

**APPENDIX
TABLE I
MEDIAN RANKS FOR PLOTTING POINTS ON WDAS
Sample Sizes N = 1 to N = 34**

Ranked Order Number	Median Ranks (Percent cdf) for Sample Size N																																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34					
1	50	29	71																																				
2		71	50	29																																			
3			71	50	29																																		
4				71	50	29																																	
5					71	50	29																																
6						71	50	29																															
7							71	50	29																														
8								71	50	29																													
9									71	50	29																												
10										71	50	29																											
11											71	50	29																										
12												71	50	29																									
13													71	50	29																								
14														71	50	29																							
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16																71	50	29																					
17																	71	50	29																				
18																		71	50	29																			
19																			71	50	29																		
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25																									71	50	29												
26																										71	50	29											
27																											71	50	29										
28																												71	50	29									
29																													71	50	29								
30																														71	50	29							
31																															71	50	29						
32																																71	50	29					
33																																	71	50	29				
34																																		71	50	29			

Note: Values in this table have been rounded-off to be consistent with plotting accuracy of Weibull Grid on WDAS, form 8933.

APPENDIX

TABLE II
ESTIMATING SCALE PARAMETER, α

m	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0.0	1.000	.905	.819	.741	.670	.606	.550	.497	.450	.406
+1.0	.368	.333	.303	.272	.247	.223	.202	.182	.166	.150
+2.0	.135	.122	.111	.100	.091	.082	.074	.067	.061	.055
	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
-0.0	1.000	1.010	1.020	1.031	1.041	1.051	1.062	1.073	1.083	1.094
-0.1	1.105	1.116	1.128	1.139	1.150	1.162	1.174	1.185	1.198	1.21
-0.2	1.22	1.23	1.25	1.26	1.26	1.28	1.30	1.31	1.32	1.34
-0.3	1.35	1.36	1.38	1.39	1.41	1.42	1.43	1.45	1.46	1.48
-0.4	1.49	1.51	1.52	1.54	1.55	1.57	1.58	1.60	1.62	1.63
-0.5	1.65	1.67	1.68	1.70	1.72	1.73	1.75	1.77	1.79	1.80
-0.6	1.82	1.84	1.86	1.88	1.90	1.92	1.94	1.95	1.97	1.99
-0.7	2.01	2.03	2.05	2.07	2.10	2.12	2.14	2.16	2.18	2.20
-0.8	2.23	2.25	2.27	2.29	2.31	2.34	2.36	2.39	2.41	2.44
-0.9	2.46	2.49	2.50	2.54	2.56	2.59	2.61	2.64	2.66	2.69
-1.0	2.72	2.74	2.78	2.80	2.83	2.86	2.89	2.92	2.94	2.98
-1.1	3.00	3.04	3.06	3.10	3.12	3.16	3.19	3.22	3.26	3.28
-1.2	3.32	3.36	3.39	3.42	3.46	3.49	3.53	3.56	3.60	3.63
-1.3	3.67	3.70	3.74	3.78	3.82	3.86	3.90	3.94	3.97	4.01
-1.4	4.06	4.10	4.14	4.18	4.23	4.26	4.30	4.35	4.90	4.94
-1.5	4.49	4.53	4.57	4.62	4.66	4.71	4.76	4.80	4.85	4.90
	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
-1.0	2.7	3.0	3.3	3.7	4.1	4.5	5.0	5.5	6.1	6.7
-2.0	7.4	8.2	9.0	10.0	11.0	12.2	13.6	14.9	16.4	18.2
-3.0	20.2	22.2	24.5	27.0	30.0	33.1	36.5	40.5	44.8	49.1
-4.0	54.5	60.0	66.5	74.0	81.5	90.0	100.0	110.0	121.0	135.0
-5.0	149.0	164.0	181.0	200.0	220.0	245.0	270.0	300.0	330.0	365.0
-6.0	405.0	445.0	490.0	540.0	600.0	660.0	740.0	810.0	900.0	990.0

APPENDIX
TABLE III
CONFIDENCE LIMIT PERCENT RANKS
FOR WDAS WEIBULL PLOT
Sample Sizes N = 1 to N = 30

		Sample Size N = 1						Sample Size N = 2					
Two-Sided		90%		95%		99%		90%		95%		99%	
One-Sided		95% UCL	95% LCL	97.5% UCL	97.5% LCL	99.5% UCL	99.5% LCL	95% UCL	95% LCL	97.5% UCL	97.5% LCL	99.5% UCL	99.5% LCL
Ranked Order	1	5	95	2.5	98	0.50	99.5	2.5	77	1.3	84	0.25	93
	2							22	98	16	99	7	99.9

