

50,000lbs / 22,680 kgs						
Landing						
Flaps	0°	1°	8°	20°	30°	45°
Min Maneuvering	166	150	144	138	134	126
V _{REF}	156	140	134	128	124	116

Takeoff										
Add 1 kt to V ₁ & V _R for Wing & Cowl A/I ON										
Flaps	0°					20°				
Press. Alt.	0	2000	4000	6000	8000	0	2000	4000	6000	8000
V ₁	≤ 10°C	113	113	113	114	114	114	113	113	112
	20°C	112	113	113	113	114	114	113	112	112
	30°C	112	113	114	114	115	114	113	112	112
	40°C	113	114	115	38° / 115	34° / 115	113	112	112	38° / 112
	MAX TEMP	50° / 115	46° / 115	42° / 115			50° / 112	46° / 112	42° / 112	34° / 112
V _R	≤ 10°C	116	116	116	116	116	114	114	113	112
	20°C	116	116	116	116	116	114	113	112	112
	30°C	116	116	116	116	116	114	113	112	112
	40°C	116	116	116	38° / 116	34° / 116	113	112	112	38° / 112
	MAX TEMP	50° / 116	46° / 116	42° / 116			50° / 112	46° / 112	42° / 112	34° / 112
V ₂ / V _{2GA}	132 / 123					129				
Flap Retraction	144 (Flaps 1)		148 (Flaps 0)		131 (Flaps 8)		149 (Flaps 1)		149 (Flaps 0)	

Additional speeds											
Approximate Single Engine Driftdown Altitude - FL310											
Altitude (FL)	<10,000	210	230	250	270	290	310	330	350	370	390
V _{FTO} / V _{ENR}	163	165	168	171	173	175	177	180	182	185	188
V _{MD} /Min Hold	177	186	187	188	190	193	195	197	200	202	205

52,000lbs / 23,587 kgs						
Landing						
Flaps	0°	1°	8°	20°	30°	45°
Min Maneuvering	169	153	147	141	137	129
V _{REF}	159	143	137	131	127	119

Takeoff											
Add 1 kt to V ₁ & V _R for Wing & Cowl A/I ON											
Flaps	0°					20°					
Press. Alt.	0	2000	4000	6000	8000	0	2000	4000	6000	8000	
V ₁	≤ 10°C	113	114	114	114	115	114	113	113	112	112
	20°C	113	113	114	114	115	113	113	113	112	112
	30°C	113	114	114	115	115	114	113	112	112	112
	40°C	114	115	115	38° / 116	34° / 115	113	112	112	38° / 112	34° / 112
	MAX TEMP	50° / 115	46° / 116	42° / 115			50° / 112	46° / 112	42° / 112		
V _R	≤ 10°C	116	116	116	116	116	114	113	113	112	112
	20°C	116	116	116	116	116	113	113	113	112	112
	30°C	116	116	116	116	116	113	113	112	112	112
	40°C	116	116	116	38° / 116	34° / 116	113	112	112	38° / 112	34° / 112
	MAX TEMP	50° / 116	46° / 116	42° / 116			50° / 112	46° / 112	42° / 112		
V ₂ / V _{2GA}	131 / 126					128					
Flap Retraction	143 (Flaps 1)		151 (Flaps 0)		140 (Flaps 8) 148 (Flaps 1) 151 (Flaps 0)						

Additional speeds											
Approximate Single Engine Driftdown Altitude - FL310											
Altitude (FL)	<10,000	210	230	250	270	290	310	330	350	370	390
V _{FTO} / V _{ENR}	166	168	171	175	177	179	181	184	186	189	192
V _{MD} /Min Hold	180	190	191	193	195	198	200	202	205	207	208

53,000lbs / 24,040 kgs						
Landing						
Flaps	0°	1°	8°	20°	30°	45°
Min Maneuvering	170	154	148	142	138	130
V _{REF}	160	144	138	132	128	120

Takeoff											
Add 1 kt to V ₁ & V _R for Wing & Cowl A/I ON											
Flaps	0°					20°					
Press. Alt.	0	2000	4000	6000	8000	0	2000	4000	6000	8000	
V ₁	≤ 10°C	113	114	114	114	115	114	113	113	112	112
	20°C	113	113	114	114	115	113	113	113	112	112
	30°C	113	114	114	115	115	113	113	112	112	111
	40°C	114	115	115	38° / 116	34° / 115	113	112	112	38° / 111	34° / 111
	MAX TEMP	50° / 115	46° / 116	42° / 115			50° / 112	46° / 112	42° / 112		
V _R	≤ 10°C	116	116	116	116	116	114	113	113	112	112
	20°C	116	116	116	116	116	113	113	113	112	112
	30°C	116	116	116	116	116	113	113	112	112	111
	40°C	116	116	116	38° / 116	34° / 116	113	112	112	38° / 111	34° / 111
	MAX TEMP	50° / 116	46° / 116	42° / 116			50° / 112	46° / 112	42° / 112		
V ₂ / V _{2GA}	130 / 127					127					
Flap Retraction	142 (Flaps 1)		152 (Flaps 0)		139 (Flaps 8)			147 (Flaps 1)		152 (Flaps 0)	

Additional speeds											
Approximate Single Engine Driftdown Altitude - FL310											
Altitude (FL)	<10,000	210	230	250	270	290	310	330	350	370	390
V _{FTO} / V _{ENR}	167	170	173	176	178	181	183	186	188	191	194
V _{MD} /Min Hold	18	192	193	195	197	200	202	205	207	209	209

54,000lbs / 24,494 kgs						
Landing						
Flaps	0°	1°	8°	20°	30°	45°
Min Maneuvering	171	155	149	143	139	131
V _{REF}	161	145	139	133	129	121

