

Deposit Workshop Meeting Agenda

June 14, 2016

Spring Hill Suites – Bakery Square
Pittsburgh

TMC Comments – Frank Farber

Frank Farber started the meeting at 8:30 a.m. and thanked everyone for taking the time to attend the meeting. The Attendance is shown in **Attachment 1**. He then presented the overview of the meeting (**Attachment 2**). The intent of the meeting is to better meet industry needs with the Rating Workshops.

History on Workshop Format – Scott Parke

Scott Parke presented a brief history of the rating workshops (**Attachment 3**), which was also provided as a handout.

Test Method Workshop Attendance Requirements –Jeff Clark

Jeff Clark reviewed the various test method requirements for the raters and workshop attendance (**Attachment 4**).

Data Analysis Presentation Revisions –Jeff Clark and John Hrizo

Jeff Clark presented (**Attachment 5**) the general format of rating workshop data review sessions and some proposed changes to review sessions and data screening that are the result of some post workshop feedback. John Hrizo provided (**Attachment 6**) examples of a data review and the practical impact of the proposed changes. There was general consensus to adopt the proposed revisions.

Parts Availability –Michael Kasimirsky

Attachment 7 contains Michael Kasimirsky's presentation on parts availability. Due to space and time concerns as well as low level of interest, it is proposed that "off workshop" parts not be included at future workshops. This means the LD parts will not be offered at the HD workshop and vice versa.

Workshop Rater Population – Frank Farber

Frank Farber opened the discussion (**Attachment 8**). There are three populations of raters at a typical workshop: lab, field, and untrained raters. The concern is, moving forward, figuring how the workshops can best serve the needs of all three groups.

Equipment / LED Evaluation - Michael Kasimirsky

Michael Kasimirsky updated the group on the changes in lighting that will need to be considered as the lighting industry moves away from fluorescent to LED lighting (**Attachment 9**). Two fixtures were provided at the prior workshop and a small experiment was conducted at the light duty workshop. Ratings were conducted with current lighting and LED lighting.

Action Item - Jack Kobrinetz volunteered to lead a task force to address the change to LED lighting

Rater Training – Group Discussion

There was general consensus that the workshop format needs to include a rater training component.

Open Discussion – Group

The group began an open discussion. The result was a proposed workshop format which could include the following:

- A single, combined annual LD & HD workshop.
- ASTM TMC calibrated (RWB in last 12 months) lab raters attend 1st session
 - Generate target means and standard deviations on all parts through discussion
 - One calibration piston is used to bring raters together before official rating starts.
 - Parts are divided into groups and rated by session 1 raters to enable all parts being rated.
 - Session 1 ratings are screened with one pass of E178.
 - Means and standard deviations are then locked.
- One rater from each lab stays and provides training for second group of non-lab raters.
- Session 2 raters rate and discuss same calibration piston before official rating starts.
- Session 2 raters are shown session 1 calibration piston results after their rating of part.
- After training session non-lab raters rate same parts to fill workshop database.

Some comments in the discussion included:

- Teri Kowalski volunteered to contact OEMs to encourage them to become more active in rating issues.
- Panels should determine the acceptability criteria for raters. This group should determine how the workshops should function.
- Test engineers tend to be mostly concerned that all lab raters rate similarly.
- Do rating manuals need to be augmented to capture more 'nuances'?
- Training is a big need for the workshops. Experienced raters should lead the training.
- We should strive for parts near p/f limits
- Would the data analysis benefit from the use of transforms?

Other Items

The set of long term objectives was discussed. High priority was given to forming a Rating Surveillance Panel or a standing committee under the Technical Guidance Committee. Another priority is to make sure that communication takes place between the rating community and the test surveillance panels.

Action Item – Frank Farber will carry the desire to form a rating panel/committee to the ASTM June Meetings.

Action Item – TMC will advise on logistical issues of moving to a single large workshop.

Next Meeting

The next meeting will be called after ASTM June meetings – likely sometime in July.

Adjournment

The meeting adjourned at 2:40 pm.

Attachment 1

Attendance

Frank Farber - TMC

Jeff Clark - TMC

Michael Kasimirsky - TMC

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Attachment 2

ASTM Rater Workshop Meeting

▶ June 2016

Test Monitoring Center
<http://astmcmc.cmu.edu>



Welcome

- ▶ Thanks for supporting the activity
- ▶ Feedback (feedback, suggestions and criticism)
 - Workshop format
 - Attendees
 - Allotted Time
 - Training Available
 - Etc.

TMC's Focus

- ▶ Workshop Attributes
 - Data driven assessment of rater's capability
 - Improve rater precision
 - Provide group discussion
 - Rater Training
 - ?
- ▶ Moving forward where does this group fall in the ASTM structure



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RATING WORKSHOP: HISTORICAL PERSPECTIVE

Attachment 3

CRC 1992
and
earlier

- 2 workshops per year. HD fall; LD spring.
- Each workshop was week-long event split into 2 sessions (session 1= high volume raters, session 2= less experienced raters)
- Data entry was Howard lugging computer equipment and printer from Houston and holing up in a conference room (Betty sometimes filling in).

RATING WORKSHOP: HISTORICAL PERSPECTIVE

- | | | |
|------------|------|--|
| CRC | 1995 | <ul style="list-style-type: none">• CRC discontinued financial support of workshop requiring workshop activities to be entirely self-supporting. |
|------------|------|--|

RATING WORKSHOP: HISTORICAL PERSPECTIVE

- | | | |
|------------|------|---|
| CRC | 1997 | <ul style="list-style-type: none">• yi presentation of workshop data is introduced to help raters identify 'flyers' |
|------------|------|---|

RATING WORKSHOP: HISTORICAL PERSPECTIVE

- | | | |
|------------|------|--|
| CRC | 2000 | <ul style="list-style-type: none">• Industry expresses desire to divide raters into “Category 1 or Category 2” ultimately defining Category 1 as any rater whose output is used in a test report and Category 2 as all others. |
|------------|------|--|

RATING WORKSHOP: HISTORICAL PERSPECTIVE

- | | | |
|------------|------|--|
| CRC | 2001 | • Publication of CRC Manuals 20 & 21
(consolidating several older manuals). |
|------------|------|--|

RATING WORKSHOP: HISTORICAL PERSPECTIVE

- | | | |
|------------|------|--|
| CRC | 2001 | <ul style="list-style-type: none">• TMC now handling data entry. A number of summary tools are successively introduced eventually leading to a “rater report card” collecting all the data produced by each rater. |
|------------|------|--|

RATING WORKSHOP: HISTORICAL PERSPECTIVE

- | | | |
|------------|-------------|---|
| CRC | 2001
Apr | <ul style="list-style-type: none">• Test Monitoring Board asked Technical Guidance Committee to form rater calibration task force chaired by Zack Bishop to develop a calibration system. |
|------------|-------------|---|

RATING WORKSHOP: HISTORICAL PERSPECTIVE

- | | | |
|------------|-------------|--|
| CRC | 2001
Oct | <ul style="list-style-type: none">• M.Pansza formally resigned as coordinator. CRC wanted to further reduce involvement, put activity out for 'bid'. CRC hired M.Pansza as a contractor to serve as coordinator. |
|------------|-------------|--|

RATING WORKSHOP: HISTORICAL PERSPECTIVE

- | | | |
|------------|-------------|--|
| CRC | 2002
Oct | <ul style="list-style-type: none">• CRC meeting San Diego for purpose of gauging industry demands for future workshop activity – 2 workshops heavy/light, each divided into level1/level2. Level 2 allowed some guidance but, emphatically, NO training. Only allowed output is certificate of participation; no group photo, hats, cups, t-shirts, etc. |
|------------|-------------|--|

RATING WORKSHOP: HISTORICAL PERSPECTIVE

- | | | |
|------------|-------------|---|
| CRC | 2004
May | <ul style="list-style-type: none">• M.Pansza fully stepped away from coordinator activities and recommended that TMC (S.Parke) assume the responsibility for CRC. |
|------------|-------------|---|

RATING WORKSHOP: HISTORICAL PERSPECTIVE

- | | | |
|------------|-------------|---|
| CRC | 2004
May | • IIIG Surveillance Panel requested a rater calibration proposal. |
|------------|-------------|---|

RATING WORKSHOP: HISTORICAL PERSPECTIVE

- | | | |
|------------|-------------|---|
| CRC | 2004
Oct | • First use of RWBY color grouping of rater output. |
|------------|-------------|---|

RATING WORKSHOP: HISTORICAL PERSPECTIVE

- | | | |
|------------|-------------|--|
| CRC | 2005
Oct | • TMC assumes hotel contract responsibility
from CRC. |
|------------|-------------|--|

RATING WORKSHOP: HISTORICAL PERSPECTIVE

- | | | |
|------------|------|--|
| CRC | 2005 | <ul style="list-style-type: none">• Format is Sun-Thu first session/second session transitioning on Tuesday ending Thurs afternoon |
|------------|------|--|

RATING WORKSHOP: HISTORICAL PERSPECTIVE

- SAE** 2007 • CRC discontinued all involvement with all deposit and distress rating activity handing all materials over to SAE.

RATING WORKSHOP: HISTORICAL PERSPECTIVE

- | | | |
|------------|------|--|
| SAE | 2007 | <ul style="list-style-type: none">• First SAE workshop, intro of TMC's server/web based data entry system. |
|------------|------|--|

RATING WORKSHOP: HISTORICAL PERSPECTIVE

**TMC/
ASTM**

2008

- SAE determined that rating activity was not a good fit. Passed along to ASTM. All materials sent to ASTM in Philadelphia. ASTM is responsible for rating manuals, scales, and rating aids; TMC is responsible for rating workshops.

RATING WORKSHOP: HISTORICAL PERSPECTIVE

**TMC/
ASTM**

2009

- In response to industry demand to better accommodate raters missing either the diesel workshop or the gas workshop, some parts from either fuel are introduced into both workshops.

RATING WORKSHOP: HISTORICAL PERSPECTIVE

**TMC/
ASTM**

2015
Feb

- In response to industry request, TMC issued memo 15-003 explaining that future spring workshops will be Seq III and Seq V only; all else will be moved to 'expanded' hd fall workshop.

RATING WORKSHOP: HISTORICAL PERSPECTIVE

**TMC/
ASTM**

2015
Oct

- Due to lack of support for the revised workshop configuration, workshop format reverted to previous configuration: 3 days, single session, parts primarily (though not exclusively) diesel for fall and gas for spring.

