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Committee D02 on PETROLEUM PRODUCTS AND LUBRICANTS

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May 23, 2005

Reply to:

Donald T. Bartlett

The Lubrizol Corporation

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(440) 347-2388

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ASTM D02.B0.03 L-37 Surveillance Panel

Members and Guests:

Attached for your review and comment are the unconfirmed minutes of the May 18th, 2005 L-37 Surveillance Panel teleconference call minutes. Please direct any corrections or comments to my attention.

Sincerely,

Donald T. Bartlett,

Chairman, L-37 Surveillance Panel

Attachments

Report of Conference Call
L-37 Surveillance Panel
May 18th, 2005, 3:30 p.m. EDT

The teleconference meeting was brought to order at 3:30 p.m. EDT.

I. Attendees:

ASTM TMC:	Don Lind	Ethyl Corp:	Cory Koglin
Lubrizol Corp:	Don Bartlett	SwRI:	Brian Koehler
PARC:	Dale Smith (proxy see <i>Attachment # 1</i>)		

II. Agenda:

The TMC updated the reference targets at 20 tests and requested Surveillance Panel approval for immediate implementation for the following gear batches:

- Lubrited hardware gear batch V1L686/P4L626A for both oils TMC 128-1 and 151-3.
- Non-lubrited hardware gear batch V1L176/P4L741A for both oils TMC 128-1 and 151-3.

III. Summary of Panel Discussion, Consensus Actions, and Motions:

Proposed targets for V1L686/P4L686 lubrited hardware:

The panel reviewed the data set and targets for lubrited gear batch V1L686/P4L626A. See *Attachment # 2*. Mr. Lind reported that none of the standard deviations had to be tweaked. There were 22 tests conducted on TMC 128-1 with 1 tests falling outside the new target/bands. There were 26 tests conducted on TMC 151-3 with 2 tests falling outside the new targets/bands. Combining the two oils, 48 tests were conducted with 3 tests falling outside the new targets/bands for a rejection rate of approximately 6 percent. The rejection rates were typical and deemed acceptable.

Motion 1 - After discussion, Mr. Koglin motioned, second by Mr. Lind, that the new statistical targets and revised means for non-lubrited gear batch V1L686/P4L626A for oils TMC 128-1 and 151-3 be approved and implemented effective May 19, 2005. The vote was unanimous, five votes for, none against, and no abstentions.

Proposed targets for V1L176/P4P741A non-lubrited hardware:

The panel reviewed the data set and targets for lubrited gear batch V1L176/P4L741A. See *Attachment # 3*. There were 27 tests conducted on TMC 128-1 with 4 tests falling outside the new targets/bands. There were 21 tests conducted on TMC 151-3 with 6 tests initially falling outside the new targets/bands. Combining the two oils, 48 tests were conducted with 10 tests falling outside the new targets/bands for a rejection rate of approximately 20 percent. The Panel was concerned with the abnormally high rejection rate.

Mr. Lind reported that, for TMC 151-3, there was statistical reasoning that allowed him to tweak the ridging σ to 0.5187 to let ratings of 10 be acceptable. Ratings of 7 would still not be included. The Panel was comfortable with this.

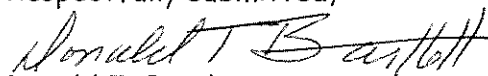
The proposed targets for all oils were deemed acceptable with the exception of rippling distress on TMC 151-3. The concern was that the initial targets (derived by the pooled standard deviation of the specific oil across all gear batches) initially allowed rippling distress values of 10. With the proposed new targets, three of the initial tests would now fall outside the new bands and future testing would not allow ratings of 10. Mr. Lind commented that if he opened the bands up to include a 10, then values of 7 would also be acceptable. The panel agreed that the data indicates that a rating of seven should not be acceptable, but rating values of 10's should.

Motion 2 - After discussion, Mr. Koehler motioned, second by Mr. Koglin, that the new statistical targets and revised means for lubrited gear batch V1L176/P4L741A for all parameters on TMC 128-1 and 151-3 be accepted with the exception for pinion rippling on TMC 151-3. For pinion rippling on TMC 151-3 using gear batch V1L176/P4L741A, the initial targets and means would remain in effect. (Rippling values of 10 would be acceptable and no sevens would be allowed in). Implementation date is effective May 19, 2005. The vote was approved, four votes in favor, none opposed, and one abstention.

Now, combining the two oils, 48 tests were conducted with 7 tests falling outside the new targets/bands for a rejection rate of approximately 14 percent. The rejection rates were deemed typical and acceptable.

The teleconference was adjourned on a motion by Mr. Lind/second by Mr Koglin at 3:58 p.m.

Respectfully submitted,


Donald T. Bartlett,

L-37 Surveillance Panel Chairman

Bartlett, Donald

From: Dale B. Smith [dsmith@parctech.com]

Sent: Wednesday, May 18, 2005 9:10 AM

To: Bartlett, Donald

Greetings Don,

I am sending this in case my meeting runs long with a new client. The new targets are acceptable to PARC for both axle batches. There are only one or two areas that would put us in jeopardy. I think that the targets should be close for the labs to keep us all honest.

Thanks,

Dale B. Smith

Technical Director

Parc Technical Services, Inc.

Attachment	<u>1</u>
Page	<u>12/1</u>
Reference	<u>L-37</u>

VIL686 / P4L626A

CMIR	Lab	Std.	Run	Oil	PINBAT	RINGBAT	DTCOMP	Pwear	Pridg	Pripp	Psplit	Rwear	Rridg	Rripp	Rsplit	lprcat	fprcat
35678	D	3	585	128-1	V1L686	P4L626A	20000808	6	6	8	10	9	9	10	10	.	.
38867	D	3	774	128-1	V1L686	P4L626A	20020420	7	7	9	9.7	9	9	10	10	2	0
44312	D	3	885	128-1	V1L686	P4L626A	20021210	7	6	6	9.9	8	9	10	10	2	0
46786	D	3A	31	128-1	V1L686	P4L626A	20031015	6	7	8	9.9	7	9	10	10	2	-1
50333	D	3A	224	128-1	V1L686	P4L626A	20041111	6	5	7	9.8	8	5	8	9.9	3	0
34460	B	191	1405	128-1	V1L686	P4L626A	20000811	7	6	6	9.9	7	8	9	10	.	.
35686	B	191	1525	128-1	V1L686	P4L626A	20011026	6	6	8	9.8	6	7	9	9.9	.	.
39385	B	191	1625	128-1	V1L686	P4L626A	20020521	6	7	8	9.9	5	7	9	9.9	2	-1
44281	B	191	1748	128-1	V1L686	P4L626A	20030123	7	7	9	9.8	8	8	10	9.9	2	-1
46774	B	191	1872	128-1	V1L686	P4L626A	20031012	6	7	8	9.9	6	8	9	9.9	2	-1
50343	B	191	2020	128-1	V1L686	P4L626A	20041020	7	7	9	9.9	8	8	10	9.9	2	-1
50344	B	286	25	128-1	V1L686	P4L626A	20041216	7	7	6	9.8	7	6	9	9.7	2	-1
34212	E	1	594	128-1	V1L686	P4L626A	20000809	5	7	8	9.8	7	8	10	9.9	.	.
35688	E	1	595	128-1	V1L686	P4L626A	20000810	5	7	8	9.9	7	8	10	9.9	.	.
37039	E	1	678	128-1	V1L686	P4L626A	20020117	7	7	8	9.7	7	7	9	9.9	3	-1
46791	E	1	774	128-1	V1L686	P4L626A	20030729	7	6	5	9.9	7	6	9	9.9	3	0
50081	E	1	812	128-1	V1L686	P4L626A	20040517	7	5	6	9.9	7	5	9	9.9	2	-1
35609	A	2	2309	128-1	V1L686	P4L626A	20000811	6	7	5	9.9	7	7	10	9.9	.	.
46803	A	2	2646	128-1	V1L686	P4L626A	20030924	6	6	7	9.9	7	6	10	9.9	2	-1
49556	A	2	2713	128-1	V1L686	P4L626A	20040603	6	7	5	9.9	7	7	9	9.9	3	0
49557	A	2	2757	128-1	V1L686	P4L626A	20041007	5	5	5	9.9	5	5	10	9.5	2	-1
50350	A	2	2812	128-1	V1L686	P4L626A	20050208	6	5	6	9.9	6	6	9	9.9	3	-1
37238	D	3	572	151-3	V1L686	P4L626A	20000715	7	5	9	9.9	8	6	10	10	.	.
37239	D	3	573	151-3	V1L686	P4L626A	20000716	7	7	9	9.9	8	9	10	10	.	.
39375	D	3	730	151-3	V1L686	P4L626A	20011215	7	5	9	9.8	9	7	9	10	2	0
42482	D	3	831	151-3	V1L686	P4L626A	20020820	7	7	9	9.9	8	9	10	10	3	0
46785	D	3	941	151-3	V1L686	P4L626A	20030514	7	7	9	9.9	9	10	10	10	2	-1
49499	D	3A	32	151-3	V1L686	P4L626A	20031016	7	8	9	9.9	9	10	10	10	3	0
50180	D	3A	164	151-3	V1L686	P4L626A	20040804	7	7	9	9.9	8	9	10	10	2	1
37225	B	191	1403	151-3	V1L686	P4L626A	20000727	7	7	9	9.7	7	7	10	9.9	.	.
37226	B	191	1404	151-3	V1L686	P4L626A	20000728	7	8	9	9.9	7	8	10	9.9	.	.
37940	B	191	1478	151-3	V1L686	P4L626A	20010619	7	6	9	9.8	8	6	9	9.9	.	.
37942	B	191	1579	151-3	V1L686	P4L626A	20020130	6	6	9	9.6	6	7	9	9.9	2	-1
42494	B	191	1676	151-3	V1L686	P4L626A	20020802	6	6	8	9.7	5	4	9	9.7	2	1
42497	B	191	1680	151-3	V1L686	P4L626A	20020807	6	6	8	9.6	6	5	9	9.9	2	0
46082	B	191	1829	151-3	V1L686	P4L626A	20030825	6	6	8	9.3	6	7	9	9.9	2	-1
49045	B	191	1898	151-3	V1L686	P4L626A	20040211	6	5	9	9.8	6	5	9	9.9	2	-1
49048	B	191	1900	151-3	V1L686	P4L626A	20040214	6	6	8	9.8	6	5	10	9.8	2	-1
51845	B	191	1967	151-3	V1L686	P4L626A	20040722	7	8	9	9.8	7	6	9	9.9	2	-1
37235	E	1	593	151-3	V1L686	P4L626A	20000808	6	8	9	9.9	7	7	9	9.9	2	-1
37581	E	1	637	151-3	V1L686	P4L626A	20010731	6	6	9	9.9	7	6	9	9.9	2	-1