Takeoff											
Add 1 kt to V ₁ & V _R for Wing & Cowl A/I ON											
Flaps	0°					20°					
Press. Alt.	0	2000	4000	6000	8000	0	2000	4000	6000	8000	
V ₁	≤ 10°C	114	114	114	115	115	114	113	113	112	112
	20°C	114	114	114	115	115	113	113	113	112	112
	30°C	113	114	115	115	116	113	113	112	112	111
	40°C	115	115	115	38° / 116	34° / 116	113	112	112	38° / 111	34° / 111
	MAX TEMP	50° / 116	46° / 116	42° / 116			50° / 112	46° / 112	42° / 112		
V _R	≤ 10°C	116	116	116	116	116	114	113	113	112	112
	20°C	116	116	116	116	116	113	113	113	112	112
	30°C	116	116	116	116	116	113	112	112	112	111
	40°C	116	116	116	38° / 116	34° / 116	113	112	112	38° / 111	34° / 111
	MAX TEMP	50° / 116	46° / 116	42° / 116			50° / 112	46° / 112	42° / 112		
V ₂ / V _{2GA}	130 / 128					127					
Flap Retraction	142 (Flaps 1)		154 (Flaps 0)		139 (Flaps 8)		147 (Flaps 1)		154 (Flaps 0)		

Additional speeds											
Approximate Single Engine Driftdown Altitude - FL310											
Altitude (FL)	<10,000	210	230	250	270	290	310	330	350	370	390
V _{FTO} / V _{ENR}	169	172	175	178	180	182	185	187	190	193	196
V _{MD} /Min Hold	184	194	195	197	200	202	205	207	209	212	211

55,000lbs / 24,948 kgs						
Landing						
Flaps	0°	1°	8°	20°	30°	45°
Min Maneuvering	172	156	150	144	140	132
V _{REF}	162	146	140	134	130	122

Takeoff											
Add 1 kt to V ₁ & V _R for Wing & Cowl A/I ON											
Flaps		0°					20°				
Press. Alt.	0	2000	4000	6000	8000	0	2000	4000	6000	8000	
V ₁	≤ 10°C	114	114	114	115	115	113	113	113	112	112
	20°C	114	114	114	115	115	113	113	113	112	112
	30°C	113	114	115	115	116	113	113	112	112	111
	40°C	115	115	115	38° / 116	34° / 116	113	112	112	38° / 111	34° / 111
	MAX TEMP	50° / 116	46° / 116	42° / 116			50° / 112	46° / 112	42° / 112		
V _R	≤ 10°C	116	116	116	116	116	113	113	113	112	112
	20°C	116	116	116	116	116	113	113	113	112	112
	30°C	116	116	116	116	116	113	113	112	112	111
	40°C	116	116	116	38° / 116	34° / 116	113	112	112	38° / 111	34° / 111
	MAX TEMP	50° / 116	46° / 116	42° / 116			50° / 112	46° / 112	42° / 112		
V ₂ / V _{2GA}	130 / 129					127					
Flap Retraction	142 (Flaps 1)		155 (Flaps 0)		139 (Flaps 8)		147 (Flaps 1)		155 (Flaps 0)		

Additional speeds											
Approximate Single Engine Driftdown Altitude - FL310											
Altitude (FL)	<10,000	210	230	250	270	290	310	330	350	370	390
V _{FTO} / V _{ENR}	170	174	177	180	182	184	186	189	192	195	198
V _{MD} /Min Hold	185	196	197	199	202	205	207	209	212	214	212

56,000lbs / 25,401 kgs						
Landing						
Flaps	0°	1°	8°	20°	30°	45°
Min Maneuvering	173	157	151	145	141	133
V _{REF}	163	147	141	135	131	123

Takeoff											
Add 1 kt to V ₁ & V _R for Wing & Cowl A/I ON											
Flaps	0°					20°					
Press. Alt.	0	2000	4000	6000	8000	0	2000	4000	6000	8000	
V ₁	≤ 10°C	114	115	115	116	117	114	113	113	112	112
	20°C	114	114	115	116	117	113	113	113	112	112
	30°C	114	115	116	117	119	114	113	112	112	112
	40°C	115	116	117	38° / 118	34° / 118	113	112	112	38° / 112	34° / 112
	MAX TEMP	50° / 117	46° / 117	42° / 117			50° / 112	46° / 112	42° / 112		
V _R	≤ 10°C	116	116	116	116	117	113	113	113	112	112
	20°C	116	116	116	117	117	113	113	113	112	112
	30°C	116	116	117	117	118	113	113	112	112	112
	40°C	116	117	117	38° / 118	34° / 118	113	112	112	38° / 112	34° / 112
	MAX TEMP	50° / 117	46° / 117	42° / 117			50° / 112	46° / 112	42° / 112		
V ₂ / V _{2GA}	130 / 130					127					
Flap Retraction	142 (Flaps 1)		157 (Flaps 0)		139 (Flaps 8)		147 (Flaps 1)		157 (Flaps 0)		

Additional speeds											
Approximate Single Engine Driftdown Altitude - FL310											
Altitude (FL)	<10,000	210	230	250	270	290	310	330	350	370	390
V _{FTO} / V _{ENR}	172	175	178	182	184	186	188	191	194	197	200
V _{MD} /Min Hold	187	198	200	202	204	207	209	212	214	216	213

57,000lbs / 25,855 kgs						
Landing						
Flaps	0°	1°	8°	20°	30°	45°
Min Maneuvering	174	158	152	146	142	134
V _{REF}	164	148	142	136	132	124