RATING WORKSHOP: HISTORICAL PERSPECTIVE

CRC	1992	2 workshops per year. HD fall; LD spring. Each workshop was week-long event. High volume raters arrived Saturday and rated through Tuesday morning. Less experienced raters arrived Tue afternoon and attended through Friday (later shifted to Sun thru Sat with Wed the 'overlap' day) Procedural rating requirements: attend ws/rate 6 parts (cat tests only) no other test type had requirements. Data entry was Howard lugging computer equipment and printer from Houston and holing up in a conference room (Betty sometimes filling in).
	1995	CRC discontinued financial support of workshop requiring workshop activities to be entirely self-supporting.
	1997	yi presentation of workshop data is introduced to help raters identify 'flyers'.
	2000	Industry expresses desire to divide raters into "Category 1 or Category 2" ultimately defining Category 1 as any rater whose output is used in a test report and Category 2 as all others.
	2001	Publication of CRC Manuals 20 & 21 (consolidating several older manuals).
	2001	TMC now handling data entry. A number of summary tools are successively introduced eventually leading to a "rater report card" collecting all the data produced by each rater.
	2001 Apr	Test Monitoring Board asked Technical Guidance Committee to form rater calibration task force chaired by Zack Bishop to develop a calibration system.
	2001 Oct	M.Pansza formally resigned as coordinator. CRC wanted to further reduce involvement, put activity out for 'bid'. CRC hired M.Pansza as a contractor to serve as coordinator.
	2002 Oct	CRC meeting San Diego for purpose of gauging industry demands for future workshop activity – 2 workshops heavy/light, each divided into level1/level2. Level 2 allowed some guidance but, emphatically, NO training ¹ . Only allowed output is certificate of participation; no group photo, hats, cups, t-shirts, etc.
	2004 May	M.Pansza fully stepped away from coordinator activities and recommended that TMC (S.Parke) assume the responsibility for CRC
	2004 May	IIIG Surveillance Panel requested a rater calibration proposal.
	2004 Oct	First use of RWBY color grouping of rater output.
	2005 Oct	TMC assumes hotel contract responsibility from CRC.
	2005	Format is Sun-Thu first session/second session transitioning on Tuesday ending Thurs afternoon
	2007	CRC discontinued all involvement with all deposit and distress rating activity handing all materials over to SAE.
SAE	2007	First SAE workshop, intro of TMC's server/web based data entry system.
TMC/ASTM	2008	SAE determined that rating activity was not a good fit. Passed along to ASTM. All materials sent to ASTM in Philadelphia. ASTM is responsible for rating manuals, scales, and rating aids; TMC is responsible for rating workshops.
	2009	In response to industry demand to better accommodate raters missing either the diesel workshop or the gas workshop, some parts from either fuel are introduced into both workshops.
	2015 Feb	In response to industry request, TMC issued memo 15-003 explaining that future spring workshops will be Seq III and Seq V only; all else will be moved to 'expanded' hd fall workshop.
	2015 Oct	Due to lack of support for the revised workshop configuration, workshop format reverted to previous configuration: 3 days, single session, parts primarily (though not exclusively) diesel for fall and gas for spring.

¹ At that moment in time, there were companies that viewed rater training as a service that they provided to customers interested in contracting with them.



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Attachment 4

Test Method Workshop Attendance Requirements

Gasoline Tests

▶ Seq. III

- Includes IIIF, IIIG, IIIH
- Each rater attend LD Workshop
 - Provision to make alternate arrangements if workshop cannot be attended
- Rate a minimum of 6 pistons
- Achieve Blue, Red, or White color code
 - Limit of two attempts

Gasoline Tests

- ▶ Seq. V
 - Each rater attend LD Workshop
 - Provision to make alternate arrangements if workshop cannot be attended
 - Rate a minimum of 24 pistons
 - Achieve Blue, Red, or White color code
 - Limit of two attempts

Diesel Tests

- ▶ 1K, 1N, 1M-PC, 1P
 - Fall HD Workshop
 - Rate a minimum of 6 pistons
 - At least 1 rater per laboratory must attend
 - Provision to make alternate arrangements if workshop cannot be attended

Diesel Tests

▶ 1R

- Train each piston deposit rater by the TMC Rating Task Force
- Each rater must attend one workshop annually to maintain expertise
- Provision to make alternate arrangements if workshop cannot be attended
- Rate a minimum of 6 pistons

Diesel Tests

- ▶ CAT C13, ISM
 - No requirements



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Attachment 5

Data Analysis Revisions

Data Analysis

- ▶ Typical Data Review Session
 - Occurs after both the Preliminary Exercise and the Practical Application
 - Each part/location are reviewed
 - Results of all raters are shown
 - Raw values and calculated Y_i values
 - Values highlighted to indicate closest and furthest from mean
 - Breakdown of ratings the reviewed

Data Analysis – Possible Revision

- ▶ Typical Data Review Session
 - Occurs after both the Preliminary Exercise and the Practical Application
 - Each part/location are reviewed
 - Results of all raters are shown
 - ~~Raw values and~~ calculated Y_i values
 - Values highlighted to indicate closest and furthest from mean
 - ~~Breakdown of ratings the reviewed~~
 - Rater can then re-rate part without compromising results

Data Analysis – Outlier Screening

- ▶ Various approaches have been used
 - No screening
 - ASTM E178 screening
 - If any location was flagged, result for that rater's entire part was removed from database
- ▶ Proposed approach
 - ASTM E178 screening
 - Single iteration
 - If any location is flagged, only that location is removed; only from target generation. Result remains in database.



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HEAVY DUTY RATING WORKSHOP (2015 October 6-8)

Part ID= CAL-B - KEYSTONE

Rated Values

* Denotes parameters not used in Blue, Red, White & Yellow assessment

Rater	G1TOT	G2TOT	G3TOT	USTOT	L1TOT	L2TOT	L3TOT	UCTOT	TGF	2ndGF	TLHC	
Aguirre, Nancy P	26.00	31.75	1.23	0.37	3.61	23.99	1.11	1.95	6.00	20.00	0.00	
Alvernaz, Jack	36.50	32.50	1.58	0.48	4.10	29.68	1.44	3.90	10.00	35.00	0.00	
Cales, Jonathon	26.50	35.50	3.13	0.28	10.70	25.31	1.32	3.29	8.00	25.00	0.00	
Castillo, George	28.50	32.50	1.30	0.83	3.74	23.93	1.15	2.10	10.00	30.00	0.00	
Clare, Jamie	27.00	34.75	1.03	0.65	1.98	26.49	1.20	3.00	20.00	22.00	0.00	
Ellis, Paul	28.50	34.75	1.39	0.54	3.49	28.30	1.49	3.42	26.00	29.00	0.00	
Fujita, Hirokazu	28.00	34.75	1.49	0.95	3.72	26.04	1.37	1.96	31.70	35.10	0.00	
Greenland, Paul	28.00	35.50	1.60	0.45	3.45	27.55	0.93	3.45	23.00	19.00	0.00	
Guo, Feng	29.25	32.50	1.49	0.57	3.00	26.80	1.05	2.40	26.00	30.00	0.00	
Hodgson, Joshua	32.00	25.00	1.37	0.87	3.67	25.90	1.43	1.84	39.00	31.00	0.00	
King, Jennifer	28.76	27.25	1.41	0.56	2.53	26.14	1.37	1.92	15.00	8.00	0.00	
Kobrinetz, Joaquin J.	29.00	37.00	1.38	0.47	9.06	23.95	1.23	3.08	16.00	40.00	0.00	
Langford, Mike	27.25	34.75	1.46	0.42	3.37	26.05	1.17	3.00	19.00	23.00	0.00	
Lonsway, Chris	30.25	36.25	1.28	0.35	2.95	23.06	1.40	3.00	11.00	29.00	0.00	
Lopez, Frank	27.00	25.00	1.63	0.81	4.67	25.48	1.18	3.11	16.00	12.00	0.00	
May, Marianne	27.75	31.75	1.14	0.36	2.95	25.05	1.07	3.30	12.00	21.00	0.00	
Potocar, William P	27.50	37.75	1.66	0.69	12.16	23.95	0.98	1.67	10.00	30.00	0.00	
Price, Gregory	26.52	40.75	1.37	0.51	11.06	29.47	1.00	2.69	19.00	36.00	0.00	
Richards, Craig	26.52	36.25	0.86	0.20	1.91	35.56	1.26	3.90	30.00	25.00	0.00	
Rodriguez, Jesus (Jesse)	29.00	25.00	1.92	0.92	4.60	27.58	0.98	2.86	8.00	5.00	0.00	
Sanchez, Christopher	26.25	25.00	1.06	0.36	2.01	23.51	1.06	3.16	14.00	10.00	0.00	
Seeck, Christian	28.56	39.25	0.68	0.49	3.24	24.48	1.08	3.35	21.00	56.00	0.00	
Terrado, Ken	32.00	34.00	1.31	0.36	12.74	24.99	0.96	2.56	33.00	25.00	0.00	
Thomsen, Sven	29.05	39.25	0.96	0.87	6.90	27.09	1.92	2.40	28.00	68.00	0.00	
Veiga, Victor	28.25	37.00	1.68	1.62	2.45	27.30	1.18	2.55	29.00	35.00	0.00	
Westerveld, Bernard Maarten	27.78	32.50	1.60	0.35	4.82	25.62	1.81	1.51	20.00	10.00	0.00	
MAXIMUM	36.50	40.75	3.13	1.62	12.74	35.56	1.92	3.90	39.00	68.00	0.00	
MINIMUM	26.00	25.00	0.68	0.20	1.91	23.06	0.93	1.51	6.00	5.00	0.00	
RANGE(MAX-MIN)	10.500	15.750	2.450	1.420	10.830	12.500	0.990	2.390	33.000	63.000	0.000	
MEAN	28.527	33.394	1.423	0.590	4.957	26.280	1.236	2.745	19.258	27.273	0.000	
STANDARD DEVIATION	2.235	4.599	0.446	0.299	3.296	2.574	0.247	0.675	8.952	13.949	0.050	
N SIZE	26.000											

This is how the ratings have been reviewed in the past. There are four outliers in this data set that are not immediately apparent.