22/1 test rejected

Attachment 2
 Page 9.9
 Reference L-37

VIL 686 / P4L 626A

37584	E	1	703	151-3	V1L686	P4L626A	20020517	7	7	9	9.9	7	6	9	9.9	2	-1
46788	E	1	745	151-3	V1L686	P4L626A	20030319	7	6	8	9.8	7	6	9	9.9	2	0
49203	E	2	4	151-3	V1L686	P4L626A	20040730	7	6	8	9.9	7	6	9	9.9	2	-1
37230	A	2	2307	151-3	V1L686	P4L626A	20000808	7	5	9	9.9	8	6	10	10	.	.
42481	A	2	2613	151-3	V1L686	P4L626A	20030508	7	8	8	9.9	7	9	9	9.9	3	-1
46800	A	2	2672	151-3	V1L686	P4L626A	20040130	7	7	9	9.9	8	9	9	9.9	2	-1
49560	A	2	2758	151-3	V1L686	P4L626A	20041013	6	7	9	9.9	6	9	9	9.9	3	-1

26/2 toots rejected

Combinos

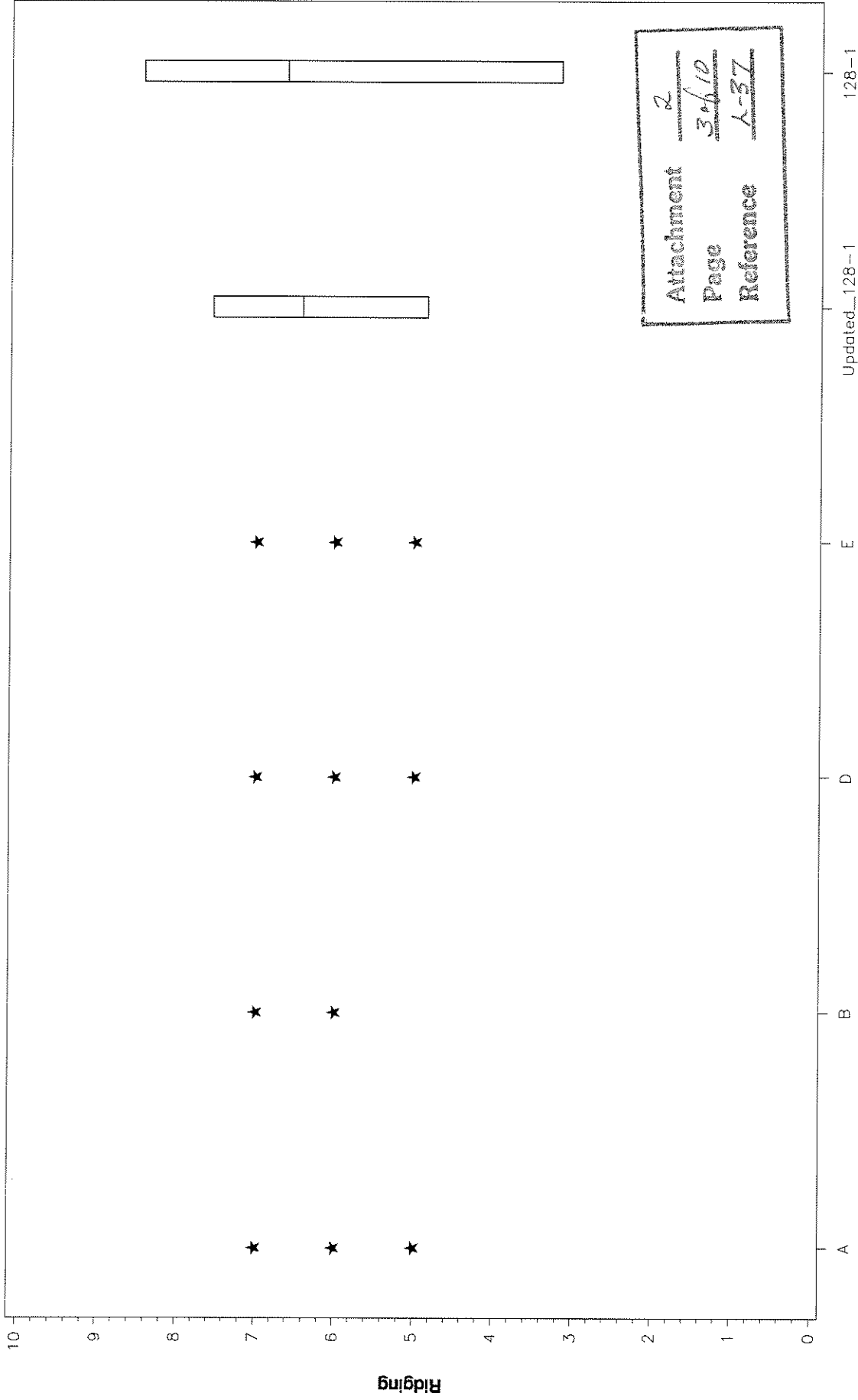
128-1 22/1

151-3 26/2

48/3 = 6.25% rejected

L-37 Lubrified Hardware, Pinion Batch V1L686/P4L626A
 Updated Test Target Data Set and Shewhart Severity Limits
 Reference Oil 128-1 (Bands Include Merit Ratings of 5, 6, & 7)

Pinion Ridging



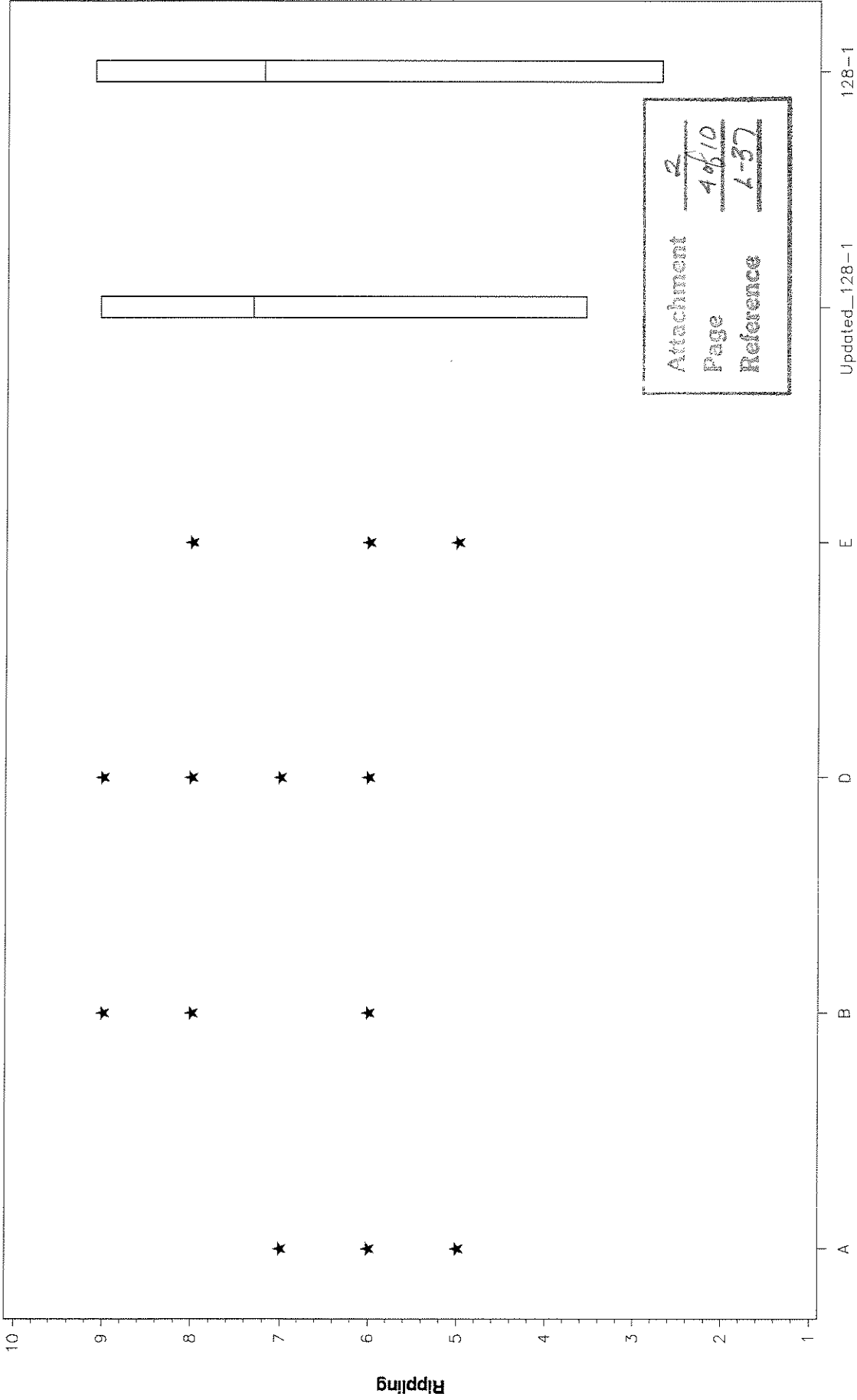
Attachment *2*
 Page *3 of 10*
 Reference *A-37*

Updated...128--1 128-1

Data Group

L-37 Lubrited Hardware, Pinion Batch V1L686/P4L626A
 Updated Test Target Data Set and Shewhart Severity Limits
 Reference Oil 128-1 (Bands Include Merit Ratings of 4 thru 9)

