



# Test Monitoring Center

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

MEMORANDUM: 03-009

DATE: February 6, 2003

TO: Sequence IIF Surveillance Panel

FROM: Michael T. Kasimirsky *Michael T. Kasimirsky*

SUBJECT: Reference Oil 433-1 Updated Test Targets

The TMC has received 22 data points on reference oil 433-1 and as such has sufficient data to update the test targets at this time. The current test targets for this oil, based on 11 data points, are shown below for comparison purposes:

<i>Current Reference Oil 433-1 Test Targets</i>		
<i>Parameter</i>	<i>Mean</i>	<i>Standard Deviation</i>
PVIS	0.1684402	0.0402156
APV	9.27	0.281
WPD	4.27	0.557
PV60	3.55682	0.298299

The updated test targets, based on the 22 available data points on this reference oil, are shown below:

<i>Updated Reference Oil 433-1 Test Targets</i>		
<i>Parameter</i>	<i>Mean</i>	<i>Standard Deviation</i>
PVIS	0.1643104	0.0321605
APV	9.30	0.306
WPD	4.57	0.760
PV60	3.59344	0.227054

Any applicable severity adjustments were applied to the data prior to target generation. These targets will be updated one final time when the TMC has 30 data points available on this reference oil. On the following pages are two tables showing the individual reference oil test results used in generation of these targets. The first table is the raw, unadjusted data as reported to the TMC and the second table is the severity-adjusted data used to calculate the test targets, with severity-adjusted parameters shown in *red italics*.

The new test targets, along with targets based on the raw data, the initial test targets on reference oil 433-1, the targets for reference oil 433, and the individual data points are displayed graphically in the six attached plots. The first two plots show Percent Viscosity Increase at 80 hours, in transformed and reported units respectively. The third shows Weighted Piston Deposits in reported units and the fourth

Memo 03-009

Page 2

shows Average Piston Varnish in reported units. The fifth and sixth plots show Percent Viscosity Increase at 60 hours (the IIF-HD parameter) in transformed and reported units, respectively.

These new targets are effective for all tests completed on or after February 24, 2003.