Attachment 6

HEAVY DUTY RATING WORKSHOP (2015 October 6-8)

Part ID= CAL-B - KEYSTONE

CAL-B Yi Values

* Denotes parameters not used in Blue, Red, White & Yellow assessment

Rater	G1TOT	G2TOT	G3TOT	USTOT	L1TOT	L2TOT	L3TOT	UCTOT	TGF	2ndGF	TLHC	
Aguirre, Nancy P	-1.13	-0.36	-0.43	-0.73	-0.41	-0.89	-0.51	-1.18	-1.48	-0.52	0.00	
Alvernaz, Jack	3.57	-0.19	0.35	-0.37	-0.26	1.32	0.83	1.71	-1.03	0.55	0.00	
Cales, Jonathon	-0.91	0.46	3.83	-1.03	1.74	-0.38	0.34	0.81	-1.26	-0.16	0.00	
Castillo, George	-0.01	-0.19	-0.28	0.80	-0.37	-0.91	-0.35	-0.96	-1.03	0.20	0.00	
Clare, Jamie	-0.68	0.29	-0.88	0.20	-0.90	0.08	-0.15	0.38	0.08	-0.38	0.00	
Ellis, Paul	-0.01	0.29	-0.08	-0.17	-0.45	0.79	1.03	1.00	0.75	0.12	0.00	
Fujita, Hirokazu	-0.24	0.29	0.15	1.20	-0.38	-0.09	0.54	-1.16	1.39	0.56	0.00	
Greenland, Paul	-0.24	0.46	0.40	-0.47	-0.46	0.49	-1.24	1.05	0.42	-0.59	0.00	
Guo, Feng	0.32	-0.19	0.15	-0.07	-0.59	0.20	-0.75	-0.51	0.75	0.20	0.00	
Hodgson, Joshua	1.55	-1.83	-0.12	0.94	-0.39	-0.15	0.79	-1.34	2.21	0.27	0.00	
King, Jennifer	0.10	-1.34	-0.03	-0.10	-0.74	-0.05	0.54	-1.22	-0.48	-1.38	0.00	
Kobrinetz, Joaquin J.	0.21	0.78	-0.10	-0.40	1.25	-0.91	-0.03	0.50	-0.36	0.91	0.00	
Langford, Mike	-0.57	0.29	0.08	-0.57	-0.48	-0.09	-0.27	0.38	-0.03	-0.31	0.00	
Lonsway, Chris	0.77	0.62	-0.32	-0.80	-0.61	-1.25	0.66	0.38	-0.92	0.12	0.00	
Lopez, Frank	-0.68	-1.83	0.46	0.74	-0.09	-0.31	-0.23	0.54	-0.36	-1.09	0.00	
May, Marianne	-0.35	-0.36	-0.64	-0.77	-0.61	-0.48	-0.67	0.82	-0.81	-0.45	0.00	
Potocar, William P	-0.46	0.95	0.53	0.34	2.19	-0.91	-1.04	-1.59	-1.03	0.20	0.00	
Price, Gregory	-0.90	1.60	-0.12	-0.27	1.85	1.24	-0.96	-0.08	-0.03	0.63	0.00	
Richards, Craig	-0.90	0.62	-1.26	-1.30	-0.92	3.61	0.10	1.71	1.20	-0.16	0.00	
Rodriguez, Jesus (Jesse)	0.21	-1.83	1.11	1.10	-0.11	0.51	-1.04	0.17	-1.26	-1.60	0.00	
Sanchez, Christopher	-1.02	-1.83	-0.82	-0.77	-0.89	-1.08	-0.71	0.62	-0.59	-1.24	0.00	
Seeck, Christian	0.02	1.27	-1.67	-0.33	-0.52	-0.70	-0.63	0.90	0.19	2.06	0.00	
Terrado, Ken	1.55	0.13	-0.25	-0.77	2.36	-0.50	-1.12	-0.27	1.54	-0.16	0.00	
Thomsen, Sven	0.23	1.27	-1.04	0.94	0.59	0.31	2.77	-0.51	0.98	2.92	0.00	
Veiga, Victor	-0.12	0.78	0.58	3.44	-0.76	0.40	-0.23	-0.29	1.09	0.55	0.00	
Westerveld, Bernard Maarten	-0.33	-0.19	0.40	-0.66	-0.04	-0.26	2.33	-1.83	0.08	-1.24	0.00	
MAXIMUM	3.57	-1.83	3.83	3.44	2.36	3.61	2.77	-1.83	2.21	2.92	0.00	
MINIMUM	-0.01	0.13	-0.03	-0.07	-0.04	-0.05	-0.03	-0.08	-0.03	0.12	0.00	
RANGE(MAX-MIN)	3.580	-1.957	3.859	3.507	2.403	3.660	2.798	-1.749	2.234	2.796	0.000	
MEAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
STANDARD DEVIATION	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.050	
N SIZE	26.000											

Viewing the Yi values, the outliers become easier to find.

HEAVY DUTY RATING WORKSHOP (2015 October 6-8)

Part ID= CAL-B - KEYSTONE

Rated Values

* Denotes parameters not used in Blue, Red, White & Yellow assessment

Rater	G1TOT	G2TOT	G3TOT	USTOT	L1TOT	L2TOT	L3TOT	UCTOT	TGF	2ndGF	TLHC	
Aguirre, Nancy P	26.00	31.75	1.23	0.37	3.61	23.99	1.11	1.95	6.00	20.00	0.00	
Castillo, George	28.50	32.50	1.30	0.83	3.74	23.93	1.15	2.10	10.00	30.00	0.00	
Clare, Jamie	27.00	34.75	1.03	0.65	1.98	26.49	1.20	3.00	20.00	22.00	0.00	
Ellis, Paul	28.50	34.75	1.39	0.54	3.49	28.30	1.49	3.42	26.00	29.00	0.00	
Fujita, Hirokazu	28.00	34.75	1.49	0.95	3.72	26.04	1.37	1.96	31.70	35.10	0.00	
Greenland, Paul	28.00	35.50	1.60	0.45	3.45	27.55	0.93	3.45	23.00	19.00	0.00	
Guo, Feng	29.25	32.50	1.49	0.57	3.00	26.80	1.05	2.40	26.00	30.00	0.00	
Hodgson, Joshua	32.00	25.00	1.37	0.87	3.67	25.90	1.43	1.84	39.00	31.00	0.00	
King, Jennifer	28.76	27.25	1.41	0.56	2.53	26.14	1.37	1.92	15.00	8.00	0.00	
Kobrinetz, Joaquin J.	29.00	37.00	1.38	0.47	9.06	23.95	1.23	3.08	16.00	40.00	0.00	
Langford, Mike	27.25	34.75	1.46	0.42	3.37	26.05	1.17	3.00	19.00	23.00	0.00	
Lonsway, Chris	30.25	36.25	1.28	0.35	2.95	23.06	1.40	3.00	11.00	29.00	0.00	
Lopez, Frank	27.00	25.00	1.63	0.81	4.67	25.48	1.18	3.11	16.00	12.00	0.00	
May, Marianne	27.75	31.75	1.14	0.36	2.95	25.05	1.07	3.30	12.00	21.00	0.00	
Potocar, William P	27.50	37.75	1.66	0.69	12.16	23.95	0.98	1.67	10.00	30.00	0.00	
Price, Gregory	26.52	40.75	1.37	0.51	11.06	29.47	1.00	2.69	19.00	36.00	0.00	
Rodriguez, Jesus (Jesse)	29.00	25.00	1.92	0.92	4.60	27.58	0.98	2.86	8.00	5.00	0.00	
Sanchez, Christopher	26.25	25.00	1.06	0.36	2.01	23.51	1.06	3.16	14.00	10.00	0.00	
Seeck, Christian	28.56	39.25	0.68	0.49	3.24	24.48	1.08	3.35	21.00	56.00	0.00	
Terrado, Ken	32.00	34.00	1.31	0.36	12.74	24.99	0.96	2.56	33.00	25.00	0.00	
Thomsen, Sven	29.05	39.25	0.96	0.87	6.90	27.09	1.92	2.40	28.00	68.00	0.00	
Westerveld, Bernard Maarten	27.78	32.50	1.60	0.35	4.82	25.62	1.81	1.51	20.00	10.00	0.00	
MAXIMUM	32.00	40.75	1.92	0.95	12.74	29.47	1.92	3.45	39.00	68.00	0.00	
MINIMUM	26.00	25.00	0.68	0.35	1.98	23.06	0.93	1.51	6.00	5.00	0.00	
RANGE(MAX-MIN)	6.000	15.750	1.240	0.600	10.760	6.410	0.990	1.940	33.000	63.000	0.000	
MEAN	28.360	33.045	1.353	0.580	4.987	25.701	1.225	2.624	19.259	26.777	0.000	
STANDARD DEVIATION	1.580	4.878	0.271	0.209	3.253	1.670	0.264	0.619	8.676	15.007	0.050	
N SIZE	22.000											

Part ID= CAL-B - KEYSTONE

CAL-B YI Values

* Denotes parameters not used in Blue, Red, White & Yellow assessment

Rater	G1TOT	G2TOT	G3TOT	USTOT	L1TOT	L2TOT	L3TOT	UCTOT	TGF	2ndGF	TLHC	
Aguirre, Nancy P	-1.49	-0.27	-0.45	-1.00	-0.42	-1.02	-0.43	-1.09	-1.53	-0.45	0.00	
Castillo, George	0.09	-0.11	-0.19	1.20	-0.38	-1.06	-0.28	-0.85	-1.07	0.21	0.00	
Clare, Jamie	-0.86	0.35	-1.19	0.34	-0.92	0.47	-0.09	0.61	0.09	-0.32	0.00	
Ellis, Paul	0.09	0.35	0.14	-0.19	-0.46	1.56	1.00	1.29	0.78	0.15	0.00	
Fujita, Hirokazu	-0.23	0.35	0.51	1.77	-0.39	0.20	0.55	-1.07	1.43	0.55	0.00	
Greenland, Paul	-0.23	0.50	0.91	-0.62	-0.47	1.11	-1.12	1.33	0.43	-0.52	0.00	
Guo, Feng	0.56	-0.11	0.51	-0.05	-0.61	0.66	-0.66	-0.36	0.78	0.21	0.00	
Hodgson, Joshua	2.30	-1.65	0.06	1.39	-0.40	0.12	0.78	-1.27	2.28	0.28	0.00	
King, Jennifer	0.25	-1.19	0.21	-0.09	-0.76	0.26	0.55	-1.14	-0.49	-1.25	0.00	
Kobrinetz, Joaquin J.	0.41	0.81	0.10	-0.52	1.25	-1.05	0.02	0.74	-0.38	0.88	0.00	
Langford, Mike	-0.70	0.35	0.40	-0.76	-0.50	0.21	-0.21	0.61	-0.03	-0.25	0.00	
Lonsway, Chris	1.20	0.66	-0.27	-1.10	-0.63	-1.58	0.66	0.61	-0.95	0.15	0.00	
Lopez, Frank	-0.86	-1.65	1.02	1.10	-0.10	-0.13	-0.17	0.78	-0.38	-0.98	0.00	
May, Marianne	-0.39	-0.27	-0.79	-1.05	-0.63	-0.39	-0.59	1.09	-0.84	-0.39	0.00	
Potocar, William P	-0.54	0.96	1.14	0.53	2.21	-1.05	-0.93	-1.54	-1.07	0.21	0.00	
Price, Gregory	-1.16	1.58	0.06	-0.33	1.87	2.26	-0.85	0.11	-0.03	0.61	0.00	
Rodriguez, Jesus (Jesse)	0.41	-1.65	2.10	1.63	-0.12	1.13	-0.93	0.38	-1.30	-1.45	0.00	
Sanchez, Christopher	-1.34	-1.65	-1.08	-1.05	-0.92	-1.31	-0.62	0.87	-0.61	-1.12	0.00	
Seeck, Christian	0.13	1.27	-2.49	-0.43	-0.54	-0.73	-0.55	1.17	0.20	1.95	0.00	
Terrado, Ken	2.30	0.20	-0.16	-1.05	2.38	-0.43	-1.00	-0.10	1.58	-0.12	0.00	
Thomsen, Sven	0.44	1.27	-1.45	1.39	0.59	0.83	2.63	-0.36	1.01	2.75	0.00	
Westerveld, Bernard Maarten	-0.37	-0.11	0.91	-1.10	-0.05	-0.05	2.22	-1.80	0.09	-1.12	0.00	
MAXIMUM	2.30	-1.65	-2.49	1.77	2.38	2.26	2.63	-1.80	2.28	2.75	0.00	
MINIMUM	0.09	-0.11	0.06	-0.05	-0.05	-0.05	0.02	-0.10	-0.03	-0.12	0.00	
RANGE(MAX-MIN)	2.215	-1.538	-2.550	1.818	2.435	2.305	2.612	-1.696	2.305	2.865	0.000	
MEAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
STANDARD DEVIATION	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.050	
N SIZE	22.000											

Screening parts removes the outliers from the data set, but it also removes the part.