		Sample Size N = 3						Sample Size N = 4					
Two-Sided		90%		95%		99%		90%		95%		99%	
One-Sided		95% UCL	95% LCL	97.5% UCL	97.5% LCL	99.5% UCL	99.5% LCL	95% UCL	95% LCL	97.5% UCL	97.5% LCL	99.5% UCL	99.5% LCL
Ranked Order	1	1.7	63	0.85	71	0.17	83	1.3	53	0.65	60	0.12	73
	2	14	87	9.5	91	4	96	10	75	7	81	2.9	89
	3	37	98	29	99	17	99.9	25	90	19	93	11	97
	4							47	99	40	99.5	27	99.9

		Sample Size N = 5						Sample Size N = 6					
Two-Sided		90%		95%		99%		90%		95%		99%	
One-Sided		95% UCL	95% LCL	97.5% UCL	97.5% LCL	99.5% UCL	99.5% LCL	95% UCL	95% LCL	97.5% UCL	97.5% LCL	99.5% UCL	99.5% LCL
Ranked Order	1	1.0	45	0.50	52	0.10	65	0.85	39	0.42	46	0.10	59
	2	7.5	66	5.5	72	2.3	81	6.5	58	4.5	64	1.9	75
	3	19	81	15	85	8.5	92	15	73	12	78	6.5	86
	4	34	92	28	95	19	98	27	85	22	88	14	93
	5	55	99	48	99.5	35	99.9	42	94	36	96	25	98
	6							61	99	54	99.5	41	99.9

Reference: "Plotting on Weibull Probability Paper", Ford Motor Company, General Parts Division, Reliability Memorandum No. IV-8, October 4, 1967.

NOTE: Values in this table have been rounded-off to be consistent with plotting accuracy of Weibull Grid on WDAS, Form 8933.

APPENDIX
TABLE III
CONFIDENCE LIMIT PERCENT RANKS
FOR WDAS WEIBULL PLOT

		Sample Size N = 11						Sample Size N = 12					
Two-Sided		90%		95%		99%		90%		95%		99%	
One-Sided		95% UCL	95% LCL	97.5% UCL	97.5% LCL	99.5% UCL	99.5% LCL	95% UCL	95% LCL	97.5% UCL	97.5% LCL	99.5% UCL	99.5% LCL
Ranked Order	1	0.46	24	0.23	29	0.10	38	0.43	22	0.21	27		36
	2	3.3	36	2.3	41	1.0	51	3.0	34	2.1	38	0.9	48
	3	8	47	6.0	52	3.3	61	7	44	5.5	48	3.0	57
	4	13	56	11	61	7	69	12	53	10	57	6	65
	5	20	65	17	69	11	77	18	61	15	65	10	73
	6	27	73	23	77	17	83	25	69	21	72	15	79
	7	35	80	31	83	23	87	32	75	28	79	21	85
	8	44	87	39	89	31	93	39	82	35	85	27	90
	9	53	92	48	94	39	97	47	88	43	90	35	94
	10	64	97	59	98	49	99	56	93	52	95	43	97
	11	76	99.5	72	99.9	62	99.9	66	97	62	98	52	99
	12							78	99.5	73	99.9	64	99.9

		Sample Size N = 13						Sample Size N = 14					
Two-Sided		90%		95%		99%		90%		95%		99%	
One-Sided		95% UCL	95% LCL	97.5% UCL	97.5% LCL	99.5% UCL	99.5% LCL	95% UCL	95% LCL	97.5% UCL	97.5% LCL	99.5% UCL	99.5% LCL
Ranked Order	1	0.39	21	0.20	25		33	0.37	19	0.18	23		31
	2	2.8	32	1.9	36	0.8	45	2.6	30	1.8	34	0.75	42
	3	6.5	41	5.0	45	2.8	54	6.1	39	4.7	43	2.6	51
	4	11	49	9	54	5.7	62	10	47	8.5	51	5.3	59
	5	17	57	14	61	9.5	69	15	54	13	58	8.5	66
	6	22	65	19	68	14	75	21	61	18	65	13	72
	7	29	71	25	75	19	81	26	68	23	71	17	78
	8	35	78	32	81	25	86	33	74	29	77	22	83
	9	43	83	39	86	31	91	39	79	35	82	28	87
	10	51	89	46	91	38	94	46	85	42	87	34	91
	11	59	93	55	95	46	97	53	90	49	91	41	95
	12	68	97	64	98	55	99	61	94	57	95	49	97
	13	79	99.5	75	99.9	67	99.9	70	97	66	98	58	99
	14							81	99	77	99.9	69	99.9

NOTE: Values in this table have been rounded-off to be consistent with plotting accuracy of Weibull Grid on WDAS, Form 8933.