MTK/mtk

Attachments

c: John L. Zalar, TMC

<ftp://www.astmtmc.cmu.edu/docs/gas/sequenceiii/memos/mem03-009.pdf>

Distribution: Electronic Mail

Table 1 – Unadjusted Reference Oil 433-1 Data

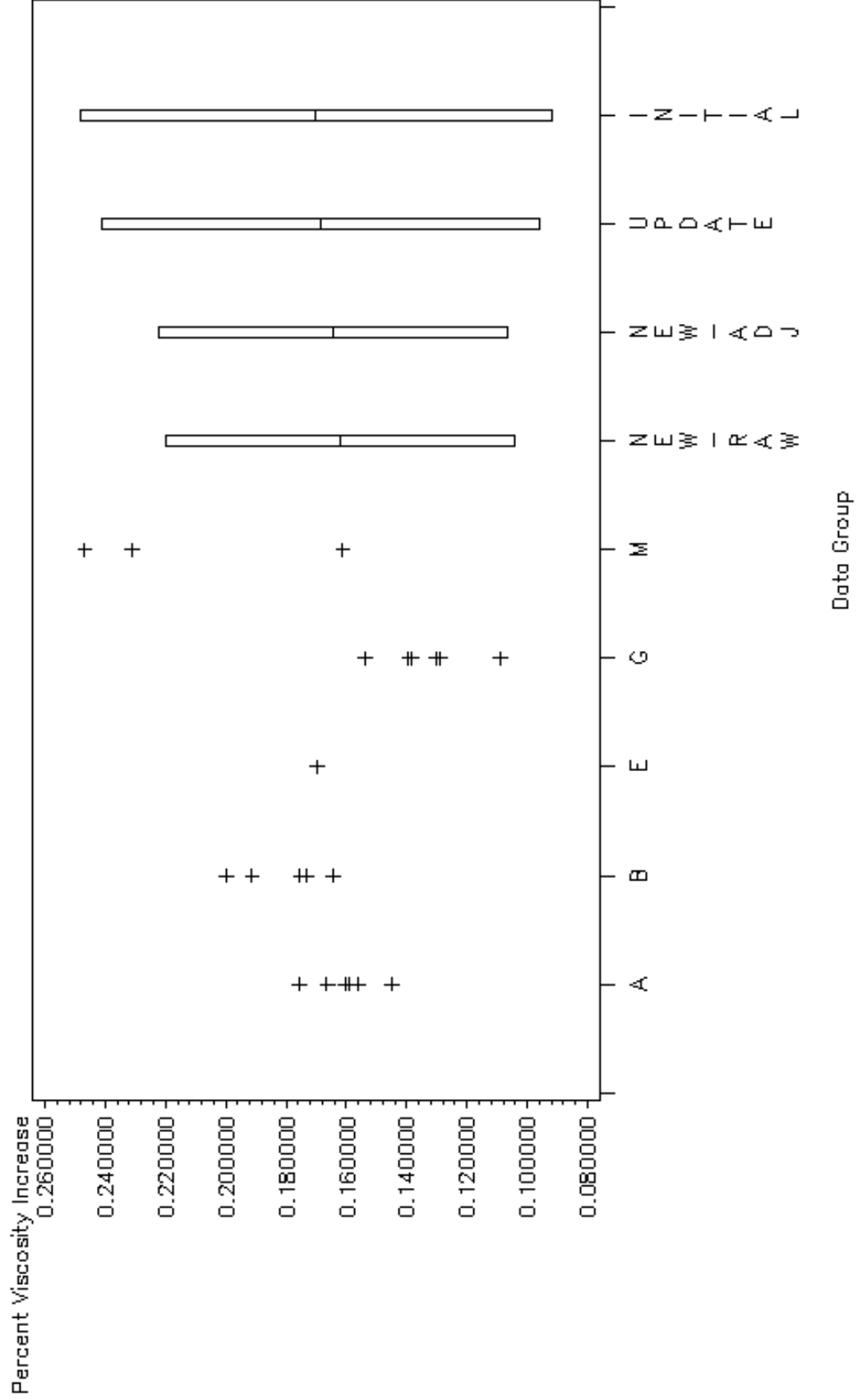
TESTKEY	LTM	SLAB	LTM	SAPP	IND	VAL	LTM	DATE	LTM	TIME	PVIS	PV	STI	APV	WPD	PV60	ACLW	SACLW	OILCON
40378	A		7		433-1	OC	8/16/2001	18:42	32.4	0.175682	9.09	3.86	31.56	58	46.9	2.91			
42144	A		7		433-1	OC	8/28/2001	21:06	39.4	0.159313	8.99	4.39	31.52	36.5	19	3.15			
42146	A		5		433-1	AC	12/9/2001	1:08	38.9	0.160334	9.56	3.75	33.16	8.1	8	3.06			
42147	A		6		433-1	AC	12/10/2001	0:06	36.1	0.166436	9.02	3.62	29.27	16.6	16.5	3.3			
42148	A		4		433-1	OC	3/8/2002	19:50	47.5	0.145095	9.55	5.8	40	153.4	123.6	3.19			
43567	A		4		433-1	AC	3/19/2002	10:24	40.9	0.156365	9.08	3.65	33.46	16.4	16.3	2.72			
40366	B		2		433-1	AC	8/19/2001	1:48	36.9	0.164622	9.32	4.4	34.1	14.9	15.1	3.51			
40367	B		1		433-1	OC	6/15/2002	9:11	25	0.2	9.41	5.81	33.1	12.7	12.5	3.52			
40369	B		1		433-1	OC	6/29/2002	10:12	27.3	0.19139	9.41	5.69	37.6	13.6	13.4	3.7			
46856	B		3B		433-1	AC	2/2/2003	14:15	45.7	0.147925	9.77	5.08	39.7	6	5.9	3.68			
46852	B		1		433-1	OC	2/3/2003	8:39	44.5	0.149906	9	4.11	40.8	64.4	38.7	2.87			
40351	E		1		433-1	AC	8/17/2001	3:57	34.7	0.16976	9.1	4.08	28.93	17.1	17	2.29			
40354	G		1		433-1	OC	8/18/2001	6:10	84.2	0.108979	9.38	3.44	71.48	23.3	14.2	4.48			
42873	G		1		433-1	AC	12/31/2001	11:26	51.5	0.139347	8.89	3.62	40.71	24.6	9.5	3.35			
42874	G		4		433-1	AC	1/28/2002	6:10	59	0.130189	9.61	3.54	48.5	48.6	7.2	4.09			
42876	G		3		433-1	AC	4/14/2002	4:55	52.2	0.138409	9.2	4.84	40.24	14.9	10.7	3.56			
44394	G		4		433-1	AC	5/3/2002	15:42	60.2	0.128885	9.7	4.54	46.18	9.5	9.5	3.82			
45915	G		1		433-1	AC	12/6/2002	6:50	52.3	0.138277	9.02	3.86	41.87	13.1	13.3	3.23			
45916	G		5		433-1	OC	1/20/2003	21:31	42.2	0.153937	8.95	4.88	35.4	123.9	121.9	3.26			
40364	M		2		433-1	AC	8/17/2001	6:01	18.7	0.231249	9.68	5.62	30.09	8	7.6	4.16			
40365	M		1		433-1	AC	2/18/2002	5:07	16.4	0.246932	9.52	4.76	24.26	11.9	11.9	3.46			
44188	M		2		433-1	AC	12/1/2002	3:41	38.5	0.161165	9.3	4.78	29.55	16.3	16.7	2.53			