HEAVY DUTY RATING WORKSHOP (2015 October 6-8)

Part ID= CAL-B - KEYSTONE

CAL-B Yi Values

* Denotes parameters not used in Blue, Red, White & Yellow assessment

Rater	G1TOT	G2TOT	G3TOT	USTOT	L1TOT	L2TOT	L3TOT	UCTOT	TGF	2ndGF	TLHC	
Aguirre, Nancy P	-1.41	-0.36	-0.44	-0.82	-0.41	-1.08	-0.51	-1.18	-1.48	-0.52	0.00	
Alvernaz, Jack	5.30	-0.19	0.79	-0.31	-0.26	2.12	0.83	1.71	-1.03	0.55	0.00	
Cales, Jonathon	-1.09	0.46	6.24	-1.23	1.74	-0.34	0.34	0.81	-1.26	-0.16	0.00	
Castillo, George	0.19	-0.19	-0.19	1.29	-0.37	-1.11	-0.35	-0.96	-1.03	0.20	0.00	
Clare, Jamie	-0.77	0.29	-1.14	0.47	-0.90	0.33	-0.15	0.38	0.08	-0.38	0.00	
Ellis, Paul	0.19	0.29	0.12	-0.04	-0.45	1.34	1.03	1.00	0.75	0.12	0.00	
Fujita, Hirokazu	-0.13	0.29	0.47	1.84	-0.38	0.07	0.54	-1.16	1.39	0.56	0.00	
Greenland, Paul	-0.13	0.46	0.86	-0.45	-0.46	0.92	-1.24	1.05	0.42	-0.59	0.00	
Guo, Feng	0.67	-0.19	0.47	0.10	-0.59	0.50	-0.75	-0.51	0.75	0.20	0.00	
Hodgson, Joshua	2.42	-1.83	0.05	1.48	-0.39	0.00	0.79	-1.34	2.21	0.27	0.00	
King, Jennifer	0.35	-1.34	0.19	0.05	-0.74	0.13	0.54	-1.22	-0.48	-1.38	0.00	
Kobrinetz, Joaquin J.	0.51	0.78	0.09	-0.36	1.25	-1.10	-0.03	0.50	-0.36	0.91	0.00	
Langford, Mike	-0.61	0.29	0.37	-0.59	-0.48	0.08	-0.27	0.38	-0.03	-0.31	0.00	
Lonsway, Chris	1.31	0.62	-0.26	-0.91	-0.61	-1.60	0.66	0.38	-0.92	0.12	0.00	
Lopez, Frank	-0.77	-1.83	0.97	1.20	-0.09	-0.24	-0.23	0.54	-0.36	-1.09	0.00	
May, Marianne	-0.29	-0.36	-0.76	-0.87	-0.61	-0.48	-0.67	0.82	-0.81	-0.45	0.00	
Potocar, William P	-0.45	0.95	1.07	0.65	2.19	-1.10	-1.04	-1.59	-1.03	0.20	0.00	
Price, Gregory	-1.08	1.60	0.05	-0.18	1.85	2.00	-0.96	-0.08	-0.03	0.63	0.00	
Richards, Craig	-1.08	0.62	-1.74	-1.60	-0.92	5.42	0.10	1.71	1.20	-0.16	0.00	
Rodriguez, Jesus (Jesse)	0.51	-1.83	1.99	1.71	-0.11	0.94	-1.04	0.17	-1.26	-1.60	0.00	
Sanchez, Christopher	-1.25	-1.83	-1.04	-0.87	-0.89	-1.35	-0.71	0.62	-0.59	-1.24	0.00	
Seeck, Christian	0.23	1.27	-2.38	-0.27	-0.52	-0.80	-0.63	0.90	0.19	2.06	0.00	
Terrado, Ken	2.42	0.13	-0.16	-0.87	2.36	-0.52	-1.12	-0.27	1.54	-0.16	0.00	
Thomsen, Sven	0.54	1.27	-1.39	1.48	0.59	0.66	2.77	-0.51	0.98	2.92	0.00	
Veiga, Victor	0.03	0.78	1.14	4.92	-0.76	0.78	-0.23	-0.29	1.09	0.55	0.00	
Westerveld, Bernard Maarten	-0.27	-0.19	0.86	-0.91	-0.04	-0.16	2.33	-1.83	0.08	-1.24	0.00	
MAXIMUM	2.42	-1.83	-2.38	1.84	2.36	2.12	2.77	-1.83	2.21	2.92	0.00	
MINIMUM	0.03	0.13	0.05	-0.04	-0.04	0.00	-0.03	-0.08	-0.03	0.12	0.00	
RANGE(MAX-MIN)	2.397	-1.957	-2.428	1.883	2.403	2.123	2.798	-1.749	2.234	2.796	0.000	
MEAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
STANDARD DEVIATION	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.050	
N SIZE	26.000											

This is the new proposed method of screening outlier ratings from the targets. The outlier ratings are still counted for the calibration.

HEAVY DUTY RATING WORKSHOP (2015 October 6-8)

Demerit Piston Deposits

Rater	Parts Rated	-1<yi<=1	-2<yi<=2	-3<yi<=3	>3	Yi STD	Group	Group Color
Aguirre, Nancy P	10	88.1%	98.0%	100.0%	0.0%	0.65	BLUE	
Alvernaz, Jack	8	79.8%	96.2%	98.7%	1.3%	0.88	WHITE	
Arrizon, Richard	6	83.3%	100.0%	100.0%	0.0%	0.72	RED	
Barrera, Tony	11	81.7%	95.7%	100.0%	0.0%	0.86	WHITE	
Booth, Jeffrey	8	66.7%	85.2%	98.8%	1.2%	1.16	YELLOW	
Cales, Jonathon	10	76.0%	97.9%	99.0%	1.0%	0.89	WHITE	
Castillo, George	9	83.7%	98.9%	100.0%	0.0%	0.71	RED	
Clapperty, Leon	8	72.2%	92.4%	96.2%	3.8%	1.10	WHITE	
Clare, Jamie	8	83.1%	96.4%	100.0%	0.0%	0.83	RED	
DeCapite, Vanessa	9	79.4%	98.9%	100.0%	0.0%	0.67	WHITE	
Ellis, Paul	8	81.3%	98.8%	100.0%	0.0%	0.75	RED	
Fujita, Hirokazu	8	83.5%	100.0%	100.0%	0.0%	0.67	RED	
Greenland, Paul	11	91.8%	100.0%	100.0%	0.0%	0.57	BLUE	
Guarda, Waldyr	11	47.8%	84.4%	95.7%	4.4%	1.00	YELLOW	
Guo, Feng	8	84.8%	100.0%	100.0%	0.0%	0.72	RED	
Hill, Howard P.	11	81.7%	99.1%	99.1%	0.9%	0.75	RED	
Hills, Barry	10	91.3%	100.0%	100.0%	0.0%	0.58	BLUE	
Hodgson, Joshua	7	69.4%	91.7%	100.0%	0.0%	1.05	WHITE	
King, Jennifer	11	66.1%	95.7%	100.0%	0.0%	0.92	WHITE	
Kobrinetz, Joaquin J.	10	94.1%	99.0%	99.0%	1.0%	0.65	BLUE	
Langford, Mike	10	76.0%	100.0%	100.0%	0.0%	0.82	WHITE	
Li, Jie	8	83.3%	100.0%	100.0%	0.0%	0.74	RED	
Lonsway, Chris	7	80.0%	96.9%	100.0%	0.0%	0.69	RED	
Lopez, Frank	11	79.1%	99.1%	100.0%	0.0%	0.81	WHITE	
May, Marianne	11	96.5%	100.0%	100.0%	0.0%	0.51	BLUE	
Parvaz, Ibrar	8	86.1%	96.2%	100.0%	0.0%	0.80	RED	
Potocar, William P	9	80.2%	98.9%	100.0%	0.0%	0.65	RED	
Price, Gregory	10	84.3%	99.0%	100.0%	0.0%	0.76	RED	
Reese, Kyle	10	56.7%	77.9%	93.3%	6.7%	1.44	YELLOW	
Richards, Craig	10	59.2%	93.2%	99.0%	1.0%	1.07	YELLOW	
Rodriguez, Jesus (Jesse)	11	87.8%	100.0%	100.0%	0.0%	0.67	BLUE	
Sanchez, Arthur	9	81.5%	100.0%	100.0%	0.0%	0.67	RED	
Sanchez, Christopher	7	77.3%	98.7%	100.0%	0.0%	0.79	WHITE	
Seeck, Christian	31	63.5%	92.6%	98.8%	1.2%	1.11	WHITE	
Swanson, Dennis	11	65.2%	89.6%	97.4%	2.6%	1.03	YELLOW	
Terrado, Ken	7	79.4%	95.6%	100.0%	0.0%	0.87	WHITE	
Thomsen, Sven	18	53.2%	85.1%	98.4%	1.6%	1.05	YELLOW	
Trevino, Robert	8	93.7%	100.0%	100.0%	0.0%	0.53	BLUE	
Veiga, Victor	11	73.2%	92.9%	98.2%	1.8%	1.02	WHITE	
Viera, Ralph B.	11	89.6%	99.1%	99.1%	0.9%	0.68	BLUE	
Wesseling, Hendrik	11	43.5%	80.0%	93.9%	6.1%	1.54	YELLOW	
Westerveld, Bernard Maarten	14	78.1%	98.0%	100.0%	0.0%	0.87	WHITE	

Group Criteria

Color codes using
unscreened data.

