

Table 6  
Fatigue Results

Specimen	Stress (ksi)	Cycles to Failure
As-cast	55	292,500
As-cast	50	343,300
As-cast	47.5	322,700
As-cast	46	339,300
As-cast	45.75	15,954,500*
As-cast	45.5	11,757,100
As-cast-600°F	60	101,300
As-cast-600°F	55	360,000
As-cast-600°F	50	321,300
As-cast-600°F	45	812,300
As-cast-600°F	44	17,305,500*
As-cast-600°F	42	16,153,900*
As-cast-600°F	40	13,042,300*
As-cast-600°F	42.5	13,000,000*
Normalized DI	55	155,800
Normalized DI	50	325,500
Normalized DI	45	350,800
Normalized DI	44	17,305,500*
Normalized DI	43.5	518,500
Normalized DI	42.5	13,196,300*
Normalized DI	40	19,994,900*
Normalized DI-600°F	60	113,100
Normalized DI-600°F	55	130,500
Normalized DI-600°F	50	292,800
Normalized DI-600°F	45	452,400
Normalized DI-600°F	42.5	1,109,900
Normalized DI-600°F	42	631,800
Normalized DI-600°F	41	17,151,700*
Normalized DI-600°F	40	15,657,400*
Q&T Ductile Iron	60	92,500
Q&T Ductile Iron	55	105,700
Q&T Ductile Iron	52	392,300
Q&T Ductile Iron	50	205,200
Q&T Ductile Iron	48	628,600
Q&T Ductile Iron	46	272,500
Q&T Ductile Iron	45	14,121,600*

\* Specimen did not fail.

Specimen	Stress (ksi)	Cycles to Failure
Q&T Ductile Iron-600°F	55	114,600
Q&T Ductile Iron-600°F	50	541,200
Q&T Ductile Iron-600°F	48	225,800
Q&T Ductile Iron-600°F	45	190,800
Q&T Ductile Iron-600°F	42	155,000
Q&T Ductile Iron-600°F	40	602,900
Q&T Ductile Iron-600°F	38	443,700
Q&T Ductile Iron-600°F	35	15,928,600*
Grade 1 ADI	75	47,200
Grade 1 ADI	70	50,300
Grade 1 ADI	60	437,800
Grade 1 ADI	55	515,500
Grade 1 ADI	50	999,800
Grade 1 ADI	49	19,094,900*
Grade 1 ADI	48	19,641,000*
Grade 1 ADI	46	21,005,900*
Grade 1 ADI	45	14,258,300*
Grade 1 ADI - 200°F	65	100,900
Grade 1 ADI - 200°F	60	105,400
Grade 1 ADI - 200°F	55	519,700
Grade 1 ADI - 200°F	50	827,100
Grade 1 ADI - 200°F	48	12,718,700*
Grade 1 ADI - 200°F	46	18,835,700*
Grade 1 ADI - 200°F	45	54,459,900*
Grade 1 ADI -300°F	65	113,300
Grade 1 ADI -300°F	60	129,500
Grade 1 ADI -300°F	58	264,900
Grade 1 ADI -300°F	56	18,498,900*
Grade 1 ADI -300°F	55	16,845,800*
Grade 1 ADI -300°F	50	18,558,100*
Grade 1 ADI -400°F	65	96,100
Grade 1 ADI -400°F	60	99,800
Grade 1 ADI -400°F	55	237,800
Grade 1 ADI -400°F	50	298,200
Grade 1 ADI -400°F	49	12,291,400*
Grade 1 ADI -400°F	48	13,296,600
Grade 1 ADI -400°F	46	20,897,100*
Grade 1 ADI -400°F	45	14,377,400*

\* Specimen did not fail.

Specimen	Stress (ksi)	Cycles to Failure
Grade 1 ADI -500°F	65	91,900
Grade 1 ADI -500°F	60	156,800
Grade 1 ADI -500°F	55	273,400
Grade 1 ADI -500°F	54	15,422,800*
Grade 1 ADI -500°F	53	226,100
Grade 1 ADI -500°F	52	336,000
Grade 1 ADI -500°F	51	496,000
Grade 1 ADI -500°F	50	14,492,500*
Grade 1 ADI -600°F	65	58,600
Grade 1 ADI -600°F	60	91,400
Grade 1 ADI -600°F	55	134,700
Grade 1 ADI -600°F	50	307,700
Grade 1 ADI -600°F	48	17,376,600*
Grade 1 ADI -600°F	46	10,522,100*
Grade 1 ADI -600°F	45	14,821,200*
Grade 5 ADI	65	32,700
Grade 5 ADI	60	96,400
Grade 5 ADI	55	76,900
Grade 5 ADI	50	109,800
Grade 5 ADI	45	102,400
Grade 5 ADI	40	196,200
Grade 5 ADI	35	305,900
Grade 5 ADI	25	17,890,000*
Grade 5 ADI -200°F	55	43,200
Grade 5 ADI -200°F	50	103,300
Grade 5 ADI -200°F	45	130,000
Grade 5 ADI -200°F	40	159,400
Grade 5 ADI -200°F	35	256,900
Grade 5 ADI -200°F	30	439,200
Grade 5 ADI -200°F	28	448,700
Grade 5 ADI -200°F	25	14,541,400*
Grade 5 ADI -300°F	55	85,500
Grade 5 ADI -300°F	50	100,000
Grade 5 ADI -300°F	45	104,400
Grade 5 ADI -300°F	40	257,000
Grade 5 ADI -300°F	35	292,000
Grade 5 ADI -300°F	32	17,495,200*
Grade 5 ADI -300°F	30	14,299,600*

\* Specimen did not fail.

Specimen	Stress (ksi)	Cycles to Failure
Grade 5 ADI -400°F	55	118,100
Grade 5 ADI -400°F	50	98,700
Grade 5 ADI -400°F	45	134,500
Grade 5 ADI -400°F	40	255,200
Grade 5 ADI -400°F	38	302,900
Grade 5 ADI -400°F	36	13,494,300*
Grade 5 ADI -400°F	35	18,815,100*
Grade 5 ADI -500°F	55	95,500
Grade 5 ADI -500°F	50	102,400
Grade 5 ADI -500°F	45	274,700
Grade 5 ADI -500°F	40	426,600
Grade 5 ADI -500°F	35	492,700
Grade 5 ADI -500°F	30	3,124,000
Grade 5 ADI -500°F	28	18,054,700*
Grade 5 ADI -500°F	26	17,353,300*
Grade 5 ADI -500°F	25	13,798,800*
Grade 5 ADI -600°F	55	99,960
Grade 5 ADI -600°F	50	105,900
Grade 5 ADI -600°F	48	229,600
Grade 5 ADI -600°F	45	294,500
Grade 5 ADI -600°F	44	391,800
Grade 5 ADI -600°F	42	757,300
Grade 5 ADI -600°F	40	45,297,400*
1045 Normalized	65	67,600
1045 Normalized	60	156,700
1045 Normalized	55	492,700
1045 Normalized	52	841,700
1045 Normalized	51	19,195,900*
1045 Normalized	50	14,346,600*
1045 Normalized-600°F	65	34,400
1045 Normalized-600°F	60	320,700
1045 Normalized-600°F	55	114,900
1045 Normalized-600°F	53	305,900
1045 Normalized-600°F	52	17,822,000*
1045 Normalized-600°F	50	20,198,000*

\* Specimen did not fail.