Pinion Rippling



Attachment 2
 Page 4 of 10
 Reference L-37

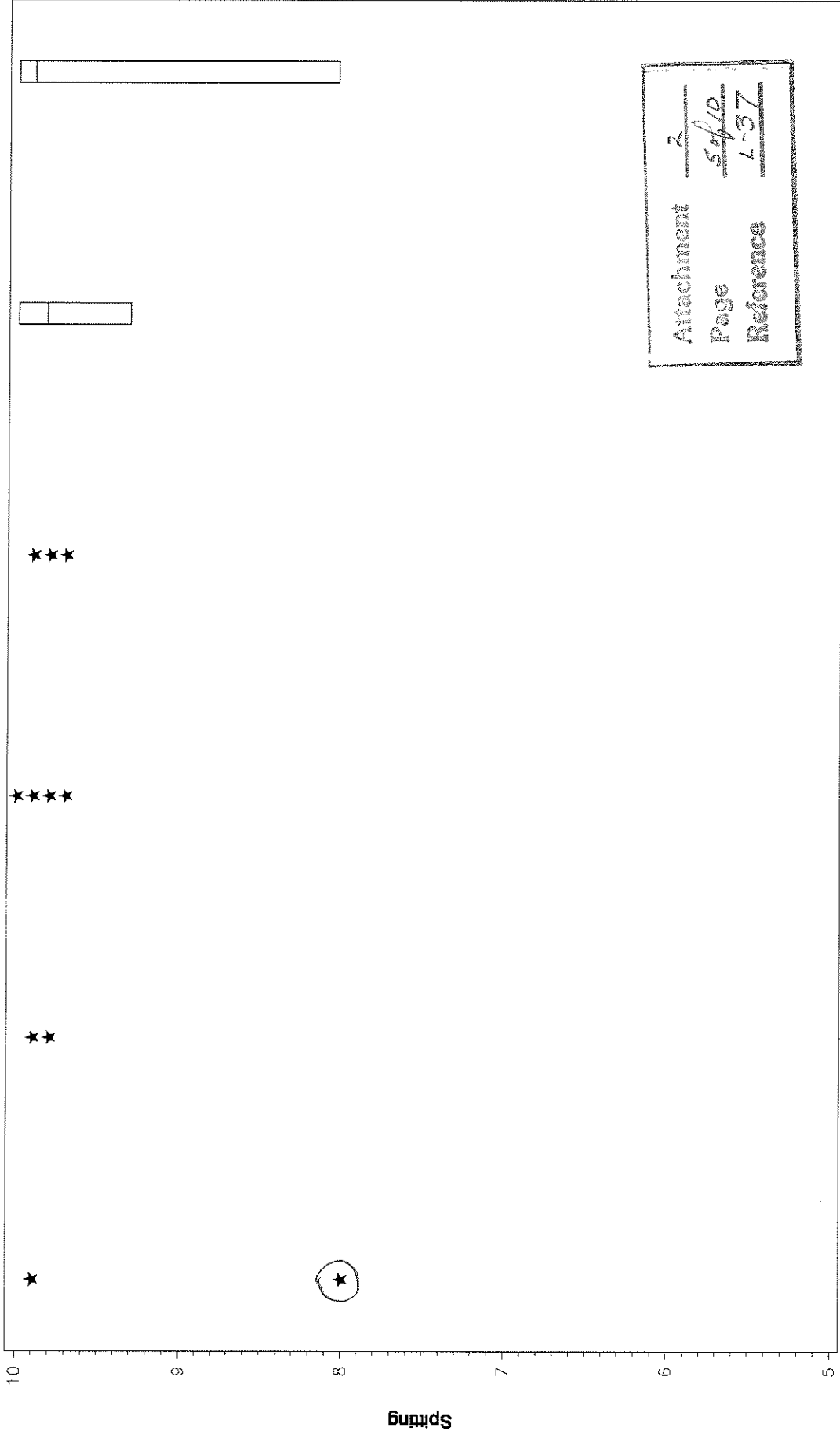
128-1

Updated_128-1

Data Group

L-37 Lubrified Hardware, Pinion Batch V1L686/P4L626A
 Updated Test Target Data Set and Shewhart Severity Limits
 Reference Oil 128-1 (Bands Include Merit Ratings of 9.3 Thru 10)

Pinion Spitting



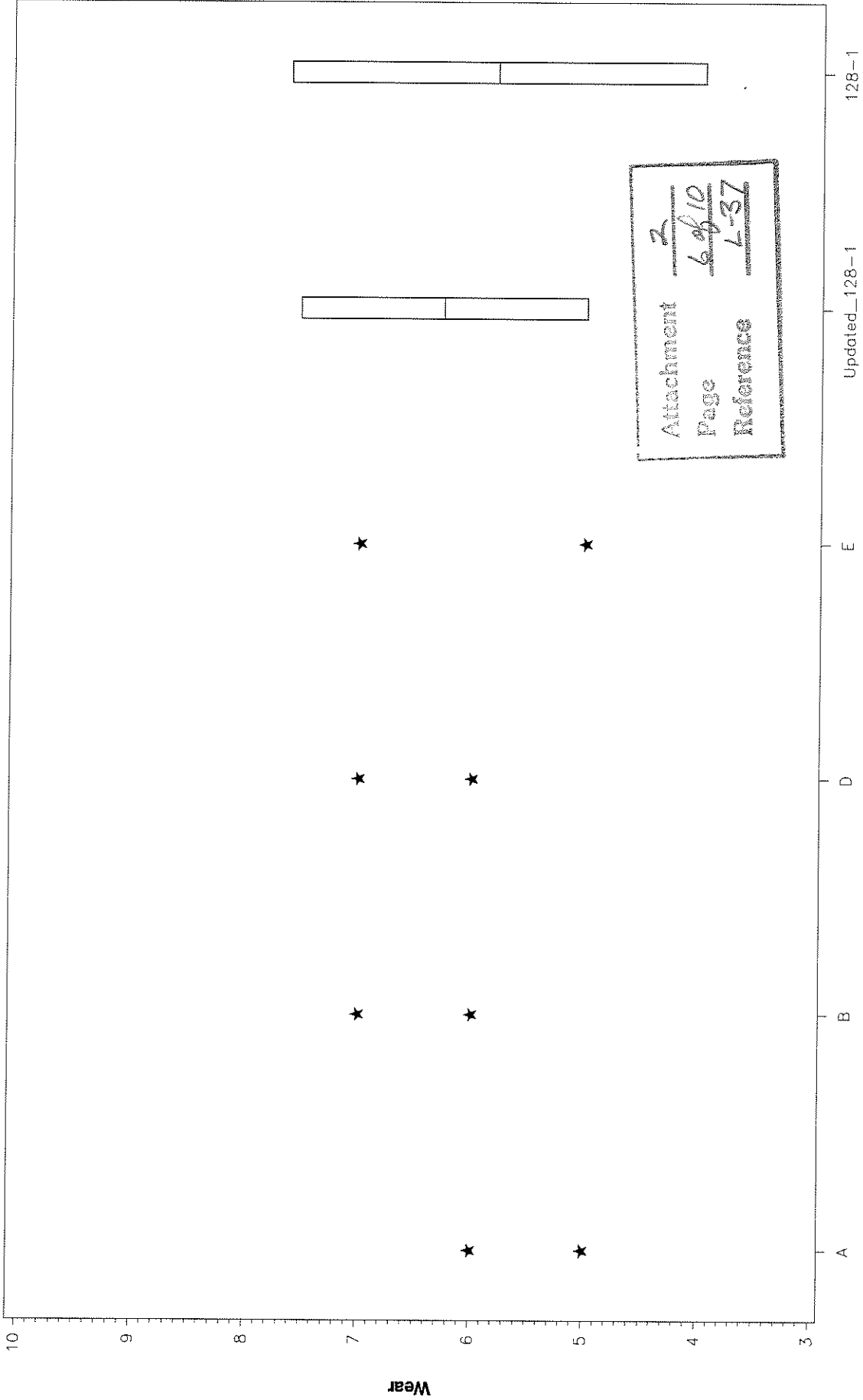
Attachment 2
 Page 5 of 10
 Reference L-37

Updated_128-1 128-1

Data Group

L-37 Lubrited Hardware, Pinion Batch V1L686/P4L626A
 Updated Test Target Data Set and Shewhart Severity Limits
 Reference Oil 128-1 (Bands Include Merit Ratings of 5, 6, & 7)

Pinion Wear



Attachment 2
 Page 6 of 10
 Reference L-37

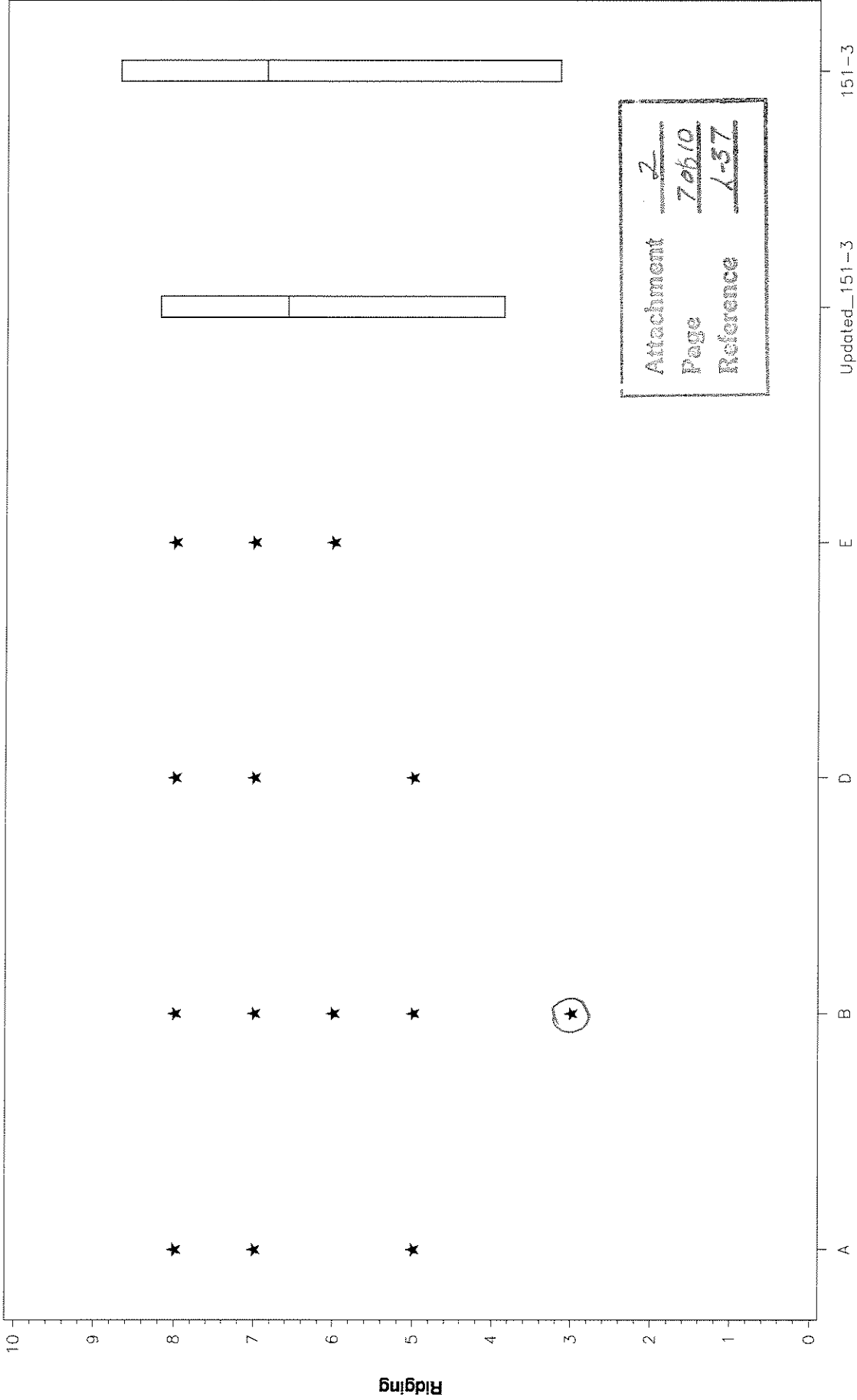
128-1

Updated_128-1

Data Group

L-37 Lubrified Hardware, Pinion Batch V1L686/P4L626A
 Updated Test Target Data Set and Shewhart Severity Limits
 Reference Oil 151-3 (Bands Include Merit Ratings of 4 thru 8)

