AVIA 18/734

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14th Part of Report No. A.& A.E.E./783.

14 SEP 1942

TS 18/2/63

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AEROPLANE AND ARMAMENT EXPERIMENTAL ESTABLISHMENT

BOSCOMBE DOWN

Kittyhawk I. A.L. 229 DATE 4/1/53
(Allison V1710 F3R)

STOCK 8

Level speed measurements with flame damping exhausts fitted

REDUCED TO 12

99 DATE 6.1.53

A.& A.E.E. Ref:- 4484/1-A.S.76/3.
M.A.P. Ref:- R.A.1864/D.A.N.A.1.

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 M.A.P.

Progress of issue of report

Report No.	Title
9th Part of A.& A.E.E./783.	A.L.229 - Fuel consumption trials and range flight with a long range jettisonable ventral tank fitted.
10th do.	A.L.229 - Performance tests with an external fuel tank fitted.
11th do.	A.L.229 - Take-off and landing trials with and without overload fuel tanks.
12th do.	A.K.572 & A.L.229 - Engine cooling trials.
13th do.	A.L.229 - Gun heating tests.

SUMMARY

Level speed measurements have been made on Kittyhawk I, A.L.229, fitted with flame damping exhausts for comparison with the results obtained on the aame aeroplane fitted with individual stub exhausts (reported in 10th part of Report No.A.& A.E.E./783). With flame damping exhausts the top speed is reduced by 1 to 2 m.p.h. true air speed.

1. Introduction:

Kittyhawk A.L.229 has been fitted with flame damping exhausts. Level speed measurements were required for comparison with speeds obtained with the individual stub pipe exhausts fitted.

2. Scope of tests.

Maximum level speeds were measured between 11,000 ft. and 19,000 ft. The tests were made between 9th June 1942 and 30th July 1942.

3. Condition of aeroplane relevant to tests made.

A full description of the aeroplane has been given in 10th Part of Report No.A.& A.E.E./783; apart from the change of exhausts and the removal of the under fuselage fuel tank, the aeroplane was in the same condition for these tests. A photograph of the flame damping exhausts has been given in 4th Part of Report No.A.& A.E.E./783 whilst the individual stub exhausts are shown in 6th Part of Report No.A.& A.E.E./783.

Tests were made at the same weight as before i.e. 8485 lb.

4. Results of test:

The speed measurements obtained with flame damping exhausts fitted are given in table I and figure 1. The corresponding results with the individual stub pipe exhausts (under fuselage fuel tank removed) have been given already in 10th part of Report No.A.& A.E.E./783. The results extracted from that report are shown dotted in figure 1. It will be seen that fitting flame damping exhausts has caused a small reduction of top speed of between 1 and 2 m.p.h. true air speed.

/TABLE I,

TABLE I.
Level speeds with flame damping exhausts fitted.

Standard Height in Feet.	True airspeed m.p.h.	A.S.I. m.p.h.	Position Error Correction. m.p.h.	Compressibility Correction. m.p.h.	R.P.M.	Manifold pressure inches of Hg.
12,000	322	260	+9.4	-1.5	3000	41.5
14,000	329	257.5	+9.3	-1.9	↓	41.5
14,400 ✱	330	256.5	+9.3	-2.0		41.5
16,000	327.5	248.5	+9.0	-2.1		39.0
18,000	322	237	+8.4	-2.2		36.0

✱ Full throttle height.

TABLE II
ENGINE LIMITATIONS

Maximum permissible r.p.m. for level flight (5 minute limit) - 3000
Maximum permissible boost for level flight, when automatic boost is not fitted (5 minute limit) 42 inches of Hg.

Illustrations
Figure I - Level speeds and manifold pressure at height.

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KITTYHAWK I AL-229 Fig 1

LEVEL SPEEDS AND MANIFOLD PRESSURE AT HEIGHT.

