



Test Monitoring Center

6555 Penn Avenue
Pittsburgh, PA 15206-4489
(412) 365-1000

MEMORANDUM: 00-175

DATE: November 20, 2000

TO: Sequence V Surveillance Panel

FROM: Richard E. Grundza

SUBJECT: Updated Statistics for Sequence VG LTMS Charting

At the November 16, 2000 Sequence V Surveillance Panel meeting, the panel agreed to update the targets for reference oils 1006 and 1007, to reflect the completion of twenty-nine tests on these reference oils. Table 1 presents the statistics for oils 1006 and 1007, based on twenty-nine operationally valid test results. The means are the arithmetic average of these results. The standard deviations are not pooled or otherwise weighted. These targets are effective for reference oil tests completing on or after November 17, 2000. Where severity adjustments were in effect, test results were corrected by the application of severity adjustments.

Table 1

Parameter	Mean 1006	Standard Deviation 1006	Mean 1007	Standard Deviation 1007
AES	8.43	0.60	8.93	0.30
RACS	9.35	0.20	8.99	0.41
AEV	9.27	0.10	9.24	0.09
APV	8.49	0.18	8.57	0.16
OSCRNSLG (ln(result+1))	1.384	0.85	0.968	0.614
NHSCMPRG	0	0	0	0

Figures 1 through 10 plot the results by laboratory and the Shewhart acceptance ranges for AES, RAC, AEV, APV, and OSCRNLSG, respectively, in reported units for both oils.

Table 2 lists the updated pooled standard deviations to be used when calculating severity adjustments. The severity adjustment standard deviations are pooled by oil. Where severity adjustments were in effect, test results were corrected by the application of severity adjustments.

Table 2

Parameter	Pooled s
AES	0.47
RACS	0.33
AEV	0.09
APV	0.17
OSCR (ln(result+1))	0.742

Tables 3 and 4 list the results, used to calculate the means and standard deviations for both reference oils. Please note that the results in this table have not been corrected for any severity adjustments in effect at the time.

REG/reg/mem00-175.reg.doc

c: FMF

JLZ

Sequence VE Test Engineers

<ftp://www.tmc.astm.cmri.cmu.edu/docs/gas/sequencev/memos/mem00-175>

Table 3
Summary of Test Results, Reference Oil 1006

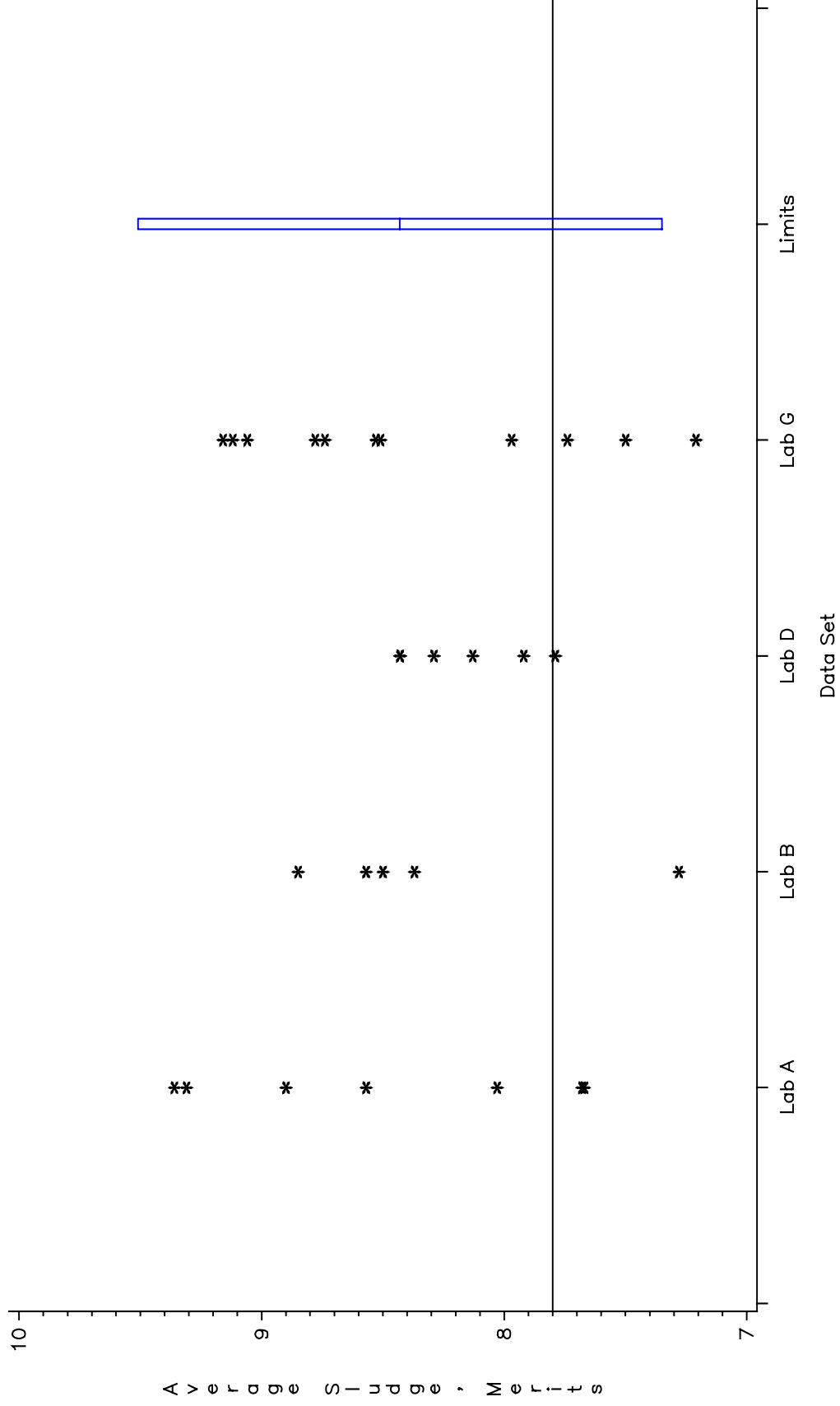
Lab	AES	RCS	AEV	APV	OSCR	HSR
Lab A	7.67	9.1	9.47	8.82	6	0
Lab G	9.12	9.5	9.17	8.42	3	0
Lab G	8.51	9.36	9.28	8.51	2	0
Lab A	8.9	9.6	9.31	8.27	1	0
Lab B	7.28	9.33	9.18	8.4	15	0
Lab G	7.21	8.78	9.10	8.45	8	0
Lab G	9.16	9.6	9.44	8.87	1	0
Lab G	8.53	9.23	9.22	8.61	3	0
Lab D	8.29	9.34	9.35	8.51	0	0
Lab G	8.78	9.56	9.2	8.77	6	0
Lab A	7.68	9.22	9.26	8.27	8	0
Lab A	9.31	9.39	9.11	8.89	7	0
Lab D	7.79	9.28	9.4	8.51	0	0
Lab B	8.5	9.38	9.22	8.61	2	0
Lab A	8.03	9.36	9.24	8.29	0	0
Lab G	7.74	9.23	9.06	8.33	4	0
Lab G	7.5	8.96	9.2	8.43	18	0
Lab G	7.97	8.96	9.21	8.39	6	0
Lab D	8.43	9.27	9.29	8.34	0	0
Lab D	8.13	8.9	9.2	8.27	3	0
Lab B	8.57	9.37	9.21	8.39	1	0
Lab G	8.74	9.38	9.15	8.35	1	0
Lab A	9.36	9.62	9.38	8.48	0	0
Lab B	8.85	9.57	9.21	8.36	3	0
Lab D	7.92	8.87	9.29	8.35	20	0
Lab D	8.43	9.19	9.17	8.32	3	0
Lab A	8.78	9.56	9.34	8.33	1	0
Lab B	8.37	9.32	9.38	8.71	6	0
Lab G	9.06	9.22	9.20	8.65	1	0