Specimen	Stress (ksi)	Cycles to Failure
8620 Carburized RT	135	20,695,700*
8620 Carburized RT	130	21,795,100*
8620 Carburized RT	120	18,429,100*
8620 Carburized RT	110	21,999,100*
8620 Carburized RT	100	14,647,000*
8620 Carburized RT	95	20,197,700*
8620 Carburized RT	85	16,098,000*
8620 Carburized RT	75	18,459,300*
8620 Carburized - 200°F	135	54,300
8620 Carburized - 200°F	130	18,134,900*
8620 Carburized - 200°F	120	21,319,400*
8620 Carburized - 200°F	110	19,754,700*
8620 Carburized - 200°F	100	20,257,300*
8620 Carburized - 200°F	95	18,678,300*
8620 Carburized - 200°F	85	19,974,400*
8620 Carburized - 200°F	75	16,497,300*
8620 Carburized - 300°F	135	40,500
8620 Carburized - 300°F	130	50,400
8620 Carburized - 300°F	125	104,200
8620 Carburized - 300°F	120	52,500
8620 Carburized - 300°F	115	198,000
8620 Carburized - 300°F	112.5	278,700
8620 Carburized - 300°F	111	19,939,500*
8620 Carburized - 300°F	110	18,171,900*
8620 Carburized - 300°F	100	16,996,400*
8620 Carburized - 300°F	95	19,262,800*
8620 Carburized - 300°F	85	17,055,200*
8620 Carburized - 300°F	75	19,715,500*

\* Specimen did not fail.

Specimen	Stress (ksi)	Cycles to Failure
8620 Carburized - 400°F	120	104,100
8620 Carburized - 400°F	115	46,700
8620 Carburized - 400°F	110	50,200
8620 Carburized - 400°F	107	250,600
8620 Carburized - 400°F	105	3,652,000
8620 Carburized - 400°F	103	7,041,800
8620 Carburized - 400°F	100	21,078,100*
8620 Carburized - 400°F	95	21,544,600*
8620 Carburized - 400°F	85	17,252,900*
8620 Carburized - 400°F	75	20,493,600*
8620 Carburized - 500°F	115	30,500
8620 Carburized - 500°F	110	35,900
8620 Carburized - 500°F	105	113,300
8620 Carburized - 500°F	100	126,700
8620 Carburized - 500°F	99.5	23,146,300
8620 Carburized - 500°F	99	18,932,900*
8620 Carburized - 500°F	98.5	20,674,400*
8620 Carburized - 500°F	98	18,190,100*
8620 Carburized - 500°F	95	14,956,000*
8620 Carburized - 500°F	85	13,700,700*
8620 Carburized - 500°F	75	19,897,300*
8620 Carburized - 600°F	115	38,700
8620 Carburized - 600°F	110	36,600
8620 Carburized - 600°F	100	59,700
8620 Carburized - 600°F	99	67,300
8620 Carburized - 600°F	98.5	130,400
8620 Carburized - 600°F	98	79,000
8620 Carburized - 600°F	97.5	33,854,300*
8620 Carburized - 600°F	95	18,291,700*
8620 Carburized - 600°F	85	14,699,100*
8620 Carburized - 600°F	75	59,754,800*

\*Specimen did not fail

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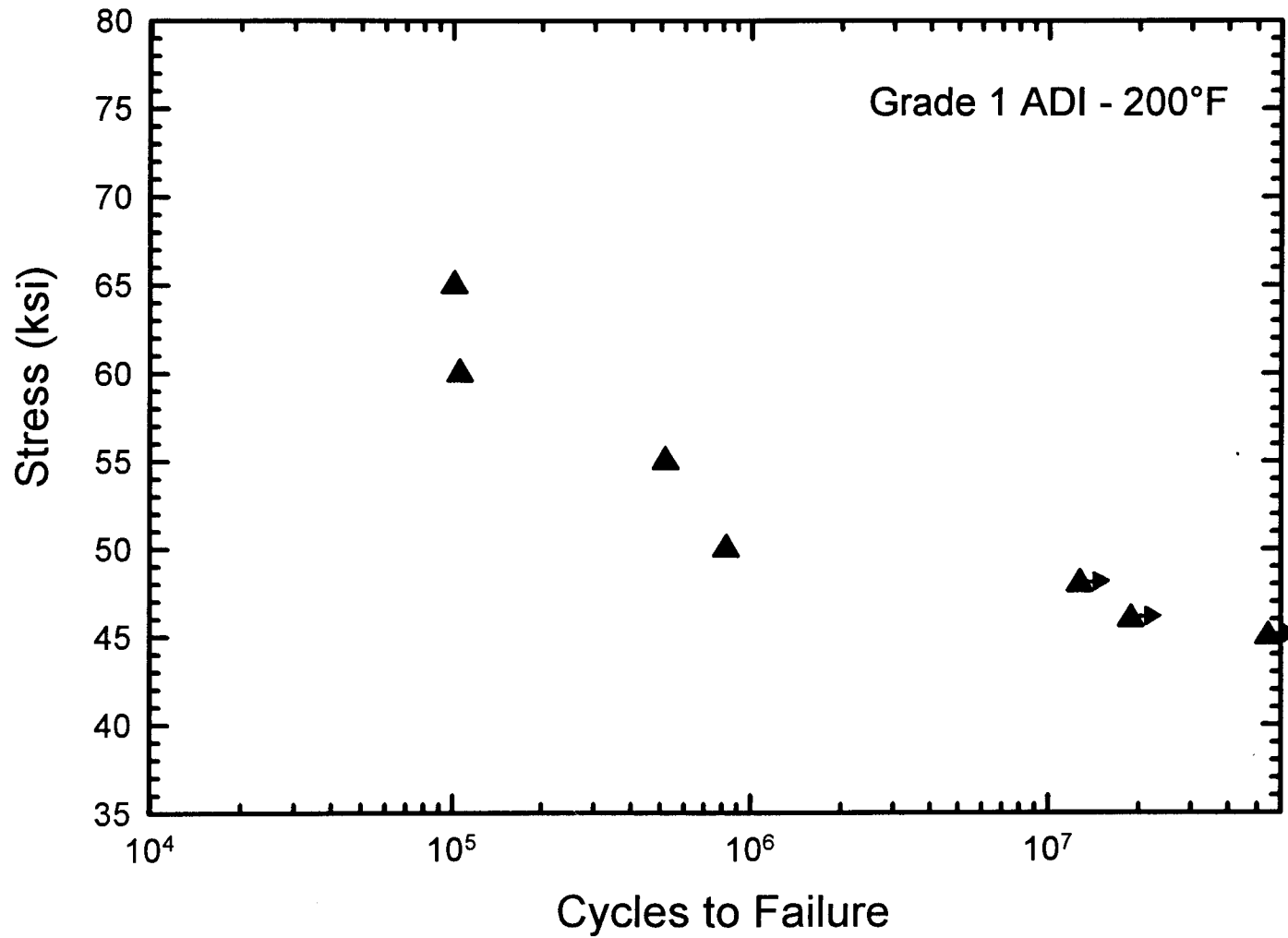


Figure IIA: Stress versus cycles to failure for Grade 1 ADI 200°F specimens. An arrow indicates the specimen did not fail.

