

Daimler Surveillance Panel Meeting Minutes

June 24, 2019

2:00 PM – 3:30 PM MT

Face to Face Meeting Held at ASTM D02 in Denver Colorado

(No call in access was available at the meeting)

Call Participants:

Lubrizol - Patrick Joyce (Chairman), John Loop, Bill Oryan, Nick Ariemma, Jim Matasic

Southwest Research Institute – Jose Starling (Secretary), Michael Lochte

Intertek – Juan Vega, Josh Ward, Joe Franklin

Daimler - Suzanne Neal, Daniel Kozub

Infineum - David Brass, Bob Salguiero

Afton – Cory Koglin

TEI – Derek Grosch

TMC – Sean Moyer, Frank Farber, Brittany Pfleegor

Paccar – Jason Anderson

Valvoline – Ed Murphy

ExxonMobil – Steven Jetter

Ford – Mike Deagan

CPChem – Jon VanScoyoc, Tanner Mitchell, Jerry Smith

Agenda Items

Parts Supply Update and Critical Parts Supply

Exhaust Rocker Arm Availability -

TEI has received a small initial order of new rocker arms (quantity of 84 or sufficient for about 14 kits) with p/n A470503634 which will be replacing rocker arm with p/n A4720503234. However these rocker arms are still not available as an order item from the dealer and no set date on when they will become available. Detroit has stated that if you are to use the new rocker arms you can no longer use p/n A4720503034 and must use the replacement A4720503734 (see attached Daimler SP Face to Face presentation for further details). Suzanne stated that their availability should be coming soon as it is not only a part required for this test but also for use in their service network.

Josh Ward made the **motion** *to be able to continue re-use of the current Rocker Arms per Daimlers re-use guidelines until new hardware becomes commercially available*. **Jose Starling** seconded the motion. Motion unanimously passed. See included re-use guidelines attached to these minutes.

It was also discussed whether the rockers should be required to be replaced at all or should the panel simply move at having them be replaced when the labs deem necessary. It was mentioned that some rocker arms had been used for up to 5 tests without issue. The rocker arm replacement is in the build kit list which is specified in the procedure thus a further motion and procedure adjustment would be required. No further discussion on this took place.

Liners and Second Ring New Batch Status-

TEI has received all 4,000 of the new Batch D liners. It was mentioned that based on limited inspections so far this batch of liners has an improved rejection rate in comparison to batch C liners. It was also mentioned that an additional 800 liners are available from Mahle if the panel would like to pursue acquiring those liners. It was discussed that acquiring these liners may be beneficial if they are still available. **Action Item:** Derek and Suzanne are to contact Mahle regarding the status of these additional 800 liners and see if they are still available.

Batch B Second rings were also received by TEI. All measurements so far on these second rings look very similar to previous batch A second rings. TEI explained that there was a high reject rate on the previous batch of second rings due to the oil that was used to coat them which had a finite shelf life. This led to corrosion causing the second rings to be rejected due to rust or staining. TEI has changed the oil being used and will take further precaution on this new batch of second rings to help insure most of the batch is usable.

Critical Batched Parts Quantity

Part	Batch	Qty	Approx. Time Left (years)
Top Ring	B	1,050	2.2
2nd Ring	A	0	0.0
	B	3,000	6.3
Oil Ring	A	710	1.5
Piston	A	627	1.3
Liner	C	0	0.0
	D	4000 liners ~3000 liners with rejection rate	8.3 ~6.3 with rejection rate

Since the new batch of liners and second rings was available it led to discussion on when coordinated references should take place and who would be participating. Intertek mentioned they are ready to run reference on the new hardware as soon as possible. Lubrizol mentioned they still have hardware remaining but are also ready to participate in the coordinated reference runs if needed. Southwest stated they still had hardware and may not be in a position to participate in the coordinated references. It was agreed that another meeting would be held in a few weeks to further discuss coordinated references and who will be participating. **Action Item:** Patrick to coordinate next panel meeting.

Alternative Fuel Supplier Request

There has been a request from Haltermann to be an alternative fuel supplier for the DD13 Scuffing test. The panel was asked what would be required in order to bring in this alternative supplier. It was mentioned that a larger group involving the various HD test panels would be getting together in the future to discuss potential requirements or considerations which may be similar among tests to bring in an alternative fuel supplier. **Action Item:** Bob Campbell to lead this group and coordinate meeting with necessary parties including panel chairs and OEM

representatives. Meeting date was not specified (expected in Q3 of this year), however this topic will be tabled until that meeting has taken place.