Pinion Ridging



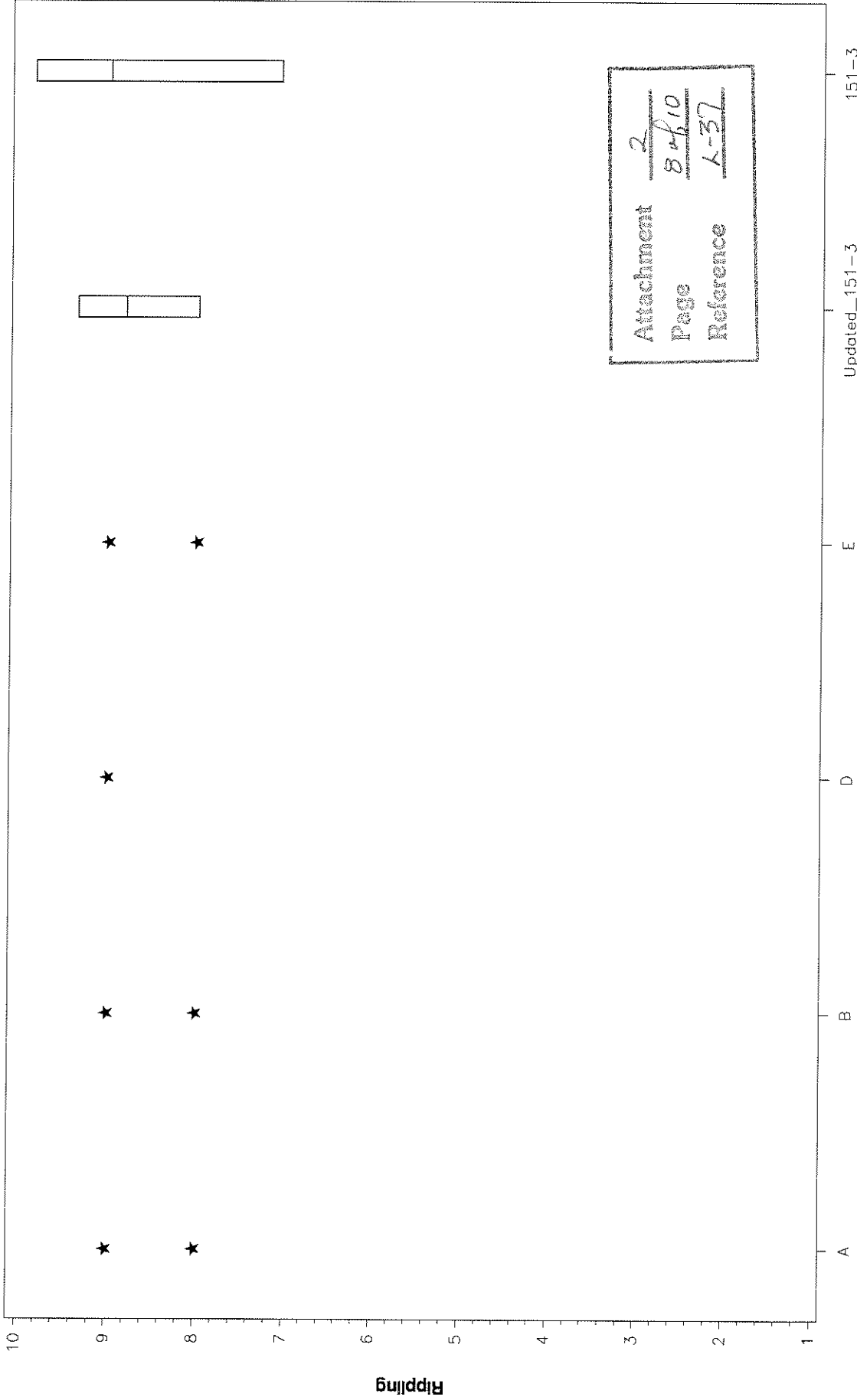
Data Group

Updated_151-3 151-3

Attachment 2
 Page 7 of 10
 Reference L-37

L-37 Lubrited Hardware, Pinion Batch V1L686/P4L626A
 Updated Test Target Data Set and Shewhart Severity Limits
 Reference Oil 151-3 (Bands Include Merit Ratings of 8 & 9)

Pinion Rippling



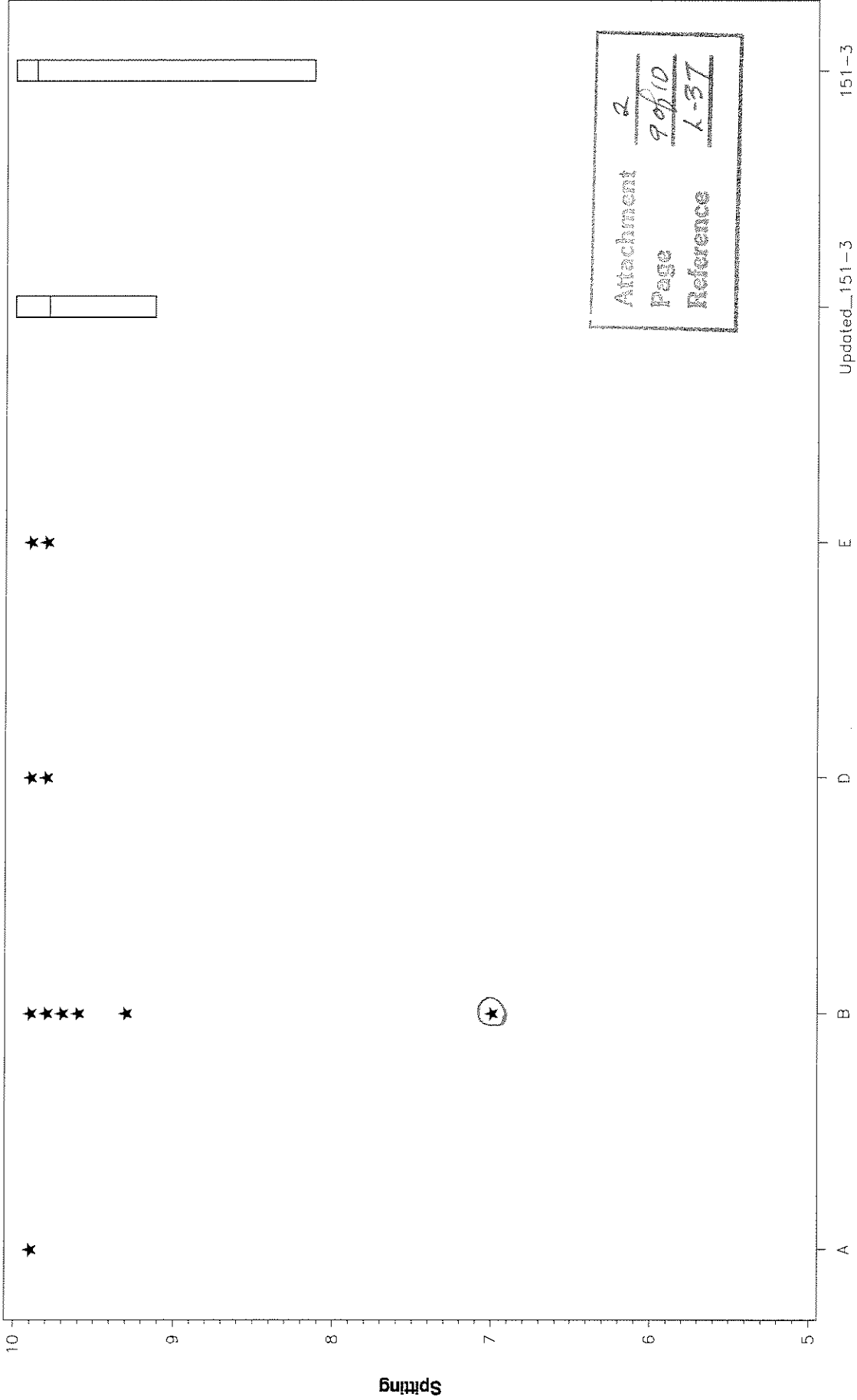
Attachment 2
 Page 8 of 10
 Reference L-37

Updated_151-3

Data Group

L-37 Lubrified Hardware, Pinion Batch V1L686/P4L626A
 Updated Test Target Data Set and Shewhart Severity Limits
 Reference Oil 151-3 (Bands Include Merit Ratings of 9.3 Thru 10)