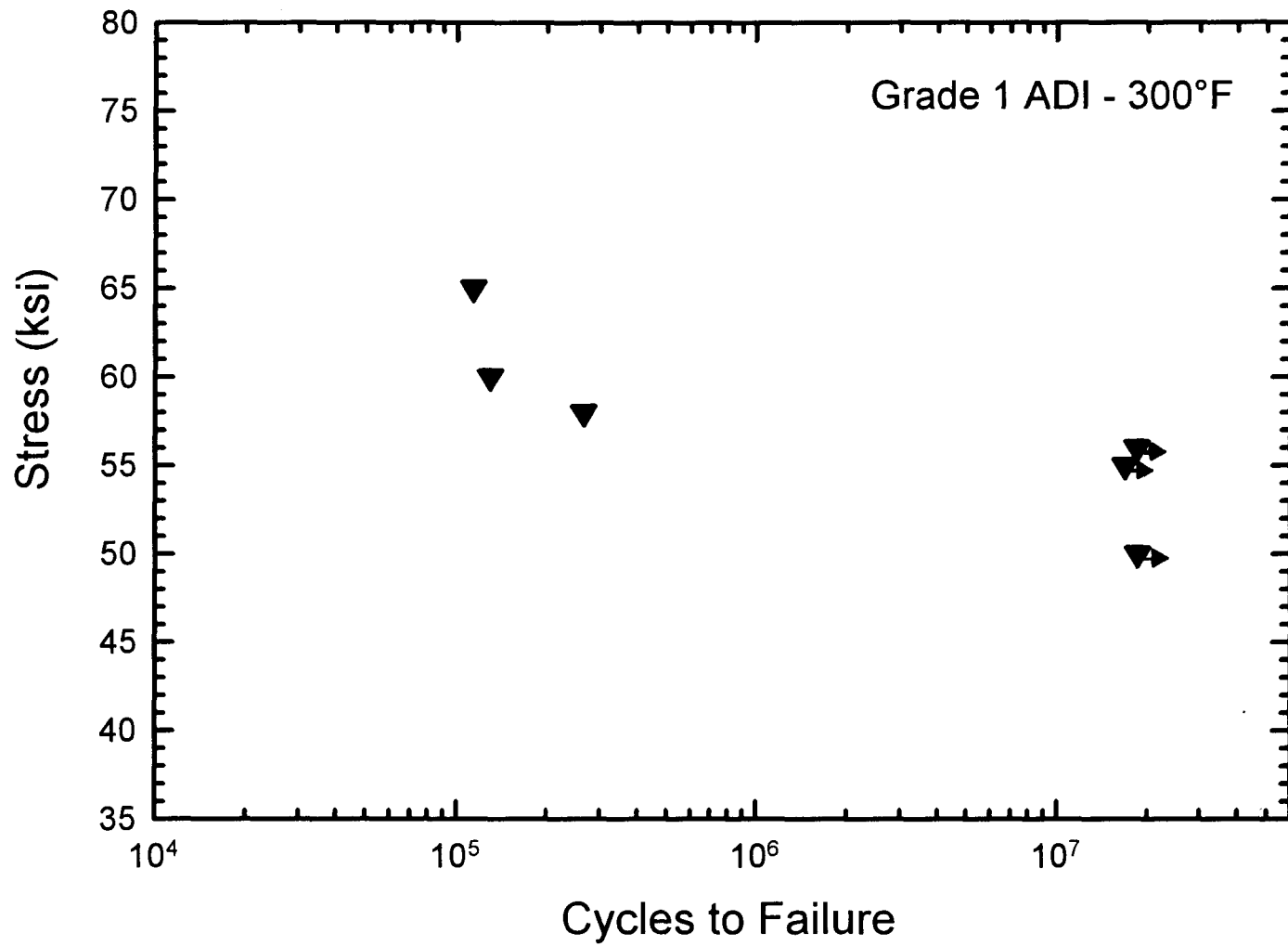


Figure IIB: Stress versus cycles to failure for Grade 1 ADI 300°F specimens. An arrow indicates the specimen did not fail.

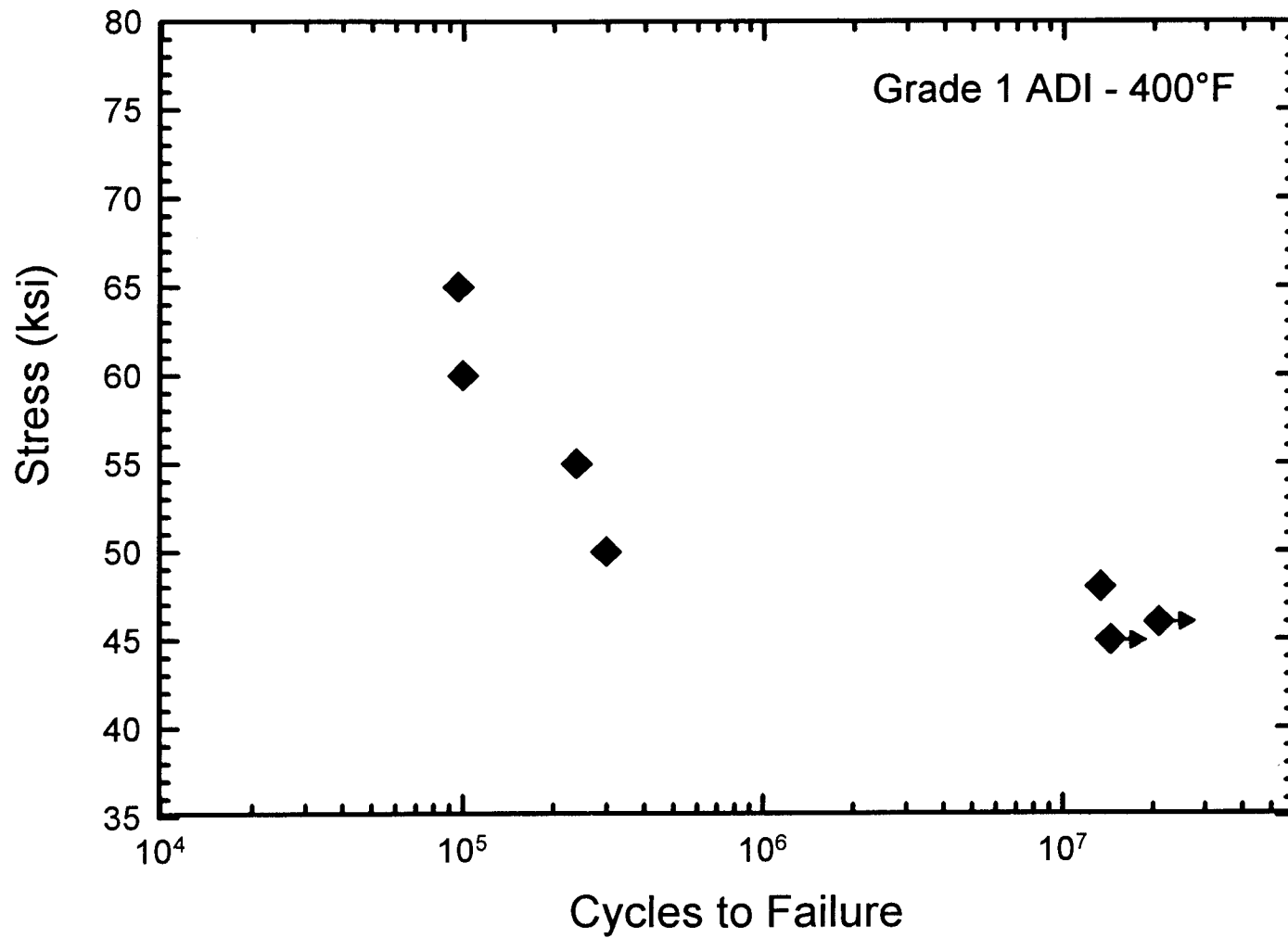


Figure IIC: Stress versus cycles to failure for Grade 1 ADI 400°F specimens. An arrow indicates the specimen did not fail.

