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Test Monitoring Center

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MEMORANDUM: 16-053

DATE: December 5, 2016

TO: Sequence V Surveillance Panel

FROM: Richard Grundza

SUBJECT: 50% Piston Varnish Rating Workshop

A workshop was held on 11/30 – 12/1/2016 at Lubrizol to standardize/improve the 50% rating technique to be used for piston ratings in the VH test. A round robin conducted earlier in the year had identified some large differences in average piston varnish ratings at different labs. Raters from the five laboratories that plan to participate in the upcoming matrix had attended this activity, and are listed in Attachment 1. The raters discussed potential reasons for the differences and determined that there were potential differences in the area that was being called 50% of the piston. A template was circulated that accurately shows the 50% area. Some raters wanted to have the option of not using the template and so after careful measurement, it was agreed to rate the area 17 mm from the bottom of the chamfer of the oil ring groove to the bottom of the oil ring chamfer. The chamfer is not to be rated. The raters also agreed that all future ratings will be conducted with oil rings on the piston, similar to what is the VG practice.

The group conducted a calibration exercise using four VH pistons, and then conducted a full set of ratings on the round robin pistons and an additional set of "cleaner" pistons. These data are summarized in Attachment 2. The workshop rating of the round robin pistons had less variability and had moved the one severe result almost a full merit and ratings of the other set of pistons showed similar levels of variability.

REG/reg/mem16-053.reg.doc

ftp://ftp.astmtmc.cmu.edu/docs/gas/sequencev/memos/mem16-053.pdf

Distribution: email

Attachment 1

List of attendees

Brian Foecking	Lubrizol
Vanessa DeCapite	Lubrizol
Johnathon Bolaney attended a work shop)	Lubrizol (has not
Jack Kobrinetz	Afton
Johnathon Cales	Ashland
Tony Barrera	Intertek
Frank Lopez	SwRI

Attachment 2

Data from Round Robin and 11/30/16 Workshop

VH 50 % Rating
Round Robin with LZ Pistons

LZ	IAR	SWRI	Afton
5.57	6.52	6.2	6.19
	6.06	6.34	
	6.45	6.13	
Average	6.343333	6.223333	

Calibration Pistons

Rater (initials)	A	B	C	D
AB	7.14	7.01	7.3	9.09
BF	7.45	7.69	7.78	9.5
JK	7.6	7.49	7.56	9.22
JB	6.95	7	6.72	9.2
VDC	6.89	7.18	7.05	9.15
FL	7.6	7.23	7.82	9.6
JC	6.86	7.16	7.3	8.7
Average	7.21	7.25	7.36	9.21
s	0.33	0.25	0.40	0.29

Rating activity	LZ Pistons								
Rater (initials)	1	2	3	4	5	6	7	8	Average
JK	6.13	6.82	6.36	6.22	7.12	6.52	6.42	6.44	6.50
JC	6.2	6.85	6.27	6.49	7.47	6.79	6.14	6.3	6.56
VDC	6.47	7.25	6.57	6.15	7.59	7.45	7.43	6.91	6.98
BF	6.47	6.61	6.32	6.6	6.8	6.54	6.2	6.49	6.50
FL	6.42	7.52	6.47	6.35	7.16	7.01	7.17	6.24	6.79
JB	6	6.73	5.37	6.03	6.91	6.49	6.63	6.35	6.31
AB	6.52	6.74	6.43	6.81	7.28	6.99	6.69	6.68	6.77
Average	6.32	6.93	6.26	6.38	7.19	6.83	6.67	6.49	6.63
								s	0.22

Set 2

	LZ Pistons								
	1	2	3	4	5	6	7	8	Average
JK	8.88	9.26	9.06	8.96	9.5	8.97	8.98	9.16	9.10
JC	9.01	9.24	9.45	9.4	9.76	9.31	9.22	9.28	9.33
VDC	9.02	9.25	9.25	8.88	9.48	8.65	8.74	9.143	9.05
BF	9.26	9.5	9.16	8.87	9.68	9.35	9.34	9.11	9.28
FL	9.13	9.4	9.36	8.99	9.67	9.31	9.42	9.42	9.34
JB	8.8	8.96	8.81	8.59	9.35	8.65	8.82	8.94	8.86
AB	8.99	9.1	9.18	8.9	9.46	9	9.24	9.13	9.12
Average	9.01	9.24	9.18	8.94	9.56	9.03	9.11	9.17	9.16
								s	0.17