Pinion Spitting



Attachment 2
 Page 9 of 10
 Reference 1-37

151-3

Updated... 151-3

E

D

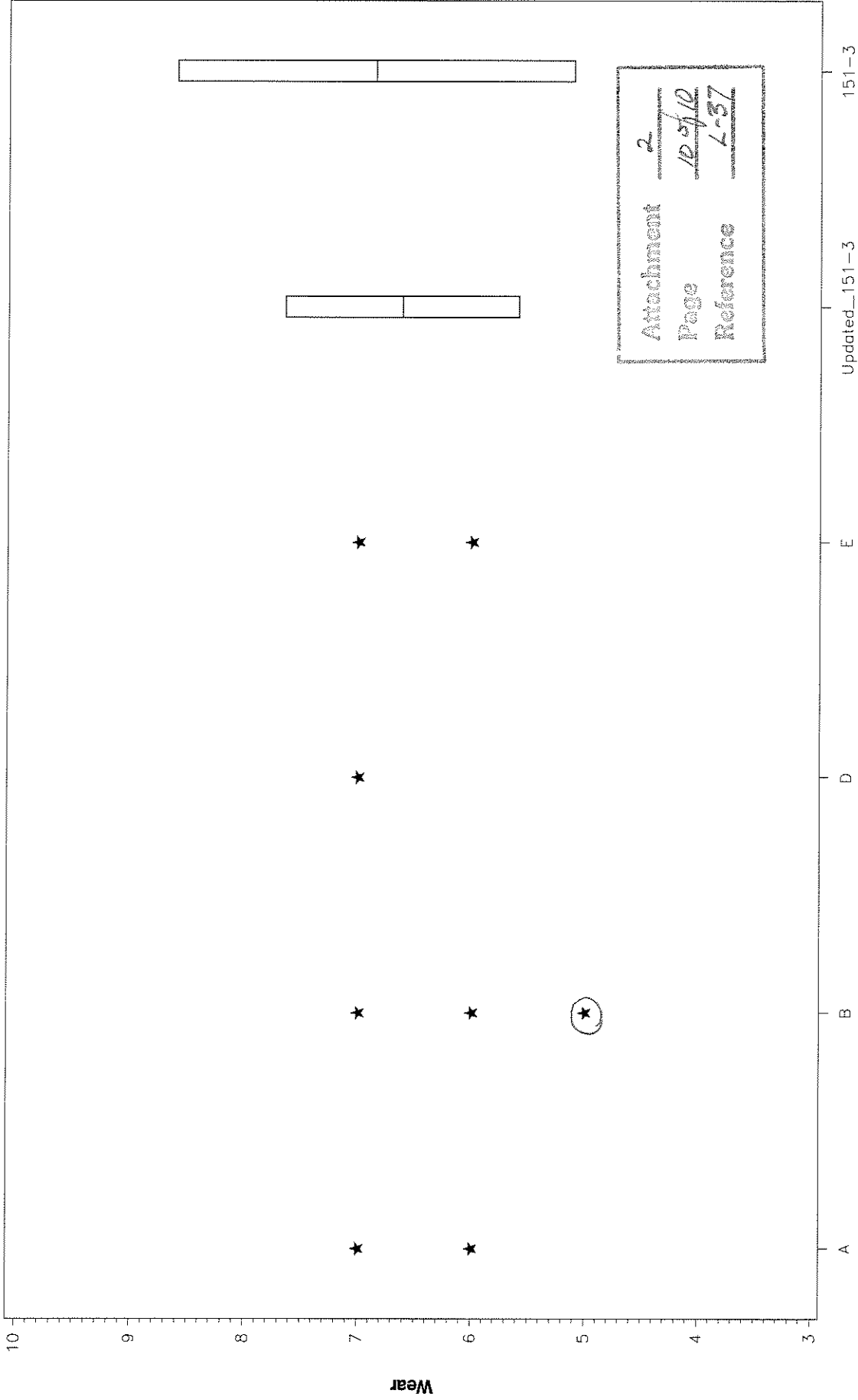
B

A

Data Group

L-37 Lubrified Hardware, Pinion Batch V1L686/P4L626A
Updated Test Target Data Set and Shewhart Severity Limits
Reference Oil 151-3 (Bonds Include Merit Ratings of 6 & 7)

Pinion Wear



Attachment 2
Page 10 of 10
Reference L-37

Updated_151-3

Data Group

VIL 1761 PAL 741A

CMIR	Lab	Std.	Run	Oil	PINBAT	RINGBAT	DTCOMP	Pwear	Pridg	Pripp	Pspit	Rwear	Rridg	Rripp	Rspit	lpcrat	fpccrat
38870	D	3	782	128-1	V1L176	P4L741A	20020508	8	9	7	10	9	10	10	10	2	1
44304	D	3	783	128-1	V1L176	P4L741A	20020509	7	9	10	10	9	10	10	10	2	0
44309	D	3	818	128-1	V1L176	P4L741A	20020725	9	8	6	10	9	9	10	10	2	0
44310	D	3	819	128-1	V1L176	P4L741A	20020726	6	8	8	10	9	9	10	10	2	0
44313	D	3	915	128-1	V1L176	P4L741A	20030314	6	9	9	10	9	10	10	10	3	0
46781	D	3	916	128-1	V1L176	P4L741A	20030325	6	8	7	9.9	8	9	9	9.9	2	0
46782	D	3A	3	128-1	V1L176	P4L741A	20030819	6	8	5	9.9	8	10	10	10	2	1
39382	B	191	1614	128-1	V1L176	P4L741A	20020505	6	7	8	9.7	7	9	9	9.8	2	1
39384	B	191	1616	128-1	V1L176	P4L741A	20020507	8	9	8	10	9	10	10	10	2	1
44280	B	191	1662	128-1	V1L176	P4L741A	20020713	7	7	9	10	7	8	9	9.9	2	0
39386	B	191	1664	128-1	V1L176	P4L741A	20020715	6	7	9	9.4	7	8	9	8	2	1
44282	B	191	1797	128-1	V1L176	P4L741A	20030515	7	8	9	10	8	9	10	10	2	0
46778	B	191	1891	128-1	V1L176	P4L741A	20031213	6	7	9	9.7	8	9	10	9.9	2	0
46935	B	191	1921	128-1	V1L176	P4L741A	20040425	6	8	9	9.4	8	9	10	9.9	2	0
50341	B	191	1941	128-1	V1L176	P4L741A	20040603	6	8	9	9.7	7	9	10	9.9	2	-1
37044	E	1	698	128-1	V1L176	P4L741A	20020507	6	8	9	9.7	7	8	9	10	2	0
39837	E	1	699	128-1	V1L176	P4L741A	20020508	6	8	7	9.4	7	8	9	9.9	2	0
39838	E	1	712	128-1	V1L176	P4L741A	20020618	6	8	7	9.6	7	8	9	9.9	2	0
39839	E	1	715	128-1	V1L176	P4L741A	20020625	6	8	7	9.9	7	8	9	9.9	2	0
51853	E	2	6	128-1	V1L176	P4L741A	20040804	6	7	6	9.3	7	8	9	9.9	2	-1
39396	A	2	2461	128-1	V1L176	P4L741A	20020507	7	9	9	9.7	7	8	9	9.9	2	0
39397	A	2	2462	128-1	V1L176	P4L741A	20020508	7	9	6	10	6	10	10	10	2	0
39399	A	2	2484	128-1	V1L176	P4L741A	20020628	6	8	4	9.7	7	9	10	9.9	2	1
39400	A	2	2488	128-1	V1L176	P4L741A	20020710	6	9	5	9.6	8	9	10	9.9	2	0
46802	A	2	2652	128-1	V1L176	P4L741A	20031126	6	9	5	9.9	9	9	10	9.7	2	0
46799	A	2	2695	128-1	V1L176	P4L741A	20040330	6	9	4	9.7	7	9	10	10	2	0
50349	A	2	2784	128-1	V1L176	P4L741A	20041201	6	9	5	9.7	8	10	9	10	2	1
39376	D	3	784	151-3	V1L176	P4L741A	20020510	7	9	10	10	9	10	10	10	2	1
39377	D	3	815	151-3	V1L176	P4L741A	20020722	7	9	10	10	9	10	10	10	2	0
42490	D	3	907	151-3	V1L176	P4L741A	20030215	8	9	9	10	9	10	10	10	2	1
49502	D	3A	71	151-3	V1L176	P4L741A	20040114	7	9	9	9.9	9	10	10	10	2	0
39383	B	191	1617	151-3	V1L176	P4L741A	20020509	6	7	8	9.4	8	8	9	9.9	2	1
39388	B	191	1665	151-3	V1L176	P4L741A	20020717	7	9	8	10	8	10	9	9.9	2	1
46084	B	191	1856	151-3	V1L176	P4L741A	20030813	6	9	8	10	8	10	9	10	2	0
50346	B	191	1919	151-3	V1L176	P4L741A	20040418	6	9	9	9.9	8	10	9	10	2	0
50347	B	191	1920	151-3	V1L176	P4L741A	20040423	7	9	9	15	7	10	9	9.9	2	0
51846	B	191	1993	151-3	V1L176	P4L741A	20040914	6	10	8	9.7	8	10	9	9.9	2	-1
51849	B	286	27	151-3	V1L176	P4L741A	20041219	7	9	9	9.9	8	10	9	9.9	2	0
37583	E	1	696	151-3	V1L176	P4L741A	20020502	6	9	9	10	7	9	9	10	2	0
42468	E	1	716	151-3	V1L176	P4L741A	20020626	6	9	9	9.9	7	10	9	9.9	2	0
42473	E	1	742	151-3	V1L176	P4L741A	20021221	6	9	9	9.9	7	10	9	9.9	3	0

27/4
Repetition

Attachment
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 Reference L-37

V1L176/P4L741A

49202	E	2	5	151-3	V1L176	P4L741A	20040803	7	9	9.9	7	10	9	9.9	2	-1
37944	A	2	2460	151-3	V1L176	P4L741A	20020503	7	10	10	7	10	10	10	2	0
37945	A	2	2487	151-3	V1L176	P4L741A	20020709	7	10	9.9	7	10	10	10	2	0
42480	A	2	2598	151-3	V1L176	P4L741A	20030306	7	9	9.9	8	10	9	9.9	3	0
46796	A	2	2631	151-3	V1L176	P4L741A	20030723	6	10	9.9	9	10	9	10	3	0
46801	A	2	2737	151-3	V1L176	P4L741A	20040805	7	9	9.9	8	10	9	9.9	3	0
50355	A	2	2825	151-3	V1L176	P4L741A	20050419	7	9	10	9	10	9	10	2	0