Rater Data Discussion and Rater Requirements

Review of the data from the Daimler SP Rater workshop from 2017 shows that there may be improvements that could be made to increase the accuracy of the ratings and perhaps remove un-necessary items from being rated. Please see attached “2017 Daimler SP Rater Workshop” presentation by Lubrizol. At the moment there is no criteria as to who can rate DD13 Scuffing test hardware. The data from the workshop shows that there is decent variation between a small number raters which are both high and not high volume raters. This data outlines that perhaps more training is required for raters or that there should be specifications on who is allowed to rate these components.

The oil control ring scuffing data also shows a very large variation. It was brought up that the surface area to be rated on the oil control ring is extremely small and very difficult to rate which is likely causing the difference in results. This rating parameter could be removed since data doesn't seem to be useful, however the panel was asked to reconsider additional training instead as perhaps the data may be useful in the future.

It was mentioned that the desired test parts to be rated could be sent to the October rating workshop and results from that data be sent out to the group. At that point the panel could set limits and specify this in the procedure as rater requirements. **Action Item:** The labs are to acquire and coordinate the necessary test parts to be rated in the October rating workshop.
Action Item: Patrick is to coordinate with internal statistician to see if he could take a look at any new data produced.

Exhaust Measurement Location Procedure Clarification

Sean brought up that the wording in section 8.6.3.4 of the exhaust pressure in tailpipe and CO2 placement did not align with the corresponding Figure A.15. It was stated that it is difficult to see in the figure, however the position of these items do meet the wording requirements. **Action Item:** Patrick will be updating the image in this figure so that it is can increase the accuracy in how this is depicted and avoid confusion.

Next Meeting:

Next meeting will take place the week after 4th of July with exact date/time to be sent out at a later date.

DAIMLER

Daimler SP Face-to-Face Meeting
June 24th, 2019

Daimler Trucks



Agenda

Test Parts

- Exhaust Rocker Arm Availability – Suzanne/TEI
- Critical Parts Quantities – TEI
- Liner and Second Ring New Batch Status – Suzanne/TEI

Alternate Fuel Supplier Request – Surveillance Panel

Ratings and Rater Requirements – Patrick

Exhaust Measurement Location Procedure Clarification – Sean Moyer

Walk On Topics

Alternative Fuel Supplier

Request from Haltermann to be an alternative fuel supplier for the DD13

Scuffing Test:

- Panel Discussion

Exhaust Rocker Arm Available

Update: (June 14th, 2019)

- **Rocker Arms:** We have received some of the new rocker arms, p/n A4720503634 which will be replacing A4720503234. Detroit has stated that if you are to use the new rocker arms you can no longer use p/n A4720503034 and MUST use the replacement, A4720503734.
- If any of the labs want some of the new rocker arms so that they can put them into the kits that they already have in inventory, we can charge you for the A4720503234 and A4720503734 rockers minus the cost of the A4720503034 rockers, and we will take them back.

Additional Information Showed During Meeting: 3734 vs. 3034 Rocker Arms

- The 3734 and 3034 are the same except the 3734 has a clearance cut to accommodate a change to the brake rocker. The 3734 can be used universally going forward.



Critical Part Update

Part	Batch	Qty	Approx. Time Left (years)
Top Ring	B	1,050	2.2
2nd Ring	A	0	0.0
	B	3,000	6.3
Oil Ring	A	710	1.5
Piston	A	627	1.3
Liner	C	0	0.0
		4000 liners	8.3
	D	~3000 liners with rejection rate	~6.3 with rejection rate

Liner and Second Ring

“D” Batch Liners:

- Initial rejection rates for Batch “D” liners:
 - 11 of the 39 liners were rejected based on the current specs, improved rejection rate compared to “C” Batch Liners

Second Rings:

- Order placed on April 23rd, 2019 - 3000 pieces received

Ratings and Rater Requirements – Patrick

- Separate Presentation

- See document attached to meeting invite (Thursday, April 04, 2019 2:30 PM-4:30 PM) from Patrick Joyce
- Document Name: “2017 Daimler SP Rater Workshop DD13 Data Summary”