Table 4
Summary of Test Results, Reference Oil 1007

Lab	AES	RCS	AEV	APV	OSCR	HSR
Lab G	9.22	9.2	9.27	8.55	0	0
Lab A	8.95	9	9.33	8.69	1	0
Lab A	9.3	9.55	9.25	8.69	1	0
Lab G	9.26	9.26	9.12	8.72	4	0
Lab A	8.82	9.05	9.34	8.44	2	0
Lab G	9.11	8.87	9.15	8.67	0	0
Lab G	8.9	9.18	9.12	8.48	4	0
Lab D	8.64	9.14	9.22	8.76	0	0
Lab A	8.49	8.99	9.21	8.36	4	0
Lab G	8.7	8.4	9.36	8.58	1	0
Lab A	9.1	9.43	9.21	8.44	2	0
Lab D	8.79	9.16	9.39	8.8	0	0
Lab B	8.1	8.14	8.91	7.92	8	0
Lab G	8.04	7.48	9.06	8.43	6	0
Lab G	8.17	8.82	9.23	8.43	0	0
Lab G	8.56	8.19	9.09	8.42	2	0
Lab B	7.75	7.93	9.19	8.55	7	0
Lab B	8.88	9.33	9.12	8.4	4	0
Lab G	8.69	8.72	8.97	8.6	3	0
Lab G	8.45	8.86	9.13	8.53	2	0
Lab D	8.48	8.56	9.24	8.75	3	0
Lab A	9.07	9.36	9.34	8.45	1	0
Lab A	8.97	9.35	9.29	8.82	4	0
Lab B	8.80	9.18	9.09	8.56	3	0
Lab G	8.66	8.8	9.14	8.41	4	0
Lab A	8.82	8.7	9.33	8.52	1	0
Lab G	9.17	9.03	9.25	8.72	1	0
Lab A	8.57	8.82	9.33	8.42	0	0
Lab G	8.87	9.12	9.14	8.42	2	0

