FMT/rlp

In reply address not the signer of this letter, but "Commanding Officer, U. S. Naval Air Station, Anacostia, D. C."

Refer to No.

U. S. NAVAL AIR STATION

ANACOSTIA, D. C.

CONFIDENTIAL
VF4P-4/MA6
(FT)(223)
Ser.#42470

SEP 19 1942

From: Commanding Officer.
To : The Chief of the Bureau of Aeronautics.

Subject: Model F4P-4 Airplane - Miscellaneous Tests - (Droppable Fuel Tanks; Performance at Military Power; Combat comparison.)

Reference: (a) BuAer. Conf. ltr. Aer-E-211-EM, C-75736, of 16 June 1942.
(b) SEU Conf. Report of June 27, 1942 (SEU 42-14/P, 1928).

Enclosure: (A) Model F4P-4 Airplane No. 02135 - Chart of Performance Characteristics, Military Power.
(B) Model F4P-4 Airplane No. 02135 - Plot of BHP Required vs. Airspeed in Various Conditions.

1. Model F4P-4 Airplane #02135 was made available for various miscellaneous tests between June 21, 1942 and August 19, 1942, including tests of droppable auxiliary wing tanks, comparison with the P-40F and F4F-4B, and a brief check of performance using the military power rating of the engine. These were practically complete when terminated by a cracked rear crankcase requiring engine replacement. The results are reported herewith.

2. The following comments apply to the auxiliary droppable tank installation:

(a) The fuel system operated satisfactorily on the auxiliary tanks, the electric fuel booster pump being required at altitude. The delay in picking up suction when transferring from main to auxiliary tanks varied from zero at

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low altitudes up to 50 seconds at high altitude, but no failure occurred.

(b) The take-off, landing, control, and stability characteristics were satisfactory with either or both tanks installed, and at all combinations of fuel load.

(c) The tanks released satisfactorily on the ground and and in flight after modification to the release mechanism. Special springs had to be fitted to cause the sway braces to drop off.

(d) One full tank and two empty tanks were released in flight. The action of the tank when released empty is rather erratic and there was considered to be some possibility of its striking the tail. Only a large number of releases will insure that this cannot occur, but as a precaution it is recommended that in this condition the release be made at moderately low speeds with power off.

(e) In order to determine the effect on drag, speed and fuel consumption, considerable data was obtained on power required at various airspeeds. The results are plotted in enclosure (B). The curve shown for power required as a normal six (6) gun fighter is considered to be more accurate than those previously available, and might be used in determining speeds for best range and endurance at other weights and altitudes. The data used in plotting similar curves with auxiliary tanks installed is less complete but is considered to be dependable.

3. The performance of the airplane (without auxiliary tanks) using the military power rating of the engine is shown in curves forming enclosure (A) and is tabulated as follows:

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Gross weight	7933
Critical altitude for 1100 H.P.(ft)	17200
Maximum Speed at airplane critical altitude (mph)	316
Service ceiling (ft)	33100
Rate of climb at sea level (ft/min)	1820
Rate of climb at 16300 feet altitude (ft/min)	1500
Take-off distance in a calm (ft)	875
Take-off distance in a 25 knot wind (ft).	342
Increase in indicated speed shifting from normal rating to military rating at 19000 feet altitude (knots)	2.5

4. The improvement in performance of the airplane at and above critical altitude with the use of the military rating appears to be very small. The carburetor air temperatures while operating in either auxiliary stage at the higher RPM are excessive and the engine was somewhat rough at maximum power. Operation at the military rating in neutral blower was satisfactory, and improved performance was apparent. It is concluded that the military rating is effective in neutral blower but is not justified in the high auxiliary blower setting. It is considered moderately effective in low auxiliary setting and satisfactory for short periods under cool conditions.