Takeoff											
Add 1 kt to V ₁ & V _R for Wing & Cowl A/I ON											
Flaps		0°					20°				
Press. Alt.		0	2000	4000	6000	8000	0	2000	4000	6000	8000
V ₁	≤ 10°C	114	115	115	116	117	113	113	113	112	112
	20°C	114	114	115	116	117	113	113	112	112	112
	30°C	114	115	116	117	119	113	113	112	112	113
	40°C	115	116	118	38° / 119	34° / 119	112	112	112	38° / 113	34° / 113
	MAX TEMP	50° / 117	46° / 118	42° / 118			50° / 112	46° / 112	42° / 112		
V _R	≤ 10°C	116	116	116	116	117	113	113	113	112	112
	20°C	116	116	116	117	118	113	113	112	112	112
	30°C	116	116	117	118	119	113	113	112	112	113
	40°C	116	117	118	38° / 119	34° / 119	112	112	112	38° / 113	34° / 113
	MAX TEMP	50° / 117	46° / 118	42° / 118			50° / 112	46° / 112	42° / 112		
V ₂ / V _{2GA}	129 / 131					126					
Flap Retraction	141 (Flaps 1)	158 (Flaps 0)				138 (Flaps 8)	146 (Flaps 1)		158 (Flaps 0)		

Additional speeds											
Approximate Single Engine Driftdown Altitude - FL310											
Altitude (FL)	<10,000	210	230	250	270	290	310	330	350	370	390
V _{FTO} / V _{ENR}	173	177	180	183	185	188	190	193	195	198	202
V _{MD} /Min Hold	189	200	202	204	207	209	212	214	216	218	214

58,000lbs / 26,308 kgs						
Landing						
Flaps	0°	1°	8°	20°	30°	45°
Min Maneuvering	175	159	153	147	143	135
V _{REF}	165	149	143	137	133	125

Takeoff											
Add 1 kt to V ₁ & V _R for Wing & Cowl A/I ON											
Flaps		0°					20°				
Press. Alt.		0	2000	4000	6000	8000	0	2000	4000	6000	8000
V ₁	≤ 10°C	115	116	117	118	118	113	113	112	113	113
	20°C	115	116	117	118	11	113	113	112	113	114
	30°C	115	116	117	119	120	113	113	113	113	114
	40°C	117	118	119	38° / 120	34° / 120	112	113	113	38° / 114	34° / 114
	MAX TEMP	50° / 118	46° / 119	42° / 119			50° / 113	46° / 113	42° / 113		
V _R	≤ 10°C	116	116	117	118	119	113	113	113	113	113
	20°C	117	117	117	118	119	113	113	113	113	114
	30°C	117	117	118	119	120	113	113	113	113	114
	40°C	117	118	119	38° / 120	34° / 120	112	113	113	38° / 114	34° / 114
	MAX TEMP	50° / 118	46° / 119	42° / 119			50° / 113	46° / 113	42° / 113		
V ₂ / V _{2GA}	130 / 133					126					
Flap Retraction	142 (Flaps 1)	160 (Flaps 0)				138 (Flaps 8)	146 (Flaps 1)		160 (Flaps 0)		

Additional speeds											
Approximate Single Engine Driftdown Altitude - FL280											
Altitude (FL)	<10,000	210	230	250	270	290	310	330	350	370	390
V _{FTO} / V _{ENR}	175	178	182	185	187	189	192	194	197	200	204
V _{MD} /Min Hold	190	202	204	206	209	211	214	216	219	219	215

59,000lbs / 26,762 kgs						
Landing						
Flaps	0°	1°	8°	20°	30°	45°
Min Maneuvering	176	160	154	148	144	136
V _{REF}	166	150	144	138	134	126

Takeoff											
Add 1 kt to V ₁ & V _R for Wing & Cowl A/I ON											
Flaps	0°					20°					
Press. Alt.	0	2000	4000	6000	8000	0	2000	4000	6000	8000	
V ₁	≤ 10°C	116	117	118	119	119	113	113	112	113	114
	20°C	116	117	118	119	120	113	113	112	113	115
	30°C	115	116	119	120	121	113	112	113	114	115
	40°C	118	119	120	38° / 121	34° / 121	112	113	114	38° / 115	34° / 115
	MAX TEMP	50° / 119	46° / 120	42° / 120			50° / 114	46° / 115	42° / 114		
V _R	≤ 10°C	117	117	118	119	120	113	113	112	114	114
	20°C	117	118	118	119	120	113	113	113	114	115
	30°C	117	118	119	120	121	113	112	113	114	115
	40°C	118	119	120	38° / 121	34° / 121	112	113	114	38° / 115	34° / 115
	MAX TEMP	50° / 119	46° / 120	42° / 120			50° / 114	46° / 115	42° / 114		
V ₂ / V _{2GA}	130 / 134					125					
Flap Retraction	142 (Flaps 1)		161 (Flaps 0)		137 (Flaps 8)			145 (Flaps 1)		161 (Flaps 0)	

Additional speeds											
Approximate Single Engine Driftdown Altitude - FL280											
Altitude (FL)	<10,000	210	230	250	270	290	310	330	350	370	390
V _{FTO} / V _{ENR}	176	180	183	187	189	191	193	196	199	202	206
V _{MD} /Min Hold	192	204	206	208	211	214	216	218	221	220	216

60,000lbs / 27,216 kgs						
Landing						
Flaps	0°	1°	8°	20°	30°	45°
Min Maneuvering	177	161	155	149	145	137
V _{REF}	167	151	145	139	135	127