FIGURE 1

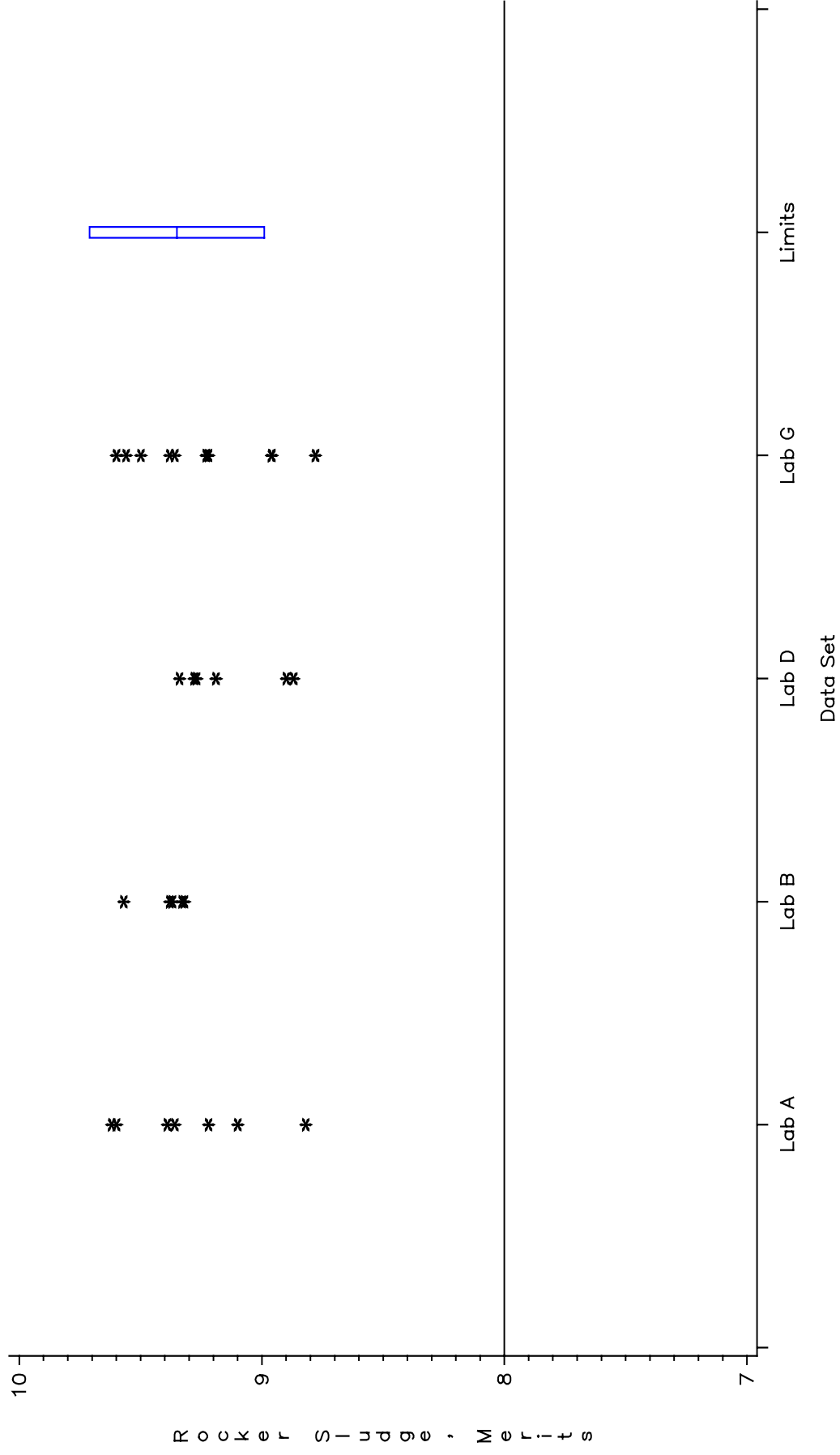
SEQUENCE VG
TARGET DATA SET AND SHEWHART LIMITS
AVERAGE ENGINE SLUDGE, 1006



REFERENCE LINE IS THE GF-3 PASS LIMIT

FIGURE 2

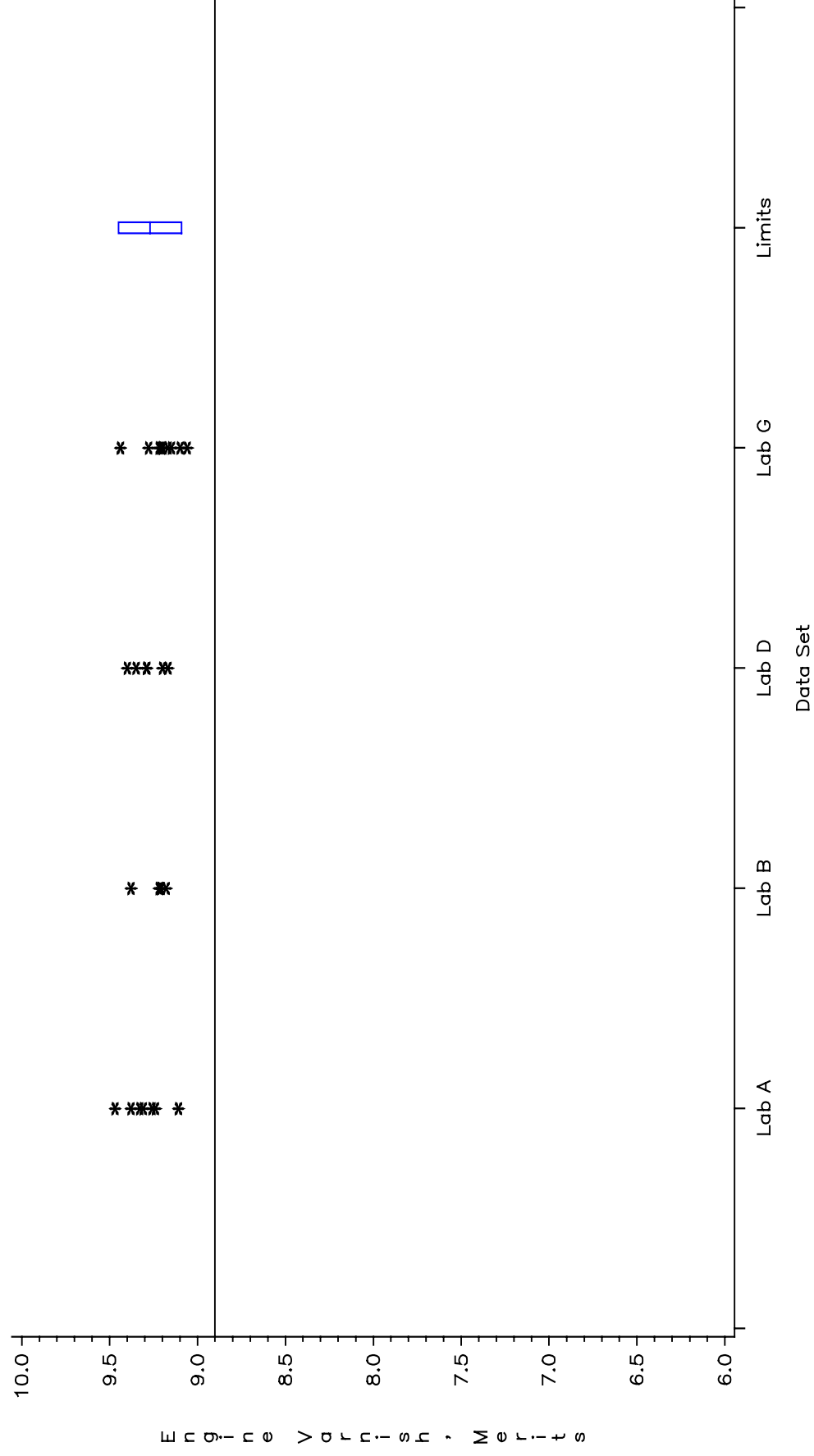
SEQUENCE VG
TARGET DATA SET AND SHEWHART LIMITS
