current target setting. Revisit these points in the future to see if more cases like this appear and warrant consideration in target setting.



Reduced Data Set

After an initial meeting to discuss target calculations, the statistics group decided to split the data using the following split. Though the split choice is not tied to any test changes, it cleanly separates the data to only include active stands for Labs B and D, while limiting Lab A and Lab G to more recent data. This resulted in a data set including 70/128 data points.

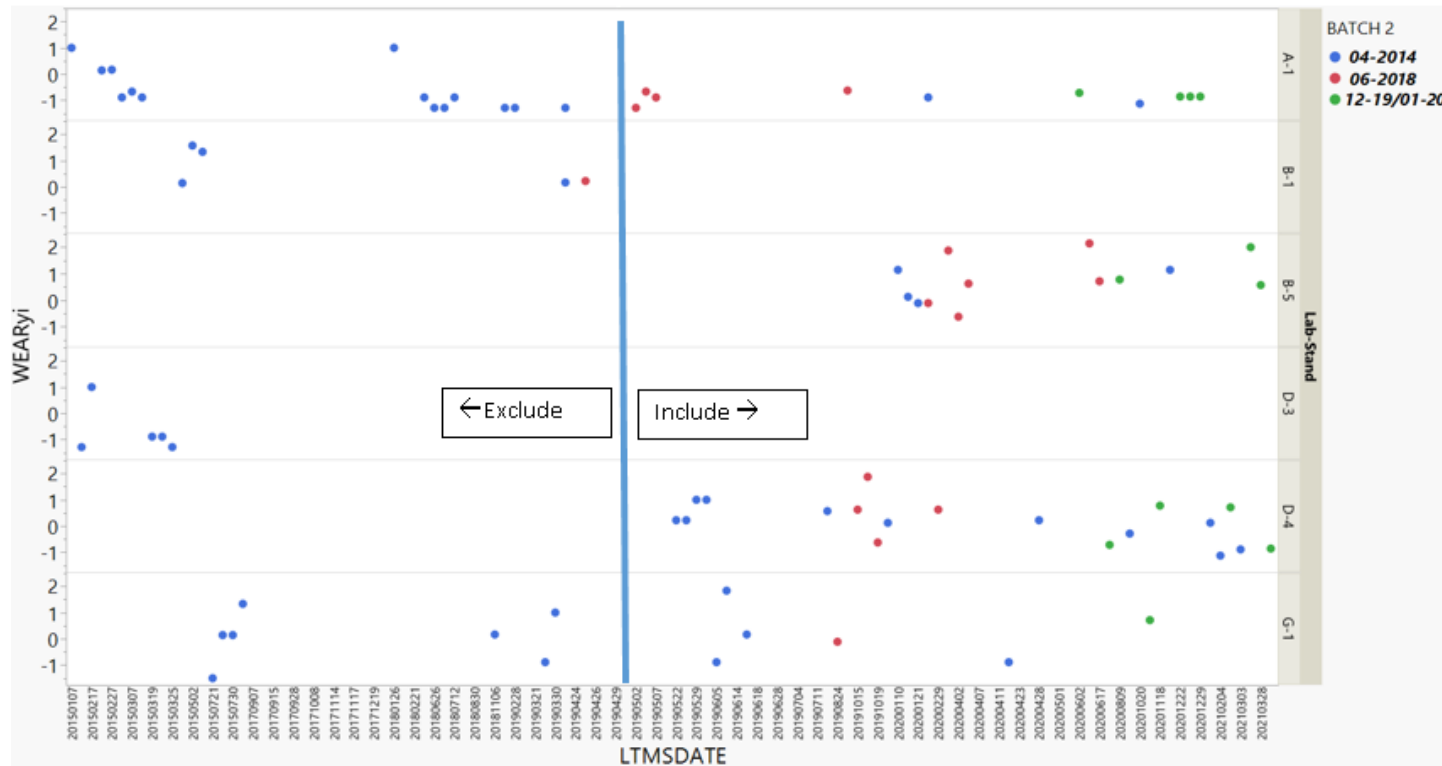
Comments

Afton - How many Lubrified tests would this eliminate?