Exhaust Measurement Location Procedure Clarification - Sean Moyer

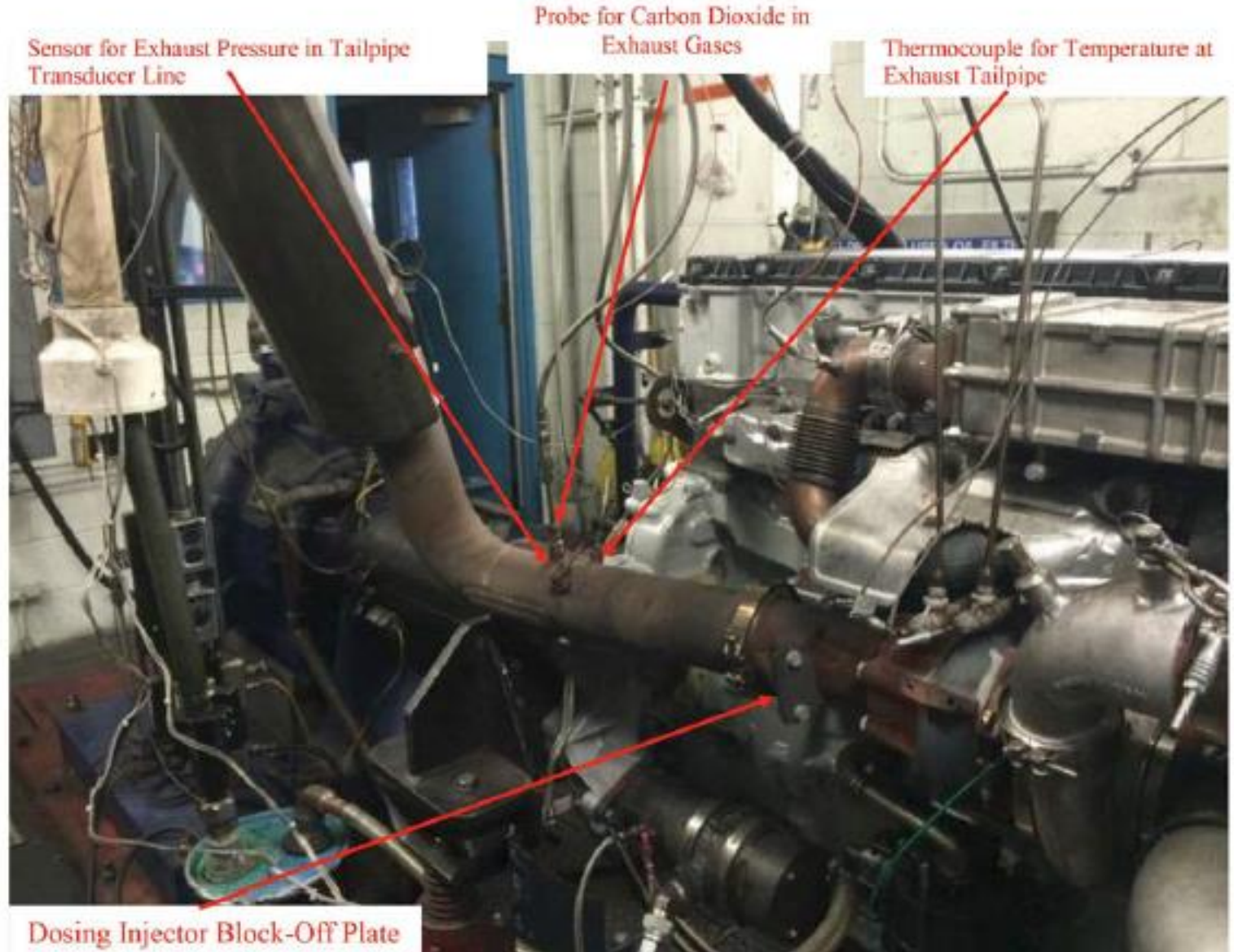


FIG. A4.15 Location of Exhaust Tailpipe Sensors

Additional Information Showed During Meeting:

Screenshot from Meeting Minutes:
- Daimler Surveillance Panel Meeting
Minutes April 4, 2019

Critical Parts Lists for Test Procedure

The DD13 Scuffing test procedure currently calls out the tailpipe temperature location in section 8.6.2.12 which is a report only parameter and the controlled item which is exhaust pressure in tailpipe did not have a location specified. It was proposed that exhaust pressure tailpipe section 8.6.3.4 have a location specified as 270 +/- 50 mm as shown in the attached document and remove the temperature location specification since it is a non-critical parameter. This change will not impact where any of the labs had their current exhaust pressure tap located.