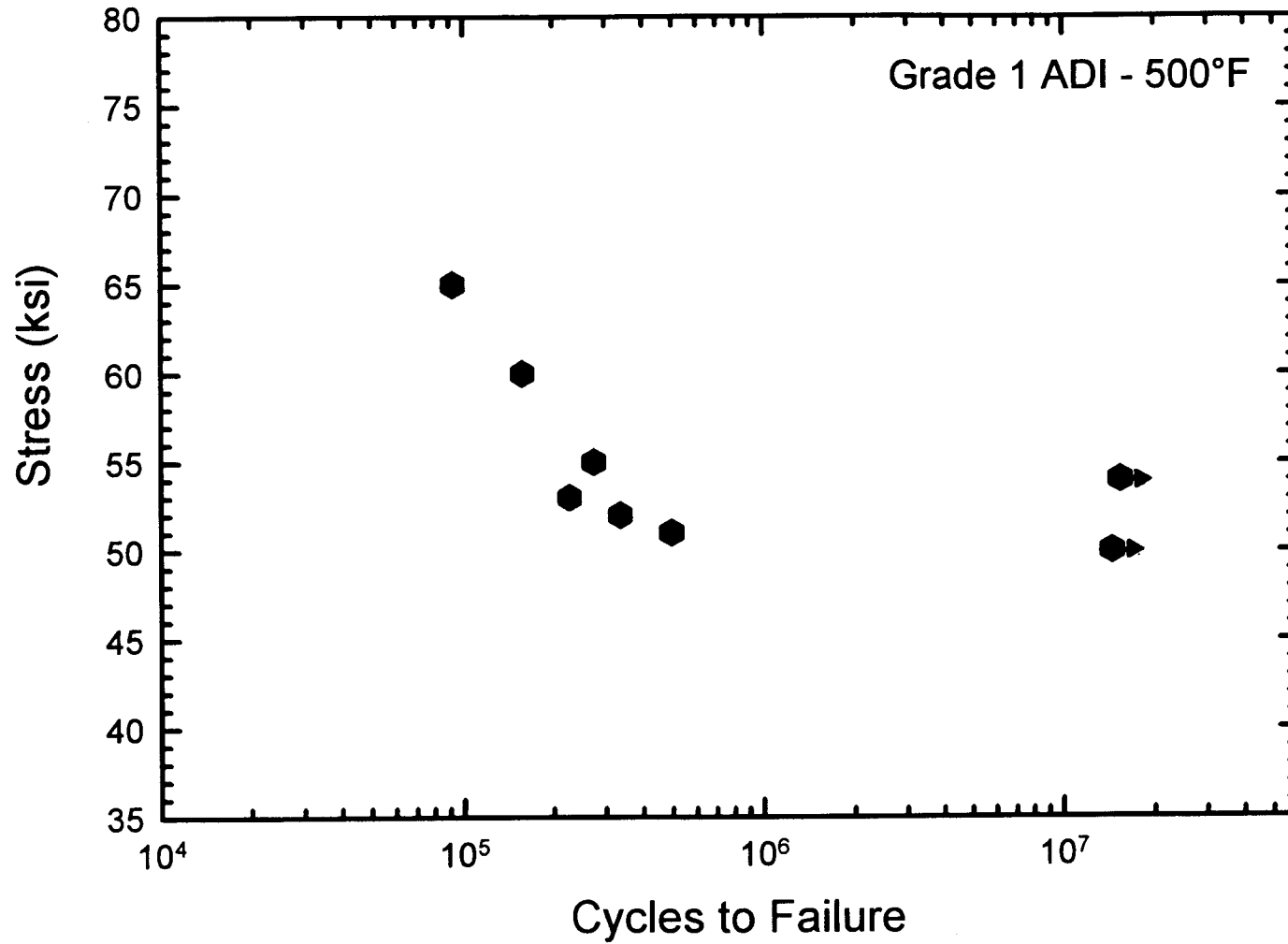


Figure IID: Stress versus cycles to failure for Grade 1 ADI 500°F specimens. An arrow indicates the specimen did not fail.