Table 2 – Severity Adjusted Reference Oil 433-1 Data

TESTKEY	LTMSLAB	LTMSAPP	IND	VAL	LTMSPDATE	LTMSTIME	PVIS	PVISTI	APV	WPD	PV60	ACLW	SACLW	OILCON
40378	A	7	433-1	OC	8/16/2001	18:42	32.4	0.175682	9.09	3.86	31.56	58	46.9	2.91
42144	A	7	433-1	OC	8/28/2001	21:06	39.4	0.159313	8.99	4.39	31.52	36.5	19	3.15
42146	A	5	433-1	AC	12/9/2001	1:08	38.9	0.160334	9.56	4.19	33.16	8.1	8	3.06
42147	A	6	433-1	AC	12/10/2001	0:06	36.1	0.166436	9.02	4.06	29.27	16.6	16.5	3.3
42148	A	4	433-1	OC	3/8/2002	19:50	47.5	0.145095	9.55	6.36	40	153.4	123.6	3.19
43567	A	4	433-1	AC	3/19/2002	10:24	40.9	0.156365	9.08	3.65	33.46	16.4	16.3	2.72
40366	B	2	433-1	AC	8/19/2001	1:48	36.9	0.164622	9.32	4.4	34.1	14.9	15.1	3.51
40367	B	1	433-1	OC	6/15/2002	9:11	25	0.2	9.41	5.81	33.1	12.7	12.5	3.52
40369	B	1	433-1	OC	6/29/2002	10:12	27.3	0.19139	9.41	5.69	37.6	13.6	13.4	3.7
46856	B	3B	433-1	AC	2/2/2003	14:15	32.5	0.17532	10.1	5.08	39.7	6	5.9	3.68
46852	B	1	433-1	OC	2/3/2003	8:39	33.4	0.173144	9.18	4.11	40.8	64.4	38.7	2.87
40351	E	1	433-1	AC	8/17/2001	3:57	34.7	0.16976	9.1	4.08	28.93	17.1	17	2.29
40354	G	1	433-1	OC	8/18/2001	6:10	84.2	0.108979	9.18	3.44	71.48	23.3	14.2	4.48
42873	G	1	433-1	AC	12/31/2001	11:26	51.5	0.139347	8.89	4.05	40.71	24.6	9.5	3.35
42874	G	4	433-1	AC	1/28/2002	6:10	59	0.130189	9.61	4.12	48.5	48.6	7.2	4.09
42876	G	3	433-1	AC	4/14/2002	4:55	52.2	0.138409	9.2	4.84	40.24	14.9	10.7	3.56
44394	G	4	433-1	AC	5/3/2002	15:42	60.2	0.128885	9.7	4.54	46.18	9.5	9.5	3.82
45915	G	1	433-1	AC	12/6/2002	6:50	52.3	0.138277	9.02	3.86	41.87	13.1	13.3	3.23
45916	G	5	433-1	OC	1/20/2003	21:31	42.2	0.153937	8.95	4.88	35.4	123.9	121.9	3.26
40364	M	2	433-1	AC	8/17/2001	6:01	18.7	0.231249	9.68	5.62	30.09	8	7.6	4.16
40365	M	1	433-1	AC	2/18/2002	5:07	16.4	0.246932	9.52	4.76	24.26	11.9	11.9	3.46
44188	M	2	433-1	AC	12/1/2002	3:41	38.5	0.161165	9.15	4.78	29.55	16.3	16.7	2.53

