

PART II—LIMITATIONS**LIST OF CHAPTERS**

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PART II—LIMITATIONS

Chapter 1—ENGINE LIMITATIONS

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1 Engine limitations — Avon Mk. 109

Power rating	Time limit per flight	RPM	JPT °C
Max. take-off and operational necessity	10 mins.	7,950±50	680
Max. intermediate	30 mins.	7,750	620
Max. continuous	Unrestricted	7,500	575
Idling on ground	Unrestricted	7,750±100	530

NOTE 1: At low air temperatures the engines may underspeed to as low as 7,800 RPM at full throttle but they will still maintain maximum thrust.

NOTE 2: The ground RPM will vary with a change in fuel density from that at which the engine settings were made. A higher density will cause a drop in RPM and a lower density a rise. Every 0.01 change in density will cause a corresponding difference of 50 in the ground RPM.

2 Oil limitations

Oil pressures

Minimum at 7,500 RPM and above ...	15 PSI
Normal at 7,500 RPM	20 PSI
Minimum at idling RPM	3 PSI

3 Fuel and oil specifications

The engines are cleared for the following fuels and oils provided that the engines are suitably adjusted.

<i>Fuel</i>	<i>Reference No.</i>	<i>N.A.T.O. Code No.</i>
AVTUR 50	34A/9431771	F.35
AVTUR 50 with icing inhibitor	34A/2201036	F.34
AVTAG	34A/9100448	F.45
AVTAG with icing inhibitor	34A/2201037	F.40
◀AVCAT	—	F.44▶

<i>Oil</i>	<i>Reference No.</i>	<i>N.A.T.O. Code No.</i>
OX-38	34A/9100591	0-149

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Chapter 2—AIRFRAME LIMITATIONS

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1 General

- (a) The aircraft is designed as a light bomber/interdictor and is cleared for bombing, loft bombing and interdiction.
- (b) The aircraft is released for the rocket interdictor role subject to the conditions stated and bearing in mind that the strength factors of the aircraft are lower than those normally required in a pure ground attack aircraft.
- (c) Intentional spinning and aerobatics, other than the loft bombing manoeuvre, are prohibited.

2 Speed and mach number limitations

	Condition	Max. IAS	Max. IMN
(a)	Airframe limitations: Clean, and with gun-pack	450	0.75M below 15,000 ft. 0.79M 15,000 to 25,000 ft. Above 25,000 ft. limited by compressibility effects. The speed at which a nose-up change of trim occurs, i.e. about 0.84M, must not be exceeded.

	Condition	Max. IAS	Max. IMN
(b)	With wing-tip tanks	365	0.79M below 25,000 ft. 0.80M above 25,000 ft.
(c)	With rockets	As at (a) and (b) above.	
(d)	For the operation of: Bomb/flare doors	350	0.75M up to 40,000 ft. 0.80M above 40,000 ft.
	Airbrakes MID	No limit	No limit
	Airbrakes OUT	400	0.75M, 12,500 ft. to 25,000 ft.
	Undercarriage	190	0.79M above 25,000 ft.
	Flaps	160	

NOTE 1: The speed for the operation of a service also applies for flight with the service in the extended position.

NOTE 2: The use of a bomb bay air deflector allows the bomb doors to be opened at airspeeds up to 450 knots depending on the type of store carried. Full details are given in the Release to Service.

3 Maximum weights

For take-off and all permitted forms of flying 56,000 lb.
For landing 40,000 lb.

NOTE: In emergency the aircraft may be landed at higher weights but greater care will be required particularly when braking (see Part III, Ch. 3, para. 5).

4 CG limits (feet aft of datum)

◀(a) In flight and landing

(i) Forward limit

With or without wing tip tanks, 1.235 at weights up to 29,000 lb., then varying linearly aft to 2.200 at 48,000 lb.; remaining constant thereafter at 2.200 up to maximum take-off weight.

(ii) Aft limit

Clean—3.058.

With wing-tip tanks 2.810.

(b) When taxiing over uneven surfaces, the aft limit should not exceed 2.885 ft. ▶

5 Manoeuvre limitations

The acceleration limitations are as follows:—

(a) *At weights up to 48,000 lb. without tip-tanks*

(i) *With negligible aileron applied*

Integral tanks full	...	...	...	...	4.0G
Integral tanks less than full	...	...	...	...	3.5G

(ii) *With aileron applied*

Integral tanks full	...	...	...	...	3.5G
Integral tanks less than full	...	...	...	...	2.0G

(b) *At weights above 48,000 lb. or with wing tip tanks fitted*

Any integral tank fuel state:—

(i) With negligible aileron applied	...	...	...	3.0G
(ii) With aileron applied	...	...	...	1.5G

(c) *Rocket firing*

(i) *With airbrakes retracted or in MID position:—*

Below 0.75M or 450 Kts.	3G at 40,000 lb.
From 0.75M to 0.83M or 450 Kts.	2G at 40,000 lb.

(ii) *With airbrakes fully out:—*

Below 0.75M or 400 Kts.	3G at 40,000 lb.
From 0.75M to 0.79M or 400 Kts.	2G at 40,000 lb.

These limitations apply during the actual firing only.

6 Jettisoning of wing tip tanks

The wing tip tanks may be jettisoned at any speed, full or empty within the limitations imposed when carrying wing tip tanks.

7 Armament limitations

When carrying armament stores, there may be certain limitations imposed additional to those quoted above. It is essential, therefore, that if any armament stores are carried, any limitations associated with their carriage and release or jettisoning are obtained from the Release to Service before flight.

8 Aircraft approach limitations

The following are the normal aircraft approach limitations:—

GCA (Precision)	200 ft.
ILS (Manual)	300 ft.
ILS—Zero reader	200 ft.



9 Barrier engagement

The aircraft is cleared for engagement with the Mk. 5, Mk. 6 and Mk. 12 arrester barriers.

PART II—LIMITATIONS

Chapter 3—MISCELLANEOUS
LIMITATIONS

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1 Pilot limitation

Pilots having a thigh length in flying clothing of more than 26.5 inches must not fly the aircraft. This restriction is imposed because personnel with a greater thigh length are liable to injury due to the knees fouling the coaming if the ejection seat is used.

**2 Ejection seats***(a) Type 1C series seats*

The minimum height recommended for ejection in straight and level flight is 1,000 feet. The best speed for ejection is 200 kts.

(b) Type 2CA series seats.

- (i) Ejection may be initiated, in straight and level flight, at any height from ground level upwards. However, runway ejections should only be made when the speed of the aircraft is above 90 kts or the circumstances of the emergency dictate that ejection is the only reasonable solution. If at any time the aircraft is nose-down or descending, the minimum safe height is increased and depends on the angle of dive and aircraft speed.
- (ii) Pre-Mod. 3776 the navigator's hatch must be jettisoned before rear crew eject. Due allowance must be made for this additional delay in deciding the minimum height for ejection.

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