	Minimum Number of Parts Rated	Minimum Yi's Within 1 STD of mean	Minimum Yi's Within 2 STD of mean	Maximum Overall Yi STD	Group Totals	
White	6	60%	90%	1.20	14	33%
Red	6	80%	95%	0.85	13	31%
Blue	6	85%	98%	0.75	8	19%
Yellow	-	-	-	-	7	17%

HEAVY DUTY RATING WORKSHOP (2015 October 6-8)

Demerit Piston Deposits

Rater	Parts Rated	-1<yi<=1	-2<yi<=2	-3<yi<=3	>3	Yi STD	Group	Group Color
Aguirre, Nancy P	10	83.2%	98.0%	100.0%	0.0%	0.73	RED	
Alvernaz, Jack	7	77.9%	95.6%	100.0%	0.0%	0.85	WHITE	
Arrizon, Richard	6	71.7%	98.3%	100.0%	0.0%	0.83	WHITE	
Barrera, Tony	11	80.0%	95.7%	100.0%	0.0%	0.87	WHITE	
Booth, Jeffrey	6	70.8%	90.8%	100.0%	0.0%	1.03	WHITE	
Cales, Jonathon	9	70.6%	97.7%	100.0%	0.0%	0.87	WHITE	
Castillo, George	9	71.7%	98.9%	100.0%	0.0%	0.86	WHITE	
Clapperty, Leon	5	73.9%	97.8%	100.0%	0.0%	0.84	N/A	
Clare, Jamie	8	68.7%	94.0%	100.0%	0.0%	0.98	WHITE	
DeCapite, Vanessa	9	72.8%	98.9%	100.0%	0.0%	0.76	WHITE	
Ellis, Paul	8	75.0%	100.0%	100.0%	0.0%	0.81	WHITE	
Fujita, Hirokazu	8	82.3%	100.0%	100.0%	0.0%	0.74	RED	
Greenland, Paul	11	90.9%	100.0%	100.0%	0.0%	0.61	BLUE	
Guarda, Waldyr	11	44.4%	77.4%	94.8%	5.2%	1.03	YELLOW	
Guo, Feng	8	81.0%	100.0%	100.0%	0.0%	0.75	RED	
Hill, Howard P.	10	76.0%	100.0%	100.0%	0.0%	0.75	WHITE	
Hills, Barry	10	89.3%	100.0%	100.0%	0.0%	0.63	BLUE	
Hodgson, Joshua	6	68.9%	90.2%	100.0%	0.0%	1.06	WHITE	
King, Jennifer	11	62.6%	95.7%	100.0%	0.0%	0.94	WHITE	
Kobrinetz, Joaquin J.	9	93.4%	100.0%	100.0%	0.0%	0.59	BLUE	
Langford, Mike	10	76.0%	100.0%	100.0%	0.0%	0.85	WHITE	
Li, Jie	8	82.1%	100.0%	100.0%	0.0%	0.76	RED	
Lonsway, Chris	7	75.4%	93.9%	100.0%	0.0%	0.80	WHITE	
Lopez, Frank	11	70.4%	97.4%	100.0%	0.0%	0.92	WHITE	
May, Marianne	11	87.8%	99.1%	100.0%	0.0%	0.65	BLUE	
Parvaz, Ibrar	8	78.5%	92.4%	100.0%	0.0%	0.91	WHITE	
Potocar, William P	9	74.7%	97.8%	100.0%	0.0%	0.78	WHITE	
Price, Gregory	10	78.4%	98.0%	100.0%	0.0%	0.85	WHITE	
Reese, Kyle	6	58.7%	87.3%	100.0%	0.0%	1.21	YELLOW	
Richards, Craig	9	55.4%	93.5%	100.0%	0.0%	1.04	YELLOW	
Rodriguez, Jesus (Jesse)	11	86.1%	99.1%	100.0%	0.0%	0.73	BLUE	
Sanchez, Arthur	9	80.4%	97.8%	100.0%	0.0%	0.73	RED	
Sanchez, Christopher	7	70.7%	98.7%	100.0%	0.0%	0.83	WHITE	
Seeck, Christian	27	61.2%	92.8%	99.6%	0.4%	1.11	WHITE	
Swanson, Dennis	9	65.6%	90.3%	100.0%	0.0%	1.01	WHITE	
Terrado, Ken	7	76.5%	94.1%	100.0%	0.0%	0.91	WHITE	
Thomsen, Sven	15	49.7%	83.0%	98.7%	1.3%	1.08	YELLOW	
Trevino, Robert	8	89.9%	100.0%	100.0%	0.0%	0.63	BLUE	
Veiga, Victor	10	72.3%	93.1%	100.0%	0.0%	1.01	WHITE	
Viera, Ralph B.	11	84.4%	97.4%	100.0%	0.0%	0.77	RED	
Wesseling, Hendrik	7	46.3%	86.3%	100.0%	0.0%	1.23	YELLOW	
Westerveld, Bernard Maarten	14	71.9%	95.9%	100.0%	0.0%	0.95	WHITE	

Color codes
screening outlier
parts.

Group Criteria

	Minimum Number of Parts Rated	Minimum Yi's Within 1 STD of mean	Minimum Yi's Within 2 STD of mean	Maximum Overall Yi STD	Group Totals	
White	6	60%	90%	1.20	24	59%
Red	6	80%	95%	0.85	6	15%
Blue	6	85%	98%	0.75	6	15%
Yellow	-	-	-	-	5	12%

HEAVY DUTY RATING WORKSHOP (2015 October 6-8)

Demerit Piston Deposits

Rater	Parts Rated	-1<yi<=1	-2<yi<=2	-3<yi<=3	>3	Yi STD	Group	Group Color
Aguirre, Nancy P	10	84.2%	98.0%	100.0%	0.0%	0.63	RED	
Alvernaz, Jack	8	74.7%	93.7%	98.7%	1.3%	0.88	WHITE	
Arrizon, Richard	6	80.0%	100.0%	100.0%	0.0%	0.78	RED	
Barrera, Tony	11	81.7%	95.7%	99.1%	0.9%	0.83	RED	
Booth, Jeffrey	8	64.2%	85.2%	97.5%	2.5%	1.10	YELLOW	
Cales, Jonathon	10	68.8%	96.9%	99.0%	1.0%	0.85	WHITE	
Castillo, George	9	76.1%	98.9%	100.0%	0.0%	0.83	WHITE	
Clapperty, Leon	8	68.4%	92.4%	96.2%	3.8%	0.92	WHITE	
Clare, Jamie	8	73.5%	96.4%	100.0%	0.0%	0.93	WHITE	
DeCapite, Vanessa	9	76.1%	98.9%	100.0%	0.0%	0.73	WHITE	
Ellis, Paul	8	77.5%	98.8%	100.0%	0.0%	0.78	WHITE	
Fujita, Hirokazu	8	82.3%	100.0%	100.0%	0.0%	0.72	RED	
Greenland, Paul	11	90.9%	100.0%	100.0%	0.0%	0.59	BLUE	
Guarda, Waldyr	11	44.4%	81.7%	94.8%	5.2%	1.20	YELLOW	
Guo, Feng	8	84.8%	100.0%	100.0%	0.0%	0.74	RED	
Hill, Howard P.	11	78.3%	99.1%	99.1%	0.9%	0.78	WHITE	
Hills, Barry	10	90.3%	100.0%	100.0%	0.0%	0.62	BLUE	
Hodgson, Joshua	7	66.7%	90.3%	98.6%	1.4%	1.05	WHITE	
King, Jennifer	11	64.4%	95.7%	100.0%	0.0%	0.94	WHITE	
Kobrinetz, Joaquin J.	10	91.2%	98.0%	98.0%	2.0%	0.66	BLUE	
Langford, Mike	10	74.0%	100.0%	100.0%	0.0%	0.83	WHITE	
Li, Jie	8	83.3%	100.0%	100.0%	0.0%	0.75	RED	
Lonsway, Chris	7	76.9%	96.9%	100.0%	0.0%	0.74	WHITE	
Lopez, Frank	11	73.0%	98.3%	100.0%	0.0%	0.89	WHITE	
May, Marianne	11	93.9%	100.0%	100.0%	0.0%	0.56	BLUE	
Parvaz, Ibrar	8	83.5%	96.2%	100.0%	0.0%	0.83	RED	
Potocar, William P	9	74.7%	98.9%	100.0%	0.0%	0.68	WHITE	
Price, Gregory	10	80.4%	98.0%	100.0%	0.0%	0.80	RED	
Reese, Kyle	10	53.9%	76.9%	92.3%	7.7%	1.85	YELLOW	
Richards, Craig	10	56.3%	93.2%	99.0%	1.0%	1.02	YELLOW	
Rodriguez, Jesus (Jesse)	11	85.2%	100.0%	100.0%	0.0%	0.74	BLUE	
Sanchez, Arthur	9	80.4%	100.0%	100.0%	0.0%	0.72	RED	
Sanchez, Christopher	7	73.3%	98.7%	100.0%	0.0%	0.83	WHITE	
Seeck, Christian	31	60.4%	92.0%	98.1%	1.9%	1.09	WHITE	
Swanson, Dennis	11	61.7%	87.8%	96.5%	3.5%	1.03	YELLOW	
Terrado, Ken	7	77.9%	94.1%	100.0%	0.0%	0.93	WHITE	
Thomsen, Sven	18	50.0%	83.0%	97.3%	2.7%	1.75	YELLOW	
Trevino, Robert	8	92.4%	100.0%	100.0%	0.0%	0.55	BLUE	
Veiga, Victor	11	72.3%	92.9%	96.4%	3.6%	1.06	WHITE	
Viera, Ralph B.	11	86.1%	98.3%	99.1%	0.9%	0.68	BLUE	
Wesseling, Hendrik	11	41.7%	79.1%	93.9%	6.1%	1.81	YELLOW	
Westerveld, Bernard Maarten	14	76.0%	97.3%	100.0%	0.0%	0.91	WHITE	

Group Criteria

Color codes
screening outlier
ratings from
targets.

	Minimum Number of Parts Rated	Minimum Yi's Within 1 STD of mean	Minimum Yi's Within 2 STD of mean	Maximum Overall Yi STD	Group Totals	
White	6	60%	90%	1.20	19	45%
Red	6	80%	95%	0.85	9	21%
Blue	6	85%	98%	0.75	7	17%
Yellow	-	-	-	-	7	17%



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Test Monitoring Center

<http://astmtmc.cmu.edu>

Attachment 7

Parts Availability

Deposit Workshop Meeting

June 14, 2016; 8:30am to 4:00pm

Pittsburgh, PA

Parts Availability

- At Past Workshops, parts from the “other” (LD at HD, HD at LD) workshop have been offered.
- Typically, these parts have occupied 6 of the 36 rating booths (17%) at the workshop.

“Off-Workshop” Parts Interest

- Typically, interest in rating these parts is very low.
 - At the 2016 LD Workshop, HD parts were available; no ratings were made.
 - At the 2015 HD Workshop, LD parts were available; 7-12 raters rated Seq. V parts and 2-3 raters rated Seq. III parts, out of 42 raters in attendance.

“Off-Workshop” Parts Impact

- Making these parts available ties up a significant amount of booth space.
- Most raters are not interested in rating the “off workshop” parts.
- Lacking sufficient rating data, analysis of any ratings obtained becomes difficult, if not impossible.

Plans for Future Workshops

- Starting with the 2016 HD Workshop, remove all “off workshop” parts.
- This should make more booths available to all raters.
- It should also help with the overcrowding problem experienced at recent HD workshops.



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Attachment 8

Rater Workshop Attendance Groups

► June 2016

Test Monitoring Center
<http://astmcmc.cmu.edu>



Rater Groups

- ▶ Lab Raters
 - TMC Calibrated Lab Raters
- ▶ Field Raters
 - Everything Else Testing
- ▶ Untrained Raters
- ▶ Exposure to Different Deposit Levels

Restricted Attendance

- ▶ TMC was asked to restrict attendance of LD 2015 to ASTM calibrated lab raters
- ▶ Moving forward how do we serve these groups?