Patrick Joyce made the motion to approve the proposed wording as shown in the attached document "Proposed D8074 Clarification for Exhaust Measurement Locations" and as shown below. Josh Ward seconded the motion. Voting took place in the panel with no negative or waives and thus the motion was passed. This change will be incorporated on the next revision of the procedure but is effective immediately.

Current

8.6.2.12 *Exhaust Temperature in Tailpipe*—Locate the thermocouple in the exhaust pipe approximately 270 mm downstream of the turbocharger outlet. Locate the thermocouple downstream of the exhaust pressure tap, and upstream of the CO₂ probe. Refer to Fig. A4.15.

8.6.3.4 *Exhaust Pressure in Tailpipe (Exhaust Back Pressure)*—Measure in a straight section of pipe upstream of the exhaust tailpipe thermocouple, with a pressure tap hole as shown in Fig. A4.15. Do not locate the tap downstream of either the temperature thermocouple or the CO₂ probe.

Proposed

8.6.2.12 *Exhaust Temperature in Tailpipe* – Locate the thermocouple in the exhaust pipe downstream of the Exhaust Pressure in Tailpipe measurement location and upstream of the CO₂ probe. Refer to Fig A4.15.

8.6.3.4 *Exhaust Pressure in Tailpipe (Exhaust Back Pressure)* – Locate the pressure tap in a straight section of the exhaust pipe 270 +/- 50 mm downstream of the turbocharger outlet. Locate the pressure tap upstream of the Exhaust Temperature in Tailpipe thermocouple and CO₂ probe as shown in Figure A.15.

Daimler Rocker Arms Re-use Guidelines as presented to the Daimler Surveillance Panel

Measure the parts as shown below.

“B” is the original DIA (or close to it)

Exhaust spec: 36.000 – 36.025

Inlet spec: 26.000 – 26.021

“A” is the wear dimension

Exhaust

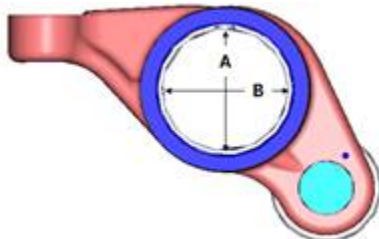
<36.050	Green	Ok to reuse
<36.100	Yellow	Can be reused, but keep an eye on it
>36.100	Red	Scrap