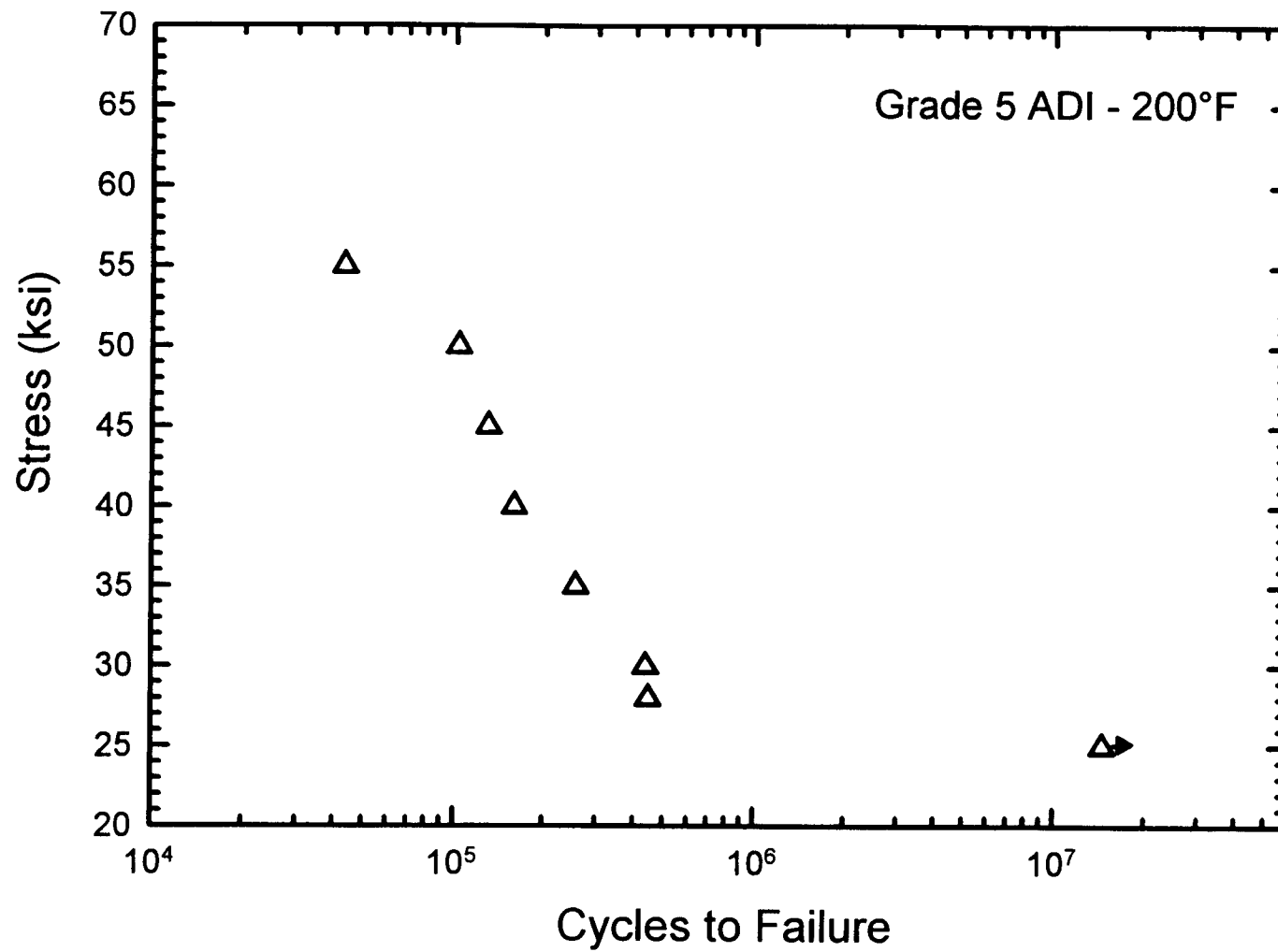


Figure IIE: Stress versus cycles to failure for Grade 5 ADI 200°F specimens. An arrow indicates the specimen did not fail.

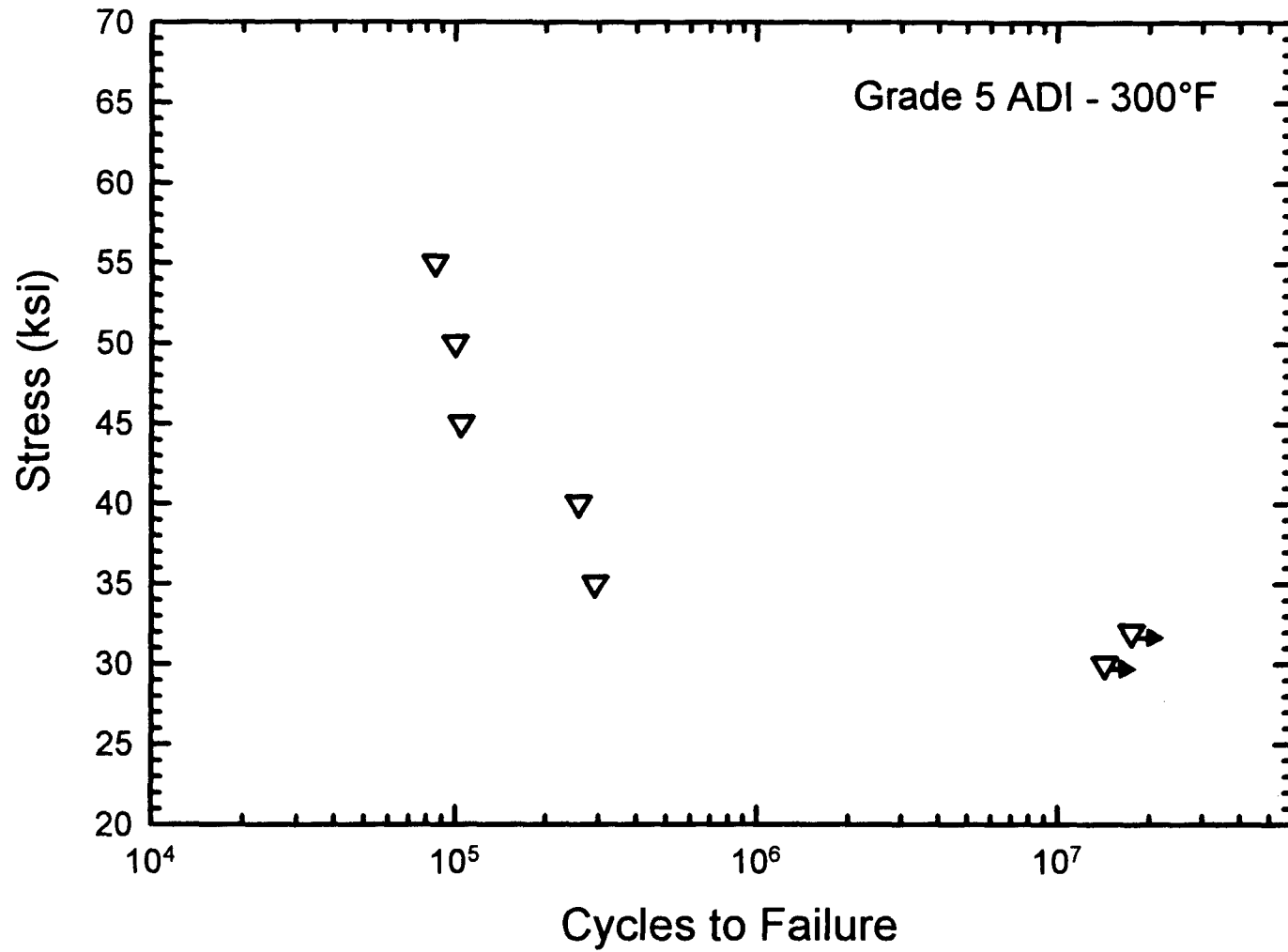


Figure IIF: Stress versus cycles to failure for Grade 5 ADI 300°F specimens. An arrow indicates the specimen did not fail.