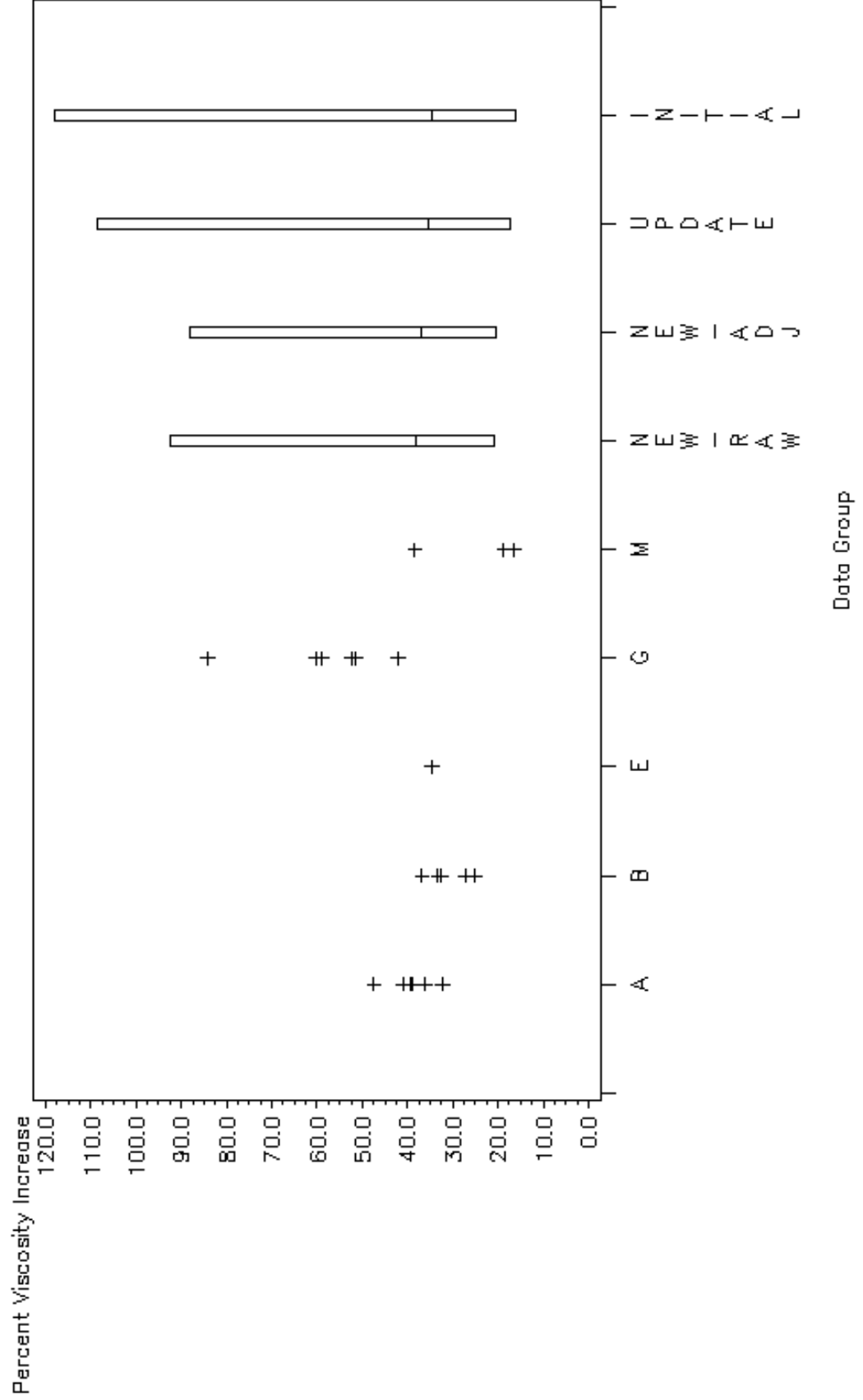
# Sequence IIIF Reference Oil 433-1 Test Target Data Set and Shewhart Bands