ROCKER COVER SLUDGE, 1006



REFERENCE LINE IS THE GF-3 PASS LIMIT

FIGURE 3

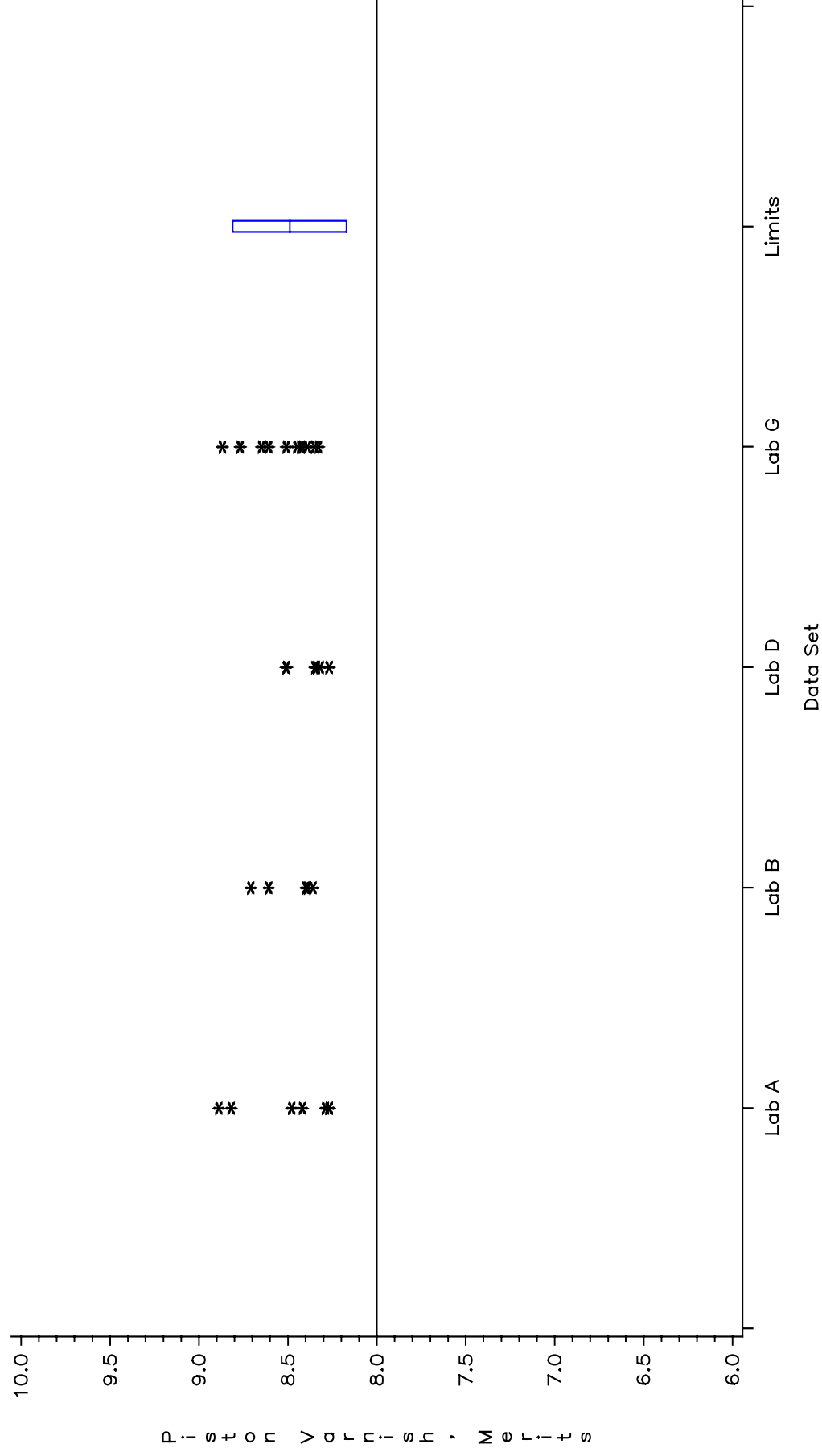
SEQUENCE VG
TARGET DATA SET AND SHEWHART LIMITS
AVERAGE ENGINE VARNISH, 1006



REFERENCE LINE IS THE GF-3 PASS LIMIT

FIGURE 4

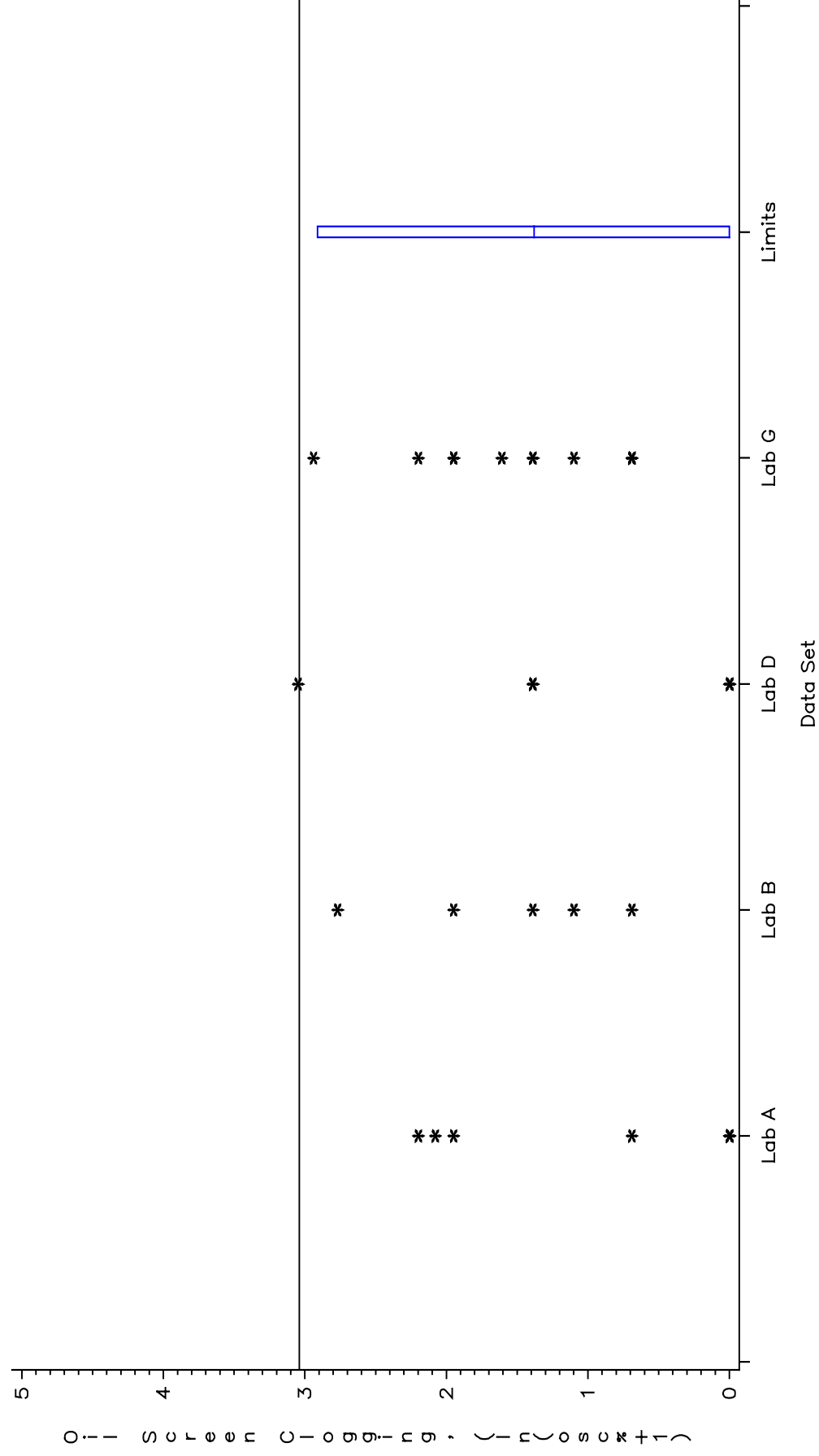