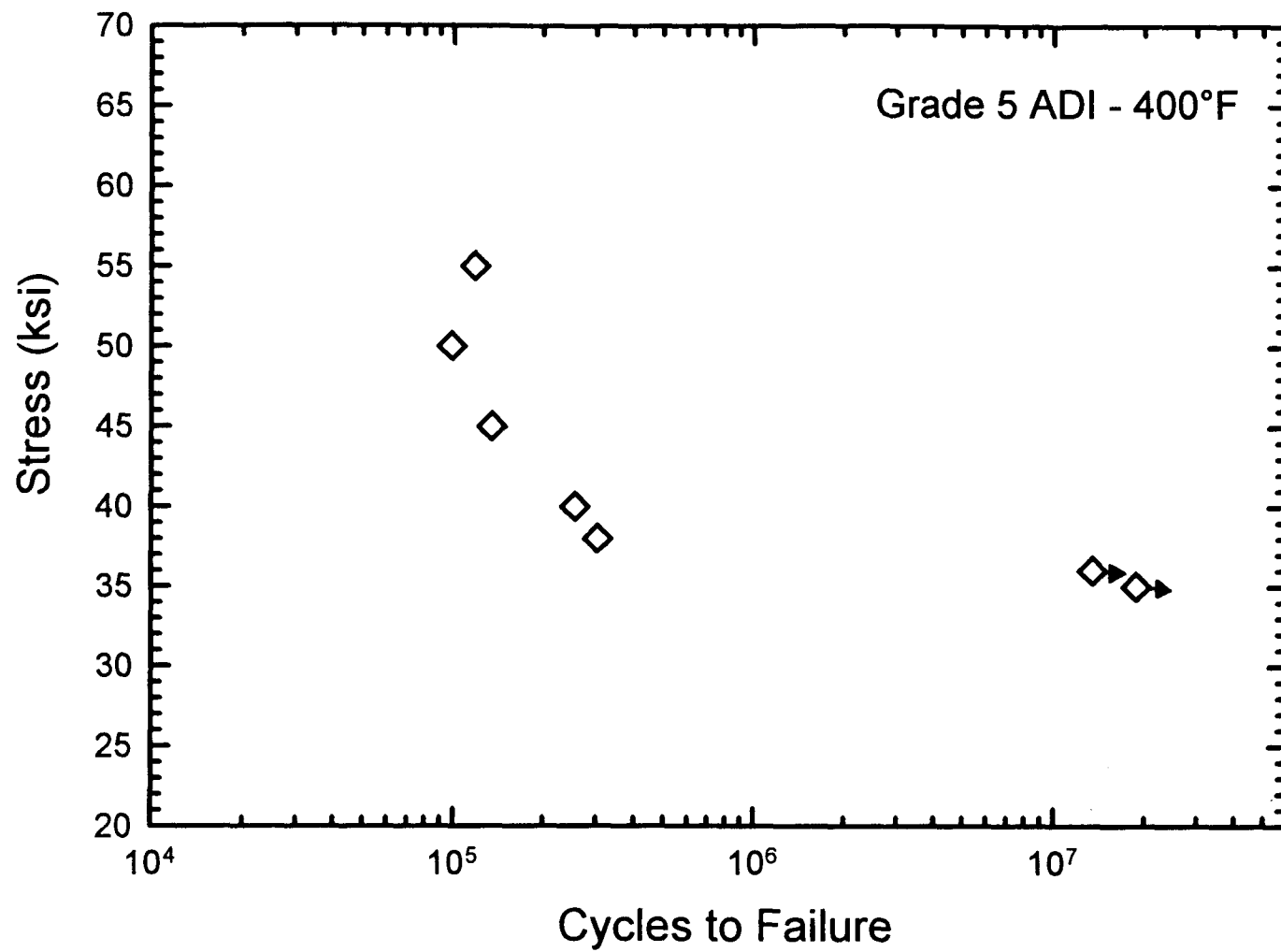


Figure IIG: Stress versus cycles to failure for Grade 5 ADI 400°F specimens. An arrow indicates the specimen did not fail.

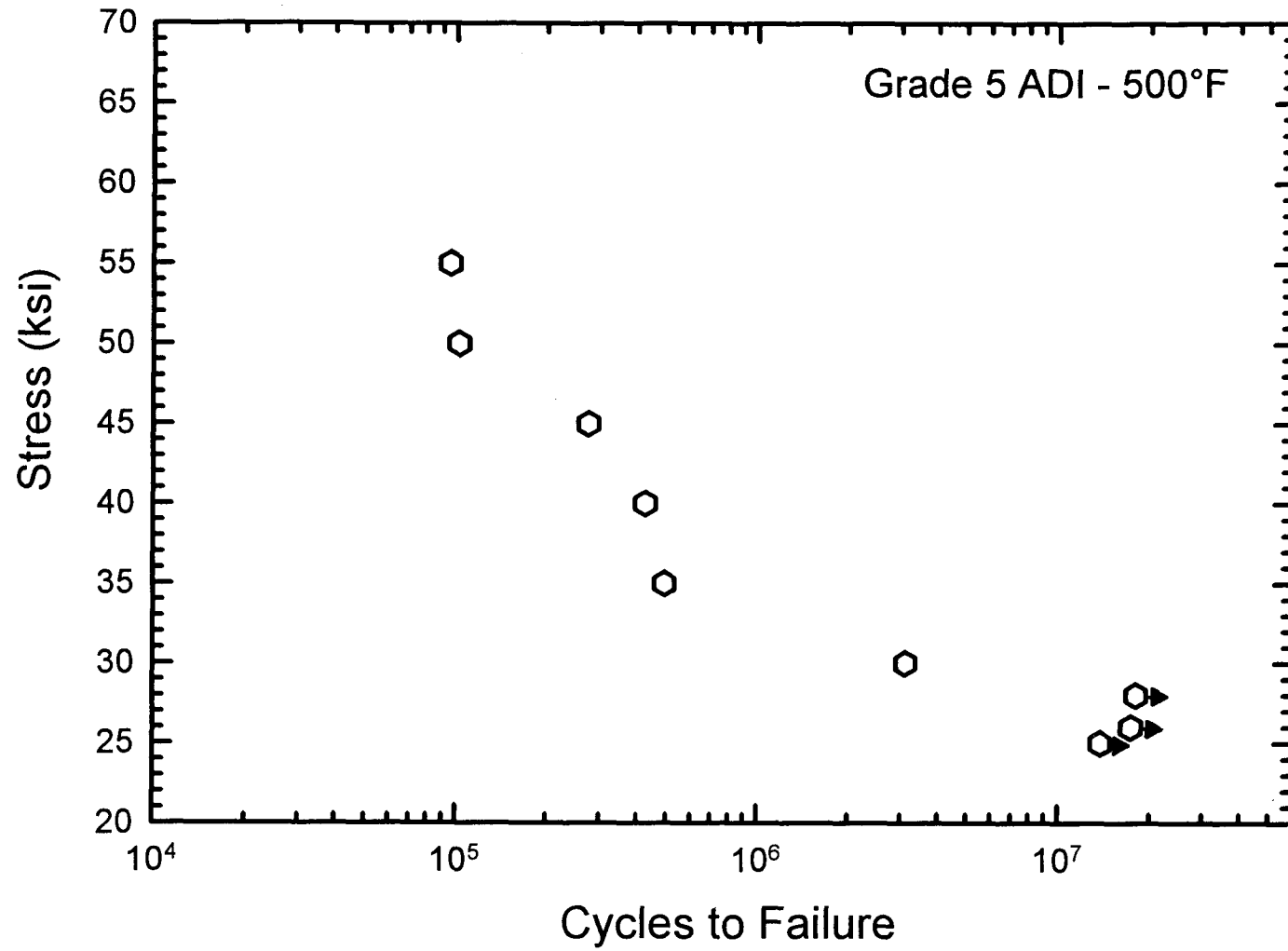


Figure IIIH: Stress versus cycles to failure for Grade 5 ADI 500°F specimens. An arrow indicates the specimen did not fail.