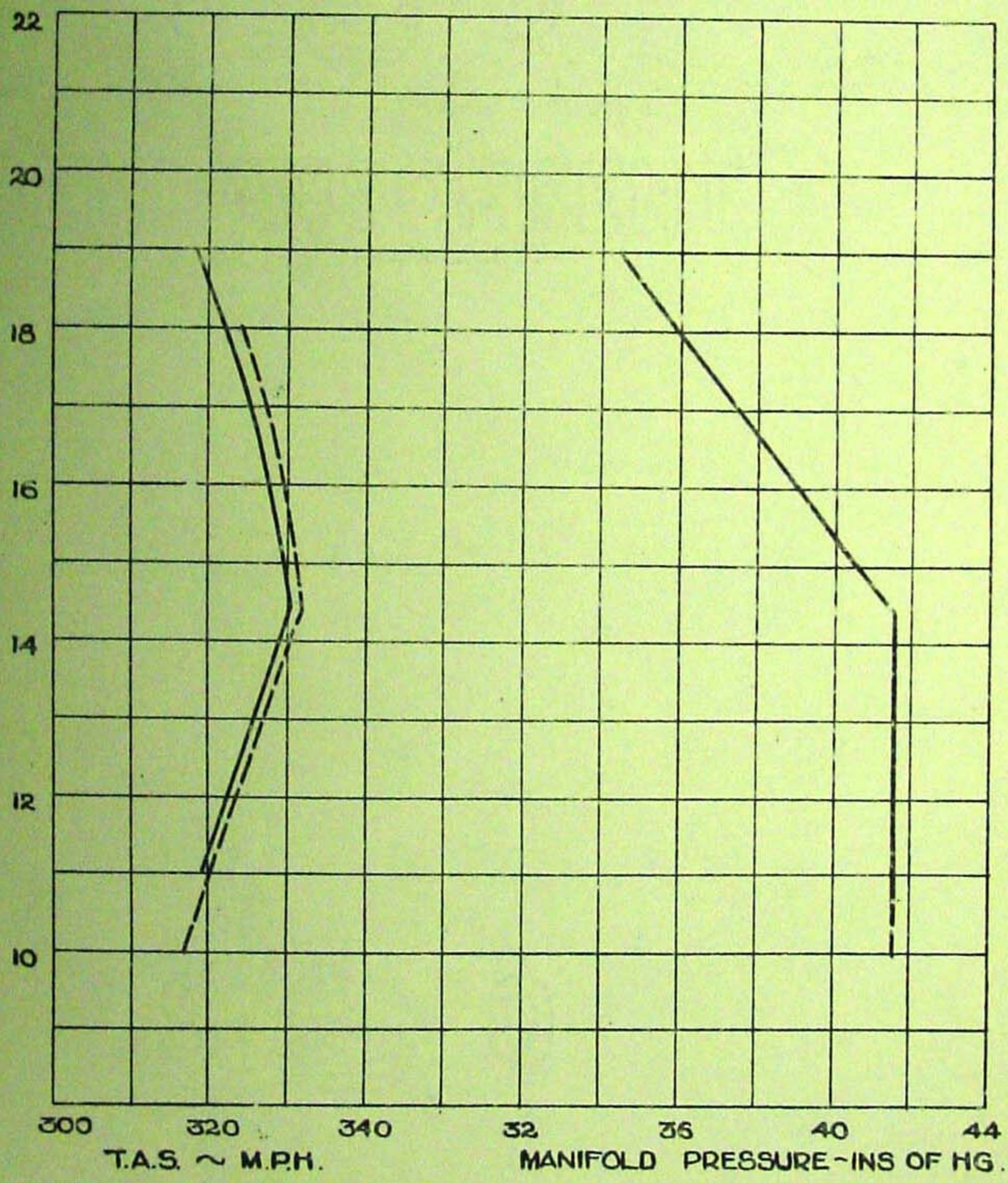
(3000 R.P.M.)

———— WITH FLAME DAMPING EXHAUST.
– – – – WITH INDIVIDUAL STUB EXHAUST.
(FROM 10th PART OF REPORT Nº A&AEE/783)

GILLS IN MINIMUM DRAG POSITION.

UNDER-FUSELAGE FUEL TANK REMOVED.

WEIGHT ~ 8485 lb.



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KITTYHAWK IA ET 573 FIG. 1

ALLISON V 1710 - F 3 R

ALL OUT LEVEL SPEED PERFORMANCE

RADIATOR COOLING GILLS IN NEUTRAL POSITION

CORRECTED TO 8220 LB.