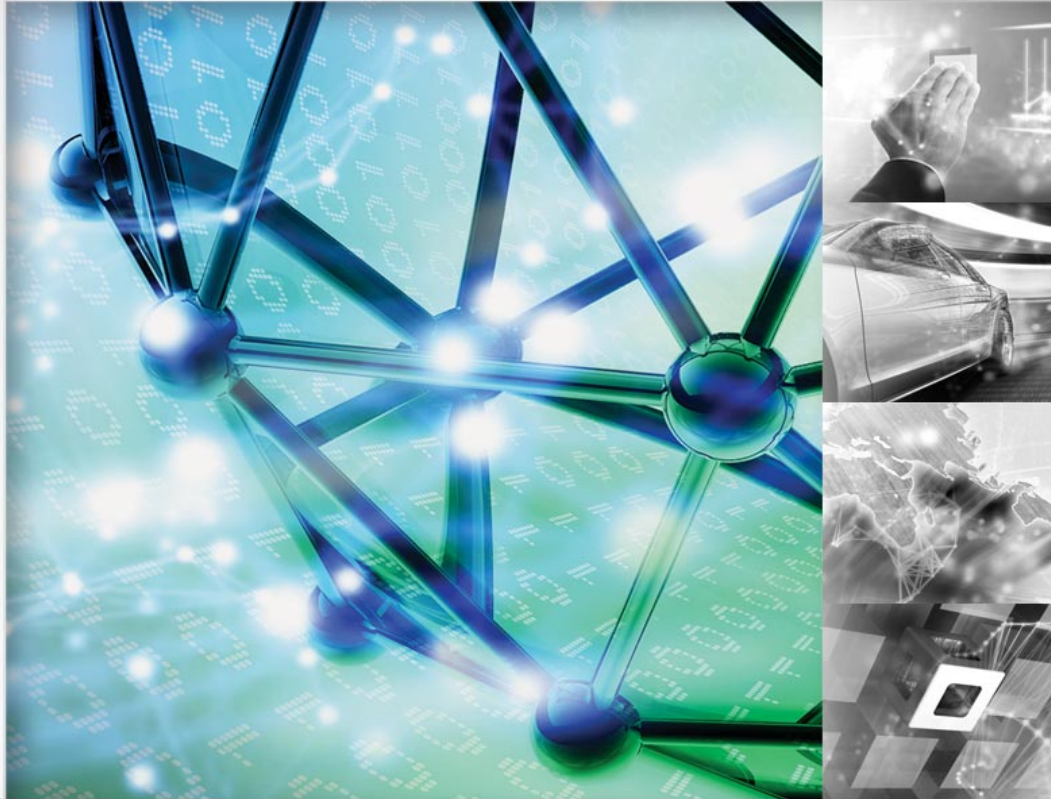
Inlet

<26.050	Green	Ok to reuse
<26.100	Yellow	Can be reused, but keep an eye on it
>26.100	Red	Scrap

A1 and A2 both need to be below the wear limit.

Quick and dirty check without removing them – if they are tight on the shaft when you try to wiggle them, they’re ok.