SEQUENCE VG
TARGET DATA SET AND SHEWHART LIMITS
AVERAGE PISTON SKIRT VARNISH, 1006



REFERENCE LINE IS THE GF-3 PASS LIMIT

FIGURE 5

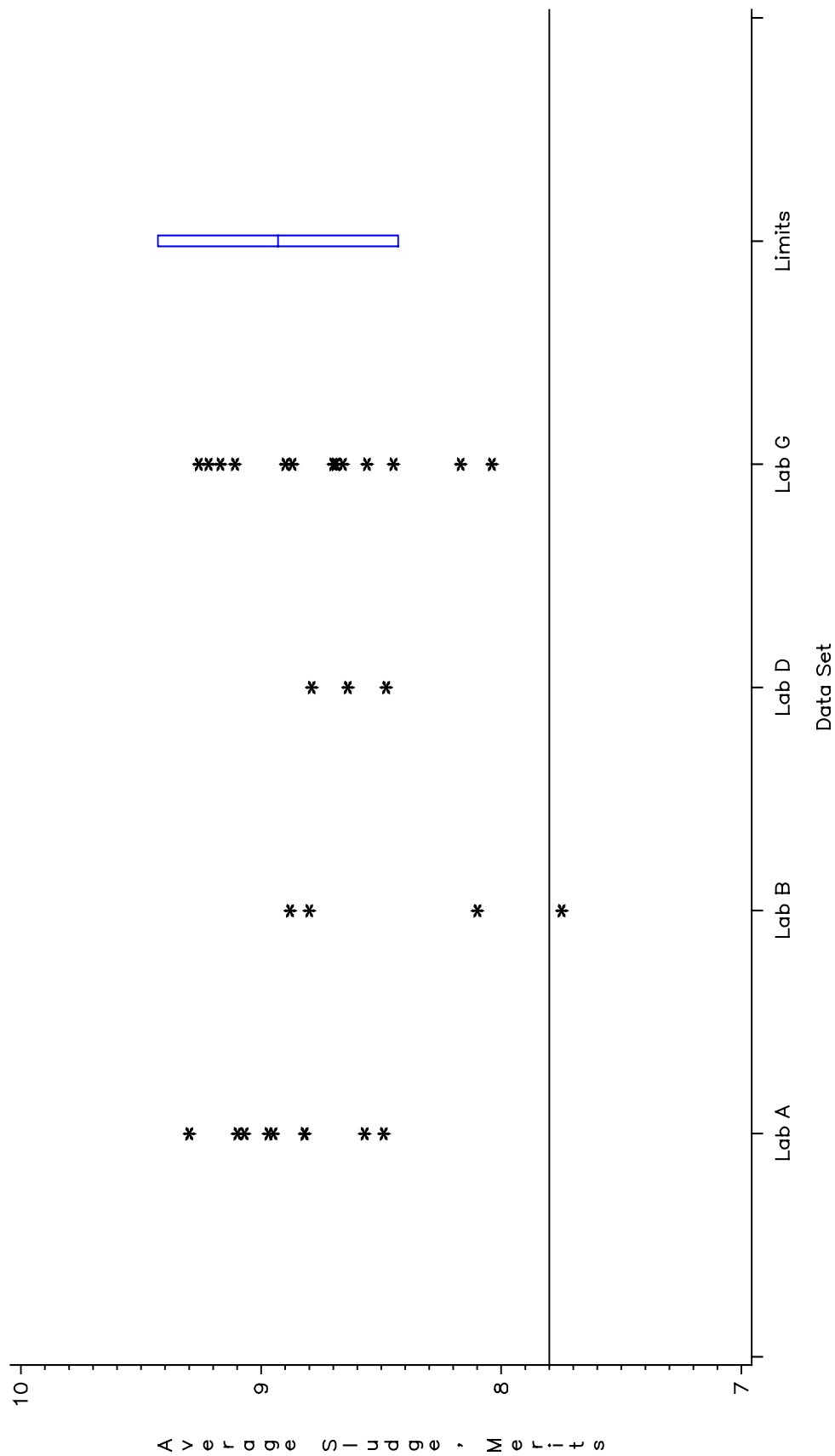
SEQUENCE VG
TARGET DATA SET AND SHEWHART LIMITS
TRANSFORMED OIL SCREEN CLOGGING, 1006