21/3 rejection

Combined

128.1 27/4

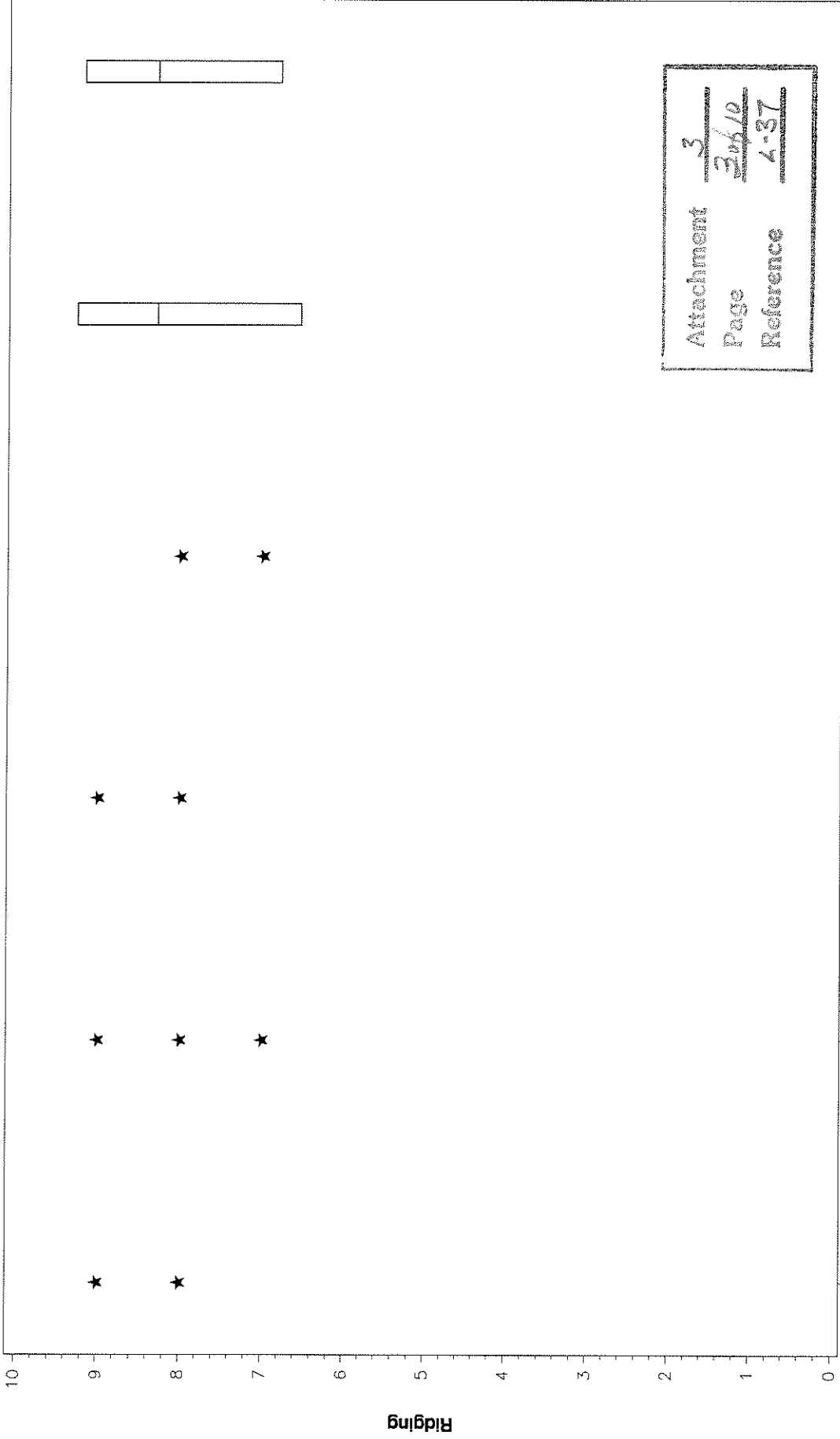
151-3 21/3

48/7 ~14% rejection

Attachment	3
Page	2 of 10
Reference	L-37

L-37 Non-lubricated Hardware, Pinion Batch V1L176/P4L741A
 Updated Test Target Data Set and Shewhart Severity Limits
 Reference Oil 128-1 (Bands Include Merit Ratings of 7, 8, & 9)

Pinion Ridging

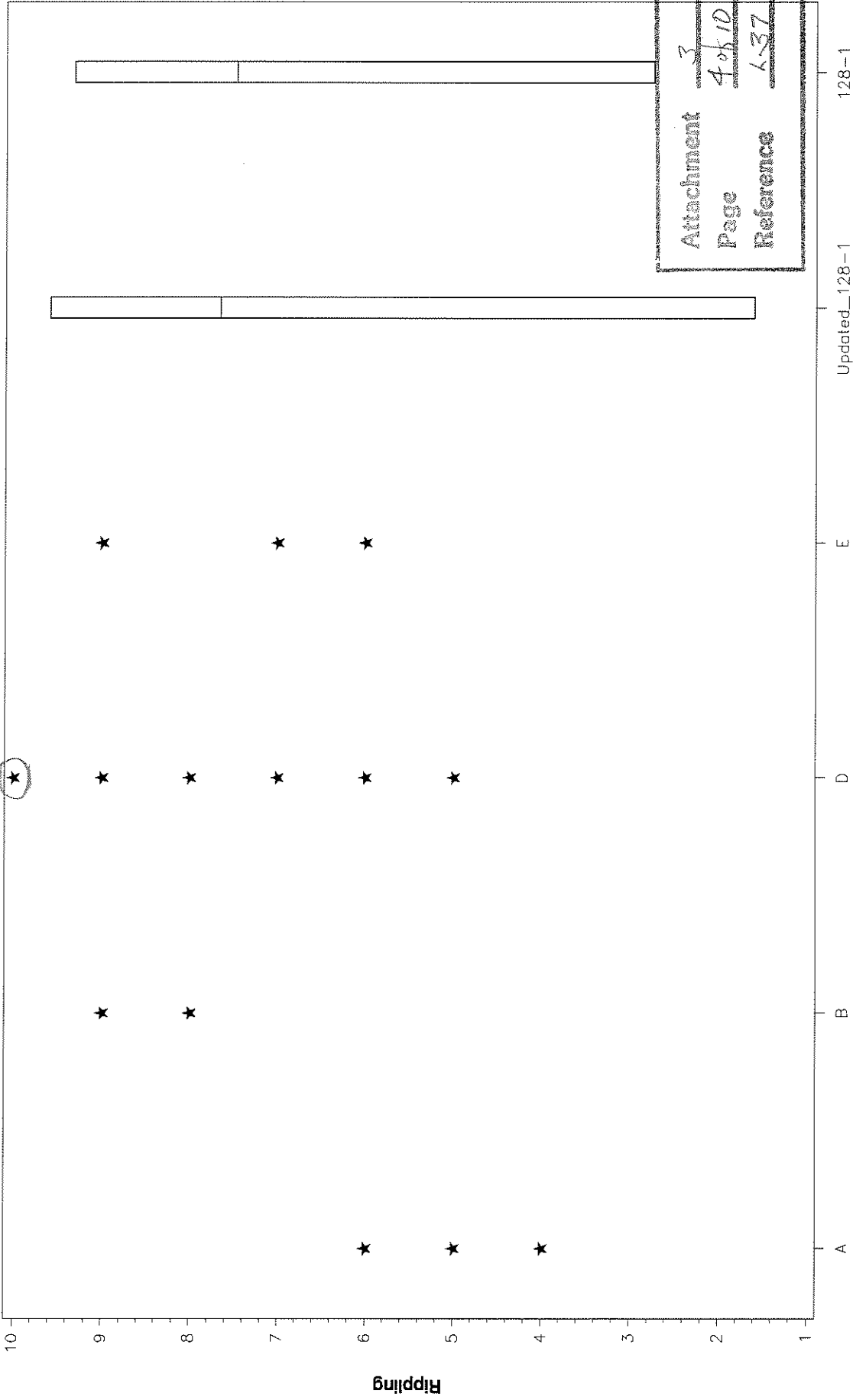


Attachment 3
 Page 3 of 10
 Reference 4-37

Data Group

L-37 Non-lubricated Hardware, Pinion Batch V1L176/P4L741A
 Updated Test Target Data Set and Shewhart Severity Limits
 Reference Oil 128-1 (Bands Include Merit Ratings of 2 thru 9)

Pinion Rippling

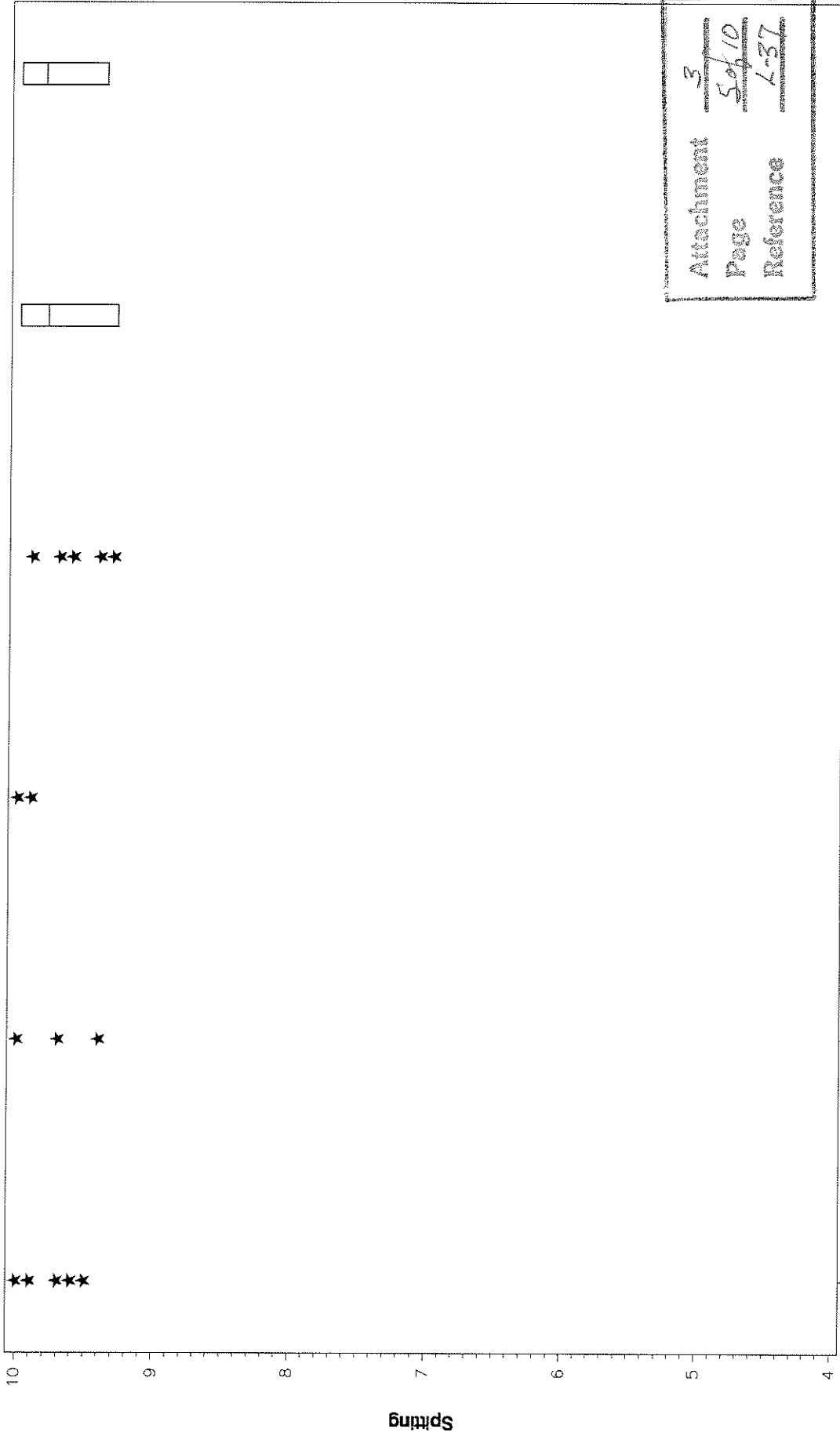


Attachment 3
 Page 4 of 10
 Reference L-37

Data Group

L-37 Non-lubricated Hardware, Pinion Batch V1L176/P4L741A
 Updated Test Target Data Set and Shewhart Severity Limits
 Reference Oil 128-1 (Bands Include Merit Ratings of 9.3 Thru 10)