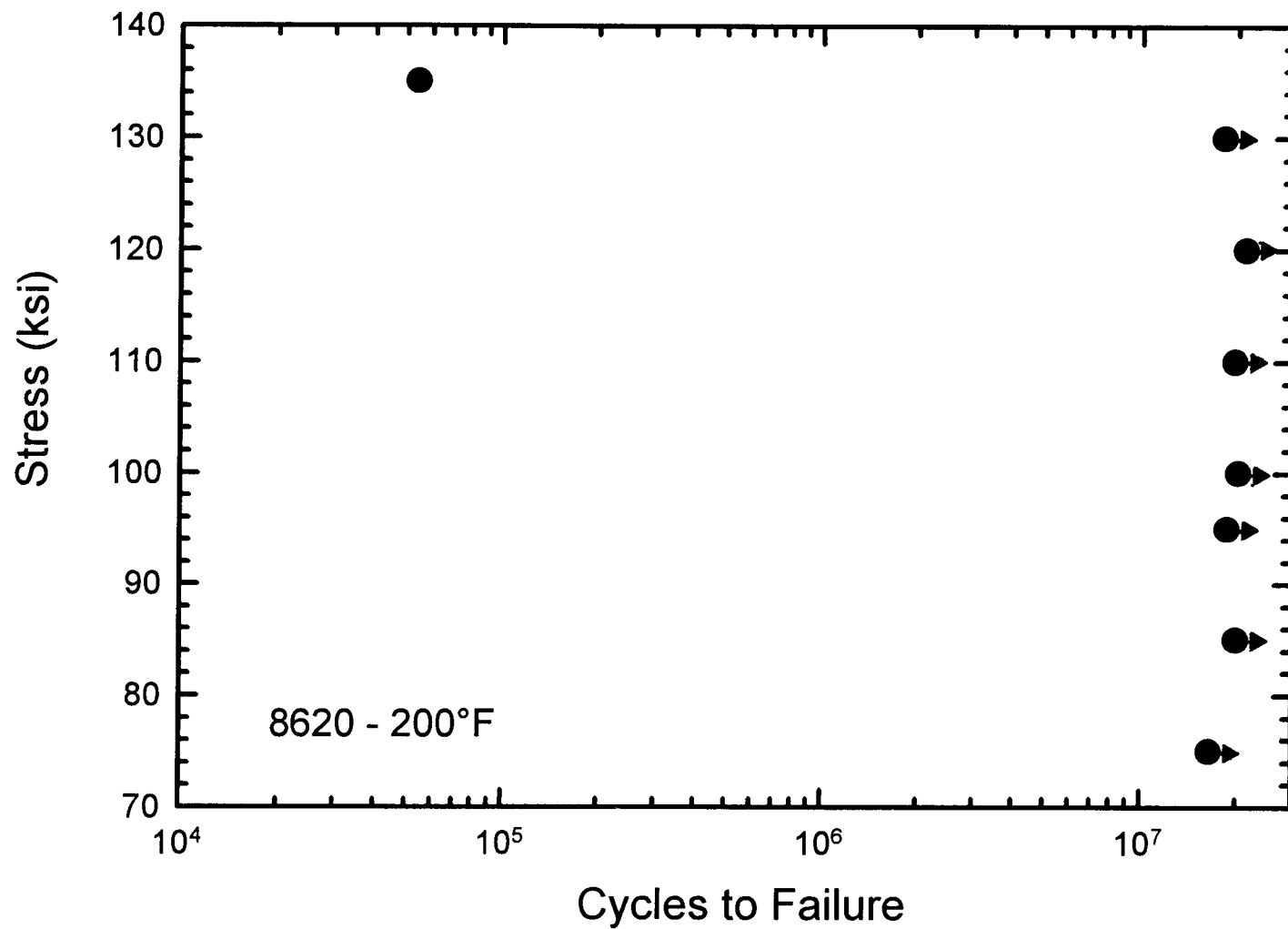


Figure III: Stress versus cycles to failure for Carburized 8620 200°F specimens. An arrow indicates the specimen did not fail.

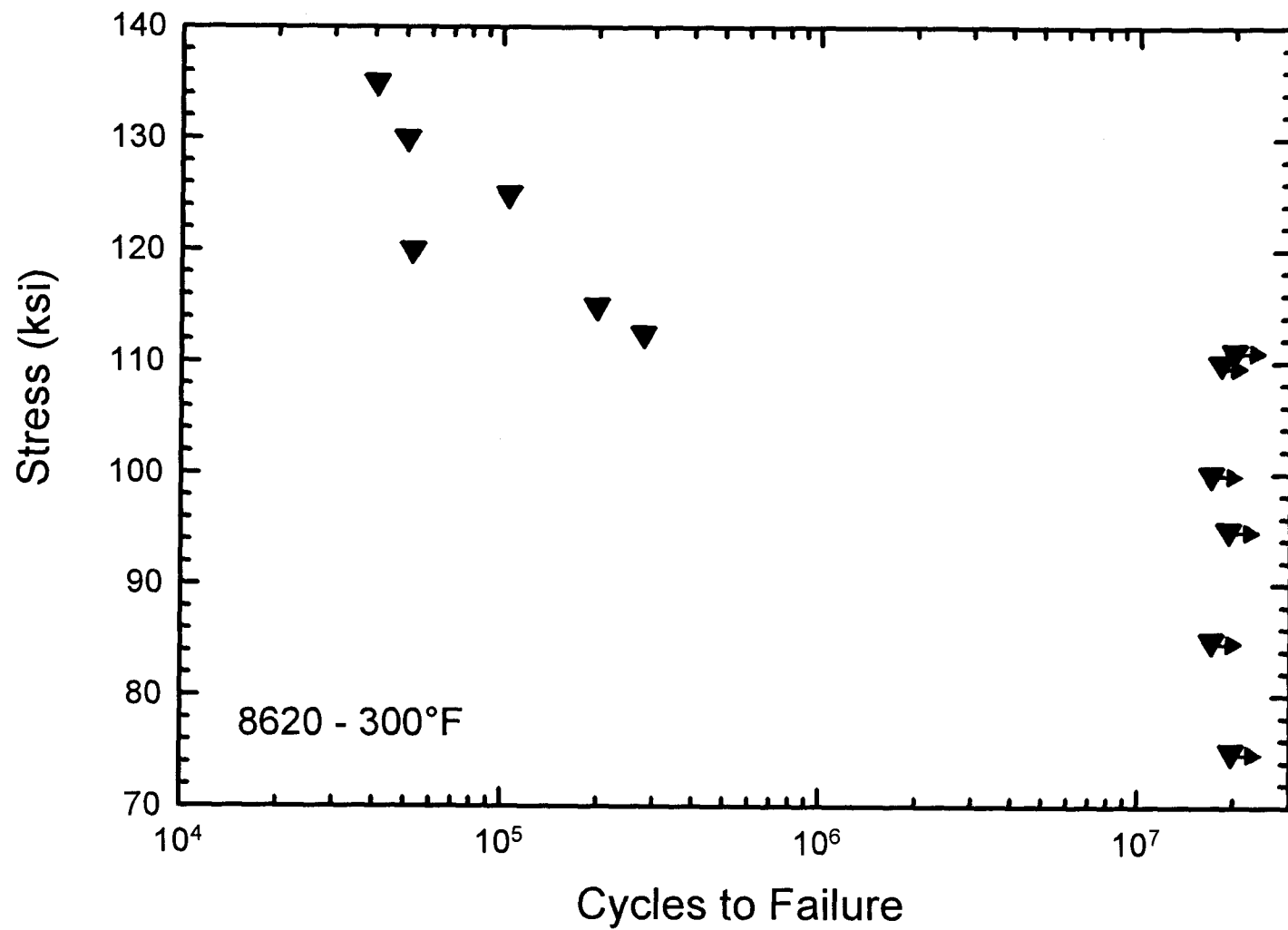


Figure III: Stress versus cycles to failure for Carburized 8620 300°F specimens. An arrow indicates the specimen did not fail.