Takeoff											
Add 1 kt to V ₁ & V _R for Wing & Cowl A/I ON											
Flaps	0°					20°					
Press. Alt.	0	2000	4000	6000	8000	0	2000	4000	6000	8000	
V ₁	≤ 10°C	117	118	119	120	121	113	114	113	114	115
	20°C	117	118	118	120	122	113	114	113	114	115
	30°C	117	118	120	122	123	113	113	115	116	117
	40°C	119	120	121	38° / 123	34° / 123	114	115	116	38° / 117	34° / 117
	MAX TEMP	50° / 121	46° / 121	42° / 121			50° / 115	46° / 116	42° / 116		
V _R	≤ 10°C	118	119	120	120	121	113	114	114	114	115
	20°C	118	119	120	121	122	113	114	114	115	116
	30°C	118	119	120	122	123	114	114	115	116	117
	40°C	119	120	121	38° / 123	34° / 123	114	115	116	38° / 117	34° / 117
	MAX TEMP	50° / 121	46° / 122	42° / 121			50° / 115	46° / 116	42° / 116		
V ₂ / V _{2GA}	131 / 135					125					
Flap Retraction	143 (Flaps 1)		163 (Flaps 0)		137 (Flaps 8)		145 (Flaps 1)		163 (Flaps 0)		

Additional speeds											
Approximate Single Engine Driftdown Altitude - FL270											
Altitude (FL)	<10,000	210	230	250	270	290	310	330	350	370	390
V _{FTO} / V _{ENR}	178	181	185	189	191	193	195	198	201	204	208
V _{MD} /Min Hold	194	206	208	211	214	216	218	221	223	222	217

61,000lbs / 27,669 kgs						
Landing						
Flaps	0°	1°	8°	20°	30°	45°
Min Maneuvering	178	162	156	150	146	138
V _{REF}	168	152	146	140	136	128

Takeoff											
Add 1 kt to V ₁ & V _R for Wing & Cowl A/I ON											
Flaps		0°					20°				
Press. Alt.	0	2000	4000	6000	8000	0	2000	4000	6000	8000	
V ₁	≤ 10°C	118	119	120	121	122	113	114	115	115	116
	20°C	118	119	120	121	123	113	114	115	116	117
	30°C	118	120	121	123	124	113	114	116	117	118
	40°C	120	121	122	38° / 124	34° / 124	115	116	117	38° / 118	34° / 118
	MAX TEMP	50° / 122	46° / 123	42° / 122			50° / 116	46° / 117	42° / 117		
V _R	≤ 10°C	119	120	121	121	122	113	114	115	115	116
	20°C	119	120	121	122	123	113	114	115	116	117
	30°C	119	120	121	123	124	114	115	116	117	118
	40°C	120	121	122	38° / 124	34° / 124	115	116	117	38° / 118	34° / 118
	MAX TEMP	50° / 122	46° / 123	42° / 122			50° / 116	46° / 117	42° / 117		
V ₂ / V _{2GA}	132 / 136					125					
Flap Retraction	144 (Flaps 1)		164 (Flaps 0)		137 (Flaps 8)			145 (Flaps 1)		164 (Flaps 0)	

Additional speeds											
Approximate Single Engine Driftdown Altitude - FL270											
Altitude (FL)	<10,000	210	230	250	270	290	310	330	350	370	390
V _{FTO} / V _{ENR}	179	183	186	190	192	195	197	200	203	206	210
V _{MD} /Min Hold	196	208	210	213	216	218	221	223	225	223	218

62,000lbs / 28,123 kgs						
Landing						
Flaps	0°	1°	8°	20°	30°	45°
Min Maneuvering	179	163	157	151	147	139
V _{REF}	169	153	147	14	137	129

Takeoff											
Add 1 kt to V ₁ & V _R for Wing & Cowl A/I ON											
Flaps	0°					20°					
Press. Alt.	0	2000	4000	6000	8000	0	2000	4000	6000	8000	
V ₁	≤ 10°C	120	121	122	123	124	114	115	116	117	118
	20°C	120	121	122	123	124	114	115	116	117	118
	30°C	120	121	123	124	125	114	116	117	118	119
	40°C	122	123	124	38° / 125	34° / 125	116	117	118	38° / 119	34° / 119
	MAX TEMP	50° / 123	46° / 125	42° / 124			50° / 117	46° / 118	42° / 118		
V _R	≤ 10°C	120	121	122	123	124	114	115	116	117	118
	20°C	121	121	122	123	124	115	115	116	117	118
	30°C	121	122	123	124	125	115	116	117	118	119
	40°C	121	123	124	38° / 125	34° / 125	116	117	118	38° / 119	34° / 119
	MAX TEMP	50° / 123	46° / 125	42° / 124			50° / 117	46° / 118	42° / 118		
V ₂ / V _{2GA}	133 / 137					126					
Flap Retraction	145 (Flaps 1)		166 (Flaps 0)		138 (Flaps 8)			146 (Flaps 1)		166 (Flaps 0)	

Additional speeds											
Approximate Single Engine Driftdown Altitude - FL310											
Altitude (FL)	<10,000	210	230	250	270	290	310	330	350	370	390
V _{FTO} / V _{ENR}	181	184	188	192	194	196	199	202	205	208	211
V _{MD} /Min Hold	199	210	212	215	218	220	223	225	227	224	219

63,000lbs / 28,576 kgs						
Landing						
Flaps	0°	1°	8°	20°	32270°	45°
Min Maneuvering	180	164	158	152	148	140
V_{REF}	170	154	148	142	138	130

Takeoff											
Add 1 kt to V ₁ & V _R for Wing & Cowl A/I ON											
Flaps		0°					20°				
Press. Alt.		0	2000	4000	6000	8000	0	2000	4000	6000	8000
V ₁	≤ 10°C	121	122	123	124	125	115	116	117	118	119
	20°C	121	122	123	124	125	115	116	117	118	119
	30°C	121	122	124	125	126	115	117	118	119	120
	40°C	123	124	125	38° / 126	34° / 126	117	118	119	38° / 120	34° / 120
	MAX TEMP	50° / 124	46° / 126	42° / 125			50° / 118	46° / 119	42° / 119		
V _R	≤ 10°C	121	122	123	124	125	115	116	117	118	119
	20°C	122	122	123	124	125	116	116	117	118	119
	30°C	122	123	124	125	126	116	117	118	119	120
	40°C	121	124	125	38° / 126	34° / 126	117	118	119	38° / 120	34° / 120
	MAX TEMP	50° / 124	46° / 126	42° / 125			50° / 118	46° / 119	42° / 119		
V ₂ / V _{2GA}	133 / 138					127					
Flap Retraction	145		167		139		147		167		
	(Flaps 1)		(Flaps 0)		(Flaps 8)		(Flaps 1)		(Flaps 0)		