Lubrizedol - Ok with reduced data set of 70 pts

TMC - OK with reducing dataset at the proposed split

SwRI - I'm OK with it for standard but have concerns for lubrified. We don't have much lubrified data so eliminating some of it make it that much harder to get good data



Is it acceptable to reduce the data set in this way?

Resolution
Split for non-lubricated. No Split for lubricated.



Limited Data for Lubrified

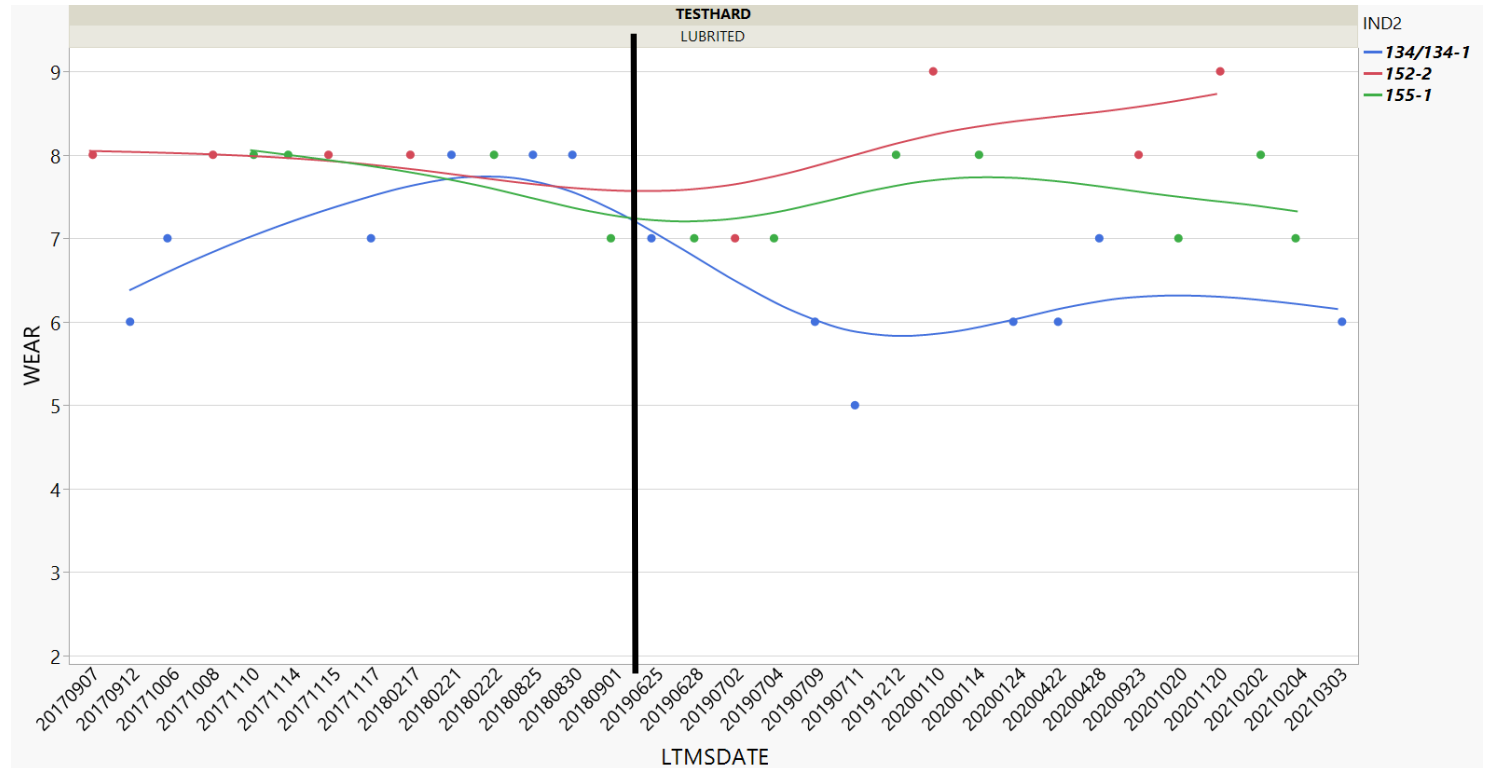
Using, the data split suggested results in very few lubrified data points, in particular for Oil 152-2. Should we...