Pinion Spitting



Attachment 3
 Page 5 of 10
 Reference L-37

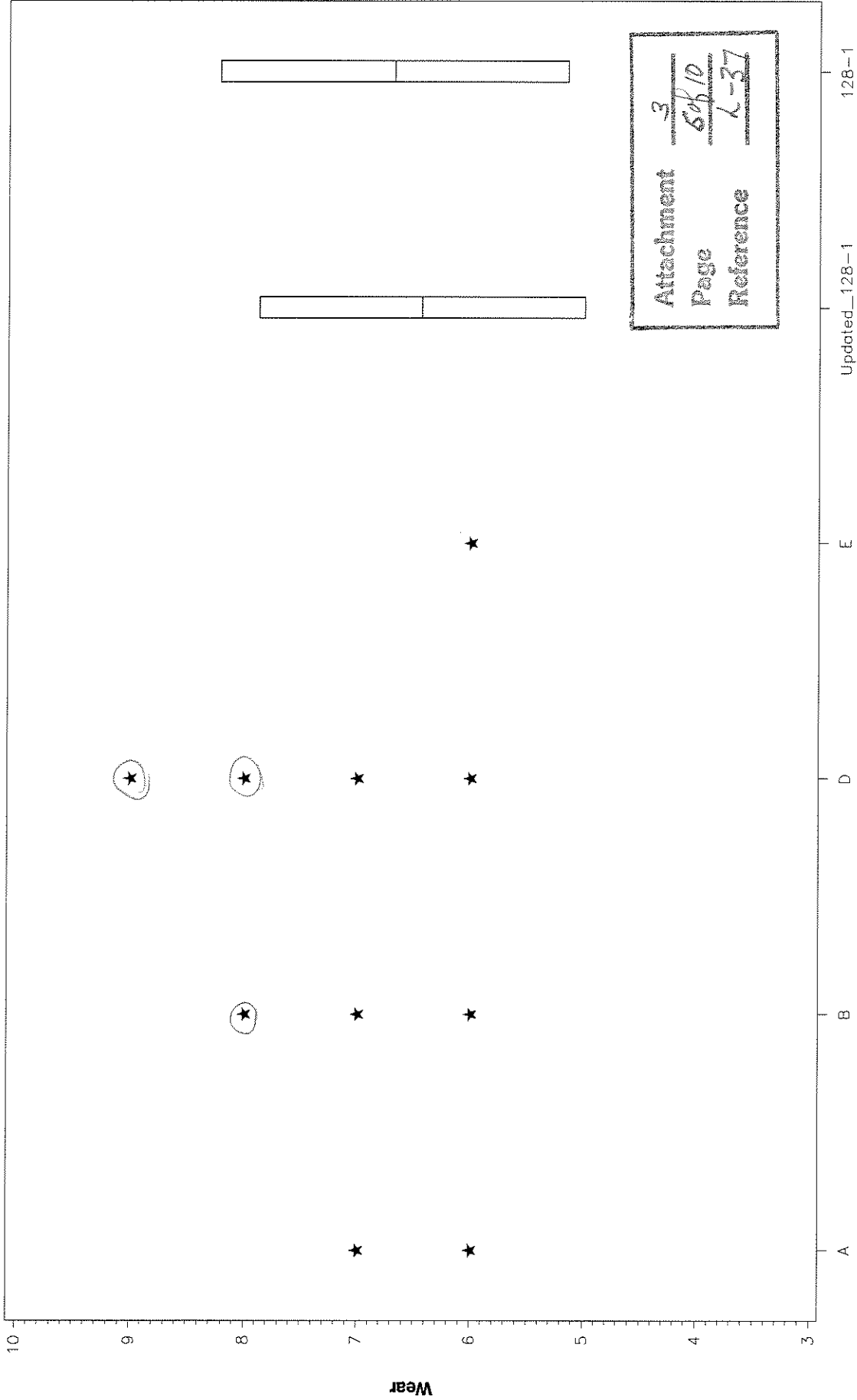
128-1

Updated_128-1

Data Group

L-37 Non-lubricated Hardware, Pinion Batch V1L176/P4L741A
 Updated Test Target Data Set and Shewhart Severity Limits
 Reference Oil 128-1 (Bands Include Merit Ratings of 5, 6, & 7)

Pinion Wear



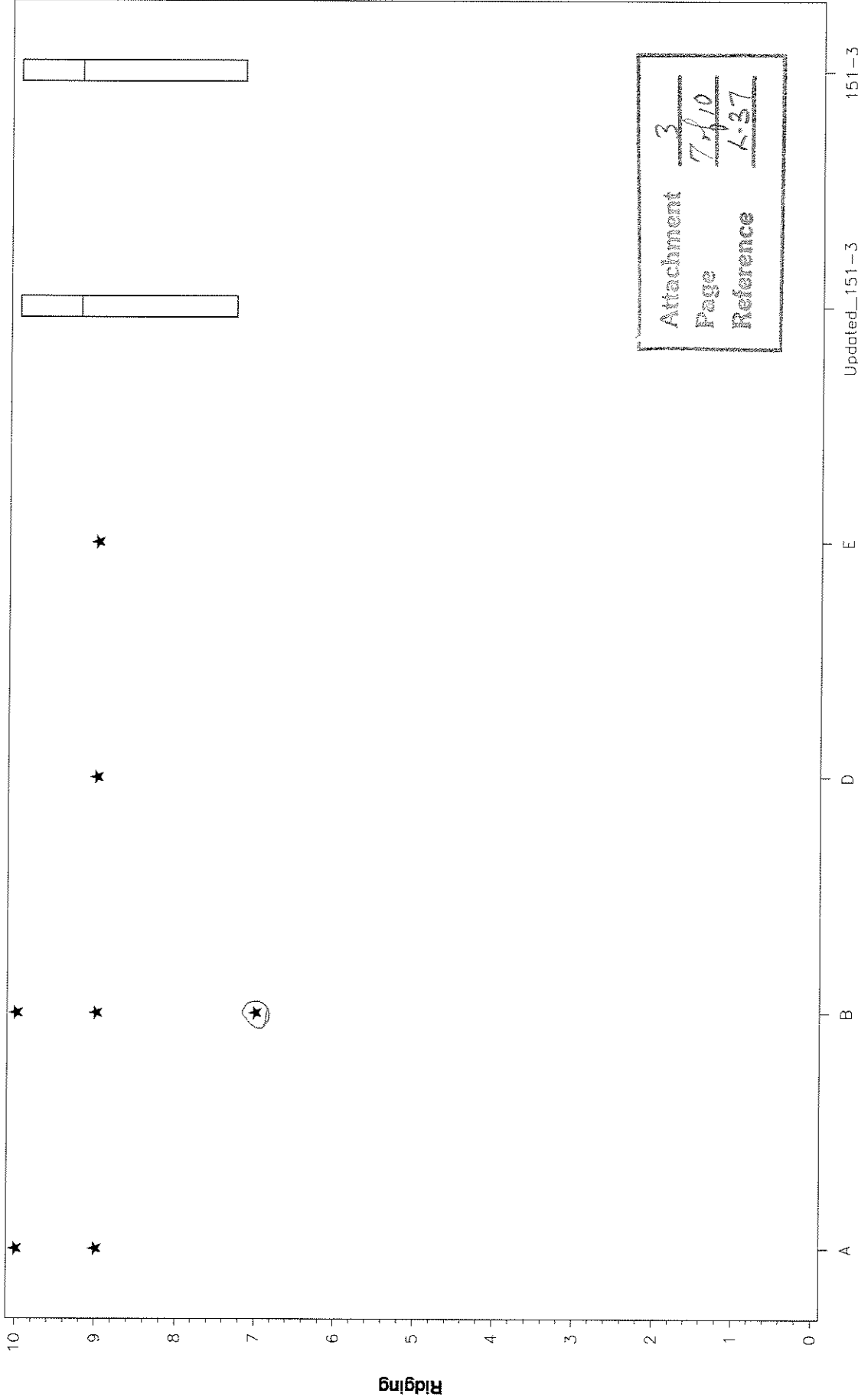
Attachment 3
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 Reference L-37

Updated_128-1 128-1

Data Group

L-37 Non-lubricated Hardware, Pinion Batch V1L176/P4L741A
Updated Test Target Data Set and Shewhart Severity Limits
Reference Oil 151-3 (Bands Include Merit Ratings of 8, 9, & 10)

