

Griffon 69—Operating Limitations

(Research Engines 7326.—1.11.45.)

1. The following are the operating limitations for which this engine has been tested and approved for Service use. Any encroachment on these limitations may initiate the development of defects which would eventually render the engine unserviceable, before the normal period between complete overhauls.

2. *Approved fuel.*—Specification DED.2475 (100/130 grade or 100/150 grade).

Approved oil.—Specification DED.2472/B.

3. <i>Engine Revolutions (r.p.m.).</i>	<i>Low Gear</i>	<i>High Gear</i>
(i) Maximum for take-off, permissible up to 1,000 ft. or for 5 min. duration, whichever is the shorter period.	2750	—
(ii) Minimum for take-off at maximum take-off boost	2600	—
(iii) Maximum for climbing (60 min. limit)	2600	2600
(iv) Maximum for combat (5 min. limit)	2750	2750
(v) Maximum for cruising	2400	2400
(vi) Maximum for special emergency	2600	2600
(vii) Maximum for diving (20 sec. limit)	2880	2880
Momentary maximum (3-sec. limit)	3150	3150

4. <i>Boost Pressures (lb./sq. in.).</i>		
(i) Maximum for take-off, permissible up to 1,000 ft. or for 5 min. duration, whichever is the shorter period	+ 12	—
(ii) Maximum for climbing (60 min. limit)	+ 9	+ 9
(iii) Maximum for combat (5 min. limit), 100/130 grade fuel	+ 18	+ 18
Maximum for combat (150 grade fuel)	+ 25	+ 25
(iv) Maximum for cruising	+ 7	+ 7
(v) Maximum for special emergency	+ 9	+ 9
(vi) Maximum for diving (100/130 grade fuel)	+ 18	+ 18
Maximum for diving (150 grade fuel)	+ 25	+ 25

5. <i>Oil Temperatures deg. C. (inlet to engine).</i>	
(i) Minimum for take-off	15
(ii) Maximum for cruising	90
(iii) Maximum for climbing	90
(iv) Emergency maximum (5 min. limit)	150

6. <i>Oil Pressures (lb./sq. in.).</i>	
(i) Minimum in flight*	45

* This is the minimum to which the pressure may fall gradually (see relevant engine handbook; Vol. I)

7. <i>Coolant.</i>	
(i) Approved type—pressure liquid	(70 per cent. water + 30 per cent. ethylene glycol)

(ii) Temperatures deg. C. (outlet from engine)	
(a) Maximum for climbing and special emergency (see para. 3 (vi) and 4 (v))	125
(b) Maximum for cruising	105
(c) Maximum for combat (5 min. limit)	135
(d) Minimum for take-off	60

Note:—Temperatures up to 115 deg. C. are permitted for short periods at cruising conditions on fighter aircraft, and on other aircraft for special applications only.

8. *Constant Speed Propeller Control.*

The governor control and throttle may be adjusted to give the desired constant r.p.m. and boost pressure, but the maximum limitations given above must not be exceeded. The general principles of the use of these limitations are given in A.M.O. A.415/38, while the following are the particular instructions for the Griffon 69 engine:—

(i) The position of the governor control for take-off should be such that with constant speed unit controlling 2,750 r.p.m. will not be exceeded.

(ii) The control should be kept in the maximum take-off setting for not longer than 5 min. or up to 1,000 ft., whichever is the shorter period. After this period it should be set so that 2,600 r.p.m. is not exceeded on the climb. (See also para. 9.)

(iii) For cruising, the control should be set to the desired r.p.m. but the limitations quoted in para. 3 and 4 must not be exceeded. For a given I.A.S. better fuel economy is obtained by keeping the engine r.p.m. as low as possible consistent with smooth running, provided the maximum cruising boost pressure is not exceeded.

9. *Emergency Use of + 25 lb./sq. in. Boost for Combat.*

(i) + 25 lb./sq. in. boost pressure may be used for combat, which includes level flight, climbing or diving operations, but it should be realised that its use for these operations is a definite overload on the engine.

(ii) The use of this boost pressure is limited to periods not exceeding 5 min. duration, and it must only be used in conjunction with 150 grade fuel and engine speeds between 2,600 r.p.m. and 2,750 r.p.m.

(iii) + 25 lb./sq. in. boost is obtained with the pilot's lever in the full forward position, *i.e.* through the gate.

(iv) The fuel consumption at 25 lb./sq. in. boost and 2,750 r.p.m. will be increased by approximately 100 per cent. over the consumption at the normal climbing conditions of + 9 lb./sq. in. and 2,600 r.p.m. Due consideration must be given therefore to the effect of the increased consumption on the air endurance of the aircraft if the use of this boost pressure becomes necessary during flight.