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Test Monitoring Center

<http://astmtmc.cmu.edu>

Attachment 9

Equipment/LED Evaluation

Deposit Workshop Meeting

June 14, 2016; 8:30am to 4:00pm

Pittsburgh, PA

Fluorescent Lighting Issues

- Currently, the industry uses these fluorescent lamps for rating:
 - FC8T9-CW (“round” fixture)
 - F15T8-CQ (“two-bulb” fixture)
- Due to Federal regulations, fluorescent lamps are going off the market.
- For some labs, breaking a fluorescent lamp is a ***significant*** problem, due to the mercury content, requiring a full “Haz-Mat” response.

European use of LED lighting

- The European CEC Rating Method specifies the use of LED light fixtures.
- At least two of the fixtures allowable for use in the CEC method are manufactured by Waldmann Lighting.
 - Tevisio (round fixture)
 - Taneo (“two bulb” fixture)

Example LED Fixtures

- Nick LaRoche, of Waldmann Lighting Company, provided examples of both fixtures for evaluation.
- These two fixtures were available at the 2015 LD Workshop for evaluation.
 - Four parts rated with LED lighting at the workshop.
 - They are LED-X (X=1-4) in the 2015 LD Workshop Final Report.

LED Fixture Details

- If 50 fixtures are ordered, they can be ordered in white, as Manual 20 requires.
- The Tevisio fixture can be special-ordered without the center magnifying lens, to reduce unit costs.

Example White Fixture



Example White Fixture





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Test Monitoring Center

@ Carnegie Mellon University
6555 Penn Avenue, Pittsburgh, PA 15206, USA

<http://astmtmc.cmu.edu>
412-365-1000

June 14, 2016

The ASTM International Light Duty Rating Workshop was held on April 5-7, 2016, in San Antonio, TX. At that workshop, two new LED light fixtures were evaluated as possible replacements for the current “round” and “two-bulb” fluorescent light fixtures currently in use.

Four “pistons” were rated: a Sequence IIIG, a Sequence IIIH, a GMOD, and a set of four Sequence VG pistons. These parts were rated by all attendees, using the current fluorescent lights, as “Baseline” parts 1 through 4.

In the second exercise, these same four “pistons” were rated using the appropriate LED replacement fixture, by any raters willing to rate them, as “LED” parts 1 through 4.

The ratings generated are shown on the following pages.

Sincerely,

Michael T. Kasimirsky
Workshop Coordinator

LIGHT DUTY RATING WORKSHOP (April 5-7, 2016)

Part ID= REF-1 - BASELINE SEQ IIIG PISTON

Rated Values

* Denotes parameters not used in Blue, Red, White & Yellow assessment

Rater	G1TOT	G3TOT	L3TOT	THTOT	
Aguirre, Nancy P	1.27	9.33	2.65	9.70	
Barrera, Tony	1.19	9.47	2.35	9.73	
Broff, Andy	0.22	9.30	1.55	9.81	
Cales, Jonathon	1.01	9.23	3.41	9.78	
Campbell, Bryan	1.64	9.21	3.31	9.75	
Caproni, David	0.89	9.51	2.83	9.77	
Castillo, George	1.21	9.56	2.62	9.53	
DeCapite, Vanessa	1.29	9.61	2.14	9.72	
Dominguez, Lucio	1.43	9.28	2.63	9.59	
Foecking, Brian	1.28	9.48	2.03	9.46	
Garza, Juan	1.50	8.95	2.03	9.20	
Greenland, Paul	1.25	9.61	3.63	9.70	
Hurst, Kevin R.	0.91	9.23	2.15	9.57	
King, Jennifer	1.25	9.31	2.31	9.76	
Kobrinetz, Joaquin J.	1.34	9.41	2.52	9.76	
Langford, Mike	1.16	9.58	2.47	9.77	
Lonsway, Chris	1.28	9.29	2.38	9.57	
Lopez, Frank	1.10	9.40	1.67	9.67	
Lowsky, John	1.54	9.61	3.29	9.74	
May, Marianne	0.87	9.55	3.06	9.67	
Potocar, William P	1.00	9.24	2.35	9.50	
Price, Gregory	1.40	9.33	2.57	9.59	
Reese, Kyle	1.16	9.39	3.12	9.70	
Rodriguez, Jesus (Jesse)	1.16	9.25	2.28	9.67	
Sanchez, Arthur	1.19	9.31	2.32	9.50	
Seiz, Ray	1.26	9.42	3.03	9.53	
Trevino, Robert	1.54	9.33	2.81	9.68	
Veiga, Victor	1.22	8.48	2.86	9.73	
Viera, Ralph B.	1.48	9.55	3.21	9.66	
Zalewski, John	0.75	9.39	2.67	9.67	
MAXIMUM	1.64	9.61	3.63	9.81	
MINIMUM	0.22	8.48	1.55	9.20	
RANGE(MAX-MIN)	1.420	1.130	2.080	0.610	
MEAN	1.193	9.354	2.608	9.649	
STANDARD DEVIATION	0.281	0.224	0.505	0.128	
N SIZE	30.000				

LIGHT DUTY RATING WORKSHOP (April 5-7, 2016)

Part ID= REF-1 - BASELINE SEQ IIIG PISTON

REF-1 Yi Values

* Denotes parameters not used in Blue, Red, White & Yellow assessment

Rater	G1TOT	G3TOT	L3TOT	THTOT	
Aguirre, Nancy P	0.27	-0.11	0.08	0.40	
Barrera, Tony	-0.01	0.52	-0.51	0.63	
Broff, Andy	-3.47	-0.24	-2.09	1.26	
Cales, Jonathon	-0.65	-0.55	1.59	1.02	
Campbell, Bryan	1.59	-0.64	1.39	0.79	
Caproni, David	-1.08	0.70	0.44	0.94	
Castillo, George	0.06	0.92	0.02	-0.93	
DeCapite, Vanessa	0.35	1.15	-0.93	0.55	
Dominguez, Lucio	0.84	-0.33	0.04	-0.46	
Foecking, Brian	0.31	0.56	-1.14	-1.48	
Garza, Juan	1.09	-1.80	-1.14	-3.52	
Greenland, Paul	0.20	1.15	2.02	0.40	
Hurst, Kevin R.	-1.01	-0.55	-0.91	-0.62	
King, Jennifer	0.20	-0.20	-0.59	0.87	
Kobrinetz, Joaquin J.	0.52	0.25	-0.17	0.87	
Langford, Mike	-0.12	1.01	-0.27	0.94	
Lonsway, Chris	0.31	-0.28	-0.45	-0.62	
Lopez, Frank	-0.33	0.21	-1.86	0.16	
Lowsky, John	1.24	1.15	1.35	0.71	
May, Marianne	-1.15	0.88	0.89	0.16	
Potocar, William P	-0.69	-0.51	-0.51	-1.17	
Price, Gregory	0.74	-0.11	-0.08	-0.46	
Reese, Kyle	-0.12	0.16	1.01	0.40	
Rodriguez, Jesus (Jesse)	-0.12	-0.46	-0.65	0.16	
Sanchez, Arthur	-0.01	-0.20	-0.57	-1.17	
Seiz, Ray	0.24	0.30	0.83	-0.93	
Trevino, Robert	1.24	-0.11	0.40	0.24	
Veiga, Victor	0.10	-3.90	0.50	0.63	
Viera, Ralph B.	1.02	0.88	1.19	0.08	
Zalewski, John	-1.58	0.16	0.12	0.16	
MAXIMUM	-3.47	-3.90	-2.09	-3.52	
MINIMUM	-0.01	-0.11	0.02	0.08	
RANGE(MAX-MIN)	-3.458	-3.797	-2.118	-3.599	
MEAN	0.000	0.000	0.000	0.000	
STANDARD DEVIATION	1.000	1.000	1.000	1.000	
N SIZE	30.000				

LIGHT DUTY RATING WORKSHOP (April 5-7, 2016)

Part ID= REF-2 - BASELINE SEQ IIH PISTON

Rated Values

* Denotes parameters not used in Blue, Red, White & Yellow assessment

Rater	G1TOT	G3TOT	L3TOT	FRTOT	
Aguirre, Nancy P	0.75	6.98	2.98	9.49	
Barrera, Tony	0.75	6.46	2.53	8.79	
Broff, Andy	0.00	5.85	2.60	8.18	
Cales, Jonathon	0.75	6.52	2.99	9.16	
Campbell, Bryan	0.68	6.61	2.98	7.43	
Caproni, David	0.74	6.55	2.83	8.70	
Castillo, George	0.74	6.46	2.68	8.57	
DeCapite, Vanessa	0.75	5.99	2.50	9.01	
Dominguez, Lucio	0.75	5.85	2.56	8.45	
Foecking, Brian	0.74	6.73	2.50	9.14	
Garza, Juan	0.75	5.20	2.23	8.41	
Greenland, Paul	0.68	6.33	2.56	9.21	
Hurst, Kevin R.	0.74	5.80	2.29	9.11	
King, Jennifer	0.75	6.37	2.82	9.15	
Kobrinetz, Joaquin J.	0.73	6.08	2.84	9.00	
Langford, Mike	0.69	6.39	2.33	8.99	
Lonsway, Chris	0.75	5.81	2.62	9.11	
Lopez, Frank	0.75	6.16	2.02	9.45	
Lowsky, John	0.47	6.30	2.89	9.19	
May, Marianne	0.75	6.52	3.03	9.40	
Potocar, William P	0.75	6.26	3.01	9.15	
Price, Gregory	0.74	6.62	2.62	9.26	
Reese, Kyle	0.71	6.11	2.12	9.11	
Rodriguez, Jesus (Jesse)	0.75	6.03	2.45	9.46	
Sanchez, Arthur	0.75	6.73	2.67	9.33	
Seiz, Ray	0.73	6.85	2.42	8.78	
Trevino, Robert	0.73	7.06	3.16	9.16	
Veiga, Victor	0.73	6.69	2.09	8.93	
Viera, Ralph B.	0.68	6.47	3.11	8.93	
Zalewski, John	0.75	6.92	2.60	9.42	
MAXIMUM	0.75	7.06	3.16	9.49	
MINIMUM	0.00	5.20	2.02	7.43	
RANGE(MAX-MIN)	0.750	1.860	1.140	2.060	
MEAN	0.701	6.357	2.634	8.982	
STANDARD DEVIATION	0.143	0.415	0.311	0.438	
N SIZE	30.000				

LIGHT DUTY RATING WORKSHOP (April 5-7, 2016)

