Part II

Chapter 2—Flying Limitations

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1 General

(*a*) The Victor B Mk. 1 and Mk. 1A aircraft are designed for manoeuvres appropriate to the role of a high altitude medium bomber. Some Mk. 1A aircraft are equipped as tankers and are designated K Mk. 1A—Two-point. Other Mk. 1A aircraft and some Mk. 1 aircraft are equipped as three-point tankers and are designated K Mk. 1 and K Mk. 1A—Three-point.

(*b*) Aerobatics, stalling and spinning are prohibited. Speed must not be reduced below that for the onset of pre-stall buffet. (See also para. 8).

2 Speed and mach number limitations

(*a*) *With all* PFC*'s working and with both yaw dampers and automach trimmer in operation*

From sea level to 34,000 feet	330 knots
Above 34,000 feet	0·93M

NOTE: No further limitations are imposed for flight with any of the following inoperative:

Artificial feel unit
Auto-mach trimmer
One yaw damper
Any one rudder PFC sub-unit

(*b*) *With any one or two aileron or elevator sub-units inoperative*
Gentle manoeuvres only are permitted . . . . 0·90M

(*c*) *For the operation of the following services and flight with them in the extended position*

Bomb doors, Mks. 1 and 1A	No limit with Mods. 447, 862, 943 and 2053 all embodied, otherwise 300 knots or 0·90M
Airbrakes	No limit
Undercarriage	235 knots
Flaps, at TAKE-OFF position	190 knots (200 knots, post-Mod. 4206)
at DOWN position	185 knots
Nose-flaps	0·75M

(*d*) *Brake parachute streaming*

(i) Normal . . . . 140 knots maximum at landing weight of 135,000 lb.

(ii) Emergency . . .

Weight (lb.)	*Max. streaming speed (knots)*	
	Chute age 5 streams or less	*Chute age 6 to 24 streams*
135,000 .	162	155
140,000 .	160	153
145,000 .	158	150
150,000 .	155	148
160,000 .	151	144
180,000 .	143	136

NOTE: Chutes which have been used at emergency speeds must not be re-used.

(*e*) Max. crosswind for take-off, landing and streaming the brake parachute . . . . . 25 knots

3 Weight limitations

(*a*) For take-off, and landing in an emergency . . . 185,000 lb.

If Mod. 3152 is not embodied, the oleo leg pressures are to be increased to 1,500 PSI.

(*b*) After refuelling in flight . 195,000 lb.

(*c*) For normal landings . . 135,000 lb.

Brakes are not to be applied above 125 knots if landing without a brake parachute.

4 G limitations

(*a*) The following acceleration factors are not to be exceeded, with negligible aileron:

(i) *B Mk.* 1 (*Mods.* 879, 935 *embodied*) *and B Mk.* 1*A aircraft*

All up weight not exceeding	*Up to* 0·9M	*Above* 0·9M
195,000 lb. Flight refuelled weight	1·7G	1·5G
180,000 lb.	1·9G	1·7G
147,000 lb.	2·3G	2·1G

(ii) *K Mk.* 1 *and K Mk.* 1*A aircraft*

All up weight not exceeding	*Up to* 0·9M	*Above* 0·9M
195,000 lb. Flight refuelled weight	1·65G	1·5G
180,000 lb.	1·75G	1·65G
147,000 lb.	2·0G	1·9G

(*b*) If buffet is experienced before the above readings are reached, a further increase in G is not permitted.

(*c*) (i) The following acceleration factors are not to be exceeded with maximum aileron:

All up weight	G *limit*
Above 170,000 lb. . . .	Gentle manoeuvres only are permitted
Not exceeding 170,000 lb. .	1·3G
Not exceeding 147,000 lb. .	1·5G

These limitations must be borne in mind when entering and leaving turns, particularly during evasive manoeuvres.

(ii) Rapid application of aileron with G is prohibited.

(*d*) The undue application of negative G is to be avoided.

5 CG limits

Aft limit, at all weights	161 in. aft of datum
Forward limit	
Up to 100,000 lb.	140 in. aft of datum
At 160,000 lb.	142·5 in. aft of datum
At 165,000 lb.	142·75 in. aft of datum
At 170,000 lb.	143 in. aft of datum
At 175,000 lb.	143·3 in. aft of datum
At 180,000 lb.	143·7 in. aft of datum
At 185,000 lb.	144·0 in. aft of datum
At 190,000 lb.	144·3 in. aft of datum
At 195,000 lb.	144·7 in. aft of datum

and linear variation between these limits.

6 Flight refuelling

(*a*) Mk. 1A aircraft are cleared for flight refuelling by day and night from KB50J tanker aircraft at 22,000 feet and 230 knots and from KC135 tanker aircraft up to 30,000 feet at 250 to 260 knots.

(*b*) Mk. 1A, (K) 1 and (K) 1A aircraft are cleared for flight refuelling from (K) 1 or (K) 1A tankers subject to the limitations of para. 7.

(*c*) The maximum refuelled weight is not to exceed 195,000 lb.

7 Tanker limitations

(*a*) (i) Tanker aircraft are not to be flown in the low level role.

(ii) The normal aircraft limitations apply when the hoses and drogues are stowed.