——— WITH NORMAL COWLING

- - - - - - WITH MODIFIED COWLING (FROM 18TH P.O.R. AtA.E.E/783)

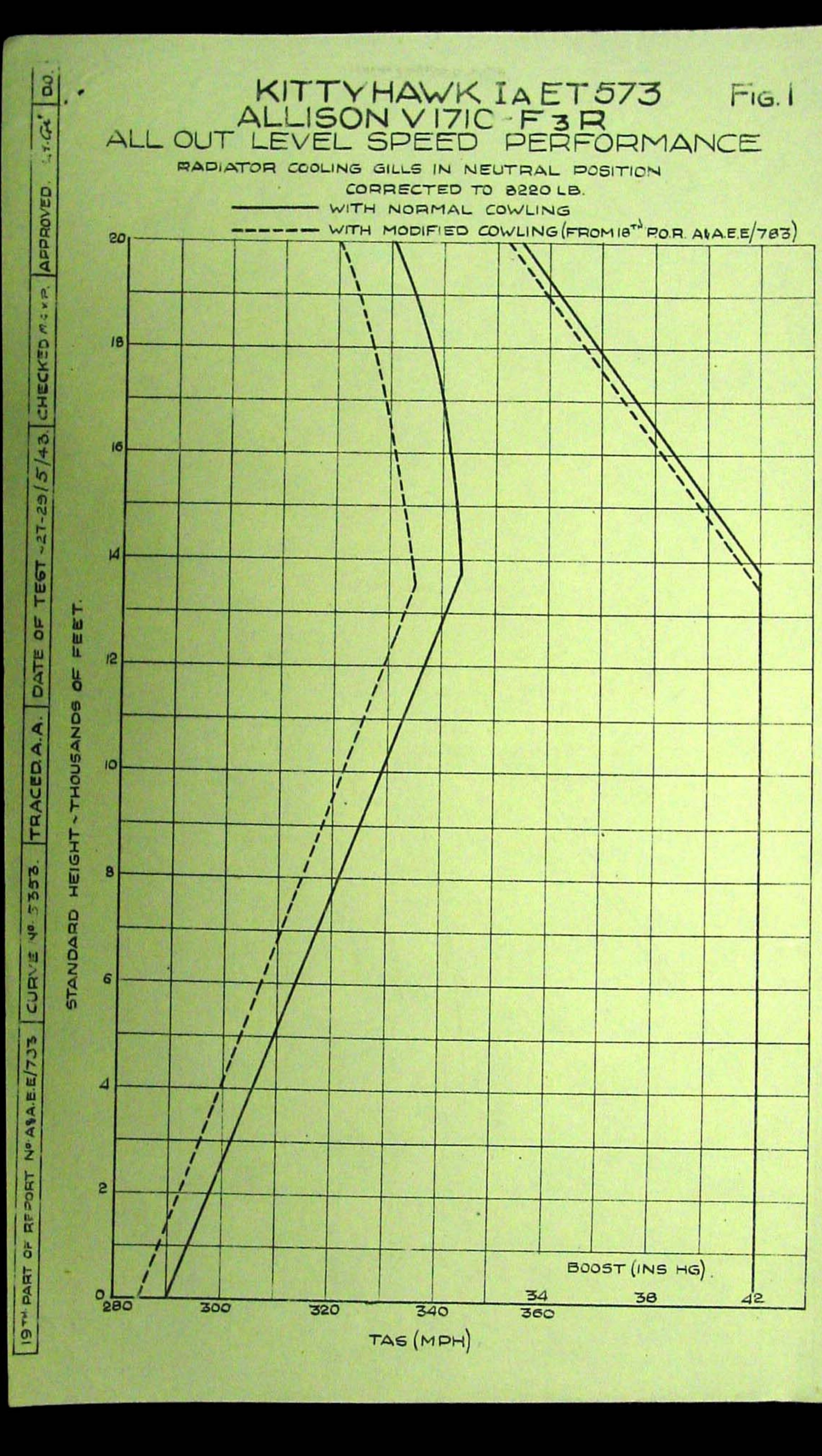

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