Percent Viscosity Increase, in transformed units



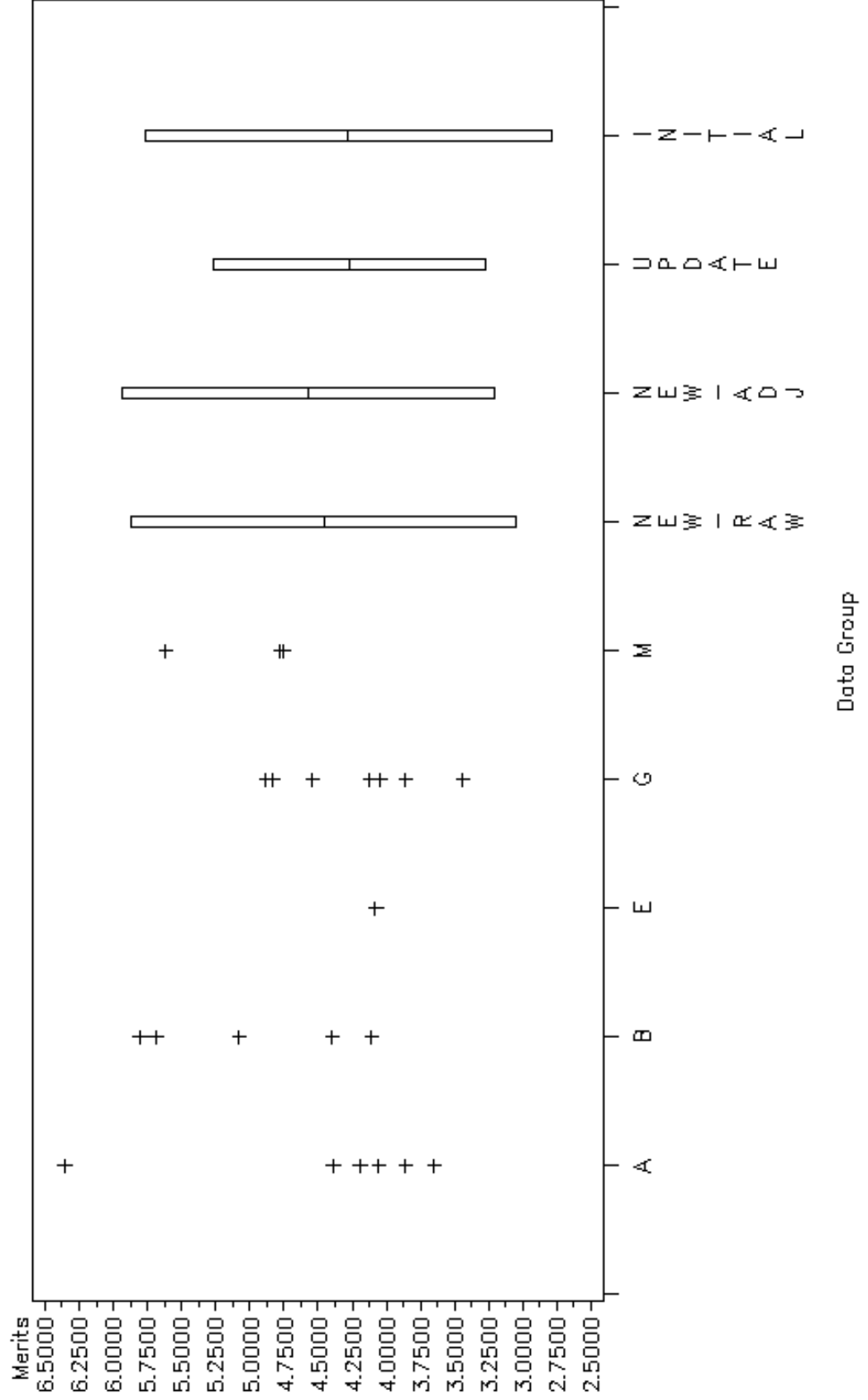
# Sequence III F Reference Oil 433-1 Test Target Data Set and Shewhart Bands