Part ID= REF-2 - BASELINE SEQ IIH PISTON

REF-2 Yi Values

* Denotes parameters not used in Blue, Red, White & Yellow assessment

Rater	G1TOT	G3TOT	L3TOT	FRTOT	
Aguirre, Nancy P	0.34	1.50	1.11	1.16	
Barrera, Tony	0.34	0.25	-0.34	-0.44	
Broff, Andy	-4.91	-1.22	-0.11	-1.83	
Cales, Jonathon	0.34	0.39	1.14	0.41	
Campbell, Bryan	-0.15	0.61	1.11	-3.55	
Caproni, David	0.27	0.47	0.63	-0.65	
Castillo, George	0.27	0.25	0.15	-0.94	
DeCapite, Vanessa	0.34	-0.88	-0.43	0.06	
Dominguez, Lucio	0.34	-1.22	-0.24	-1.22	
Foecking, Brian	0.27	0.90	-0.43	0.36	
Garza, Juan	0.34	-2.79	-1.30	-1.31	
Greenland, Paul	-0.15	-0.06	-0.24	0.52	
Hurst, Kevin R.	0.27	-1.34	-1.11	0.29	
King, Jennifer	0.34	0.03	0.60	0.38	
Kobrinetz, Joaquin J.	0.20	-0.67	0.66	0.04	
Langford, Mike	-0.08	0.08	-0.98	0.02	
Lonsway, Chris	0.34	-1.32	-0.05	0.29	
Lopez, Frank	0.34	-0.47	-1.98	1.07	
Lowsky, John	-1.62	-0.14	0.82	0.47	
May, Marianne	0.34	0.39	1.27	0.95	
Potocar, William P	0.34	-0.23	1.21	0.38	
Price, Gregory	0.27	0.64	-0.05	0.63	
Reese, Kyle	0.06	-0.60	-1.65	0.29	
Rodriguez, Jesus (Jesse)	0.34	-0.79	-0.59	1.09	
Sanchez, Arthur	0.34	0.90	0.11	0.79	
Seiz, Ray	0.20	1.19	-0.69	-0.46	
Trevino, Robert	0.20	1.70	1.69	0.41	
Veiga, Victor	0.20	0.80	-1.75	-0.12	
Viera, Ralph B.	-0.15	0.27	1.53	-0.12	
Zalewski, John	0.34	1.36	-0.11	1.00	
MAXIMUM	-4.91	-2.79	-1.98	-3.55	
MINIMUM	0.06	0.03	-0.05	0.02	
RANGE(MAX-MIN)	-4.974	-2.822	-1.930	-3.564	
MEAN	0.000	0.000	0.000	0.000	
STANDARD DEVIATION	1.000	1.000	1.000	1.000	
N SIZE	30.000				

LIGHT DUTY RATING WORKSHOP (April 5-7, 2016)

Part ID= REF-3 - BASELINE GMOD PISTON

Rated Values

* Denotes parameters not used in Blue, Red, White & Yellow assessment

Rater	G1TOT	G2TOT	L3TOT	THTOT	
Aguirre, Nancy P	2.12	6.67	8.91	9.74	
Barrera, Tony	1.43	5.39	8.62	9.71	
Broff, Andy	1.98	6.25	8.35	9.88	
Cales, Jonathon	1.79	4.45	9.05	9.70	
Campbell, Bryan	2.14	4.93	8.63	9.71	
Caproni, David	1.46	5.55	8.94	9.73	
Castillo, George	1.53	6.00	9.34	9.74	
DeCapite, Vanessa	1.25	5.04	9.16	9.88	
Dominguez, Lucio	1.44	5.39	9.13	9.59	
Foecking, Brian	1.66	6.47	9.33	9.57	
Garza, Juan	1.74	6.84	9.25	9.65	
Greenland, Paul	1.89	6.50	9.05	9.88	
Hurst, Kevin R.	1.43	6.08	8.93	9.64	
King, Jennifer	1.54	5.79	9.10	9.95	
Kobrinetz, Joaquin J.	1.52	5.57	9.07	9.84	
Langford, Mike	1.88	4.74	9.10	9.91	
Lonsway, Chris	1.50	5.20	9.12	9.66	
Lopez, Frank	1.39	5.74	9.27	9.69	
Lowsky, John	1.87	6.63	9.22	9.85	
May, Marianne	1.46	6.36	9.35	9.74	
Potocar, William P	1.36	5.19	9.30	9.69	
Price, Gregory	1.78	5.23	8.85	9.59	
Reese, Kyle	1.95	5.10	9.68	9.58	
Rodriguez, Jesus (Jesse)	1.36	5.35	8.94	9.70	
Sanchez, Arthur	1.77	6.77	9.28	9.81	
Seiz, Ray	1.97	5.01	9.46	9.91	
Trevino, Robert	1.78	6.54	8.75	9.71	
Veiga, Victor	1.37	6.32	8.90	9.78	
Viera, Ralph B.	1.39	5.67	9.48	9.89	
Zalewski, John	2.00	5.52	9.31	9.54	
MAXIMUM	2.14	6.84	9.68	9.95	
MINIMUM	1.25	4.45	8.35	9.54	
RANGE(MAX-MIN)	0.890	2.390	1.330	0.410	
MEAN	1.658	5.743	9.096	9.742	
STANDARD DEVIATION	0.259	0.669	0.284	0.115	
N SIZE	30.000				

LIGHT DUTY RATING WORKSHOP (April 5-7, 2016)

Part ID= REF-3 - BASELINE GMOD PISTON

REF-3 Yi Values

* Denotes parameters not used in Blue, Red, White & Yellow assessment

Rater	G1TOT	G2TOT	L3TOT	THTOT	
Aguirre, Nancy P	1.79	1.39	-0.65	-0.02	
Barrera, Tony	-0.88	-0.53	-1.68	-0.28	
Broff, Andy	1.24	0.76	-2.63	1.20	
Cales, Jonathon	0.51	-1.93	-0.16	-0.36	
Campbell, Bryan	1.86	-1.22	-1.64	-0.28	
Caproni, David	-0.77	-0.29	-0.55	-0.10	
Castillo, George	-0.50	0.38	0.86	-0.02	
DeCapite, Vanessa	-1.58	-1.05	0.23	1.20	
Dominguez, Lucio	-0.84	-0.53	0.12	-1.32	
Foecking, Brian	0.01	1.09	0.83	-1.49	
Garza, Juan	0.32	1.64	0.54	-0.80	
Greenland, Paul	0.90	1.13	-0.16	1.20	
Hurst, Kevin R.	-0.88	0.50	-0.58	-0.88	
King, Jennifer	-0.46	0.07	0.02	1.80	
Kobrinetz, Joaquin J.	-0.54	-0.26	-0.09	0.85	
Langford, Mike	0.86	-1.50	0.02	1.45	
Lonsway, Chris	-0.61	-0.81	0.09	-0.71	
Lopez, Frank	-1.04	0.00	0.61	-0.45	
Lowsky, John	0.82	1.33	0.44	0.94	
May, Marianne	-0.77	0.92	0.90	-0.02	
Potocar, William P	-1.15	-0.83	0.72	-0.45	
Price, Gregory	0.47	-0.77	-0.87	-1.32	
Reese, Kyle	1.13	-0.96	2.06	-1.40	
Rodriguez, Jesus (Jesse)	-1.15	-0.59	-0.55	-0.36	
Sanchez, Arthur	0.43	1.54	0.65	0.59	
Seiz, Ray	1.21	-1.10	1.29	1.45	
Trevino, Robert	0.47	1.19	-1.22	-0.28	
Veiga, Victor	-1.12	0.86	-0.69	0.33	
Viera, Ralph B.	-1.04	-0.11	1.36	1.28	
Zalewski, John	1.32	-0.33	0.76	-1.75	
MAXIMUM	1.86	-1.93	-2.63	1.80	
MINIMUM	0.01	0.00	0.02	-0.02	
RANGE(MAX-MIN)	1.857	-1.929	-2.645	1.819	
MEAN	0.000	0.000	0.000	0.000	
STANDARD DEVIATION	1.000	1.000	1.000	1.000	
N SIZE	30.000				

LIGHT DUTY RATING WORKSHOP (April 5-7, 2016)

Part ID= REF-4 - BASELINE SEQ. V PISTONS

Rated Values

* Denotes parameters not used in Blue, Red, White & Yellow assessment

Rater	P1MERI	P2MERI	P3MERI	P4MERI	
Aguirre, Nancy P	9.13	8.97	8.38	8.88	
Barrera, Tony	9.54	8.84	8.47	8.86	
Broff, Andy	9.49	8.80	8.08	8.88	
Cales, Jonathon	9.55	9.32	8.88	9.12	
Campbell, Bryan	8.58	8.49	8.16	8.33	
Caproni, David	9.50	9.10	8.97	9.30	
Castillo, George	9.56	9.21	8.27	9.26	
DeCapite, Vanessa	9.60	9.45	8.58	9.15	
Dominguez, Lucio	9.45	9.20	8.59	9.21	
Foecking, Brian	9.64	9.33	8.47	9.17	
Garza, Juan	9.40	8.77	7.85	8.60	
Greenland, Paul	9.46	9.29	8.43	9.01	
Hurst, Kevin R.	9.38	9.23	8.75	8.96	
King, Jennifer	9.64	9.50	9.02	9.36	
Kobrinetz, Joaquin J.	9.56	9.25	8.68	9.10	
Langford, Mike	9.60	9.26	8.76	9.00	
Lonsway, Chris	9.56	9.42	8.97	9.29	
Lopez, Frank	9.65	9.38	8.81	9.35	
Lowsky, John	9.55	9.32	8.95	9.25	
May, Marianne	9.61	9.49	8.56	9.28	
Potocar, William P	9.49	9.34	8.97	9.22	
Price, Gregory	9.30	9.04	9.04	8.81	
Reese, Kyle	8.92	8.82	7.69	8.59	
Rodriguez, Jesus (Jesse)	9.62	9.42	8.41	9.59	
Sanchez, Arthur	9.51	9.31	8.85	9.12	
Seiz, Ray	9.76	9.68	8.77	9.12	
Trevino, Robert	9.29	9.09	8.63	8.91	
Veiga, Victor	9.60	9.34	8.77	9.40	
Viera, Ralph B.	9.45	9.27	8.27	9.17	
Zalewski, John	9.72	9.69	8.03	8.79	
MAXIMUM	9.76	9.69	9.04	9.59	
MINIMUM	8.58	8.49	7.69	8.33	
RANGE(MAX-MIN)	1.180	1.200	1.350	1.260	
MEAN	9.470	9.221	8.569	9.069	
STANDARD DEVIATION	0.239	0.273	0.358	0.272	
N SIZE	30.000				

LIGHT DUTY RATING WORKSHOP (April 5-7, 2016)