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TABLE III
CONFIDENCE LIMIT PERCENT RANKS
FOR WDAS WEIBULL PLOT

		Sample Size N = 17						Sample Size N = 18					
Two-Sided		90%		95%		99%		90%		95%		99%	
One-Sided		95% UCL	95% LCL	97.5% UCL	97.5% LCL	99.5% UCL	99.5% LCL	95% UCL	95% LCL	97.5% UCL	97.5% LCL	99.5% UCL	99.5% LCL
Ranked Order	1	0.30	16	0.16	19		27	0.28	15	0.14	19		25
	2	2.1	25	1.5	29	0.63	36	2.0	24	1.4	27	0.59	35
	3	5.0	33	3.8	36	2.1	44	4.7	31	3.6	35	2.0	42
	4	8.5	40	6.8	43	4.3	51	8.0	38	6.4	41	4.0	49
	5	12	46	10	50	7.0	57	12	44	10	48	6.5	55
	6	17	52	14	56	10	63	16	50	13	53	9.5	61
	7	21	58	18	62	14	69	20	55	17	59	13	66
	8	26	64	23	67	18	73	24	61	21	64	17	71
	9	31	69	28	72	22	78	29	66	26	69	21	75
	10	36	74	33	77	27	82	34	71	31	74	25	79
	11	42	79	38	82	31	86	39	76	36	78	29	83
	12	48	83	44	86	37	90	45	80	41	83	34	87
	13	54	88	50	90	43	93	50	84	47	87	39	91
	14	60	91	57	93	49	96	56	88	52	90	45	93
	15	67	95	64	96	56	98	62	92	59	94	51	96
	16	75	98	71	99	64	99.5	69	95	65	96	58	98
	17	84	99.5	81	99.9	73	99.9	76	98	73	99	65	99
	18								85	99.7	81	99.9	75

NOTE: Values in this table have been rounded-off to be consistent with plotting accuracy of Weibull Grid on WDAS, Form 8933.

N = 17 to N = 18

APPENDIX
TABLE III
CONFIDENCE LIMIT PERCENT RANKS
FOR WDAS WEIBULL PLOT

		Sample Size N = 21						Sample Size N = 22					
Two-Sided		90%		95%		99%		90%		95%		99%	
One-Sided		95% UCL	95% LCL	97.5% UCL	97.5% LCL	99.5% UCL	99.5% LCL	95% UCL	95% LCL	97.5% UCL	97.5% LCL	99.5% UCL	99.5% LCL
Ranked Order	1	0.24	13	0.12	16		22	0.23	13	0.11	15		21
	2	1.7	21	1.1	24	0.50	30	1.6	20	1.1	23	0.48	29
	3	4.0	27	3.0	30	1.6	37	3.8	26	2.9	29	1.5	36
	4	6.7	33	5.4	36	3.3	43	6.4	31	5.1	35	3.2	42
	5	10	38	8	42	5.5	49	9.5	37	7.8	40	5.2	47
	6	13	44	11	47	8	54	13	42	11	45	7.5	52
	7	17	49	15	52	11	59	16	47	14	50	10	57
	8	21	53	18	57	14	63	19	51	17	55	13	61
	9	24	58	22	61	17	68	23	56	21	59	16	65
	10	29	63	26	66	21	72	27	60	24	64	19	69
	11	33	67	30	70	24	76	31	65	28	68	23	73
	12	37	71	34	74	28	79	35	69	32	72	27	77
	13	42	75	38	78	32	83	39	73	36	76	30	81
	14	46	79	43	82	37	86	44	77	41	79	35	84
	15	51	83	48	85	41	89	48	80	45	83	39	87
	16	56	87	53	89	46	92	53	84	50	86	43	90
	17	61	90	58	92	51	94	58	87	55	89	48	92
	18	67	93	64	95	57	97	63	91	60	92	53	95
	19	73	96	70	97	63	98	68	93	65	95	58	97
	20	79	98	76	99	69	99	74	96	71	97	64	98
	21	87	99.7	84	99.9	78	99.9	80	98	77	99	71	99.5
	22							87	99.5	85	99.9	79	99.9

NOTE: Values in this table have been rounded-off to be consistent with plotting accuracy of Weibull Grid on WDAS, Form 8933.