REFERENCE LINE IS THE GF-3 PASS LIMIT

FIGURE 6

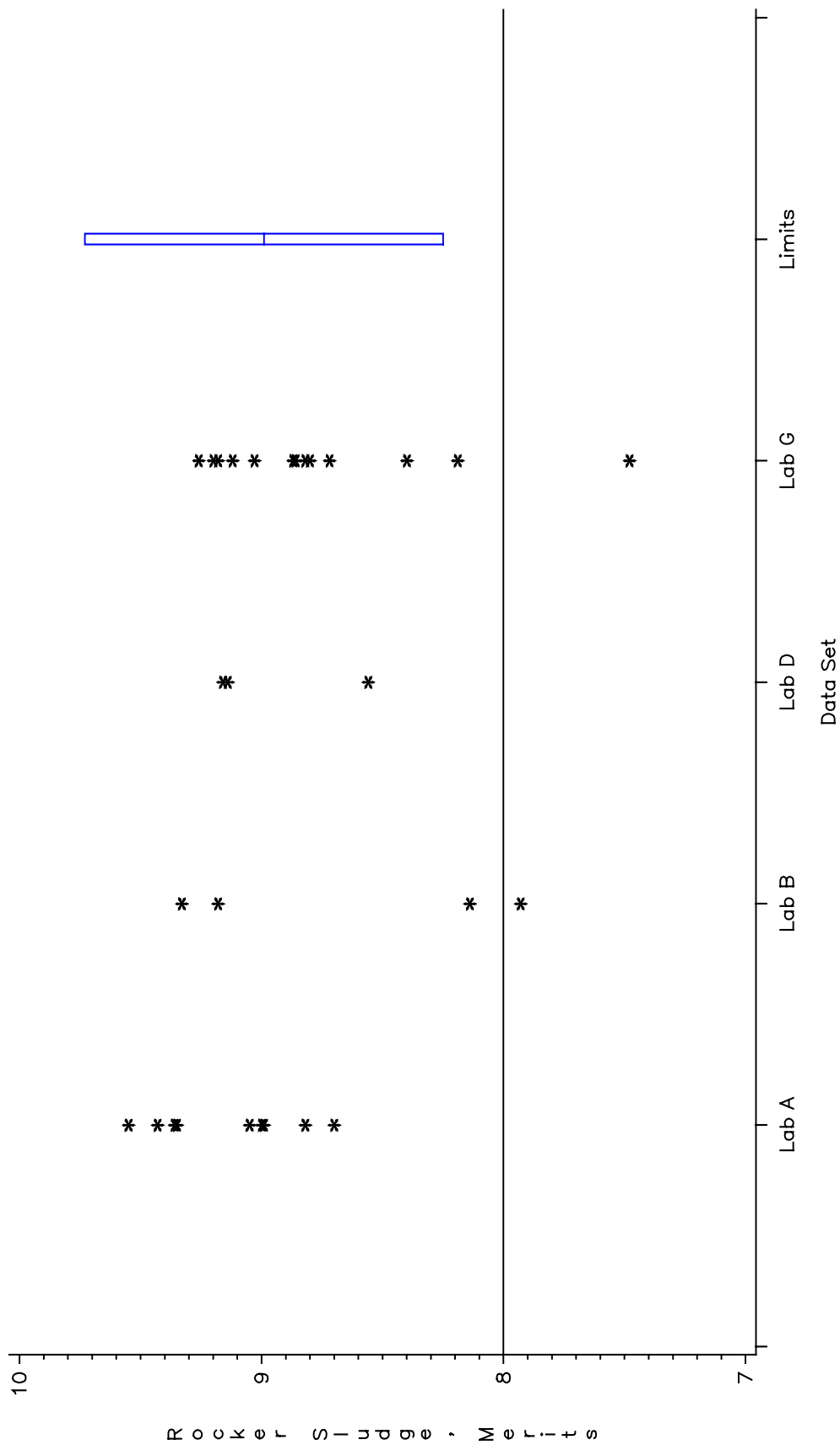
SEQUENCE VG
TARGET DATA SET AND SHEWHART LIMITS
AVERAGE ENGINE SLUDGE, 1007



REFERENCE LINE IS THE GF-3 PASS LIMIT
Lab results are uncorrected, Targets calculated using corrected results