1. Use a model which combines lubrified and nonlubrified hardware. This increases the number of data points for estimating lab severity, which is appropriate if lab severity shouldn't change with hardware. Oil means will still be adjustment for lubrified vs. nonlubrified using model variables.
2. Use all data for lubrified without a split and predict with a model.
3. Do not attempt to update at this time.

Resolution
Use #2 above since we are not splitting lubrified data. As an additional action item, research if there is any dependence of lab severity on hardware (lubrified vs. non-lubrified).

Comments

Afton - Not Ok with combined Lubrified and Non-Lubrified. I vote for Option 2
Lubrizedol - Ok with suggestion # 2 152 and 155 averages are within a few tenths between all and reduced but 134 averages significant. Ok with pooled standard deviations.
TMC - OK with no split for Lubrified hardware and using the full history of data on this hardware, but not ok with combining lubrified and non-lubrified datasets. Ok with pooling stand deviations together for 152-2 and 155-1.
SwRI - Not OK with combining lubrified and non-lubrified. They're too different to look at with the same lens. I vote option 2.



Ok to Provide Option for Adjusted Standard Deviations?

Due to the integer nature of parameters like Rippling, the stats group may want to provide an option of a small adjustment to the standard deviation. Is this acceptable?

In this example, for standard deviation, by using 0.4, if you have a $Z_i=0.5$, you would be allowed a single "10" on 152-2 or 155-1 without failing. Same goes for a $Z_i = -0.5$ and a result of "8" on these oils. Using 0.33 makes it extremely unlikely to ever pass a value different from 9 under any circumstance.

Oil	Current Mean	Proposed Mean	Current SD	Proposed SD
134-1	7.4	6.71	1.6	1.50
152-2	9.3	9.00	0.5	0.33
155-1	8.7	9.00	0.7	0.33

Resolution
Small adjustments, whether through Std. Dev. Adjustments or limit adjustments, would be acceptable to the panel.

0.4 better?