N = 21 to N = 22

APPENDIX
TABLE III
CONFIDENCE LIMIT PERCENT RANKS
FOR WDAS WEIBULL PLOT

		Sample Size N = 25						Sample Size N = 26					
		90%		95%		99%		90%		95%		99%	
Two-Sided	One-Sided	95% UCL	95% LCL	97.5% UCL	97.5% LCL	99.5% UCL	99.5% LCL	95% UCL	95% LCL	97.5% UCL	97.5% LCL	99.5% UCL	99.5% LCL
	1	0.20	11	0.10	14		19	0.19	11	0.10	13		18
	2	1.4	17	0.98	20	0.42	26	1.3	17	0.94	20	0.40	25
	3	3.3	23	2.5	26	1.3	32	3.2	22	2.4	25	1.3	31
	4	5.6	28	4.5	31	2.8	37	5.4	27	4.3	30	2.7	36
	5	8	33	6.8	36	4.5	42	8	32	6.5	35	4.4	41
	6	11	37	9.5	41	6.5	47	11	36	9	39	6.3	45
	7	14	42	12	45	9	51	13	41	12	44	8.5	50
	8	17	46	15	49	11	55	16	45	14	48	11	54
	9	20	50	18	53	14	59	19	49	17	52	13	58
	10	24	54	21	57	17	63	23	53	20	56	16	61
	11	27	58	24	61	20	67	26	56	23	59	19	65
	12	31	62	28	65	23	71	29	60	27	63	22	69
	13	34	66	31	69	26	74	33	64	30	67	25	72
	14	38	69	35	72	29	77	36	67	33	70	28	75
	15	42	73	39	75	33	80	40	71	37	73	31	78
	16	46	76	43	79	37	83	43	74	41	77	35	81
	17	50	80	47	82	40	86	47	77	44	80	39	84
	18	54	83	51	85	44	89	51	81	48	83	42	87
	19	58	86	55	88	49	91	55	84	52	86	46	89
	20	62	89	59	91	53	93	59	87	56	88	50	91
	21	67	92	64	93	58	95	64	89	61	91	55	94
	22	72	94	69	95	63	97	68	92	65	93	59	95
	23	77	97	74	97	68	99	73	95	70	96	64	97
	24	82	99	80	99	74	99.5	78	97	75	97	69	99
	25	89	99.7	86	99.9	81	99.9	83	99	80	99	75	99.5
	26							89	99.9	87	99.9	81	99.9

NOTE: Values in this table have been rounded-off to be consistent with plotting accuracy of Weibull Grid on WDAS, Form 8933.

N = 25 to N = 26

APPENDIX
TABLE III
CONFIDENCE LIMIT PERCENT RANKS
FOR WDAS WEIBULL PLOT

		Sample Size N = 29						Sample Size N = 30					
Two-Sided		90%		95%		99%		90%		95%		99%	
One-Sided		95% UCL	95% LCL	97.5% UCL	97.5% LCL	99.5% UCL	99.5% LCL	95% UCL	95% LCL	97.5% UCL	97.5% LCL	99.5% UCL	99.5% LCL
Ranked Order	1	0.17	10	0.10	12		17	0.17	9.5	0.10	12		16
	2	1.2	15	0.84	18	0.36	23	1.1	15	0.81	17	0.35	22
	3	2.8	20	2.1	23	1.2	28	2.7	19	2.1	22	1.1	27
	4	4.8	25	3.8	27	2.4	33	4.6	24	3.7	27	2.3	32
	5	7.0	29	5.8	32	3.9	37	7	28	5.6	31	3.7	36
	6	9.5	33	8	36	5.6	41	9	32	7.5	35	5.4	40
	7	12	37	10	40	7.5	45	11	36	10	39	7.2	44
	8	15	41	13	43	9.5	49	14	39	12	42	9	48
	9	17	44	15	47	12	53	17	43	15	46	11	51
	10	20	48	18	51	14	57	19	47	17	49	14	55
	11	23	51	21	54	17	60	22	50	20	53	16	58
	12	26	55	23	58	19	63	25	53	23	56	19	61
	13	29	58	26	61	22	66	28	57	25	59	21	65
	14	32	61	29	64	25	69	31	60	28	63	24	68
	15	35	65	33	67	27	72	34	63	31	65	26	71
	16	38	68	36	71	31	75	37	66	34	69	29	73
	17	42	71	39	73	34	78	40	69	37	72	32	76
	18	45	74	42	76	37	81	43	72	41	75	35	79
	19	49	77	46	79	40	83	47	75	44	77	38	81
	20	52	80	49	82	43	86	50	78	47	80	42	84
	21	56	83	53	85	47	88	53	81	51	83	45	86
	22	59	85	56	87	51	90	57	83	54	85	48	89
	23	63	88	60	90	54	92	61	86	58	88	52	91
	24	67	91	64	92	58	94	64	89	61	90	56	93
	25	71	93	68	94	63	96	68	91	65	92	59	95
	26	75	95	73	96	67	97	72	93	69	94	64	96
	27	80	97	77	98	72	99	76	95	73	96	68	98
	28	85	99	82	99	77	99.5	80	97	78	98	73	99
	29	90	99.9	88	99.9	83	99.9	85	99	83	99	78	99.5
	30								90	99.9	88	99.9	84

NOTE: Values in this table have been rounded-off to be consistent with plotting accuracy of Weibull Grid on WDAS, Form 8933.