Pinion Ridging



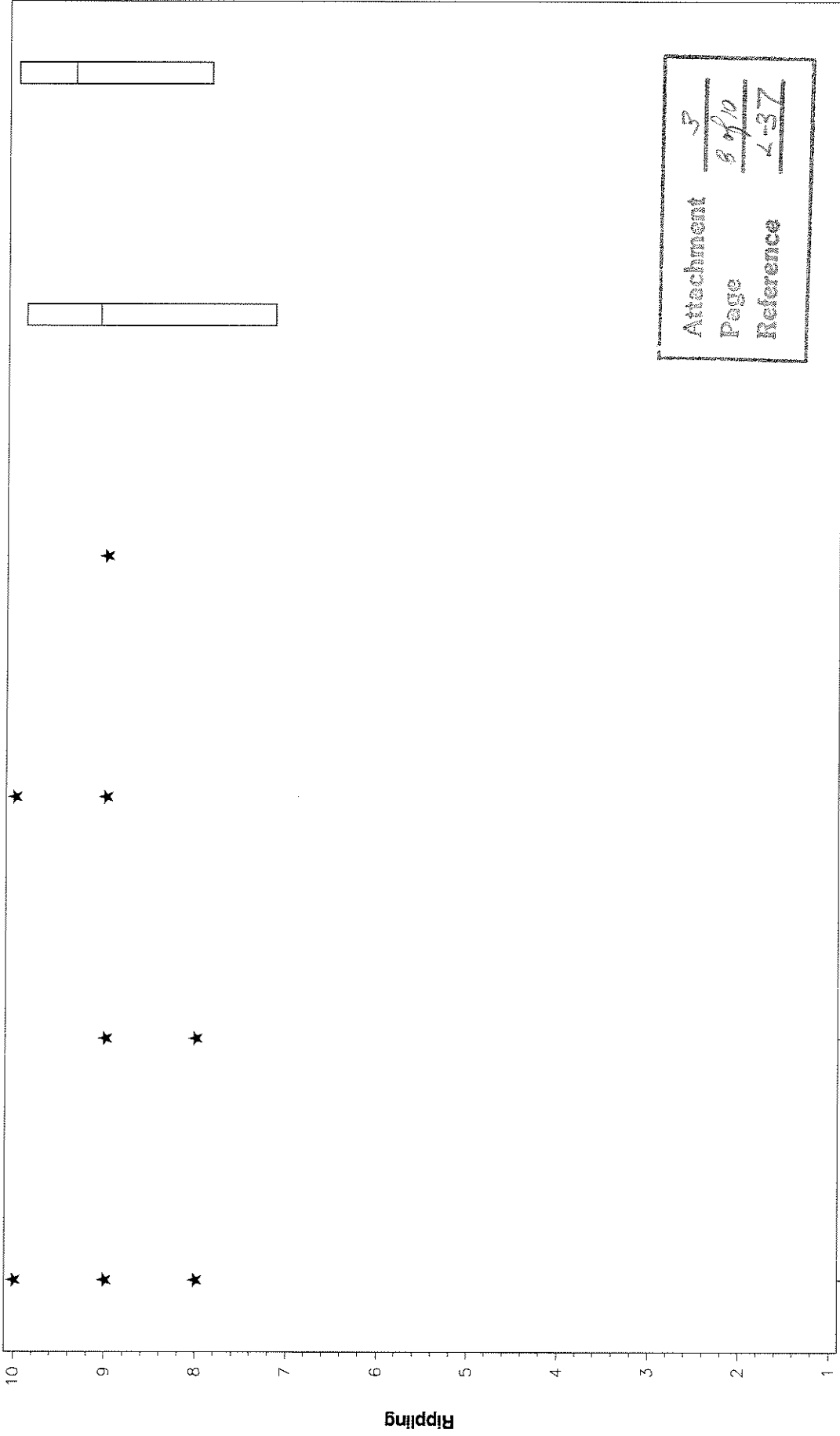
Attachment 3
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Reference L-37

Updated_151-3 151-3

Data Group

L-37 Non-lubricated Hardware, Pinion Batch V1L176/P4L741A
 Updated Test Target Data Set and Shewhart Severity Limits
 Reference Oil 151-3 (Bands Include Merit Ratings of 8 & 9)

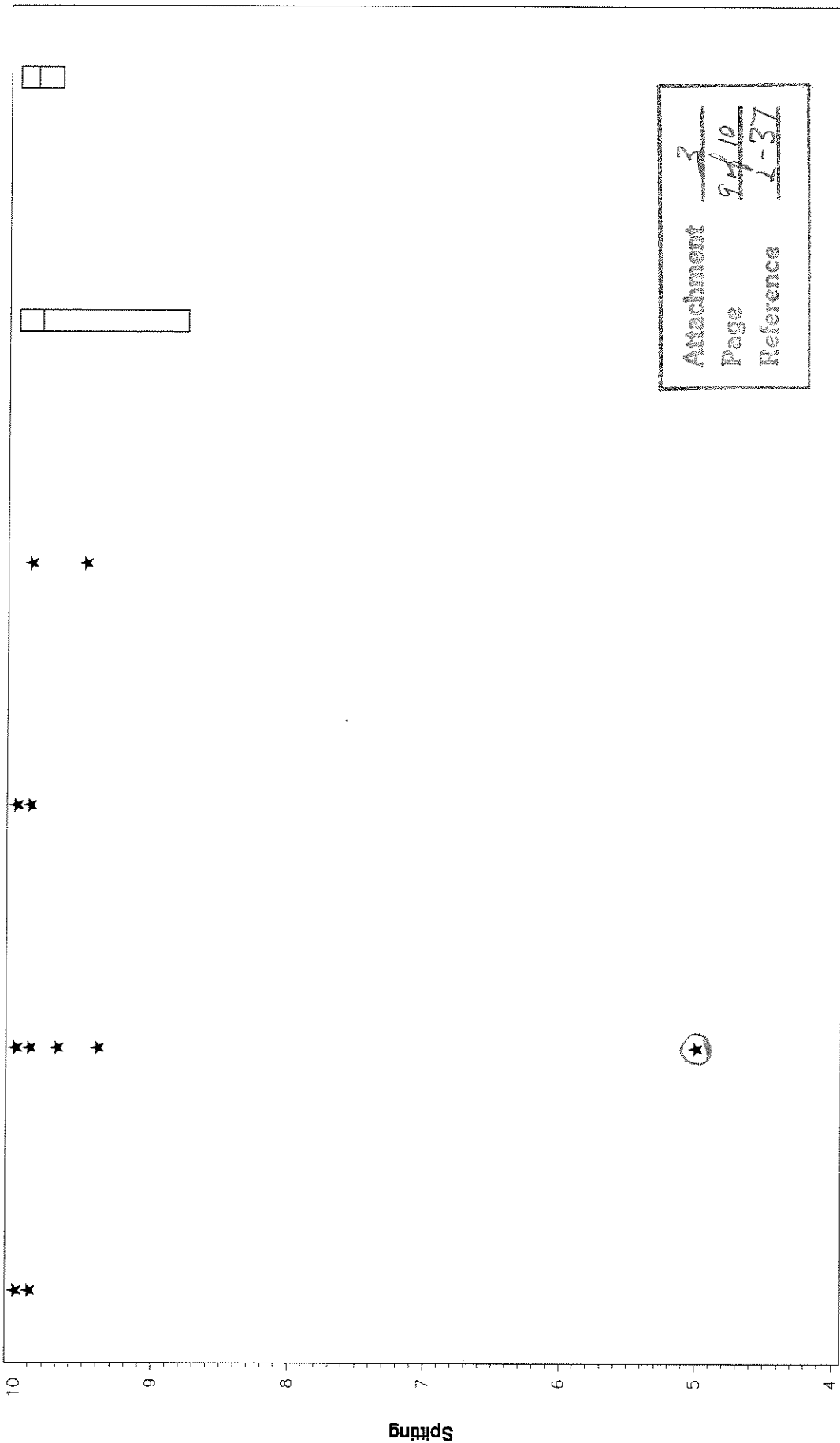
Pinion Rippling



Attachment 3
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 Reference L-37

L-37 Non-lubricated Hardware, Pinion Batch V1L176/P4L741A
 Updated Test Target Data Set and Shewhart Severity Limits
 Reference Oil 151-3 (Bands Include Merit Ratings of 9.0 Thru 10)

Pinion Spitting



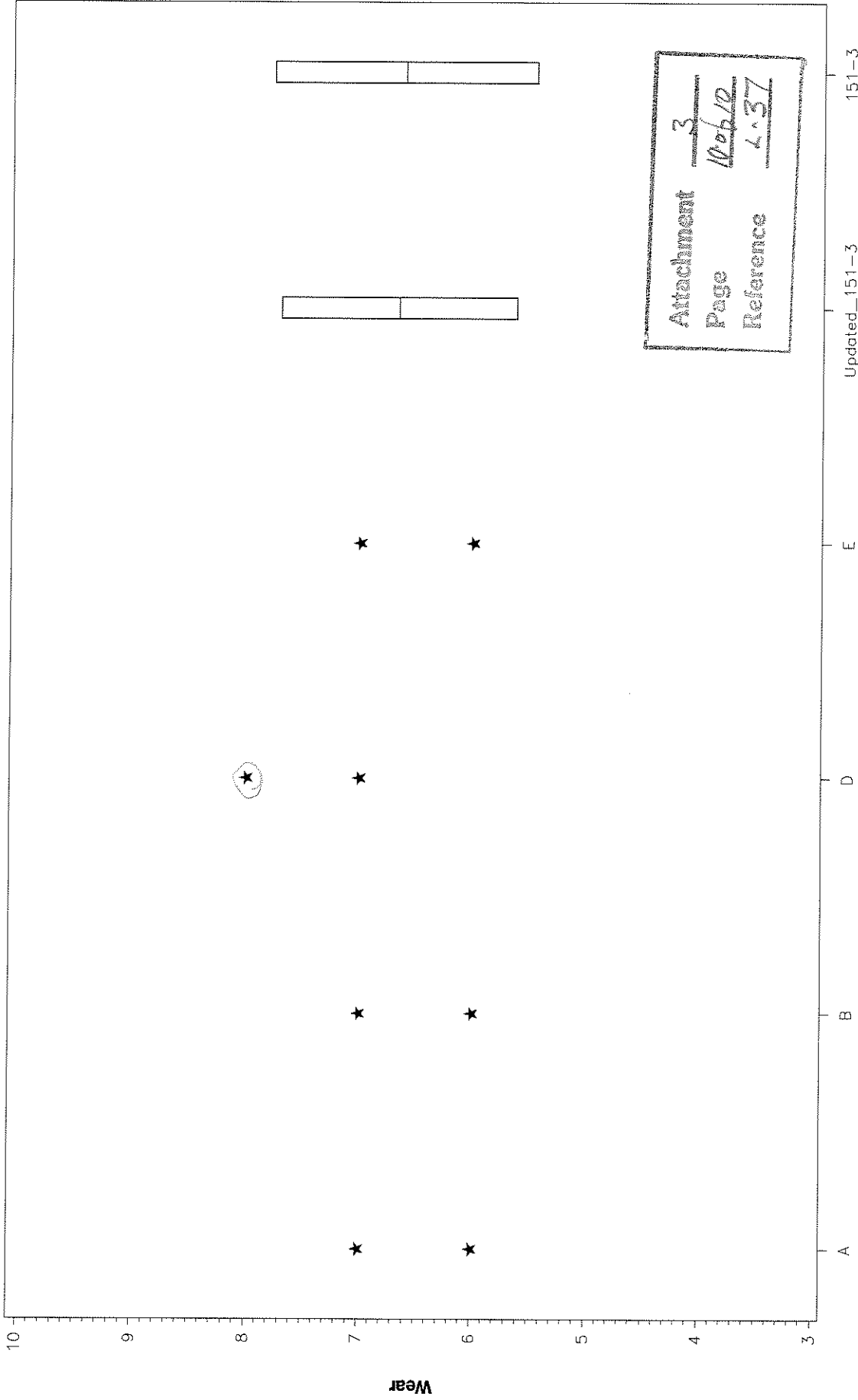
Attachment 3
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 Reference L-37

Updated_151-3 151-3

Data Group

L-37 Non-lubricated Hardware, Pinion Batch V1L176/P4L741A
 Updated Test Target Data Set and Shewhart Severity Limits
 Reference Oil 151-3 (Bands Include Merit Ratings of 6, & 7)

Pinion Wear



Attachment 3
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 Reference L-37

Updated_151-3 151-3

Data Group