

APPROACH

Although the Approach Climb maneuver is always performed with Flaps 9°, for JAA certified airplane there are two Flaps 9° approach climb speeds: one to be used when landing is planned with Flaps 22°, and another one for landing with Flaps 45°.

The reason for this is because of a JAA requirement for demonstration of the airplane capability to make a transition from all engines landing approach in LDG DN/Flaps 22° or 45° configuration to a one engine inoperative go-around in LDG UP/Flaps 9° configuration without an excessive loss of altitude and not requiring long acceleration times.

In order to meet this requirement, the approach climb speeds are defined equal to V_{REF} , and the normal procedures for Flaps 45° landing recommend the addition of at least 5 KIAS to V_{REF} during the approach flight phase.

In addition, different charts are presented for "No Ice Encounter" and "After Ice Encounter", as the Flaps 9°, 18° and 22° Stick Shaker and Pusher firing angles of attack are advanced, resulting in different stall speeds.

The "No Ice Encounter" charts must be used in the following conditions:

- Anti-Ice off; and
- No Ice Accretion; and
- No SPS/ICE SPEEDS messages displayed on EICAS.

The "After Ice Encounter" charts must be used in the following conditions:

- Anti-Ice on; or
- Ice Accretion present; or
- SPS/ICE SPEEDS message displayed on EICAS.

NOTE: Use the Flaps 22° "After Ice Encounter" speeds for CAT II or HGS AIII operations, even if no ice was encountered in flight.

APPROACH CLIMB SPEED & REFERENCE SPEED APPROACH FLAPS 9°/LANDING FLAPS 22°

WEIGHT (kg)	NO ICE ENCOUNTER	AFTER ICE ENCOUNTER
	$V_{APP\ CL}$ and V_{REF} (KIAS)	$V_{APP\ CL}$ and V_{REF} (KIAS)
12000	104	109
12500	106	112
13000	108	114
13500	110	116
14000	112	118
14500	114	120
15000	116	122
15500	118	124
16000	120	126
16500	122	128
17000	124	130
17500	126	132
18000	128	134
18500	129	136
19000	131	138
19500	133	140
20000	135	141
20500	136	143
21000	138	145
21500	140	147
22000	141	149

NOTE: For CAT II or HGS All operations, use the "After Ice Encounter" speeds.

APPROACH CLIMB SPEED & REFERENCE SPEED APPROACH FLAPS 9°/LANDING FLAPS 45°

WEIGHT (kg)	NO ICE ENCOUNTER	AFTER ICE ENCOUNTER
	$V_{APP\ CL}$ and V_{REF} (KIAS)	$V_{APP\ CL}$ and V_{REF} (KIAS)
12000	103	108
12500	105	110
13000	107	112
13500	109	114
14000	111	116
14500	113	118
15000	115	120
15500	117	122
16000	119	124
16500	121	126
17000	122	127
17500	124	129
18000	126	131
18500	127	132
19000	129	134
19500	130	135
20000	132	137
20500	133	139
21000	135	140
21500	136	142
22000	138	143

FLAP MANEUVERING SPEED

These speeds allow for an inadvertent 15° overshoot beyond the normal 30° bank over stick shaker actuation.

		FLAP MANEUVERING SPEED (KIAS)			
		BELOW MSLW*		ABOVE MSLW*	
FLAPS	GEAR	NO ICING CONDITIONS	WITH ICING CONDITIONS	NO ICING CONDITIONS	WITH ICING CONDITIONS
0°	UP	180	200	180	200
9°	UP/DN	160			
18°/22°	UP/DN	140	150		
45°	DN	140			

*Maximum Structural Landing Weight as specified on Limitations Section.

FINAL APPROACH SPEED

$V_{APP} = V_{REF} + \text{wind correction.}$

Wind correction = $\frac{1}{2}$ steady headwind component + gust increment above steady wind.

For Flaps 45° landing, the minimum wind correction is 5 KIAS and the maximum is 15 KIAS.