N = 29 to N = 30

APPENDIX
TABLE IV - A
ONE-SIDED NONPARAMETRIC, N = 1 - 1000
STATISTICAL TOLERANCE LIMITS

Sample Size	One-Sided Tolerance Limits Confidence Levels				Sample Size	One-Sided Tolerance Limits Confidence Levels			
	90.0%	95.0%	99.0%	99.9%		90.0%	95.0%	99.0%	99.9%
1	10.0	5.0	1.0	0.1	92	97.5	96.8	95.1	92.8
2	31.6	22.4	10.0	3.2	93	97.6	96.8	95.2	92.8
3	46.4	36.8	21.5	10.0	94	97.6	96.9	95.2	92.9
4	56.2	47.3	31.6	17.8	95	97.6	96.9	95.3	93.0
5	63.1	54.9	39.8	25.1	96	97.6	96.9	95.3	93.1
6	68.1	60.7	46.4	31.6	97	97.7	97.0	96.4	93.1
7	72.0	65.2	51.6	37.3	98	97.7	97.0	96.4	93.2
8	75.0	68.8	56.2	42.2	99	97.7	97.0	96.5	93.3
9	77.4	71.7	59.9	46.4	100	97.7	97.0	96.5	93.3
10	79.4	74.1	63.1	50.1	105	97.8	97.2	95.7	93.6
11	81.1	76.2	65.8	53.4	110	97.9	97.3	95.9	93.9
12	82.5	77.9	68.1	56.2	115	98.0	97.4	96.1	94.2
13	83.8	79.4	70.2	58.8	120	98.1	97.5	96.2	94.4
14	84.8	80.7	72.0	61.1	125	98.2	97.6	96.4	94.6
15	85.6	81.9	73.6	63.1	130	98.2	97.7	96.5	94.6
16	86.6	82.9	75.0	64.9	135	98.3	97.8	96.6	95.0
17	87.3	83.8	76.3	66.8	140	98.4	97.9	96.6	95.2
18	88.0	84.7	77.4	68.1	145	98.4	98.0	96.9	95.3
19	88.6	85.4	78.5	69.5	150	98.5	98.0	97.0	95.5
20	89.1	86.1	79.4	70.8	155	98.5	98.1	97.1	95.6
21	89.6	86.7	80.3	72.0	160	98.6	98.1	97.2	95.6
22	90.1	87.3	81.1	73.1	165	98.6	98.2	97.2	95.9
23	90.5	87.8	81.9	74.1	170	98.7	98.2	97.3	96.0
24	90.9	88.3	82.5	75.0	175	98.7	98.3	97.4	96.1
25	91.2	88.7	83.2	75.9	180	98.7	98.3	97.5	96.2
26	91.5	89.1	83.8	76.7	185	98.8	98.4	97.5	96.3
27	91.8	89.5	84.3	77.4	190	98.8	98.4	97.6	96.4
28	92.1	89.9	84.8	78.1	195	98.8	98.5	97.7	96.5
29	92.4	90.2	85.3	78.8	200	98.9	98.5	97.7	96.6
30	92.6	90.5	85.8	79.4	205	98.9	98.5	97.8	96.7
31	92.8	90.8	86.2	80.0	210	98.9	98.6	97.8	96.8
32	93.1	91.1	86.6	80.6	215	98.9	98.6	97.9	96.8
33	93.3	91.3	87.0	81.1	220	99.0	98.6	97.9	96.9
34	93.5	91.6	87.3	81.6	225	99.0	98.7	98.0	97.0
35	93.6	91.8	87.7	82.1	230	99.0	98.7	98.0	97.0
36	93.8	92.0	88.0	82.5	235	99.0	98.7	98.1	97.1
37	94.0	92.2	88.3	83.0	240	99.0	98.8	98.1	97.2
38	94.1	92.4	88.6	83.4	245	99.1	98.8	98.2	97.3
39	94.3	92.6	88.9	83.8	250	99.1	98.8	98.2	97.3
40	94.4	92.8	89.1	84.1	255	99.1	98.8	98.2	97.3
41	94.5	93.0	89.4	84.5	260	99.1	98.9	98.2	97.4
42	94.7	93.1	89.6	84.8	265	99.1	98.9	98.3	97.4
43	94.8	93.3	89.8	85.2	270	99.2	98.9	98.3	97.5