Additional speeds											
Approximate Single Engine Driftdown Altitude - FL310											
Altitude (FL)	<10,000	210	230	250	270	290	310	330	350	370	390
V_{FTO} / V_{ENR}	182	186	189	193	195	198	200	203	206	209	213
V_{MD}/Min Hold	201	212	214	217	220	222	225	227	228	225	219

64,000lbs / 29,030 kgs						
Landing						
Flaps	0°	1°	8°	20°	30°	45°
Min Maneuvering	182	166	160	154	150	142
V _{REF}	172	156	150	144	140	132

Takeoff											
Add 1 kt to V ₁ & V _R for Wing & Cowl A/I ON											
Flaps		0°					20°				
Press. Alt.	0	2000	4000	6000	8000	0	2000	4000	6000	8000	
V ₁	≤ 10°C	122	123	124	125	126	116	118	118	119	120
	20°C	122	123	124	125	127	116	117	118	120	121
	30°C	122	124	125	126	128	116	118	119	120	122
	40°C	124	125	127	38° / 128	34° / 128	118	119	120	38° / 121	34° / 122
	MAX TEMP	50° / 126	46° / 127	42° / 127			50° / 120	46° / 121	42° / 120		
V _R	≤ 10°C	123	123	124	125	126	117	118	118	119	120
	20°C	123	124	124	125	127	117	118	118	120	121
	30°C	123	124	125	126	128	117	118	119	120	122
	40°C	123	125	127	38° / 128	34° / 128	118	119	120	38° / 121	34° / 122
	MAX TEMP	50° / 126	46° / 127	42° / 127			50° / 120	46° / 121	42° / 120		
V ₂ / V _{2GA}	134 / 139					128					
Flap Retraction	146 (Flaps 1)		169 (Flaps 0)		140 (Flaps 8)			148 (Flaps 1)		169 (Flaps 0)	

Additional speeds											
Approximate Single Engine Driftdown Altitude - FL260											
Altitude (FL)	<10,000	210	230	250	270	290	310	330	350	370	390
V _{FTO} / V _{ENR}	184	187	191	195	197	199	202	205	208	211	215
V _{MD} /Min Hold	203	214	217	220	222	225	227	230	230	226	-

65,000lbs / 29,484 kgs						
Landing						
Flaps	0°	1°	8°	20°	30°	45°
Min Maneuvering	183	167	161	155	151	143
V _{REF}	173	157	151	145	141	133

Takeoff											
Add 1 kt to V ₁ & V _R for Wing & Cowl A/I ON											
Flaps		0°					20°				
Press. Alt.	0	2000	4000	6000	8000	0	2000	4000	6000	8000	
V ₁	≤ 10°C	123	124	125	126	127	117	119	119	120	121
	20°C	123	124	125	126	128	117	118	119	121	122
	30°C	123	125	126	127	129	117	119	120	121	123
	40°C	125	126	128	38° / 129	34° / 129	119	120	121	38° / 122	34° / 123
	MAX TEMP	50° / 127	46° / 128	42° / 128			50° / 121	46° / 122	42° / 121		
V _R	≤ 10°C	124	124	125	126	127	118	119	119	120	121
	20°C	124	125	125	126	128	118	119	119	121	122
	30°C	124	125	126	127	129	118	119	120	121	123
	40°C	125	126	128	38° / 129	34° / 129	119	120	121	38° / 122	34° / 123
	MAX TEMP	50° / 127	46° / 128	42° / 128			50° / 121	46° / 122	42° / 121		
V ₂ / V _{2GA}	135 / 140					129					
Flap Retraction	147 (Flaps 1)		170 (Flaps 0)		141 (Flaps 8)			149 (Flaps 1)		170 (Flaps 0)	

Additional speeds											
Approximate Single Engine Driftdown Altitude - FL310											
Altitude (FL)	<10,000	210	230	250	270	290	310	330	350	370	390
V _{FTO} / V _{ENR}	185	189	192	196	198	201	204	207	210	213	217
V _{MD} /Min Hold	206	216	219	222	224	227	229	232	231	227	-

66,000lbs / 29,937 kgs						
Landing						
Flaps	0°	1°	8°	20°	30°	45°
Min Maneuvering	184	168	162	156	152	144
V _{REF}	174	158	152	146	142	134

Takeoff											
Add 1 kt to V ₁ & V _R for Wing & Cowl A/I ON											
Flaps	0°					20°					
Press. Alt.	0	2000	4000	6000	8000	0	2000	4000	6000	8000	
V ₁	≤ 10°C	125	126	127	128	129	119	120	120	121	123
	20°C	125	126	127	128	129	119	120	121	122	123
	30°C	125	126	128	129	130	119	120	121	123	124
	40°C	126	128	129	38° / 130	34° / 130	120	121	123	38° / 124	34° / 124
	MAX TEMP	50° / 128	46° / 130	42° / 129			50° / 122	46° / 123	42° / 123		
V _R	≤ 10°C	125	126	127	128	129	119	120	120	121	123
	20°C	125	126	127	128	129	119	120	121	122	123
	30°C	125	126	128	129	130	119	120	121	123	124
	40°C	126	128	129	38° / 130	34° / 130	120	121	123	38° / 124	34° / 124
	MAX TEMP	50° / 128	46° / 130	42° / 129			50° / 122	46° / 123	42° / 123		
V ₂ / V _{2GA}	136 / 142					130					
Flap Retraction	136 (Flaps 1)		142 (Flaps 0)		142 (Flaps 8)		150 (Flaps 1)		172 (Flaps 0)		