For Flaps 22° landing:

- Performing CAT I approaches, the minimum wind correction is 5 KIAS and the maximum is 20 KIAS.
- Performing CAT II or CAT III approaches, the minimum wind correction is 0 KIAS and the maximum is 20 KIAS.

For Emergency and Abnormal procedures using Flaps 0°, 9° and 18°, the minimum wind correction is 0 KIAS and the maximum is 20 KIAS. When there is wind and abnormal operation speed additives, use the sum of both corrections.

APPROACH CLIMB WEIGHT AND APPROACH CLIMB GRADIENT TABLES

The one engine inoperative Approach Climb Weight tables show the weights as function:

- temperature (°C) and airport pressure altitude (ft) at 2.5% gradient for CAT II operation;
- airport pressure altitude and gradient.

The one engine inoperative Approach Climb Gradient tables show the gradients as function of airport pressure altitude (ft), weight (kg) and temperature (°C).

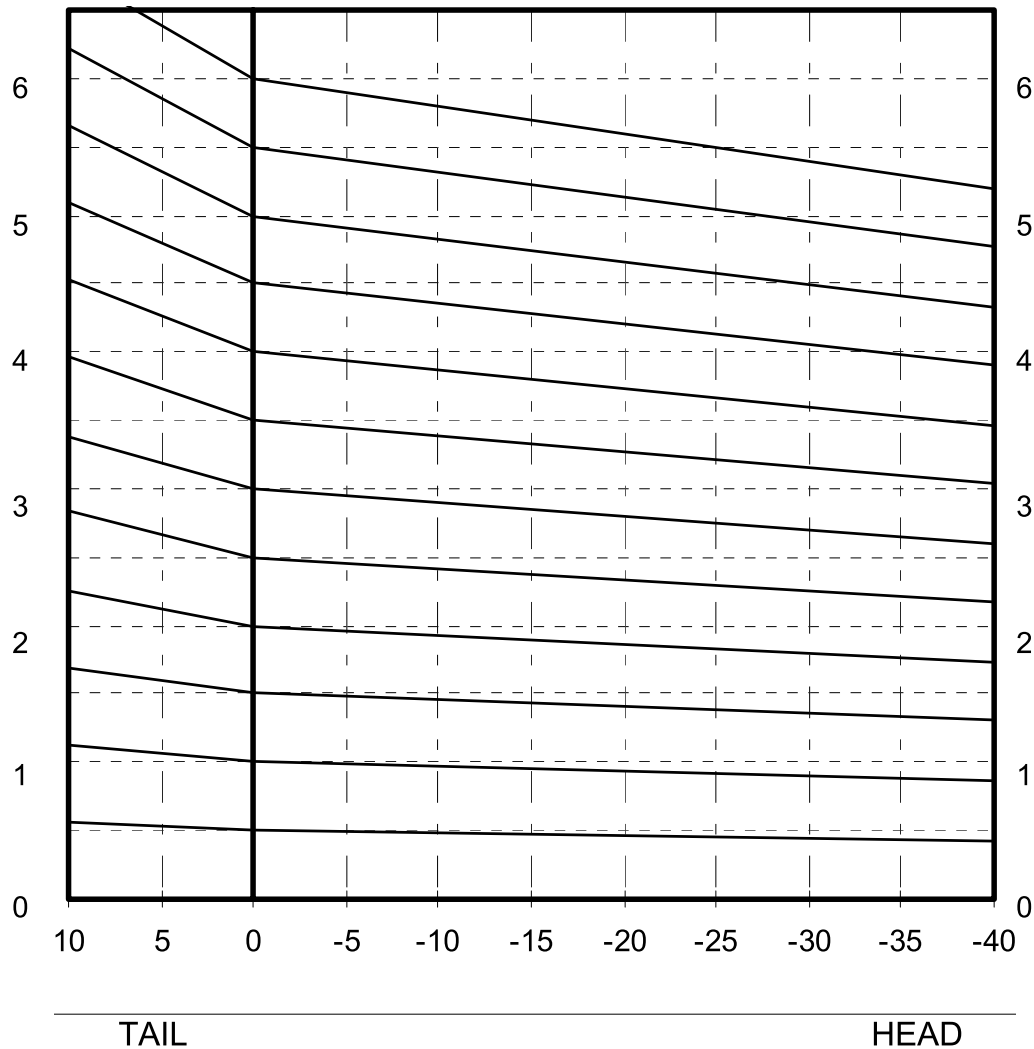
The associated conditions are:

- Flaps22° or 45°
- Gear.....UP
- Bleeds.....OPEN or CLOSED
- Anti-Ice.....ON or OFF

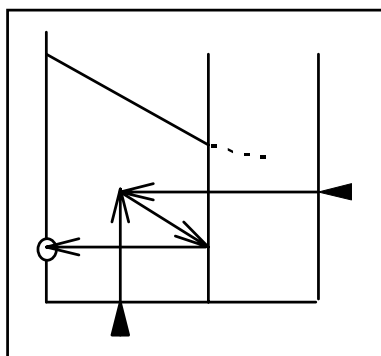
GROUND/AIR GRADIENT RELATIONSHIP

**GRADIENT
GROUND %**

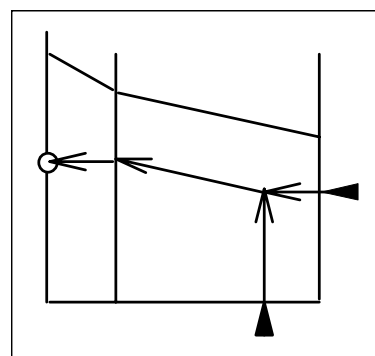
**GRADIENT
AIR %**



WIND



Tail Wind



Head Wind

APPROACH CLIMB WEIGHT - CAT II OPERATION LANDING FLAPS 22° - GRADIENT 2.5%

ROLLS-ROYCE AE3007A and A1/1 ENGINES

ANTI-ICE OFF

SAT (°C)	Altitude (ft)								
	0	1000	2000	3000	4000	5000	6000	7000	8000
-20	22545	22065	21630	21185	20745	20315	19840	19330	18835
-15	22535	22095	21640	21185	20760	20330	19855	19340	18860
-10	22565	22095	21645	21200	20770	20320	19860	19345	18865
-5	22565	22100	21650	21220	20760	20335	19865	19355	18870
0	22560	22090	21645	21195	20760	20325	19865	19350	18865
2	22555	22085	21640	21195	20755	20320	19865	19350	18865
4	22550	22085	21635	21190	20755	20320	19865	19350	18865
6	22540	22080	21630	21185	20750	20315	19860	19350	18865
8	22535	22075	21620	21175	20740	20310	19860	19350	18865
10	22530	22070	21615	21170	20735	20310	19860	19350	18865
12	22520	22060	21605	21165	20730	20305	19855	19345	18820
14	22510	22050	21600	21160	20730	20300	19855	19345	18780
16	22500	22045	21595	21150	20720	20295	19850	19340	18580
18	22490	22035	21585	21145	20715	20285	19845	19015	18230
20	22480	22025	21575	21135	20705	20280	19525	18690	17880
22	22475	22020	21570	21075	20700	19945	19130	18300	17505
24	22465	22010	21560	21015	20310	19615	18735	17910	17125
26	22455	22000	21555	20725	19905	19275	18355	17530	16760
28	22450	21995	21085	20250	19490	18940	17990	17170	16400
30	22440	21535	20610	19780	19075	18600	17630	16805	16040
32	21910	21005	20120	19335	18680	18275	17275	16450	15695
34	21380	20475	19630	18885	18285	17950	16920	16095	15355
36	20850	19965	19160	18445	17890	17625	16570	15750	—
38	20325	19475	18700	18020	17500	17295	16225	—	—
40	19800	18985	18240	17590	17110	16970	—	—	—
42	19300	18510	17790	17180	16740	—	—	—	—
44	18800	18030	17345	16770	—	—	—	—	—
46	18290	17550	16890	—	—	—	—	—	—
48	17765	17055	—	—	—	—	—	—	—
50	17250	—	—	—	—	—	—	—	—