44	94.9	93.4	90.1	85.5	275	99.2	98.9	98.3	97.5
45	95.0	93.6	90.3	85.8	280	99.2	98.9	98.4	97.6
46	95.1	93.7	90.5	86.1	285	99.2	99.0	98.4	97.6
47	95.2	93.8	90.7	86.3	290	99.2	99.0	98.4	97.6
48	95.3	93.9	90.9	86.6	295	99.2	99.0	98.5	97.7
49	95.4	94.1	91.0	86.9	300	99.2	99.0	98.5	97.7
50	95.5	94.2	91.2	87.1	305	99.2	99.0	98.5	97.8
51	95.6	94.3	91.4	87.3	310	99.3	99.0	98.5	97.8
52	95.7	94.4	91.5	87.6	315	99.3	99.1	98.5	97.8
53	95.7	94.5	91.7	87.8	320	99.3	99.1	98.6	97.9
54	95.8	94.6	91.8	88.0	325	99.3	99.1	98.6	97.9
55	95.9	94.7	92.0	88.2	330	99.3	99.1	98.6	97.9
56	96.0	94.8	92.1	88.4	335	99.3	99.1	98.6	98.0
57	96.0	94.9	92.2	88.6	340	99.3	99.1	98.7	98.0
58	96.1	95.0	92.4	88.8	345	99.3	99.1	98.7	98.0
59	96.2	95.0	92.5	89.0	350	99.3	99.1	98.7	98.0
60	96.2	95.1	92.6	89.1	355	99.4	99.2	98.7	98.1
61	96.3	95.2	92.7	89.3	360	99.4	99.2	98.8	98.2
62	96.4	95.3	92.8	89.5	400	99.4	99.3	98.9	98.3
63	96.4	95.4	93.0	89.6	420	99.5	99.3	98.9	98.4
64	96.5	95.4	93.1	89.8	440	99.5	99.3	99.0	98.4
65	96.5	95.5	93.2	89.9	460	99.5	99.4	99.0	98.5
66	96.6	95.6	93.3	90.1	480	99.5	99.4	99.0	98.6
67	96.6	95.6	93.4	90.2	500	99.5	99.4	99.1	98.6
68	96.7	95.7	93.5	90.3	520	99.6	99.4	99.1	98.7
69	96.7	95.8	93.5	90.4	540	99.6	99.4	99.2	98.7
70	96.8	95.8	93.6	90.6	560	99.6	99.5	99.2	98.8
71	96.8	95.9	93.7	90.7	580	99.6	99.5	99.2	98.8
72	96.9	95.9	93.8	90.9	600	99.6	99.5	99.2	98.9
73	96.9	96.0	93.9	91.0	620	99.6	99.5	99.3	98.9
74	96.9	96.0	94.0	91.1	640	99.6	99.5	99.3	98.9
75	97.0	96.1	94.0	91.2	660	99.7	99.5	99.3	99.0
76	97.0	96.1	94.1	91.3	680	99.7	99.6	99.3	99.0
77	97.1	96.2	94.2	91.4	700	99.7	99.6	99.4	99.0
78	97.1	96.2	94.3	91.5	720	99.7	99.6	99.4	99.1
79	97.1	96.3	94.3	91.6	740	99.7	99.6	99.4	99.1
80	97.2	96.3	94.4	91.7	760	99.7	99.6	99.4	99.1
81	97.2	96.4	94.5	91.8	780	99.7	99.6	99.4	99.1
82	97.2	96.4	94.5	91.9	800	99.7	99.6	99.4	99.1
83	97.3	96.5	94.6	92.0	820	99.7	99.6	99.4	99.2
84	97.3	96.5	94.7	92.1	840	99.7	99.6	99.5	99.2
85	97.3	96.5	94.7	92.2	860	99.7	99.7	99.5	99.2
86	97.4	96.6	94.8	92.3	880	99.7	99.7	99.5	99.2
87	97.4	96.6	94.8	92.4	900	99.7	99.7	99.5	99.2
88	97.4	96.7	94.9	92.5	920	99.8	99.7	99.5	99.3
89	97.4	96.7	95.0	92.5	940	99.8	99.7	99.5	99.3
90	97.5	96.7	95.0	92.6	960	99.8	99.7	99.5	99.3
91	97.5	96.8	95.1	92.7	980	99.8	99.7	99.5	99.3
					1000	99.8	99.7	99.5	99.3