Percent Viscosity Increase, in original units



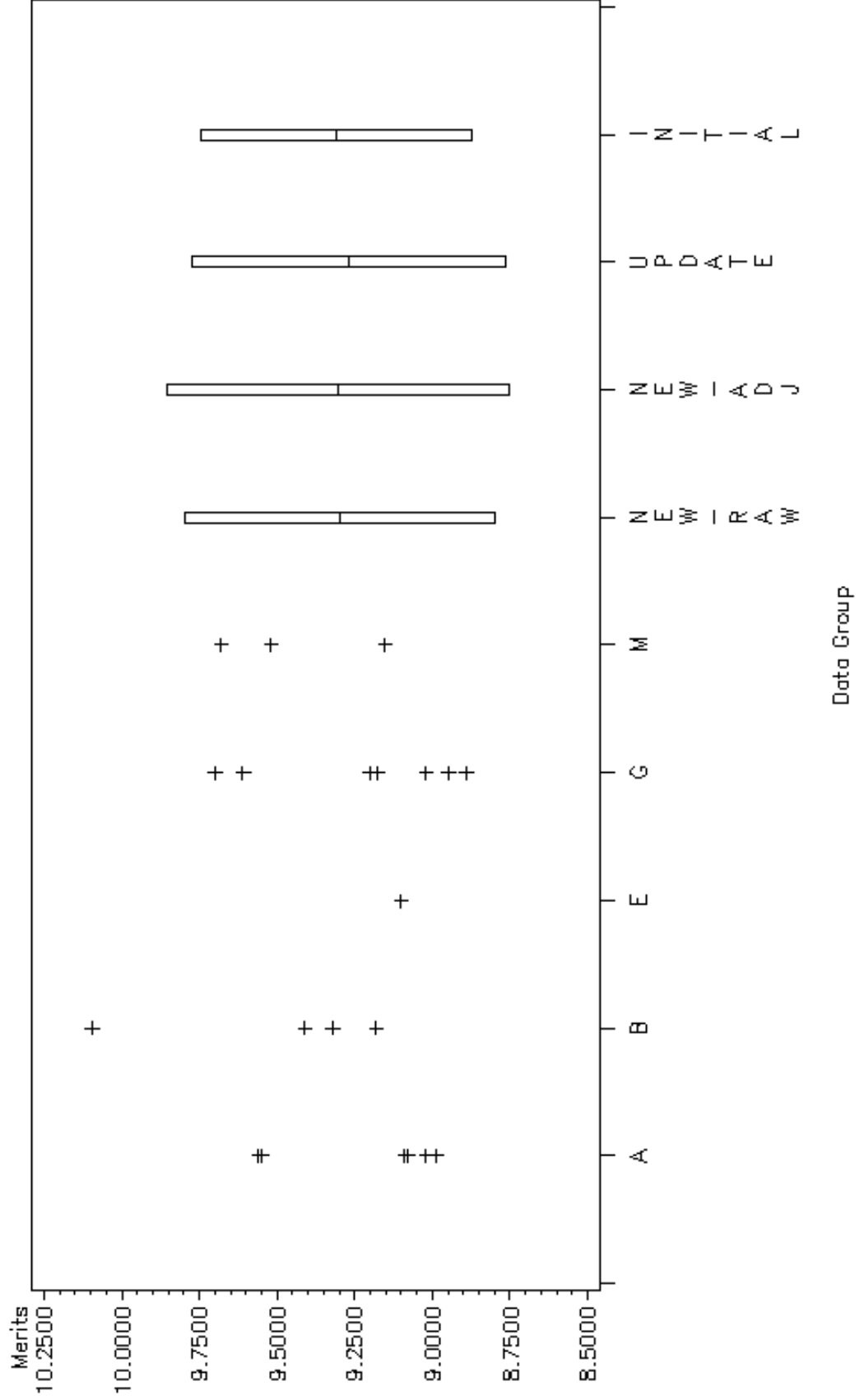
# Sequence IIF Reference Oil 433-1 Test Target Data Set and Shewhart Bands