Part ID= REF-4 - BASELINE SEQ. V PISTONS

REF-4 Yi Values

* Denotes parameters not used in Blue, Red, White & Yellow assessment

Rater	P1MERI	P2MERI	P3MERI	P4MERI	
Aguirre, Nancy P	-1.42	-0.92	-0.53	-0.70	
Barrera, Tony	0.29	-1.39	-0.28	-0.77	
Broff, Andy	0.08	-1.54	-1.36	-0.70	
Cales, Jonathon	0.33	0.36	0.87	0.19	
Campbell, Bryan	-3.72	-2.67	-1.14	-2.72	
Caproni, David	0.12	-0.44	1.12	0.85	
Castillo, George	0.37	-0.04	-0.83	0.70	
DeCapite, Vanessa	0.54	0.84	0.03	0.30	
Dominguez, Lucio	-0.09	-0.08	0.06	0.52	
Foecking, Brian	0.71	0.40	-0.28	0.37	
Garza, Juan	-0.29	-1.65	-2.01	-1.73	
Greenland, Paul	-0.04	0.25	-0.39	-0.22	
Hurst, Kevin R.	-0.38	0.03	0.51	-0.40	
King, Jennifer	0.71	1.02	1.26	1.07	
Kobrinetz, Joaquin J.	0.37	0.11	0.31	0.11	
Langford, Mike	0.54	0.14	0.53	-0.26	
Lonsway, Chris	0.37	0.73	1.12	0.81	
Lopez, Frank	0.75	0.58	0.67	1.03	
Lowsky, John	0.33	0.36	1.06	0.67	
May, Marianne	0.58	0.99	-0.02	0.78	
Potocar, William P	0.08	0.44	1.12	0.55	
Price, Gregory	-0.71	-0.66	1.32	-0.95	
Reese, Kyle	-2.30	-1.47	-2.45	-1.76	
Rodriguez, Jesus (Jesse)	0.63	0.73	-0.44	1.92	
Sanchez, Arthur	0.17	0.33	0.79	0.19	
Seiz, Ray	1.21	1.68	0.56	0.19	
Trevino, Robert	-0.75	-0.48	0.17	-0.59	
Veiga, Victor	0.54	0.44	0.56	1.22	
Viera, Ralph B.	-0.09	0.18	-0.83	0.37	
Zalewski, John	1.04	1.72	-1.50	-1.03	
MAXIMUM	-3.72	-2.67	-2.45	-2.72	
MINIMUM	-0.04	0.03	-0.02	0.11	
RANGE(MAX-MIN)	-3.678	-2.709	-2.430	-2.835	
MEAN	0.000	0.000	0.000	0.000	
STANDARD DEVIATION	1.000	1.000	1.000	1.000	
N SIZE	30.000				

LIGHT DUTY RATING WORKSHOP (April 5-7, 2016)

Part ID= LED-1 - BASELINE SEQ IIIG PISTON

Rated Values

* Denotes parameters not used in Blue, Red, White & Yellow assessment

Rater	G1TOT	G3TOT	L3TOT	THTOT	
Foecking, Brian	1.25	9.53	2.42	9.62	
King, Jennifer	0.94	9.60	2.40	9.89	
Kobrinetz, Joaquin J.	1.18	9.47	2.30	9.76	
Lonsway, Chris	1.16	9.13	2.10	9.51	
Lowsky, John	2.18	9.39	3.39	9.82	
May, Marianne	0.92	9.60	3.09	9.59	
Potocar, William P	0.96	9.33	2.45	9.45	
Price, Gregory	1.34	9.26	2.57	9.63	
MAXIMUM	2.18	9.60	3.39	9.89	
MINIMUM	0.92	9.13	2.10	9.45	
RANGE(MAX-MIN)	1.260	0.470	1.290	0.440	
MEAN	1.241	9.414	2.590	9.659	
STANDARD DEVIATION	0.410	0.168	0.431	0.152	
N SIZE	8.000				

Part ID= LED-1 - BASELINE SEQ IIIG PISTON

LED-1 Yi Values

* Denotes parameters not used in Blue, Red, White & Yellow assessment

Rater	G1TOT	G3TOT	L3TOT	THTOT	
Foecking, Brian	0.02	0.69	-0.39	-0.25	
King, Jennifer	-0.74	1.11	-0.44	1.52	
Kobrinetz, Joaquin J.	-0.15	0.33	-0.67	0.66	
Lonsway, Chris	-0.20	-1.69	-1.14	-0.98	
Lowsky, John	2.29	-0.14	1.86	1.06	
May, Marianne	-0.78	1.11	1.16	-0.45	
Potocar, William P	-0.69	-0.50	-0.33	-1.37	
Price, Gregory	0.24	-0.91	-0.05	-0.19	
MAXIMUM	2.29	-1.69	1.86	1.52	
MINIMUM	0.02	-0.14	-0.05	-0.19	
RANGE(MAX-MIN)	2.270	-1.547	1.903	1.707	
MEAN	0.000	0.000	0.000	0.000	
STANDARD DEVIATION	1.000	1.000	1.000	1.000	
N SIZE	8.000				

LIGHT DUTY RATING WORKSHOP (April 5-7, 2016)

Part ID= LED-2 - BASELINE SEQ IIH PISTON

Rated Values

* Denotes parameters not used in Blue, Red, White & Yellow assessment

Rater	G1TOT	G3TOT	L3TOT	FRTOT	
Foecking, Brian	0.75	6.64	2.34	9.12	
King, Jennifer	0.75	6.02	2.80	9.38	
Kobrinetz, Joaquin J.	0.72	5.93	2.63	8.95	
Lonsway, Chris	0.75	6.26	2.31	9.38	
Lowsky, John	0.75	6.64	3.38	9.39	
May, Marianne	0.75	6.59	2.85	9.33	
Potocar, William P	0.75	6.24	2.93	9.01	
Price, Gregory	0.74	6.54	3.26	9.28	
MAXIMUM	0.75	6.64	3.38	9.39	
MINIMUM	0.72	5.93	2.31	8.95	
RANGE(MAX-MIN)	0.030	0.710	1.070	0.440	
MEAN	0.745	6.358	2.813	9.230	
STANDARD DEVIATION	0.050	0.285	0.387	0.178	
N SIZE	8.000				

Part ID= LED-2 - BASELINE SEQ IIH PISTON

LED-2 YI Values

* Denotes parameters not used in Blue, Red, White & Yellow assessment

Rater	G1TOT	G3TOT	L3TOT	FRTOT	
Foecking, Brian	0.10	0.99	-1.22	-0.62	
King, Jennifer	0.10	-1.19	-0.03	0.84	
Kobrinetz, Joaquin J.	-0.50	-1.50	-0.47	-1.57	
Lonsway, Chris	0.10	-0.34	-1.30	0.84	
Lowsky, John	0.10	0.99	1.47	0.90	
May, Marianne	0.10	0.82	0.10	0.56	
Potocar, William P	0.10	-0.41	0.30	-1.24	
Price, Gregory	-0.10	0.64	1.16	0.28	
MAXIMUM	-0.50	-1.50	1.47	-1.57	
MINIMUM	0.10	-0.34	-0.03	0.28	
RANGE(MAX-MIN)	-0.600	-1.160	1.500	-1.853	
MEAN	0.000	0.000	0.000	0.000	
STANDARD DEVIATION	0.214	1.000	1.000	1.000	
N SIZE	8.000				

LIGHT DUTY RATING WORKSHOP (April 5-7, 2016)

Part ID= LED-3 - BASELINE GMOD PISTON

Rated Values

* Denotes parameters not used in Blue, Red, White & Yellow assessment

Rater	G1TOT	G2TOT	L3TOT	THTOT	
Foecking, Brian	1.85	7.88	9.27	9.65	
King, Jennifer	1.71	5.58	9.29	10.00	
Kobrinetz, Joaquin J.	1.33	5.13	9.03	9.79	
Lonsway, Chris	1.33	4.74	9.11	9.66	
Lowsky, John	2.55	6.75	9.12	9.85	
May, Marianne	1.23	5.61	9.18	9.70	
Potocar, William P	1.39	5.13	9.18	9.46	
Price, Gregory	1.58	5.81	9.21	9.64	
MAXIMUM	2.55	7.88	9.29	10.00	
MINIMUM	1.23	4.74	9.03	9.46	
RANGE(MAX-MIN)	1.320	3.140	0.260	0.540	
MEAN	1.621	5.829	9.174	9.719	
STANDARD DEVIATION	0.431	1.023	0.086	0.162	
N SIZE	8.000				

Part ID= LED-3 - BASELINE GMOD PISTON

LED-3 Yi Values

* Denotes parameters not used in Blue, Red, White & Yellow assessment

Rater	G1TOT	G2TOT	L3TOT	THTOT	
Foecking, Brian	0.53	2.00	1.12	-0.43	
King, Jennifer	0.21	-0.24	1.35	1.74	
Kobrinetz, Joaquin J.	-0.68	-0.68	-1.67	0.44	
Lonsway, Chris	-0.68	-1.06	-0.74	-0.36	
Lowsky, John	2.15	0.90	-0.62	0.81	
May, Marianne	-0.91	-0.21	0.07	-0.12	
Potocar, William P	-0.54	-0.68	0.07	-1.60	
Price, Gregory	-0.10	-0.02	0.42	-0.49	
MAXIMUM	2.15	2.00	-1.67	1.74	
MINIMUM	-0.10	-0.02	0.07	-0.12	
RANGE(MAX-MIN)	2.250	2.023	-1.744	1.855	
MEAN	0.000	0.000	0.000	0.000	
STANDARD DEVIATION	1.000	1.000	1.000	1.000	
N SIZE	8.000				

LIGHT DUTY RATING WORKSHOP (April 5-7, 2016)

Part ID= LED-4 - BASELINE SEQ. V PISTONS

Rated Values

* Denotes parameters not used in Blue, Red, White & Yellow assessment

Rater	P1MERI	P2MERI	P3MERI	P4MERI	
Barrera, Tony	9.66	9.38	8.59	9.07	
Foecking, Brian	9.69	9.54	8.56	9.14	
King, Jennifer	9.61	9.47	9.06	9.22	
Kobrinetz, Joaquin J.	9.59	9.30	8.73	9.20	
Lonsway, Chris	9.70	9.27	8.50	9.22	
May, Marianne	9.63	9.48	8.60	9.26	
Price, Gregory	9.35	9.04	8.79	8.98	
MAXIMUM	9.70	9.54	9.06	9.26	
MINIMUM	9.35	9.04	8.50	8.98	
RANGE(MAX-MIN)	0.350	0.500	0.560	0.280	
MEAN	9.604	9.354	8.690	9.156	
STANDARD DEVIATION	0.119	0.170	0.191	0.100	
N SIZE	7.000				

Part ID= LED-4 - BASELINE SEQ. V PISTONS

LED-4 YI Values

* Denotes parameters not used in Blue, Red, White & Yellow assessment

Rater	P1MERI	P2MERI	P3MERI	P4MERI	
Barrera, Tony	0.47	0.15	-0.52	-0.86	
Foecking, Brian	0.72	1.09	-0.68	-0.16	
King, Jennifer	0.05	0.68	1.93	0.65	
Kobrinetz, Joaquin J.	-0.12	-0.32	0.21	0.44	
Lonsway, Chris	0.80	-0.50	-0.99	0.65	
May, Marianne	0.22	0.74	-0.47	1.05	
Price, Gregory	-2.13	-1.85	0.52	-1.76	
MAXIMUM	-2.13	-1.85	1.93	-1.76	
MINIMUM	0.05	0.15	0.21	-0.16	
RANGE(MAX-MIN)	-2.182	-2.001	1.725	-1.606	
MEAN	0.000	0.000	0.000	0.000	
STANDARD DEVIATION	1.000	1.000	1.000	1.000	
N SIZE	7.000				