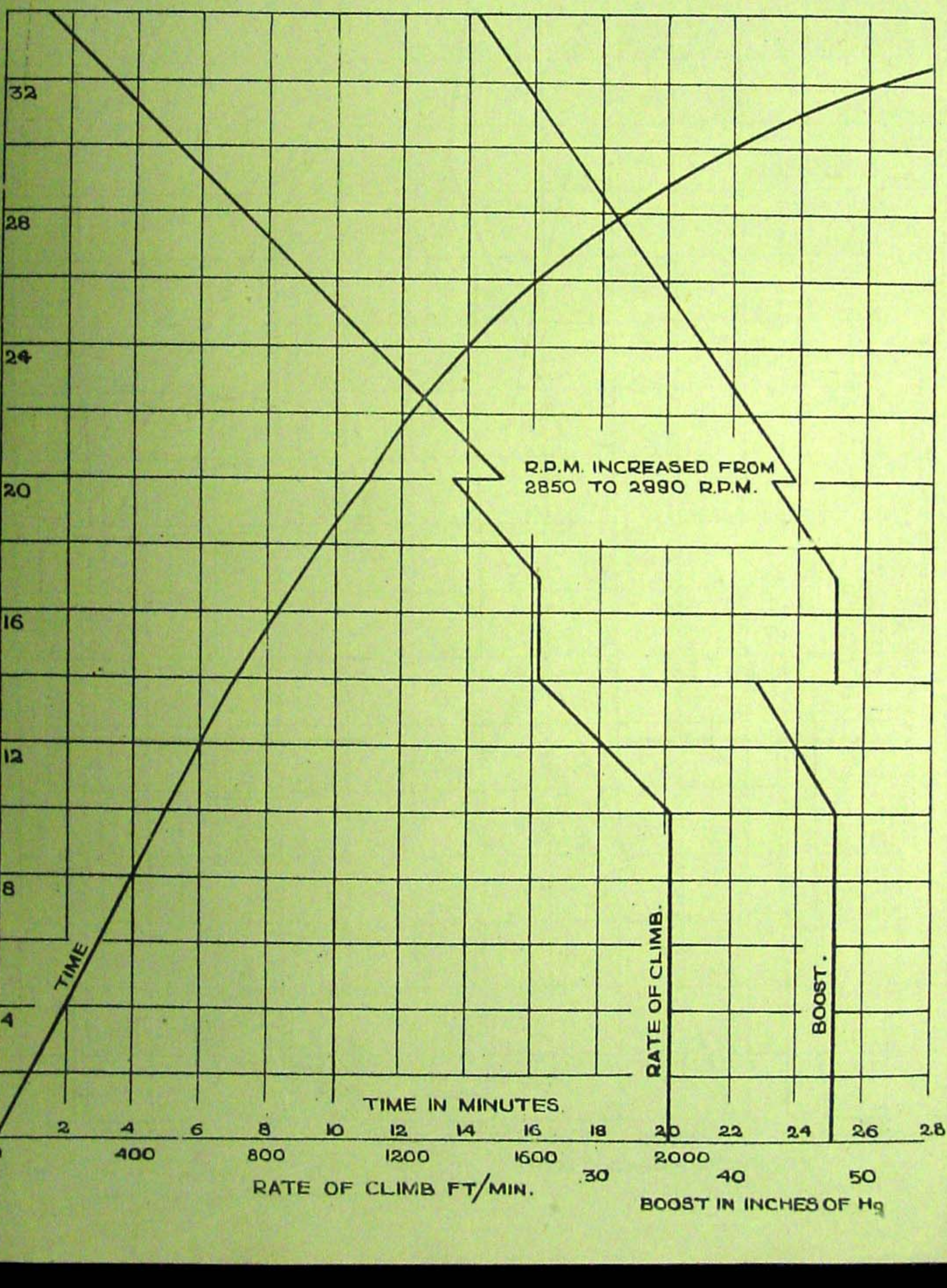
FIG. 1

KITTYHAWK II FL-220

WEIGHT ~ 8910 lbs.

PERFORMANCE ON CLIMB.

GILLS FULLY OPEN.