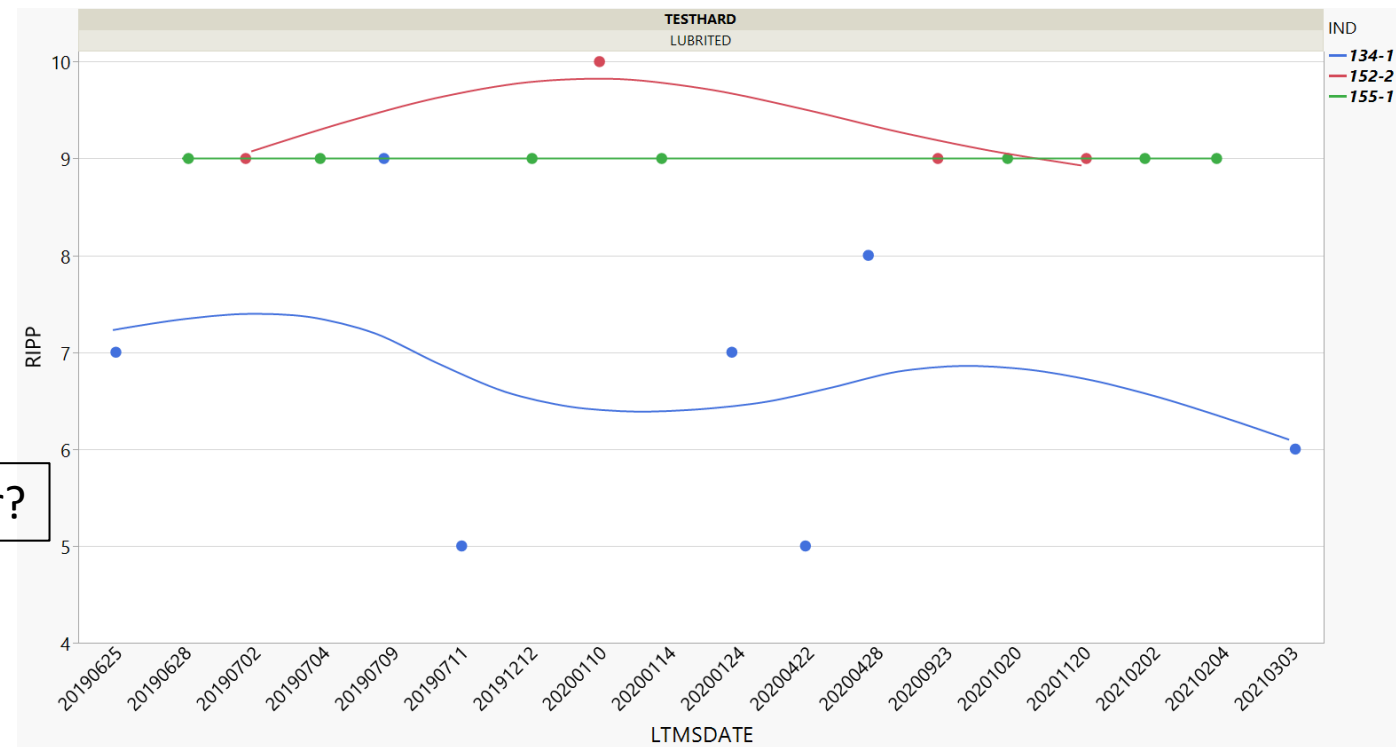
Comments

Afton - Ok with adjusting std dev

Lubrizol - Ok with adjusted std dev

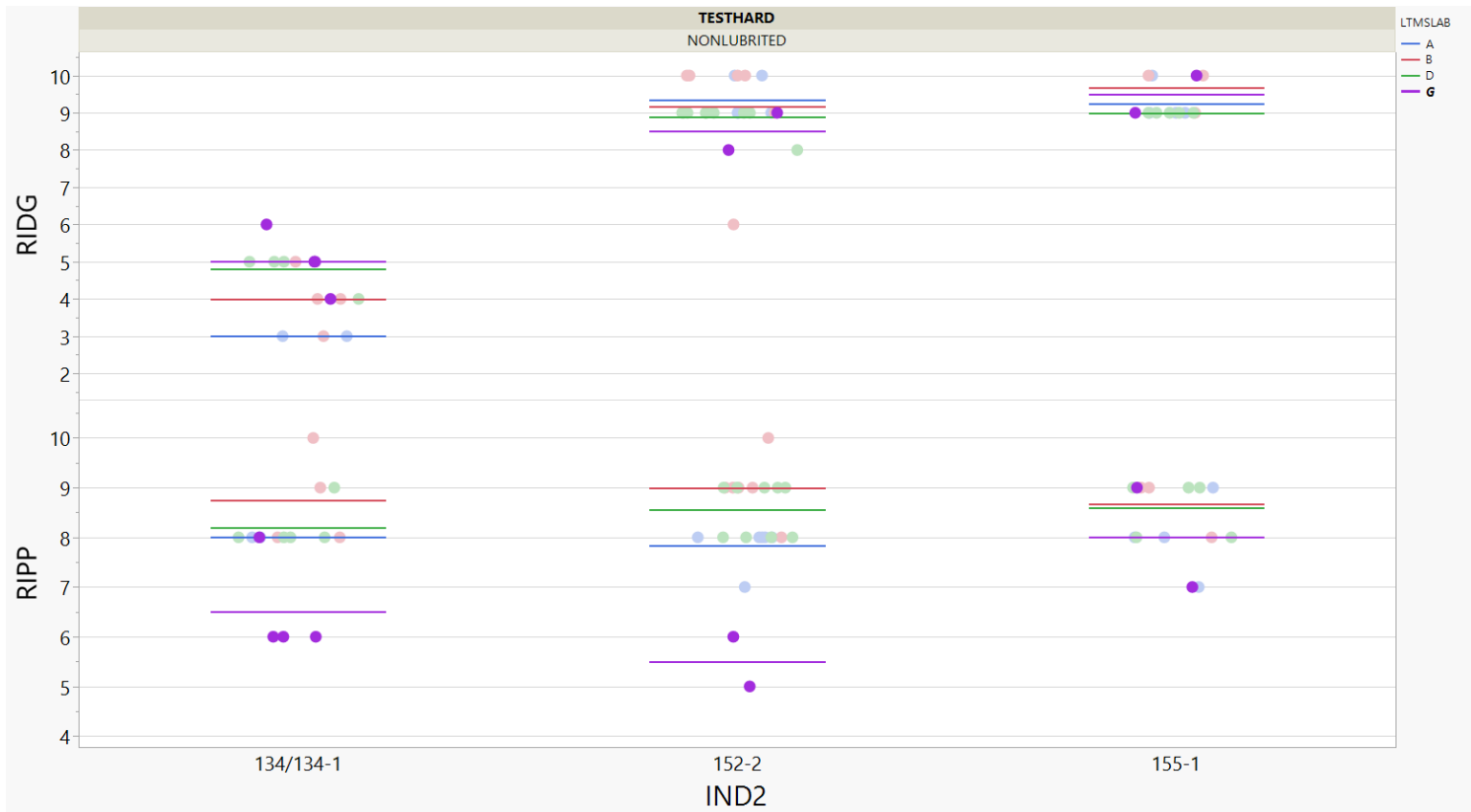
TMC - I have some concern with opening up the range of acceptable results too much so that everything passes for RIDG on 152-2 and 155-1. 10 out of the 11 results for 152-2 and 155-1 are a 9. Do we have to open up the range for the one results that was a 10?