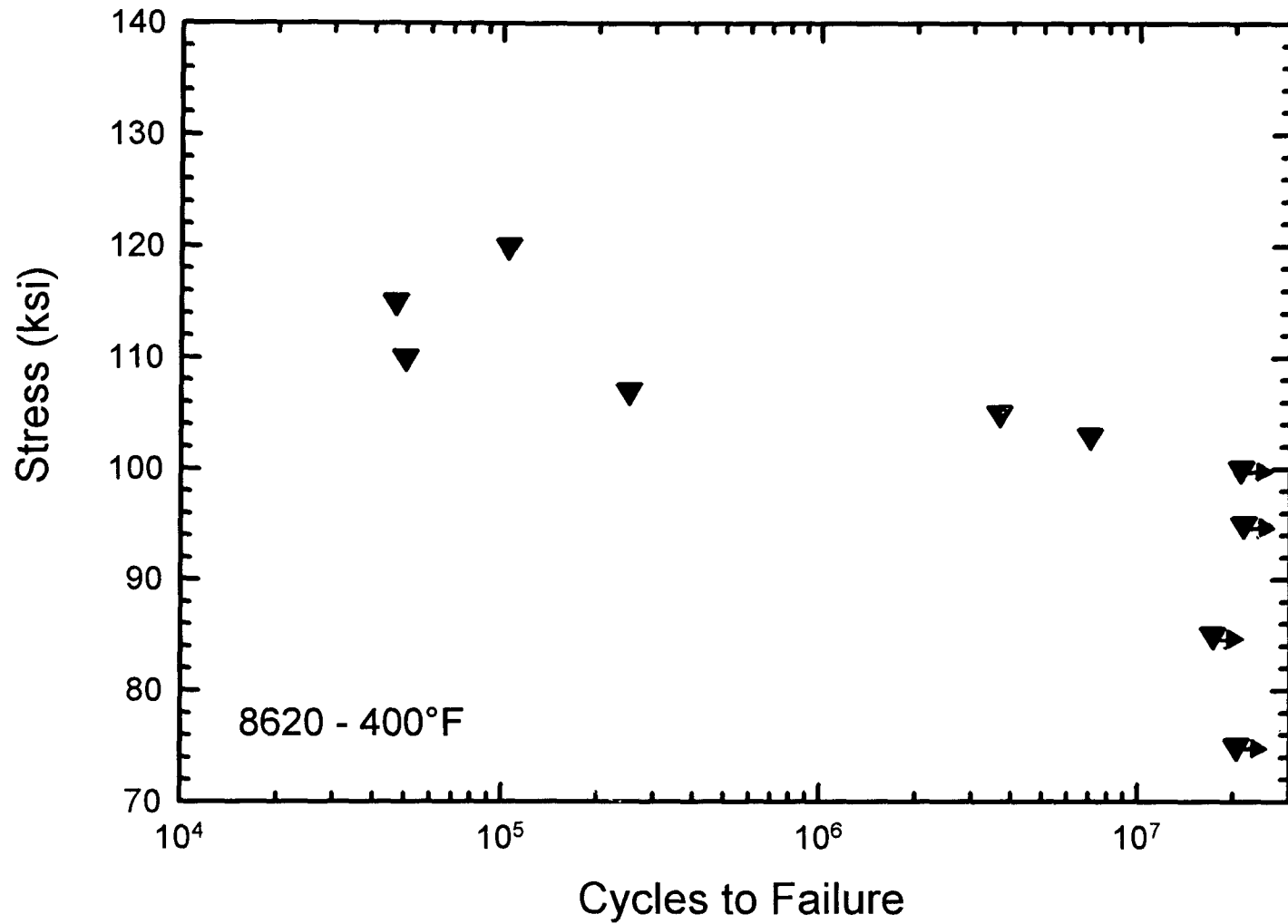


Figure IIK: Stress versus cycles to failure for Carburized 8620 400°F specimens. An arrow indicates the specimen did not fail.

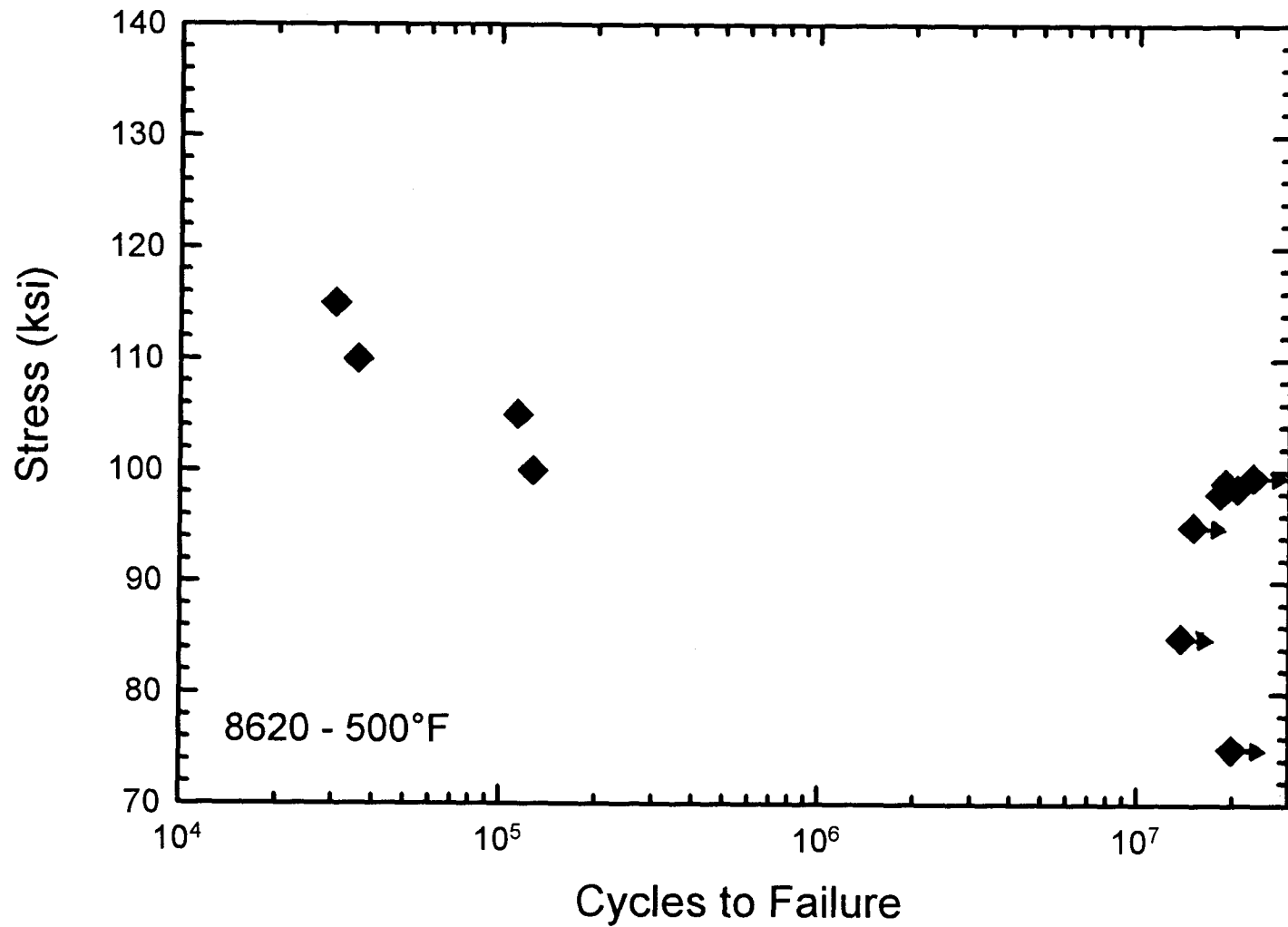


Figure IIL: Stress versus cycles to failure for Carburized 8620 500°F specimens. An arrow indicates the specimen did not fail.