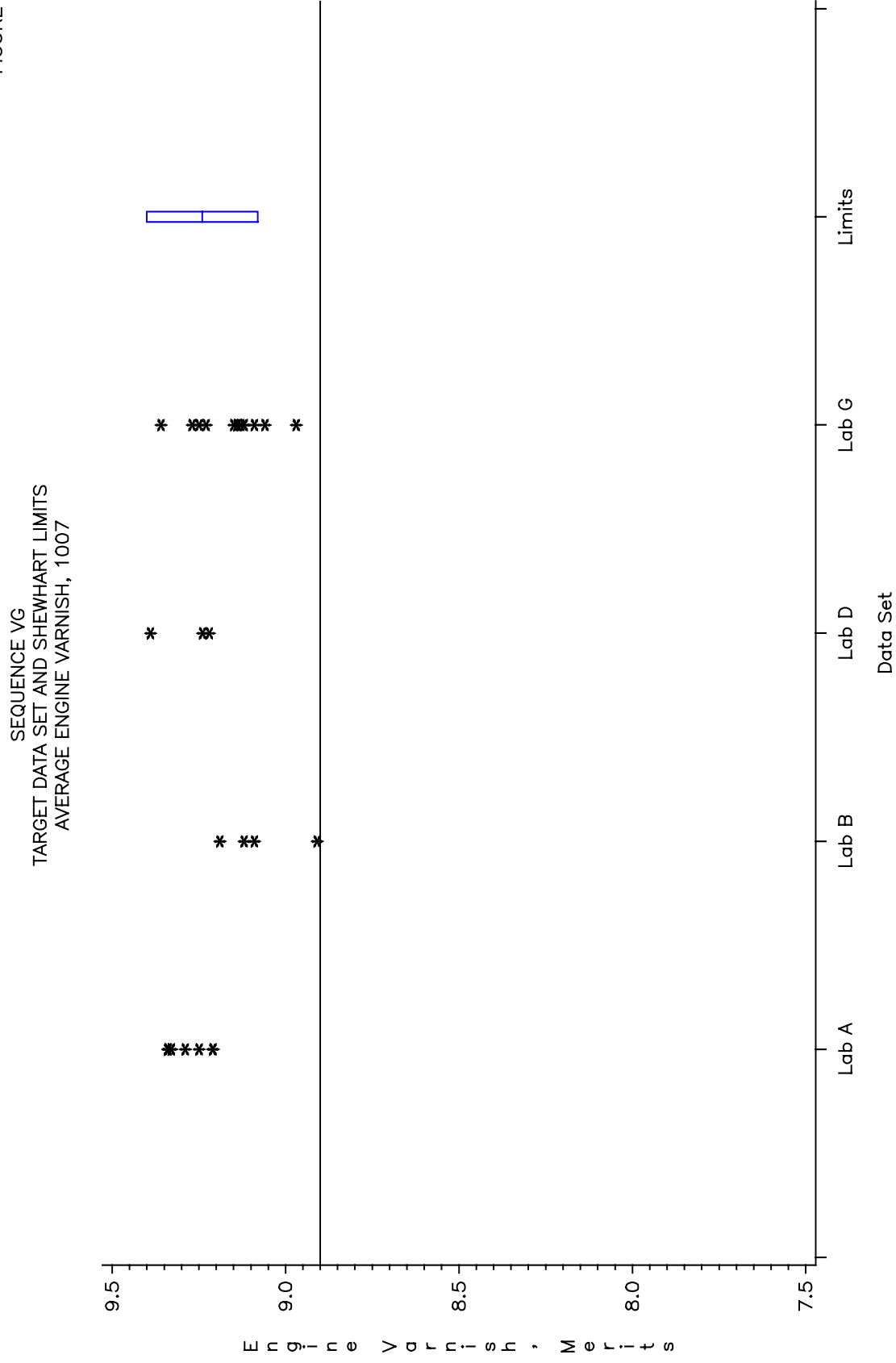
FIGURE 7

SEQUENCE VG
TARGET DATA SET AND SHEWHART LIMITS
ROCKER COVER SLUDGE, 1007



REFERENCE LINE IS THE GF-3 PASS LIMIT
Lab results are unadjusted, targets generated using adjusted results