5. The P4P-4 was compared to the F4F-4B, carrying the same load, at various altitudes to determine relative climb, speeds, and turning ability. The gross weights were 7933 lbs. and 7694 lbs. respectively. The difference in performance was very small, the F4F-4B being slightly superior in speed and climb at low altitudes and the F4F-4 slightly superior at 15000 feet and above. There was no sensible difference in turning ability.

6. The F4F-4 was compared to the P-40F to determine relative climb, speed and turning ability. At the continuous engine ratings the F4F-4 is superior in climb, the

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superiority increasing with altitude, and is inferior in level speed below 20000 feet. At the maximum ratings the P-40Y is superior in climb below 18000 feet and in level speed below about 22000 feet. At higher altitudes the P4P-4 is superior in all respects. It is superior in turning ability at all altitudes, and in vision and general handling qualities.

W.V. SAUNDERS

Copies to: Bu. Aero. (4)

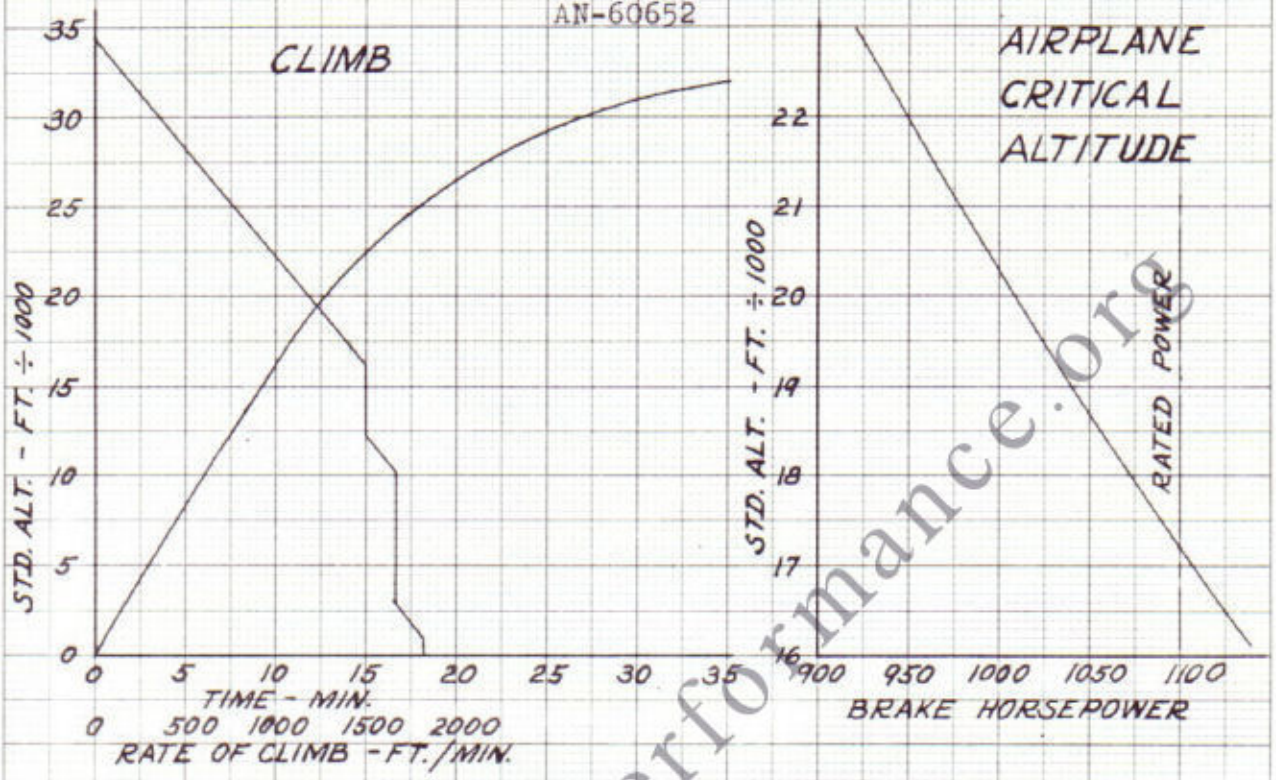
02185

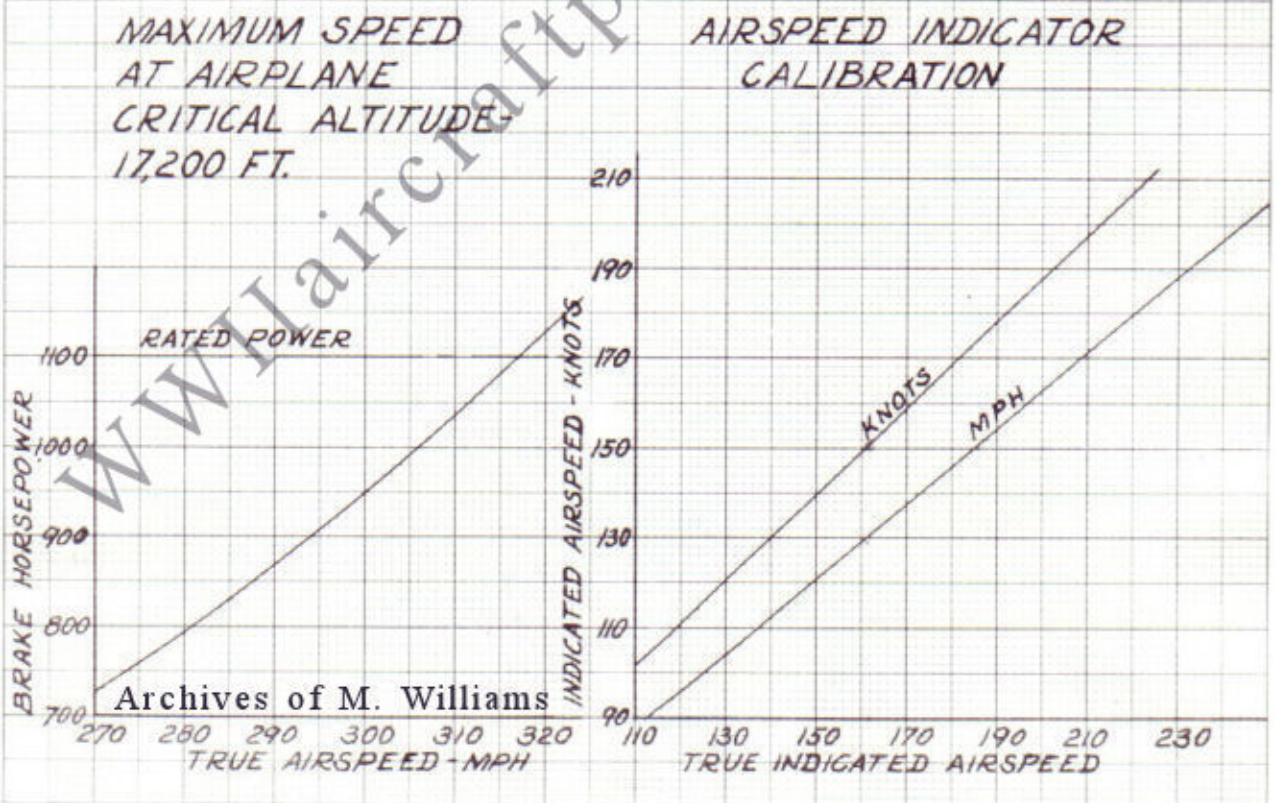
MO. L F4F-4 AIRPLANE No. 135

PERFORMANCE CHARACTERISTICS - MILITARY POWER

6 GUN FIGHTER GROSS WEIGHT = 7933 LBS.

AN-60652

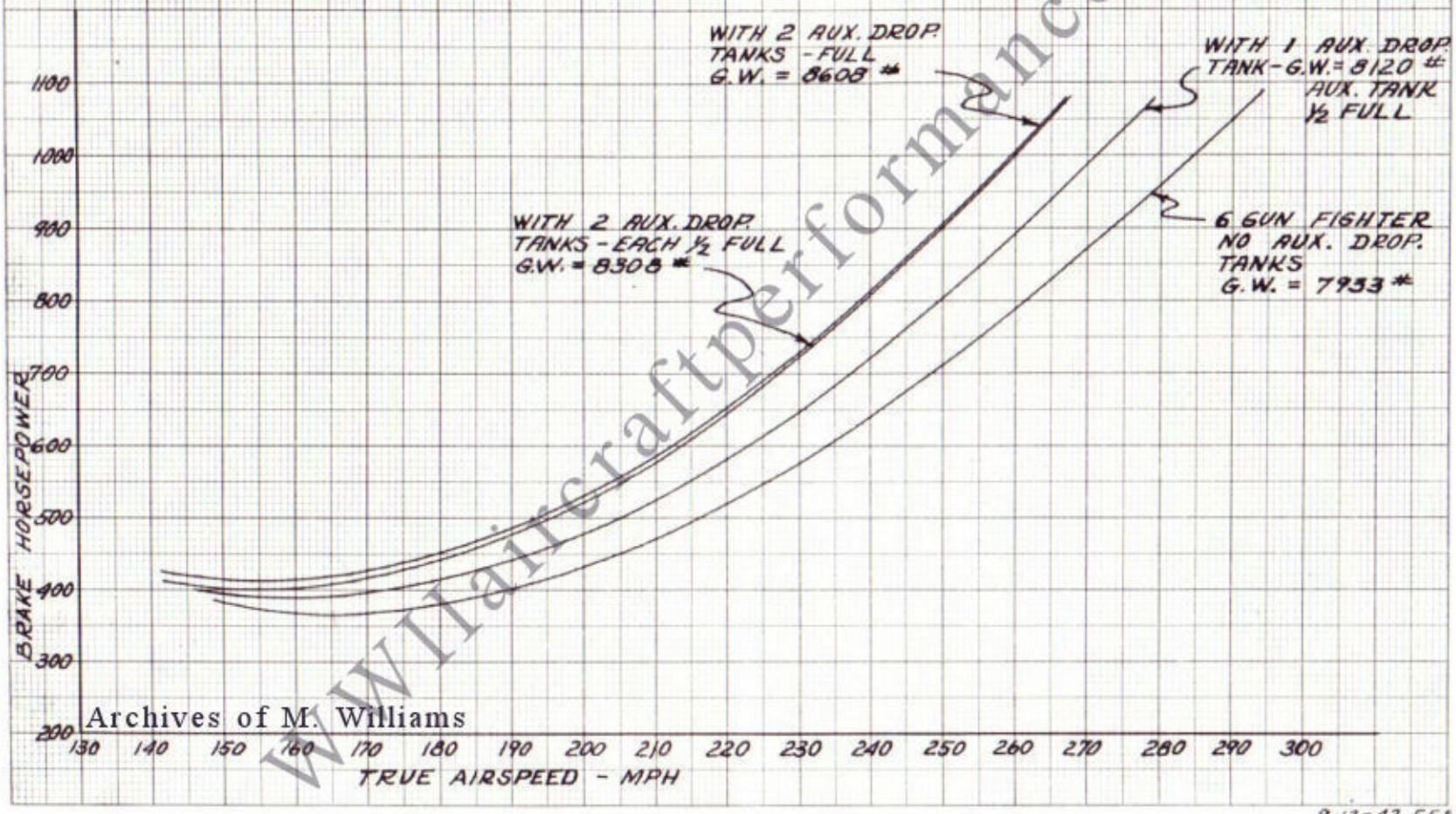




8-13-43 EFE

MODEL F4F-4 AIRPLANE No. 02135
$BHP_{ecp.}$ vs. TRUE AIRSPEED AT 10,000 FT. – WITH AND WITHOUT AUXILIARY DROPPABLE 50 GAL. WING TANKS

AN-60653



9-13-42 F.E.B