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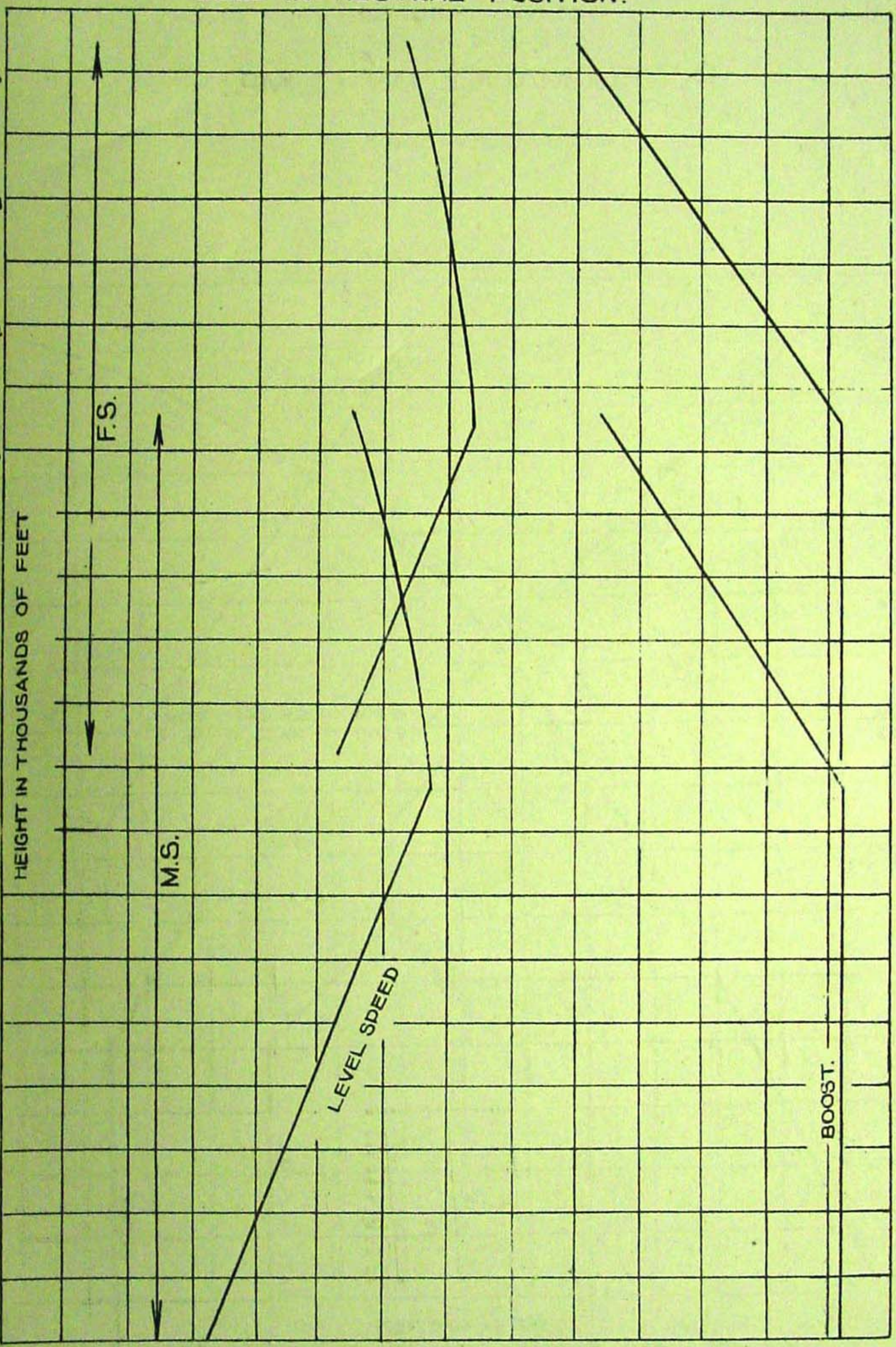
KITTYHAWK II FL~220

Fig 2

WEIGHT ~ 8910 lb.

LEVEL SPEEDS AND BOOST AT HEIGHTS.

GILLS IN NEUTRAL POSITION.



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