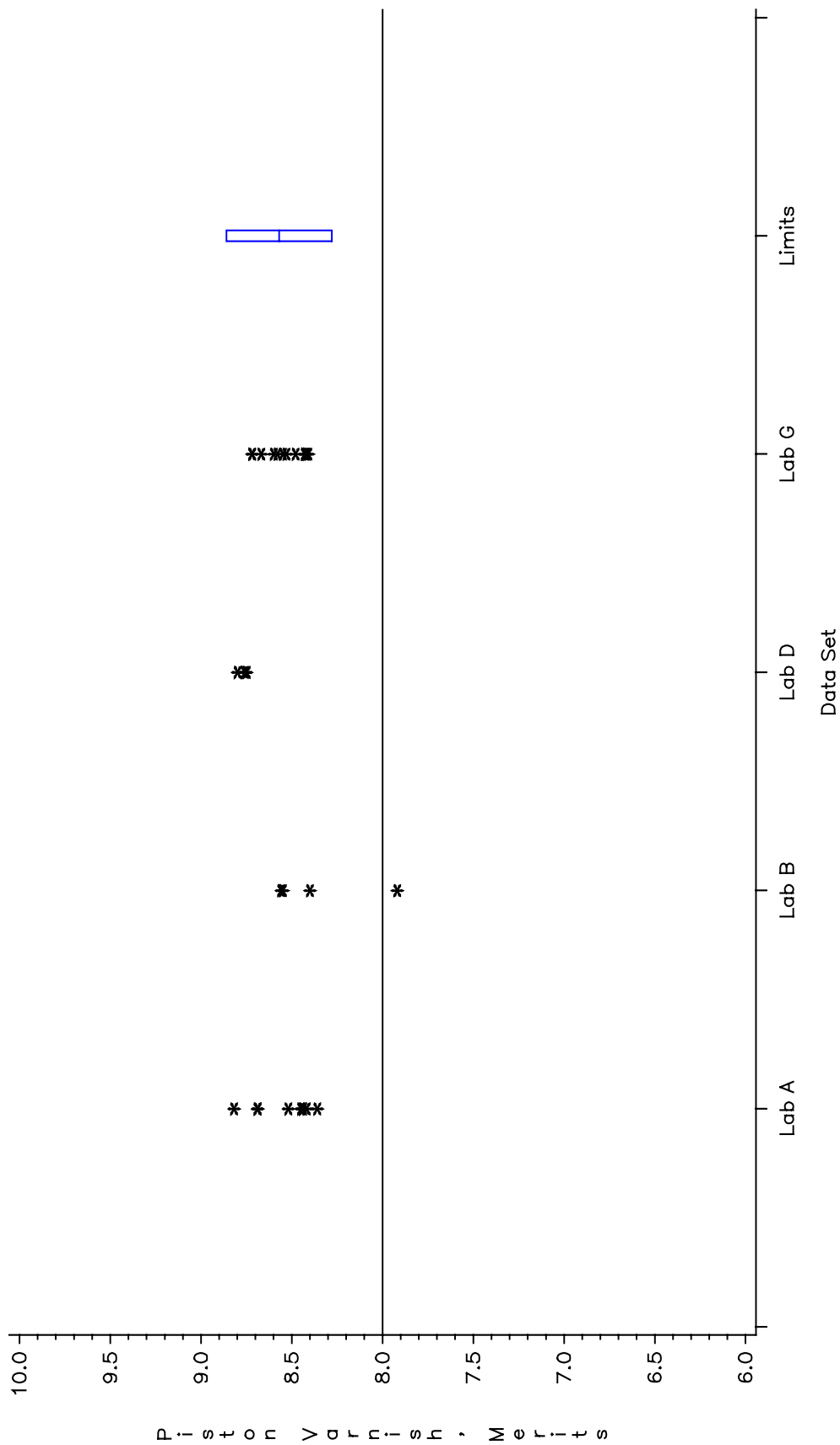
FIGURE 8



REFERENCE LINE IS THE GF-3 PASS LIMIT
Lab results are unadjusted, targets generated using adjusted results

FIGURE 9

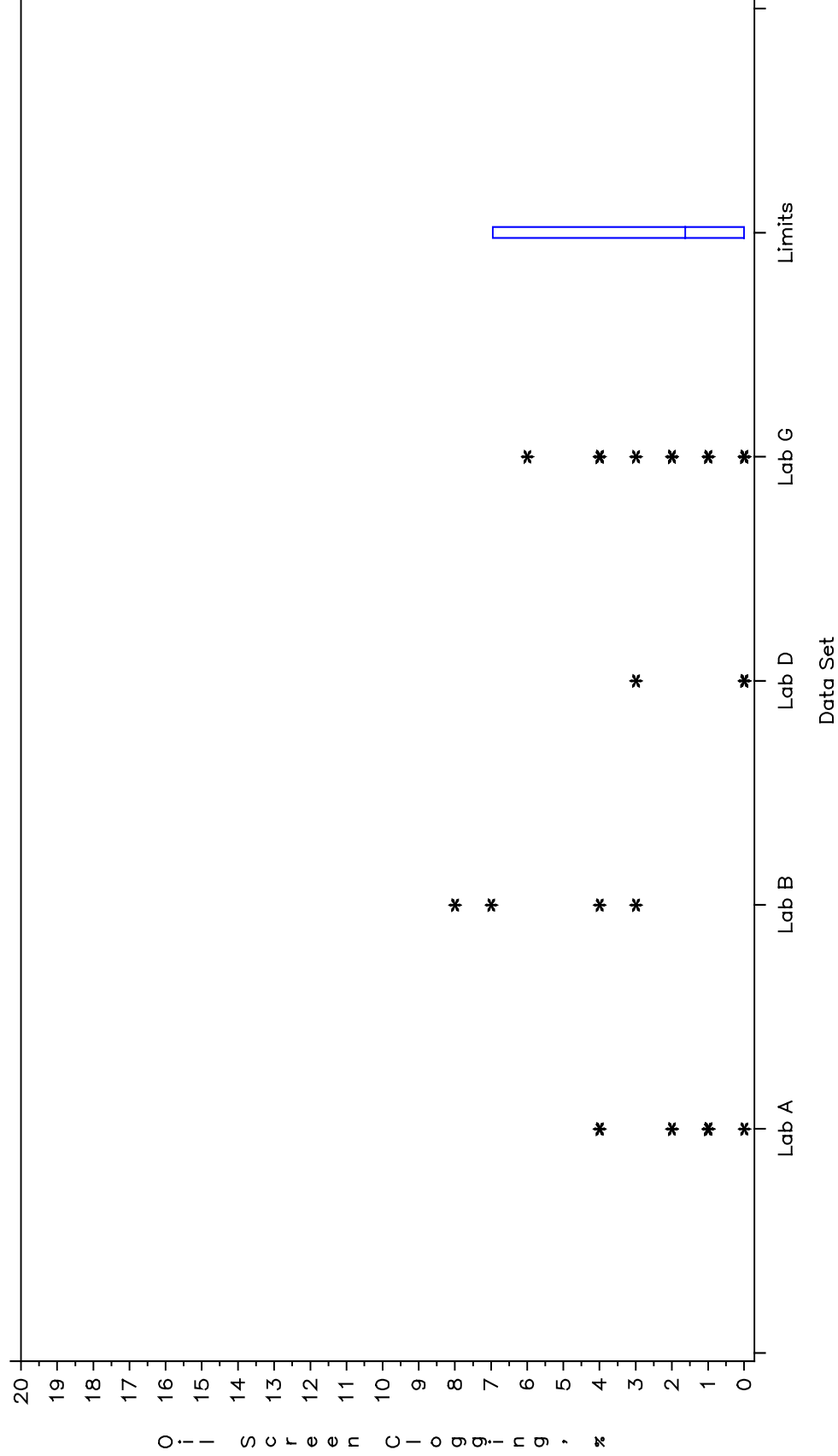
SEQUENCE VG
TARGET DATA SET AND SHEWHART LIMITS
AVERAGE PISTON SKIRT VARNISH, 1007



REFERENCE LINE IS THE GF-3 PASS LIMIT
Lab results are unadjusted, targets generated using adjusted results

FIGURE 10

SEQUENCE VG
TARGET DATA SET AND SHEWHART LIMITS
OIL SCREEN CLOGGING, 1007



REFERENCE LINE IS THE GF-3 PASS LIMIT
Lab results are unadjusted, targets generated using adjusted results