Ref: Industrial Quality Control, Vol. 21, No. 11, May 1965, pp 566-569, "Using Single-Sided Non-Parametric Tolerance Limits & Percentiles" by I. Belson & K. Nakano.
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APPENDIX

TABLE IV - C

TWO-SIDED NONPARAMETRIC
STATISTICAL TOLERANCE LIMITS

Values (r, s) such that we may assert with confidence at least γ that 100P percent of a population lies between the rth smallest and the sth largest of a random sample of n from that population (no assumption of normality required)

n \ P		$\gamma = 0.75$				$\gamma = 0.90$			
		.75	.90	.95	.99	.75	.90	.95	.99
50		5,5	2,1	—	—	5,4	1,1	—	—
55		6,6	2,2	1,1	—	5,5	2,1	—	—
60		7,6	2,2	1,1	—	6,5	2,1	—	—
65		7,7	3,2	1,1	—	6,6	2,2	—	—
70		8,7	3,2	1,1	—	7,6	2,2	—	—
75		8,8	3,3	1,1	—	7,7	2,2	—	—
80		9,8	3,3	2,1	—	8,7	3,2	1,1	—
85		10,9	4,3	2,1	—	8,8	3,2	1,1	—
90		10,10	4,3	2,1	—	9,8	3,2	1,1	—
95		11,10	4,3	2,1	—	9,9	3,3	1,1	—
100		11,11	4,4	2,1	—	10,10	3,3	1,1	—
110		12,12	5,4	2,2	—	11,11	4,3	2,1	—
120		14,13	5,5	2,2	—	12,12	4,4	2,1	—
130		15,14	6,5	3,2	—	13,13	5,4	2,1	—
140		16,15	6,6	3,2	—	14,14	5,5	2,2	—
150		17,17	6,6	3,3	—	16,15	5,5	2,2	—
170		20,19	7,7	4,3	—	18,17	6,6	3,2	—
200		23,23	9,8	4,4	—	21,21	8,7	3,3	—
300		35,35	13,13	6,6	1,1	33,32	12,11	5,5	—
400		47,47	18,18	9,8	2,1	45,44	16,16	8,7	1,1
500		59,59	23,22	11,11	2,1	57,56	21,20	10,9	1,1
600		72,71	28,27	13,13	2,2	68,68	26,25	12,11	2,1
700		84,83	33,32	16,15	3,2	80,80	30,30	14,14	2,2
800		96,96	37,27	18,18	3,3	92,92	35,34	16,16	3,2
900		108,108	42,42	21,20	4,3	104,104	40,39	19,18	3,2
1000		121,120	47,47	23,22	4,4	117,116	44,44	21,20	3,3