(iii) Only gentle manoeuvres are permitted when the hoses are trailed. Refuelling in icing conditions is not recommended.

(iv) Pending embodiment of Mods. 4262 and 4263, refuelling by night is permitted only by three-point tankers in the case of small highly manoeuvrable aircraft or if the receiver provides adequate lighting, since the inadequate tanker lighting could lead to receiver pilot disorientation.

(v) In the training role, dry contacts are permitted, by day only unless the receiver is cleared for night contacts. Blanking plates are to be fitted to the hoses to ensure that no fuel is passed.

(vi) The aircraft may be flown without pods provided that blanks are fitted on the pylons which are left in position on the wing. Flight with the Mk. 17 HDU removed is prohibited.

(vii) If Mod. 4171 is not embodied in the Mk. 20 B pod pressurisation system the rate of descent must not exceed 5,000 ft./min. when the pods are not full.

(viii) Pending further trials the auto-pilot is not to be used during flight refuelling, except in the case of Lightning aircraft.

(*b*) *Trailing and trailed speeds—Mk. 20 B pods*

Under all conditions the minimum and maximum speeds are to be observed. The speed range is as follows:

Height	*Speed*	
	Min.	*Max.*
Sea level to 24,000 ft.	230 kts.	310 kts.
24,000 ft. to 40,000 ft.	230 kts.	310 kts. decreasing linearly to 260 kts./0·85M at 40,000 ft.

(*c*) *Wind-in speeds—Mk. 20 B pods*

Hoses should normally be wound in at the following speeds:

Height	*Speed*
Sea level to 35,000 ft.	Below 275 kts.
35,000 ft. to 40,000 ft.	Decreasing linearly to 260 kts./0·85M

(*d*) *Trailing, trailed and wind-in speeds—Mk.* 17 HDU

(i) *High-speed drogue*

1 *Training role*

Max. speed. 270 knots up to 35,000 feet, decreasing linearly to 260 knots at 40,000 feet.

Min. speed. 230 knots.

2 *Tanker role*

Max. speed. 270 knots up to 25,000 feet, decreasing linearly to 260 knots at 40,000 feet.

Min. speed. 230 knots.

(ii) *Intermediate-speed drogue*

Max. speed. 280 knots up to 34,000 feet, decreasing linearly to 260 knots (0·85M) at 40,000 feet; 0·85M up to 43,000 feet.

Min. speed. 210 knots up to 40,000 feet, increasing linearly to 230 knots at 43,000 feet.

(iii) *Low-speed drogue*

Not yet cleared for service use.

(*e*) *Emergency—pods and HDU*

(i) The recommended speeds for selecting EMERGENCY TRAIL are as follows:

AUW	*Speed*
Up to 150,000 lb.	200 kts.
150,000 lb. to 195,000 lb.	Increasing linearly to 230 kts.

(ii) The recommended hose jettison speed is 230 knots.

(*f*) The following aircraft are cleared for both wet and dry contacts from the positions stated:

Receiver	*Tanker*	*Positions*	*Day or Night*
Victor K1, B1A, K1A, 2 (BS), 2 (SR)	3-pt.	HDU	D
Vulcan 1A, 2	3-pt.	HDU	D
VC10 C1	3-pt.	HDU	D/N
Belfast *	3-pt.	HDU	D
F100	2/3-pt.	All	D
Buccaneer 1 and 2	2/3-pt.	All	D
Lightning 1A, 2, 3, 5, interim 6, 6	2/3-pt. †	All	D/N‡
Javelin 9	2/3-pt.	HDU, port pod (emergy only)	D
Sea Vixen 1 and 2	2/3-pt.	HDU, stbd pod	D

* Low-speed drogue clearance required.

† The auto-pilot may be used.

‡ Night contacts, 3-point tankers only.

8 Fixed droop leading edges

Mk. 1A, (K) 1A and (K) 1 aircraft embodying Mod. 2352 must not be flown at speeds below the onset of pre-stall buffet or the recommended threshold speed, whichever is higher.

9 Aircraft approach limitations (AAL)

The AAL's are:

GCA/Precision Radar	250 feet above airfield level
GCA/Search Radar	400 feet above airfield level
Manual ILS	350 feet above airfield level
ILS/Zero Reader	250 feet above airfield level
Auto ILS	250 feet above airfield level

10 Miscellaneous limitations

(*a*) The engines are cleared for use with AVTUR fuel. AVTAG fuel may be used, provided that silica-gel $\frac{1}{4}$ in. plus crystals are used in the fuel tank pressurising system air drier and the silica-gel desiccant is inspected during primary star servicing.

(*b*) (i) Engine anti-icing is cleared for use.

(ii) Airframe anti-icing is cleared for use provided that the following modifications are embodied:

B Mk. 1A . . .	2548A, B, C, 2774, 2802
K Mk. 1, K Mk. 1A . .	2802

(*c*) The Auto-Mach trimming system is only to be switched on when deliberate flight beyond 0·85M is intended and is to be switched off before reducing speed below 0·84M.

(*d*) Dry running of booster pumps should be avoided. The pumps may be dry run for up to 30 minutes without damage but beyond that limit serious deterioration will occur. There is no fire risk. In the 3-point tanker role bomb bay tank booster pumps can be dry run for up to two hours without damage.