Additional speeds											
Approximate Single Engine Driftdown Altitude - FL250											
Altitude (FL)	<10,000	210	230	250	270	290	310	330	350	370	390
V _{FTO} / V _{ENR}	187	190	194	198	200	203	206	209	212	215	219
V _{MD} /Min Hold	208	218	221	224	226	229	231	234	232	228	-

67,000lbs / 30,391 kgs						
Landing						
Flaps	0°	1°	8°	20°	30°	45°
Min Maneuvering	185	169	163	157	153	145
V _{REF}	175	159	153	147	143	135

Takeoff											
Add 1 kt to V ₁ & V _R for Wing & Cowl A/I ON											
Flaps	0°					20°					
Press. Alt.	0	2000	4000	6000	8000	0	2000	4000	6000	8000	
V ₁	≤ 10°C	126	127	128	129	130	120	121	121	122	124
	20°C	126	127	128	129	130	120	121	122	123	124
	30°C	126	127	129	130	131	120	121	122	124	125
	40°C	127	129	130	38° / 131	34° / 131	121	122	124	38° / 125	34° / 125
	MAX TEMP	50° / 129	46° / 131	42° / 130			50° / 123	46° / 124	42° / 124		
V _R	≤ 10°C	126	127	128	129	130	120	121	121	122	124
	20°C	126	127	128	129	130	120	121	122	123	124
	30°C	126	127	129	130	131	120	121	122	124	125
	40°C	127	129	130	38° / 131	34° / 131	121	122	124	38° / 125	34° / 125
	MAX TEMP	50° / 129	46° / 131	42° / 130			50° / 123	46° / 124	42° / 124		
V ₂ / V _{2GA}	137 / 143					130					
Flap Retraction	149 (Flaps 1)		173 (Flaps 0)		142 (Flaps 8)		150 (Flaps 1)		173 (Flaps 0)		

Additional speeds											
Approximate Single Engine Driftdown Altitude - FL310											
Altitude (FL)	<10,000	210	230	250	270	290	310	330	350	370	390
V _{FTO} / V _{ENR}	188	192	195	199	202	205	207	210	213	217	220
V _{MD} /Min Hold	210	220	223	226	228	231	233	236	233	228	-

68,000lbs / 30,844 kgs						
Landing (overweight)						
Flaps	0°	1°	8°	20°	30°	45°
Min Maneuvering	186	170	164	158	154	146
V _{REF}	176	160	154	148	144	136

Takeoff											
Add 1 kt to V ₁ & V _R for Wing & Cowl A/I ON											
Flaps	0°					20°					
Press. Alt.	0	2000	4000	6000	8000	0	2000	4000	6000	8000	
V ₁	≤ 10°C	127	128	129	130	131	121	122	123	124	125
	20°C	127	128	129	130	132	121	122	123	124	125
	30°C	127	128	130	131	133	121	122	124	125	126
	40°C	129	130	131	38° / 133	34° / 133	123	124	125	38° / 126	34° / 126
	MAX TEMP	50° / 131	46° / 132	42° / 131			50° / 124	46° / 125	42° / 125		
V _R	≤ 10°C	127	128	129	130	131	121	122	123	124	125
	20°C	127	128	129	130	132	121	122	123	124	125
	30°C	128	129	130	131	133	121	122	124	125	126
	40°C	129	130	131	38° / 133	34° / 133	123	124	125	38° / 126	34° / 126
	MAX TEMP	50° / 131	46° / 132	42° / 131			50° / 124	46° / 125	42° / 125		
V ₂ / V _{2GA}	138 / 144					131					
Flap Retraction	150 (Flaps 1)		175 (Flaps 0)		143 (Flaps 8)		151 (Flaps 1)		175 (Flaps 0)		

Additional speeds											
Approximate Single Engine Driftdown Altitude - FL310											
Altitude (FL)	<10,000	210	230	250	270	290	310	330	350	370	390
V _{FTO} / V _{ENR}	190	193	197	201	203	206	209	212	215	218	222
V _{MD} /Min Hold	213	222	225	228	230	233	235	237	234	229	-

69,000lbs / 31,298 kgs						
Landing (overweight)						
Flaps	0°	1°	8°	20°	30°	45°
Min Maneuvering	187	171	165	159	155	147
V _{REF}	177	161	155	149	145	137

Takeoff											
Add 1 kt to V _I & V _R for Wing & Cowl A/I ON											
Flaps	0°					20°					
Press. Alt.	0	2000	4000	6000	8000	0	2000	4000	6000	8000	
V _I	≤ 10°C	128	129	130	131	132	122	123	124	125	126
	20°C	128	129	130	131	133	122	123	124	125	126
	30°C	128	129	131	132	134	122	123	125	126	127
	40°C	130	131	132	38° / 134	34° / 134	124	125	126	38° / 127	34° / 127
	MAX TEMP	50° / 132	46° / 133	42° / 132			50° / 125	46° / 126	42° / 126		
V _R	≤ 10°C	128	129	130	131	132	122	123	124	125	126
	20°C	128	129	130	131	133	122	123	124	125	126
	30°C	129	130	131	132	134	122	123	125	126	127
	40°C	130	131	132	38° / 134	34° / 134	124	125	126	38° / 127	34° / 127
	MAX TEMP	50° / 132	46° / 133	42° / 132			50° / 125	46° / 126	42° / 126		
V ₂ / V _{2GA}	139 / 145					132					
Flap Retraction	151 (Flaps 1)		176 (Flaps 0)		144 (Flaps 8)		152 (Flaps 1)		176 (Flaps 0)		

