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AEROPLANE AND ARMAMENT EXPERIMENTAL ESTABLISHMENT.

TS 18/4/63

BOSCOMBE DOWN.

UNCLASSIFIED

Kittyhawk A.K. 572.

(Allison V.1710 F.3.R)

Rate of climb and position error measurements.

A. & A.E.E. Ref:- A.A.E.E./4484/1-A.S.76.
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"This report deals with the aircraft (or equipment) as tested. Action to remedy defects or decisions to accept items not in strict compliance with the specification are matters for decision and action by the Ministry of Aircraft Production."

Report No.	Title.
3rd Part of A. & A.E.E. /783.	A.K. 579 - Flame damping trials with American design fishtails.
4th do.	A.K. 572 - Carbon monoxide contamination tests.
5th do.	A.K. 572 - Weights, loading data and leading particulars.
6th do.	A.K. 572 - Fuel consumption trials.
7th do.	A.K. 579 & A.L. 229 - Radio trials - Communication sets.

SUMMARY.

The performance on climb has been measured at a weight of 8480 lb. The results show:-

The maximum rate of climb is 1640 ft/min.	at 11,400 ft.
Time to 10,000 feet.	is 6.2 minutes.
Time to 20,000 feet.	" 14.2 minutes.
Service ceiling	" 28,700 feet.
Estimated absolute ceiling.	" 29,900 feet.

The position of the pressure head, the position error correction, and the correction to the altimeter when connected to the static of the airspeed system are included in the report.

1. Introduction.

Performance measurements were required on Kittyhawk A.K. 572. This part of the report contains the performance on climb and measurement of position error. Level speed performance will be given in a later report.

2. Scope of tests.

The climbs were made at an initial climbing speed of 145 m.p.h. A.S.I., the recommended speed from tests made in the U.S.A. No partial climb tests were made to confirm this climbing speed.

The position error correction was measured by the aneroid method.

The tests were made between 13/2/42 and 29/3/42.

3. Condition of aeroplane relevant to tests made.

This aeroplane is an early 4-gun model and has neither the various American modifications and improvements, nor any British modifications incorporated, and is not therefore representative of Kittyhawks that will be in use operationally. The external differences were that four guns were installed instead of six, and that there was no housing for the G.45 camera under the starboard wing. Neither aerials nor aerial masts were fitted. The effect of these modifications on the performance on climb and position error is likely to be small and the results given in this report should apply equally to the later type at the same weight.

/Neither

Neither bomb racks nor external overload tanks were fitted. exhausts were individual stub exhausts as distinct from the multi-fishtail ejectors which were fitted subsequently. The propeller was a Curtiss Electric type C.5315.S-D16 of 11'0" diameter.

The tests were made at a weight of 8480 lb., with the centre of gravity 26.5 inches aft of the datum measured with undercarriage down. This weight is the fighter load when fitted with 4 x 0.5" guns. On the later aeroplanes with 6 x 0.5" guns, the weight will be approximately the same due to a reduction in ammunition load.

4. Results of tests.

The performance on climbs given in Table I and in Figure I. These show that:-

Maximum rate of climb (at 11,400 ft) is 1640 ft/min.
 Time to 10,000 ft. 6.2 minutes.
 Time to 20,000 ft. 14.2 minutes.
 Service ceiling. 28,700 feet.
 Estimated absolute ceiling. 29,900 feet.

The position of the pressure head, together with the corresponding position error correction and correction to altimeter when connected to the static of the airspeed system, are given in figures 1, 2 and 3 respectively.

TABLE I.
PERFORMANCE ON CLIMB.

Standard Height Feet.	Rate of climb Ft/min.	Time Mins.	T. A. S. m. p. h.	A. S. I. m. p. h.	Compressibility and Position Error Corr ^{ns} .		R. P. M.	Boost Hg. in.	Radiator Shutters.
					P. E. C.	C. E.			
0	-	0	-	-	-	-	-	-	Fully open.
2000	1570	1.3	150	145	+0.8	-	2600	37	↓
4000	1580	2.55	155	↓	↓	-0.1	↓	↓	
6000	1600	3.8	159	↓	↓	-0.2	↓	↓	
8000	1610	5.05	164.5	↓	↓	-0.2	↓	↓	
10000	1630	6.25	169	↓	↓	-0.3	↓	↓	
*11400	1640	7.15	173	↓	↓	-0.3	↓	↓	
12000	1580	7.5	173.5	144	+0.8	-0.3	36.4	↓	
14000	1400	8.85	175	141	+0.5	-0.4	33.7	↓	
16000	1220	10.4	177	138	+0.2	-0.4	31.1	↓	
18000	1050	12.15	178	135	-0.2	-0.5	28.8	↓	
20000	870	14.25	179.5	132	-0.5	-0.6	26.7	↓	
22000	700	16.8	180.5	129	-0.8	-0.6	24.9	↓	
24000	520	20.1	182	126	-1.3	-0.7	23.0	↓	
26000	340	24.75	183.5	123	-1.6	-0.7	21.4	↓	
28000	160	33.15	184.5	120	-2.0	-0.8	19.7	↓	

* Full throttle height. Greatest height reached - 28,500 ft.
 Estimated service ceiling - 28,700 ft. Estimated absolute ceiling - 29,900 ft.

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