2017 Daimler SP Rater Workshop DD13 Parts Review

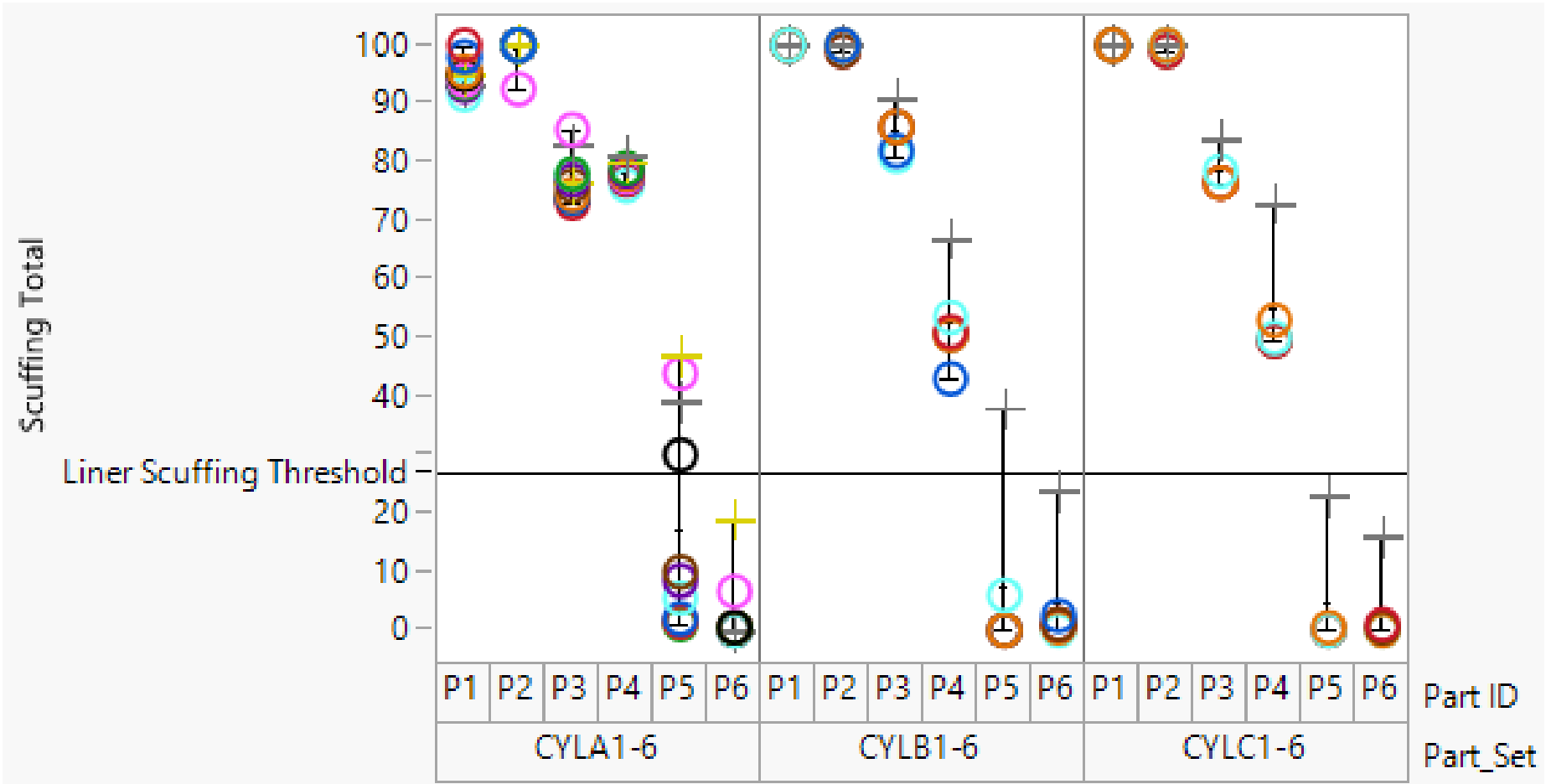
The Lubrizol Corporation
January 2019

Summary



- 3 Sets of DD13 parts were rated at the 2017 HD workshop
 - Raw data can be found here:
<http://www.astmtmc.cmu.edu/ftp/refdata/diesel/dd13/data/rating%20data/>
 - Parts included: Liner, Top Ring, Second Ring, Oil Ring
- Currently D8074 procedure as no requirements on who can rate test parts at EOT
- Objective of this study was to gather data for the Surveillance Panel on parts rating variability of the rating community for reported measurements in D8074