ANTI-ICE ON

SAT (°C)	Altitude (ft)								
	0	1000	2000	3000	4000	5000	6000	7000	8000
-20	22225	21805	21420	21010	20525	20050	19510	19010	18500
-15	22220	21830	21435	21015	20560	20075	19555	19050	18570
-10	22250	21830	21435	21035	20565	20080	19560	19050	18570
-5	22235	21830	21435	21050	20565	20090	19565	19060	18575
0	22315	21840	21390	20940	20505	20065	19430	18620	17835
2	22305	21835	21380	20935	20430	19765	19035	18225	17450
4	22295	21830	21375	20930	20360	19470	18640	17835	17070
6	22285	21825	21370	20810	20110	19150	18255	17455	16700
8	22280	21820	21365	20575	19680	18810	17890	17090	16345
10	22270	21810	21355	20340	19250	18465	17520	16725	15985

APPROACH CLIMB WEIGHT - ONE ENGINE INOPERATIVE (NO ICE ACCRETION)

ROLLS-ROYCE AE3007A and A1/1 ENGINES

BLEED CLOSED - ANTI-ICE OFF

FLAPS 22°

Gradient (%)										
Alt (ft)	2.0	2.5	3.0	3.3	3.5	4.0	4.5	5.0	5.5	6.0
-500	22880	21921	21082	20653	20376	19635	18870	18234	17657	17115
0	22730	21785	20950	20532	20254	19487	18746	18105	17543	16996
500	22490	21567	20763	20340	20058	19250	18549	17915	17360	16825
1000	22245	21345	20571	20144	19836	19006	18347	17735	17173	16650
1500	21999	21121	20379	19939	19602	18811	18144	17554	16986	16474
2000	21781	20911	20183	19703	19362	18611	17945	17368	16812	16294
2500	21520	20687	19941	19421	19074	18372	17732	17145	16604	16079
3000	21251	20457	19658	19128	18823	18126	17511	16924	16391	15875
3500	21067	20300	19463	18943	18661	17963	17360	16783	16244	15742
4000	20901	20140	19263	18780	18496	17815	17205	16639	16094	15606

FLAPS 45°

Gradient (%)										
Alt (ft)	2.0	2.5	3.0	3.3	3.5	4.0	4.5	5.0	5.5	6.0
-500	22453	21581	20803	20411	20150	19431	18748	18139	17596	17072
0	22308	21442	20689	20294	20032	19292	18628	18015	17485	16963
500	22076	21220	20508	20110	19823	19069	18437	17842	17308	16807
1000	21853	20994	20323	19910	19604	18869	18241	17667	17127	16647
1500	21635	20817	20139	19694	19384	18680	18045	17492	16953	16486
2000	21412	20635	19943	19473	19159	18487	17865	17312	16794	16321
2500	21149	20423	19689	19211	18911	18259	17662	17101	16607	16127
3000	20906	20205	19426	18951	18686	18024	17452	16901	16414	15934
3500	20757	20050	19239	18793	18526	17877	17304	16768	16276	15805
4000	20606	19876	19047	18633	18362	17731	17152	16633	16136	15674

DECREASE WEIGHT BY 302 kg PER 1°C ABOVE ISA+15 CONDITIONS.
FOR ANTI-ICE ON:

- DECREASE WEIGHT BY 1010 kg WITH FLAPS 22°.
- DECREASE WEIGHT BY 1556 kg WITH FLAPS 45°.

NOTE: Values above Maximum Landing Weight are to be used for interpolation only.