Additional speeds											
Approximate Single Engine Driftdown Altitude - FL240											
Altitude (FL)	<10,000	210	230	250	270	290	310	330	350	370	390
V _{FTO} / V _{ENR}	191	195	197	202	205	208	210	213	216	220	224
V _{MD} /Min Hold	215	224	227	230	233	235	238	239	235	230	-

70,000lbs / 31,751 kgs						
Landing (overweight)						
Flaps	0°	1°	8°	20°	30°	45°
Min Maneuvering	188	172	166	160	156	148
V _{REF}	178	162	156	150	146	138

Takeoff											
Add 1 kt to V ₁ & V _R for Wing & Cowl A/I ON											
Flaps	0°					20°					
Press. Alt.	0	2000	4000	6000	8000	0	2000	4000	6000	8000	
V ₁	≤ 10°C	129	130	131	132	133	123	124	125	126	127
	20°C	129	130	131	133	134	123	124	125	126	128
	30°C	129	131	132	134	135	123	125	126	127	128
	40°C	131	132	134	38° / 135	34° / 135	125	126	127	38° / 128	34° / 128
	MAX TEMP	50° / 133	46° / 134	42° / 134			50° / 126	46° / 128	42° / 127		
V _R	≤ 10°C	129	130	131	132	133	123	124	125	126	127
	20°C	130	130	131	133	134	123	124	125	126	127
	30°C	130	131	132	134	135	123	125	126	127	128
	40°C	131	132	134	38° / 135	34° / 135	125	126	127	38° / 128	34° / 128
	MAX TEMP	50° / 133	46° / 134	42° / 134			50° / 126	46° / 128	42° / 127		
V ₂ / V _{2GA}	140 / 146					133					
Flap Retraction	152 (Flaps 1)		177 (Flaps 0)		145 (Flaps 8)			153 (Flaps 1)		177 (Flaps 0)	

Additional speeds											
Approximate Single Engine Driftdown Altitude - FL310											
Altitude (FL)	<10,000	210	230	250	270	290	310	330	350	370	390
V _{FTO} / V _{ENR}	192	196	200	204	206	209	212	215	218	222	226
V _{MD} /Min Hold	217	226	230	232	235	237	240	240	236	231	-

71,000lbs / 32,205 kgs						
Landing (overweight)						
Flaps	0°	1°	8°	20°	30°	45°
Min Maneuvering	189	173	167	161	157	149
V _{REF}	179	163	157	151	147	139

Takeoff											
Add 1 kt to V ₁ & V _R for Wing & Cowl A/I ON											
Flaps	0°					20°					
Press. Alt.	0	2000	4000	6000	8000	0	2000	4000	6000	8000	
V ₁	≤ 10°C	130	131	132	133	134	124	125	126	127	128
	20°C	130	131	132	134	135	124	125	126	127	129
	30°C	130	132	133	135	136	124	126	127	128	129
	40°C	132	133	135	38° / 136	34° / 136	126	127	128	38° / 129	34° / 129
	MAX TEMP	50° / 134	46° / 135	42° / 135			50° / 127	46° / 129	42° / 128		
V _R	≤ 10°C	130	131	132	133	134	124	125	126	127	128
	20°C	131	131	132	134	135	124	125	126	127	128
	30°C	131	132	133	135	136	124	126	127	128	129
	40°C	132	133	135	38° / 136	34° / 136	126	127	128	38° / 128	34° / 129
	MAX TEMP	50° / 134	46° / 135	42° / 135			50° / 127	46° / 129	42° / 128		
V ₂ / V _{2GA}	141 / 147					134					
Flap Retraction	153 (Flaps 1)		178 (Flaps 0)		146 (Flaps 8)			154 (Flaps 1)		178 (Flaps 0)	

Additional speeds											
Approximate Single Engine Driftdown Altitude - FL310											
Altitude (FL)	<10,000	210	230	250	270	290	310	330	350	370	390
V _{FTO} / V _{ENR}	193	198	201	205	208	211	214	217	220	224	227
V _{MD} /Min Hold	219	229	232	234	237	239	242	241	237	231	-

72,000lbs / 32,659 kgs						
Landing (overweight)						
Flaps	0°	1°	8°	20°	30°	45°
Min Maneuvering	190	174	168	162	158	150
V _{REF}	180	164	158	152	148	140

Takeoff											
Add 1 kt to V ₁ & V _R for Wing & Cowl A/I ON											
Flaps	0°					20°					
Press. Alt.	0	2000	4000	6000	8000	0	2000	4000	6000	8000	
V ₁	≤ 10°C	132	132	134	135	136	125	126	127	128	129
	20°C	132	133	134	135	136	125	126	128	129	130
	30°C	132	133	135	136	137	126	127	128	129	130
	40°C	133	135	136	38° / 137	34° / 137	127	128	129	38° / 130	34° / 130
	MAX TEMP	50° / 135	46° / 137	42° / 136			50° / 127	46° / 130	42° / 129		
V _R	≤ 10°C	132	132	134	135	136	125	126	127	128	129
	20°C	132	133	134	135	136	125	126	128	129	130
	30°C	132	133	135	136	137	126	127	128	129	130
	40°C	133	135	136	38° / 137	34° / 137	127	128	129	38° / 129	34° / 130
	MAX TEMP	50° / 135	46° / 137	42° / 136			50° / 129	46° / 130	42° / 129		
V ₂ / V _{2GA}	142 / 148					135					
Flap Retraction	154 (Flaps 1)		180 (Flaps 0)		147 (Flaps 8)			155 (Flaps 1)		180 (Flaps 0)	