Cylinder Liners



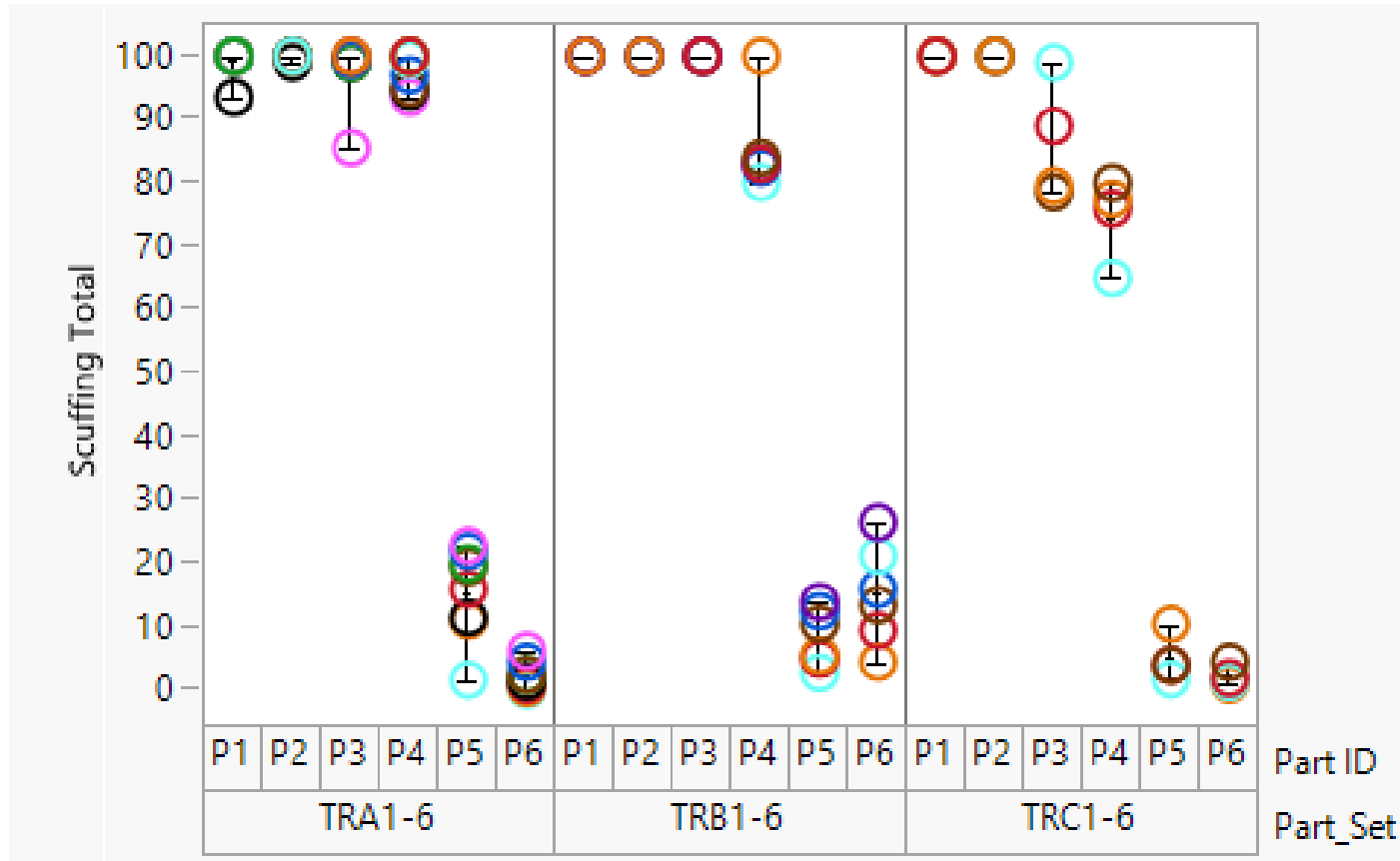
Colors represent different raters

“O” Indicates a High Volume Rater

“+” Indicates Not a High Volume Rater



Top Rings



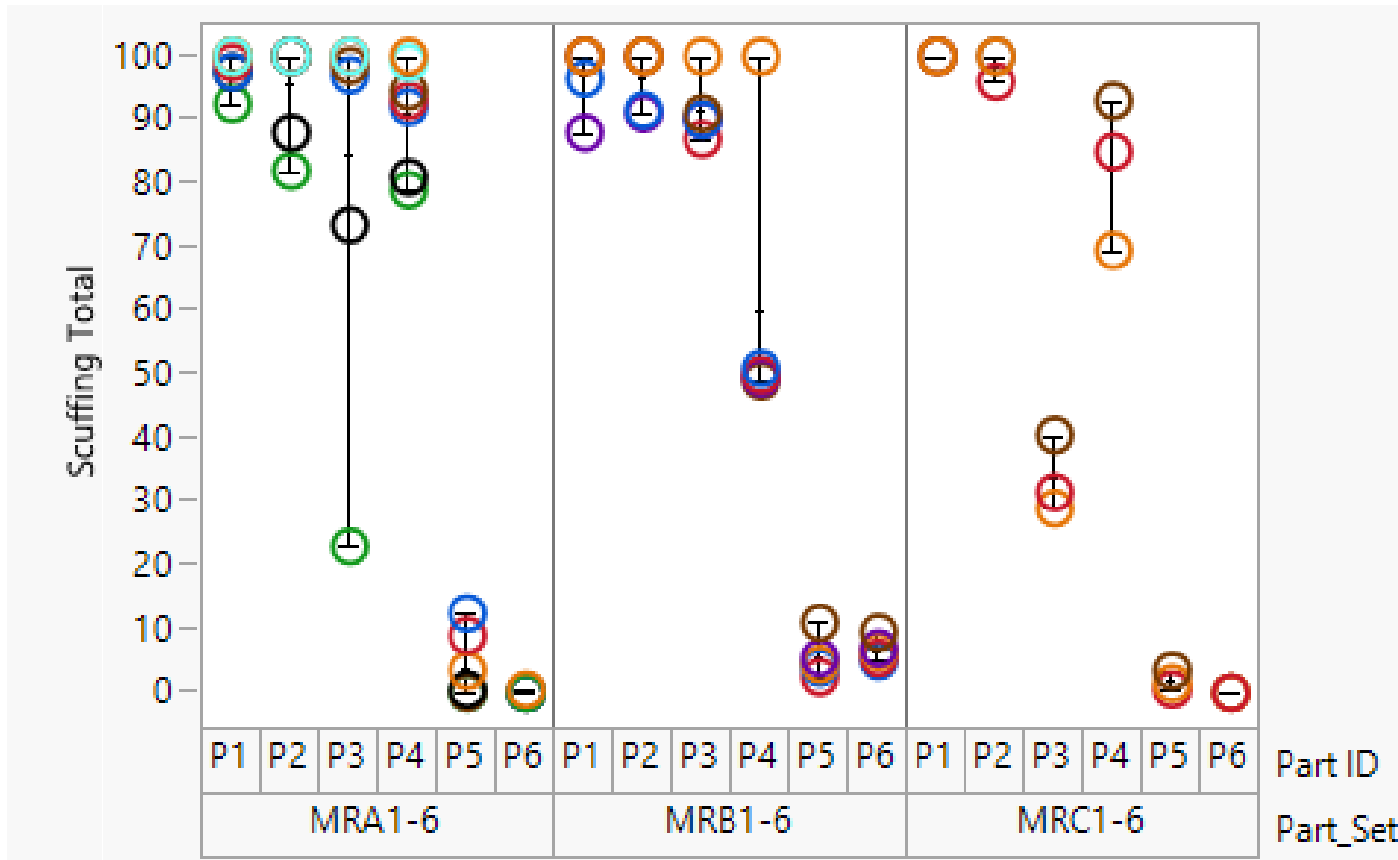
Colors represent different raters

“O” Indicates a High Volume Rater

“+” Indicates Not a High Volume Rater



2nd Rings



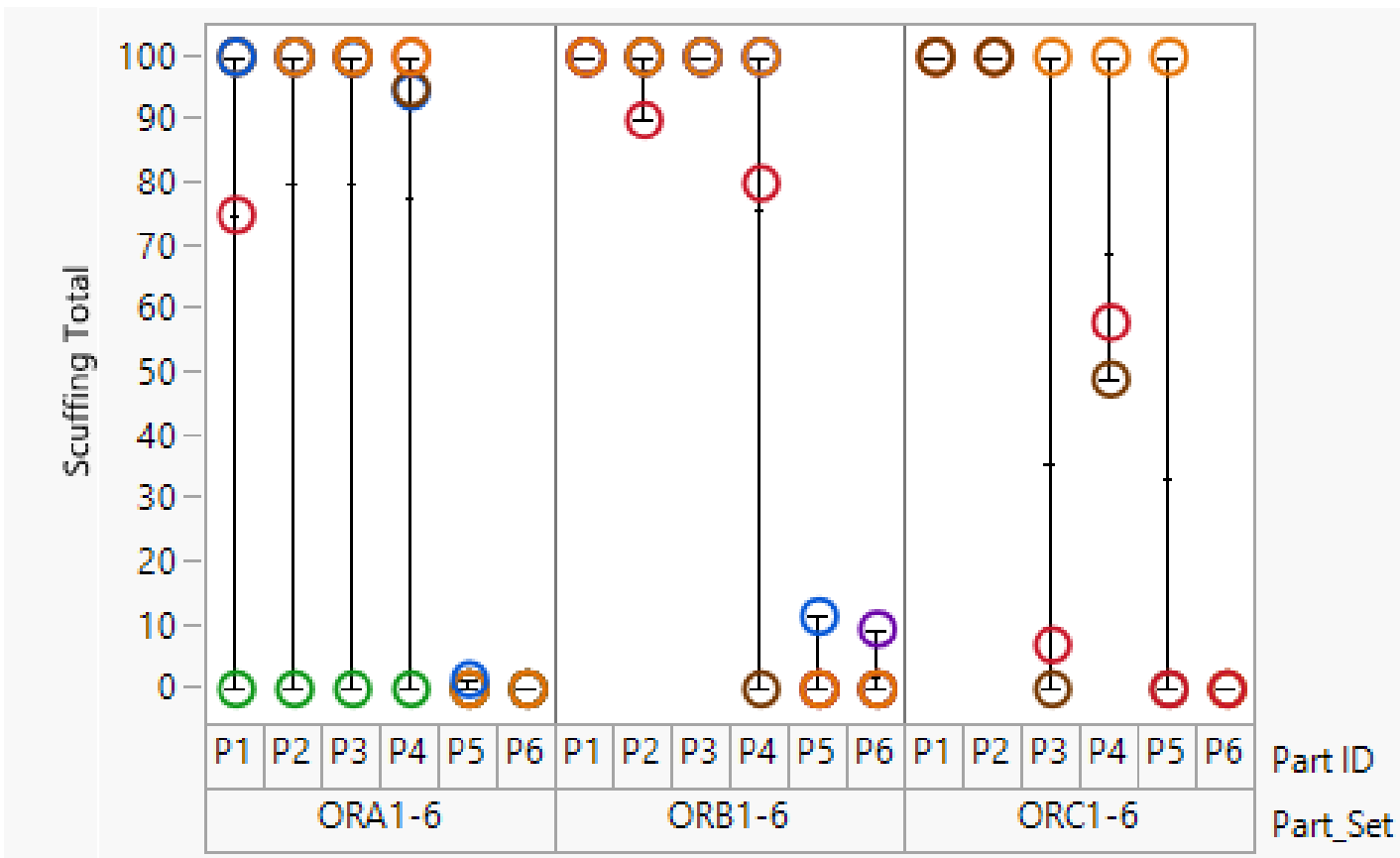
Colors represent different raters

“O” Indicates a High Volume Rater

“+” Indicates Not a High Volume Rater



Oil Rings



Colors represent different raters

“O” Indicates a High Volume Rater

“+” Indicates Not a High Volume Rater





Working together, achieving great things

When your company and ours combine energies, great things can happen. You bring ideas, challenges and opportunities. We'll bring powerful additive and market expertise, unmatched testing capabilities, integrated global supply and an independent approach to help you differentiate and succeed.