SwRI - OK



How to Treat Lab G Rippling Data

The Lab G data below, half of which are non-chartable but still valid to the procedure, is very different from the other labs for data after May 1, 2019. How should this be treated in target setting?



Full ratings for 5 most severe

Oil	Date	WEAR	RIDG	RIPP	SPIT	Chart
152-2	6/5/2019	7	8	6	9.8	N
134/134-1	6/12/2019	7	6	6	9.9	Y
134/134-1	6/15/2019	5	5	6	8	Y
134/134-1	8/24/2019	5	5	6	9.9	Y
152-2	5/2/2020	7	9	5	9.9	N

Comments

Afton - Why were these tests non-chartable? Need more information

Lubrizol - Ok with including all data but open for suggestions

TMC - The tests are non-chartable. Were they approval runs on a hardware that has since been approved? If so how does lab G's run on the hardware compare to other labs post approval?

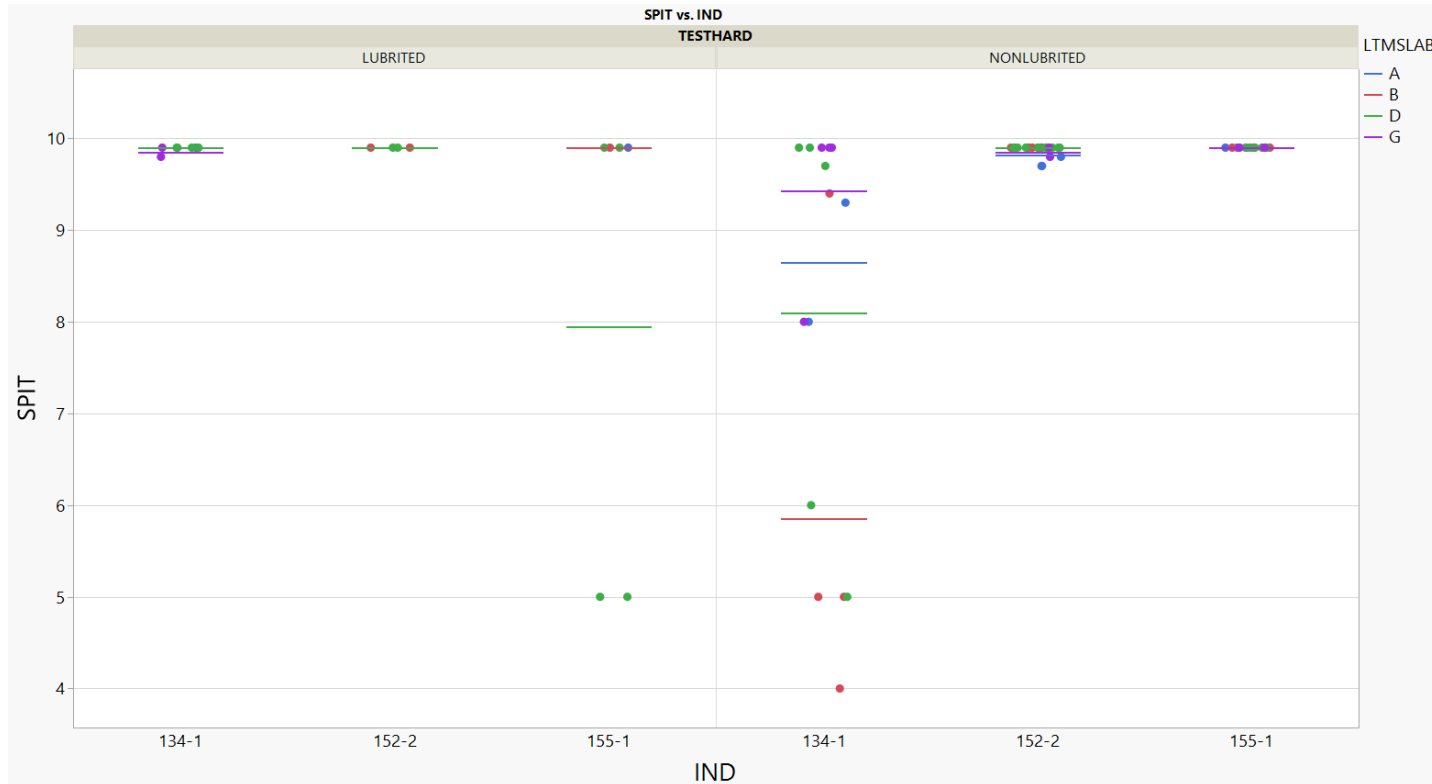
SwRI - Similar to slide 25 above (slide 6 in this presentation). I think we can pigeonhole ourselves not looking at the two together in these cases.

Resolution

Remove 152-2 data points from target setting.
Leave in 134/134-1 data.

Variability in I34-1 Non-Lubricated

Is the variability of results in oil 134-1 acceptable?



Comments

Afton - Need more information on what could have caused the variability

Lubrizol - Not sure what can be done about the variability

TMC - A large range of results with a gap in the middle. I have no good answer. Does the panel have a preference on what they would like to see used for targets in this case? Adjusted mean for upper range or lower range of results? Keep the mean and open up the std to cover a large range or results?

SwRI - I think we should discuss making spitting a non-critical parameter in terms of referencing due to variability.

Resolution

SP will choose "Go/No-Go" acceptance windows at the next meeting for this parameter. Stats group to create plots by oil and hardware to aid in this exercise.

Recommend to Not Have Std. Dev. = 0

For Pitting/Spalling, is it ok to change standard deviations of 0 to standard deviations of 0.10?

Are there other values to consider?

Comments

Afton - OK with making std dev 0.1

Lubrizol - Ok with SD not being zero and recommended

TMC - Ok with changing stdev from 0 to 0.1

SwRI - Agree no zero but see comment above (Previous Slide)

Oil	Current Mean	Proposed Mean	Current SD	Proposed SD
134-1	7.9	7.93	2	2.26
152-2	9.9	9.90	0.1	0.10
155-1	9.9	9.90	0	0.10

Resolution

Standard deviation will not be an issue if moving to "Go/No-Go" acceptance windows.