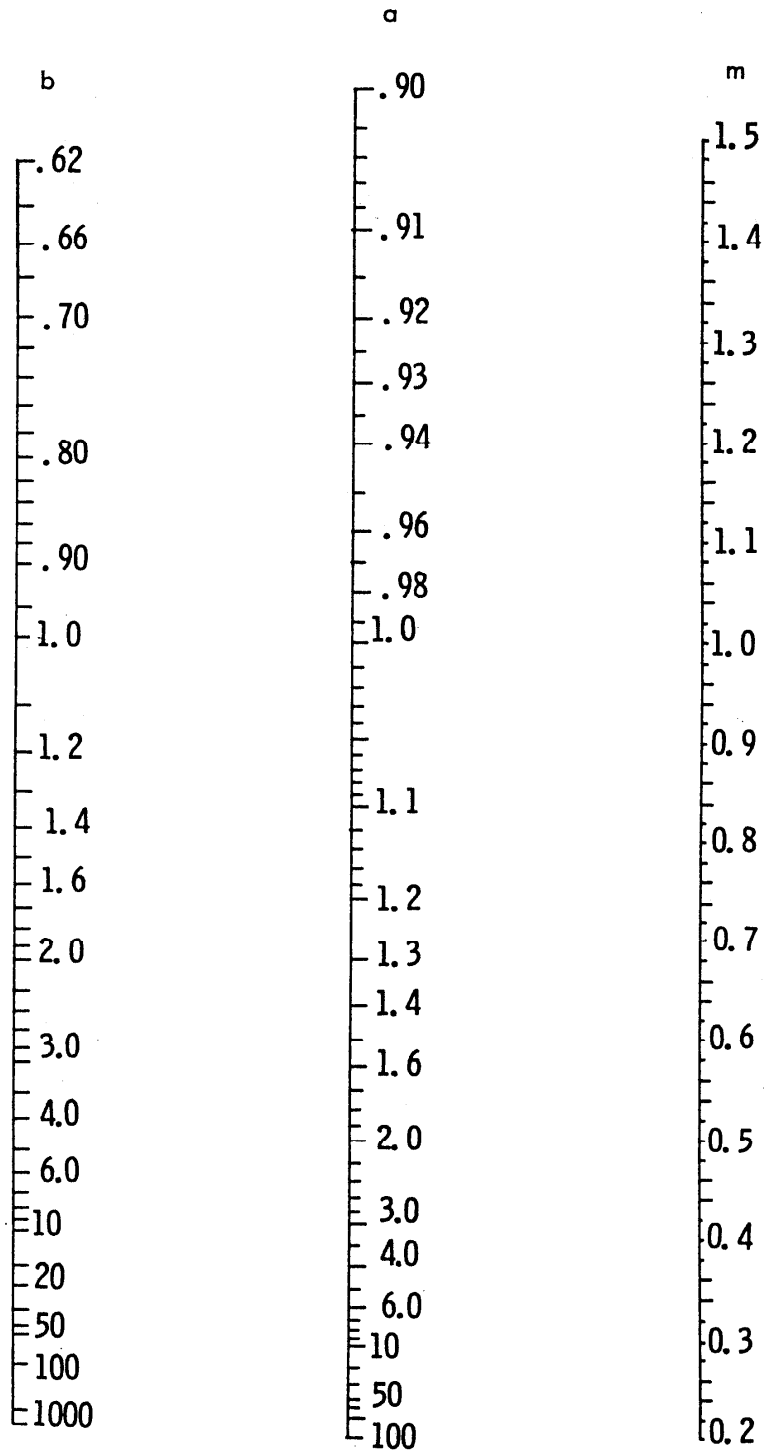
n \ P		$\gamma = 0.95$				$\gamma = 0.99$			
		.75	.90	.95	.99	.75	.90	.95	.99
50		4,4	1,1	—	—	3,3	—	—	—
55		5,4	1,1	—	—	4,3	—	—	—
60		5,5	1,1	—	—	4,4	—	—	—
65		6,5	2,1	—	—	5,4	1,1	—	—
70		6,6	2,1	—	—	5,5	1,1	—	—
75		7,6	2,1	—	—	5,5	1,1	—	—
80		7,7	2,2	—	—	6,5	1,1	—	—
85		8,7	2,2	—	—	6,6	2,1	—	—
90		8,8	3,2	—	—	7,6	2,1	—	—
95		9,8	3,2	1,1	—	7,7	2,1	—	—
100		9,9	3,2	1,1	—	8,7	2,2	—	—
110		10,10	3,3	1,1	—	9,8	2,2	—	—
120		11,11	4,3	1,1	—	10,9	3,2	—	—
130		13,12	4,4	2,1	—	11,10	3,3	1,1	—
140		14,13	4,4	2,1	—	12,11	3,3	1,1	—
150		15,14	5,4	2,1	—	13,13	4,3	1,1	—
170		17,16	6,5	2,2	—	15,15	5,4	2,1	—
200		20,20	7,6	3,2	—	18,18	6,5	2,2	—
300		32,31	11,11	5,4	—	29,29	10,9	4,3	—
400		43,43	15,15	7,6	—	40,40	14,13	6,5	—
500		55,54	20,19	9,8	1,1	52,51	18,17	7,7	—
600		67,66	24,24	11,10	1,1	63,63	22,22	9,9	—
700		78,78	29,28	13,13	2,1	75,74	26,26	11,11	1,1
800		90,90	33,33	15,15	2,2	86,86	31,30	13,13	1,1
900		102,102	38,37	18,17	2,2	98,97	35,35	15,15	2,1
1000		114,114	43,42	20,19	3,2	110,109	40,39	18,17	2,1

Ref: *Annals of Mathematical Statistics*, Vol. 29, No. 2, June 1958, pp. 599-601, "Tables for Obtaining Non-Parametric Tolerance Limits" by Paul N. Somerville.

APPENDIX

CHART I

NOMOGRAPH FOR ESTIMATING a & b When $m < 1.5$



ERRATA

The following corrections should be made to Quality Assurance Service QE 202:

1. *Table of Contents, Section 5.1, change "Multimodel" to read "Multimodal".*
2. *Figures 1, 6-14, WDAS Form 8933, change "Unimodel, Bimodel, Multimodel" to read "Unimodal, Bimodal, Multimodal".*
3. *Page 8, Figure 9, in column 8, change "65, 81, 96.6" to read "62, 76, 89" respectively. These three points must be replotted on the grid and a new line inserted.*
4. *Page 9, table of Calculations for Figure 9, change the figures for Sample Numbers 6 through 10 to read as follows:*

6	750	Failure		1.125	5.375	$\frac{5.375-.3}{10+.4} = 49\%$
7	835	Success			--	-----
8	1,100	Failure	$\frac{(10+1)-5.375}{1+3} = 1.406$	6.781	6.781	$\frac{6.781-.3}{10+.4} = 62\%$
9	1,300	Failure		1.406	8.187	$\frac{8.187-.3}{10+.4} = 76\%$
10	2,100	Failure		1.406	9.593	$\frac{9.593-.3}{10+.4} = 89\%$

5. *Page 15, Section 5.1, change the following:*
 - a) "Multimodel" in heading to read "Multimodal".
 - b) paragraph A line 2, "bi-model" to read "bimodal".
 - c) paragraph A line 11, "Tri-model" to read "Trimodal".
 - d) Figure 12 title "Bimodel" to read "Bimodal".