Additional speeds											
Approximate Single Engine Driftdown Altitude - FL220											
Altitude (FL)	<10,000	210	230	250	270	290	310	330	350	370	390
V _{FTO} / V _{ENR}	195	199	203	207	209	212	215	218	222	225	229
V _{MD} /Min Hold	222	231	233	236	239	241	244	242	238	-	-

73,000lbs / 33,112 kgs						
Landing (overweight)						
Flaps	0°	1°	8°	20°	30°	45°
Min Maneuvering	191	175	169	163	159	151
V _{REF}	181	165	159	153	149	141

Takeoff											
Add 1 kt to V ₁ & V _R for Wing & Cowl A/I ON											
Flaps	0°					20°					
Press. Alt.	0	2000	4000	6000	8000	0	2000	4000	6000	8000	
V ₁	≤ 10°C	133	133	135	136	137	126	127	128	129	130
	20°C	133	134	135	136	137	126	127	129	130	131
	30°C	133	134	136	137	138	127	128	129	130	131
	40°C	134	136	137	38° / 138	34° / 138	128	129	130	38° / 130	34° / 131
	MAX TEMP	50° / 136	46° / 138	42° / 137			50° / 130	46° / 131	42° / 130		
V _R	≤ 10°C	133	133	135	136	137	126	127	128	129	130
	20°C	133	134	135	136	137	126	127	129	130	131
	30°C	133	134	136	137	138	127	128	129	130	131
	40°C	134	136	137	38° / 138	34° / 138	128	129	130	38° / 130	34° / 131
	MAX TEMP	50° / 136	46° / 138	42° / 137			50° / 130	46° / 131	42° / 130		
V ₂ / V _{2GA}	143 / 149					136					
Flap Retraction	155 (Flaps 1)		181 (Flaps 0)		148 (Flaps 8)			156 (Flaps 1)		181 (Flaps 0)	

Additional speeds											
Approximate Single Engine Driftdown Altitude - FL220											
Altitude (FL)	<10,000	210	230	250	270	290	310	330	350	370	390
V _{FTO} / V _{ENR}	196	200	204	208	211	214	217	220	223	227	231
V _{MD} /Min Hold	223	233	235	238	241	243	246	244	239	-	-

74,000lbs / 33,566 kgs						
Landing (overweight)						
Flaps	0°	1°	8°	20°	30°	45°
Min Maneuvering	192	176	170	164	160	152
V _{REF}	182	166	160	154	150	142

Takeoff											
Add 1 kt to V ₁ & V _R for Wing & Cowl A/I ON											
Flaps	0°					20°					
Press. Alt.	0	2000	4000	6000	8000	0	2000	4000	6000	8000	
V ₁	≤ 10°C	134	135	136	137	138	127	129	129	130	131
	20°C	134	135	136	137	139	128	130	130	131	132
	30°C	134	135	137	138	139	128	130	130	132	132
	40°C	136	137	138	38° / 139	34° / 139	129	131	131	38° / 132	34° / 132
	MAX TEMP	50° / 138	46° / 139	42° / 138			50° / 131	46° / 131	42° / 131		
V _R	≤ 10°C	134	135	136	137	138	127	128	129	130	131
	20°C	134	135	136	137	139	128	129	130	131	132
	30°C	134	135	137	138	139	128	129	130	132	132
	40°C	136	137	138	38° / 139	34° / 139	129	130	131	38° / 132	34° / 132
	MAX TEMP	50° / 138	46° / 139	42° / 138			50° / 131	46° / 131	42° / 131		
V ₂ / V _{2GA}	144 / 150					137					
Flap Retraction	156 (Flaps 1)		186 (Flaps 0)		149 (Flaps 8)		157 (Flaps 1)		183 (Flaps 0)		

Additional speeds											
Approximate Single Engine Driftdown Altitude - FL220											
Altitude (FL)	<10,000	210	230	250	270	290	310	330	350	370	390
V _{FTO} / V _{ENR}	198	202	206	210	212	215	218	221	225	229	233
V _{MD} /Min Hold	225	235	237	240	243	245	248	245	240	-	-

75,000lbs / 34,019 kgs						
Landing (overweight)						
Flaps	0°	1°	8°	20°	30°	45°
Min Maneuvering	193	177	171	165	161	153
V _{REF}	183	167	161	155	151	143

Takeoff											
Add 1 kt to V ₁ & V _R for Wing & Cowl A/I ON											
Flaps	0°					20°					
Press. Alt.	0	2000	4000	6000	8000	0	2000	4000	6000	8000	
V ₁	≤ 10°C	135	136	137	138	139	128	129	130	131	132
	20°C	135	136	137	138	140	129	130	131	132	133
	30°C	135	136	138	139	140	129	130	131	133	133
	40°C	137	138	139	38° / 140	34° / 140	130	131	132	38° / 133	34° / 133
	MAX TEMP	50° / 139	46° / 140	42° / 139			50° / 132	46° / 131	42° / 132		
V _R	≤ 10°C	135	136	137	138	139	128	129	130	131	132
	20°C	135	136	137	138	140	129	130	131	132	133
	30°C	135	136	138	139	140	129	130	131	132	133
	40°C	137	138	139	38° / 140	34° / 140	130	131	132	38° / 133	34° / 133
	MAX TEMP	50° / 139	46° / 140	42° / 139			50° / 132	46° / 131	42° / 1132		
V ₂ / V _{2GA}	144 / 151					137					
Flap Retraction	156 (Flaps 1)		186 (Flaps 0)		149 (Flaps 8)			157 (Flaps 1)		184 (Flaps 0)	

Additional speeds											
Approximate Single Engine Driftdown Altitude - FL210											
Altitude (FL)	<10,000	210	230	250	270	290	310	330	350	370	390
V _{FTO} / V _{ENR}	199	203	207	211	214	217	220	223	226	230	234
V _{MD} /Min Hold	226	237	239	242	244	247	249	246	240	-	-