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19th Part of Report No. A. & A.L.L./783.

20 JUN 1943

AIRCRAFT AND ARMAMENT EXPERIMENTAL ESTABLISHMENT

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BOSCOMBEL DOWN

Kittyhawk IA L.T.573
(Allison V1710 F3R)

Level speed performance
with normal cowling fitted.

DATE	STOCK
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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 Prodn.

A. & A.L.L. Ref:- 4484/1/A.S.76/
M.A.P. Ref:- R.A.1864/D.A.N.L.L.
Period of tests:- May, 1943.

Progress of issue of report

Report No.	Title
14th Part of A. & A.L.L./783.	A.L.229 - Level speed measurements with flame damping exhausts fitted.
15th do.	A.L.229 - Weights and loading data.
16th do.	A.K.751 - Handling and performance with a Hydulignum propeller.
17th do.	A.L.229 & A.K.572 - Handling trials.
18th do.	L.T.573 - Level speed performance with a modified engine cowling incorporating air cleaners.

1. Introduction.

Level speed measurements have been made on this aircraft when fitted with a modified cowling incorporating a faired air intake with air cleaner filters on each side of the cowling. The results of these tests were given in the 18th Part of Report No. A.L.L./783. The aircraft has now been fitted with a normal cowling and further level speed performance tests have been made. Comparison with the previous results gives the speed loss due to the additional external air intakes.

2. Condition of aircraft relevant to tests.

2.1. General. The aircraft has been described in the 18th Part of Report No. A.L.L./783. The only alteration that has since been made was the fitting of a normal type nose cowling without the air intakes on each side. These intakes are the only external change.

Photographs which show the normal cowling now fitted were attached to the 6th Part of Report No. A.L.L./783.

2.2. Loading. The tests were made at a take-off weight of 8,650 lb. with the centre of gravity 25.9" aft of the datum.

2.3. Engine numbers and limitations. The aircraft was fitted with an Allison V1710-F3R engine, Nos.9812/42-34127. The operational limitations applicable to these tests were:-

	R.F.M.	Boost
Maximum permissible for all-out level and take-off (5 mins.)	3000	42 Ins.Hg

3. Scope of tests.

Measurements of all-out level speed were made from 4,000 ft. to 20,000 ft. with the radiator cooling gills in the neutral position.

4. Results.

The results of the tests have been corrected to standard atmospheric conditions and to 95% of the take-off weight, viz. 8,220 lb., by the methods given in Report No. A.L.L./Res/170. In evaluating these speeds the same position error correction curve has been used as for the previous tests on this aircraft, viz. that measured on A.K.572 and given in the 8th Part of Report No. A.L.L./783.

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The results of these tests are given fully in Table I and Fig. 1, and summarised below:-

Maximum level speed at 10,000 ft. 329 mph.TAS.
 " " " " 13,800 ft. 344 mph.TAS.(Full throttle height)
 " " " " 20,000 ft. 330 mph.TAS.

The results obtained with the tropical cowling fitted have been extracted from the 13th Part of this report and plotted in Fig. 1 for comparison.

5. Conclusions.

A comparison with the results given in the 13th Part of this Report shows that the maximum level speed at full throttle height has been increased from 335 mph. with the modified cowling (air intakes on each side) to 344 mph. with the standard cowling. The full throttle height has been raised by 300 ft. It is pointed out that the level speed measurements with the modified cowling were made using air from the normal and not the filter air intake. Since the normal intake is the same with both cowlings the change of speed is due to changes only in the drag characteristics of the aircraft.

TABLE I
All-out level speed performance
 Radiator cooling gills in neutral position
 Corrected to 8,220 lb.

Standard height (ft)	T.A.S. m.p.h.	A.S.I. m.p.h.	Corrections m.p.h.		R.P.M.	Boost Ins.Hg		
			F.L.	C.L.				
2,000	298	280	+10	-0.4	3000	42		
4,000	305	278	+10	-0.8	↓	↓		
6,000	313	277	+ 9.9	-1.1				
8,000	321	276	+ 9.8	-1.6				
10,000	329	275	+ 9.8	-2.0				
12,000	337	273	+ 9.7	-2.5				
13,800*	344	271	+ 9.6	-2.9				
16,000	341	260	+ 9.4	-3.2			38.8	
18,000	337	249	+ 8.9	-3.3			35.9	
20,000	330	236	+ 8.3	-3.2			↓	33.9

* Full throttle height.

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