Weighted Piston Deposits, in reported units



# Sequence IIIF Reference Oil 433-1 Test Target Data Set and Shewhart Bands

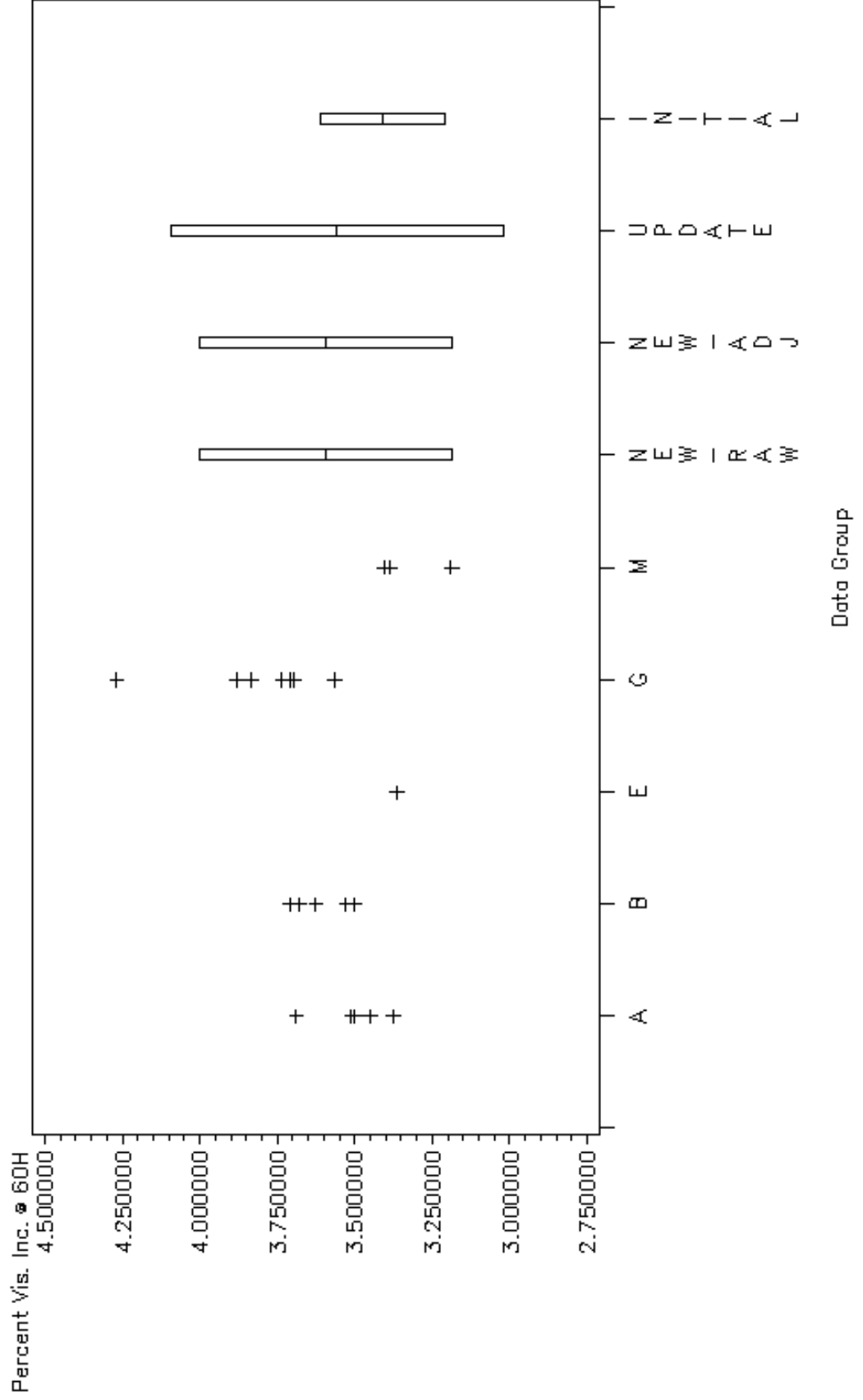
Average Piston Varnish, in reported units





# Sequence IIIF Reference Oil 433-1 Test Target Data Set and Shewhart Bands

Percent Viscosity Increase @ 60H, in transformed units



# Sequence IIIF Reference Oil 433-1 Test Target Data Set and Shewhart Bands

Percent Viscosity Increase @ 60H, in original units

