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FLIGHT TEST
U. S. NAVAL AIR STATION
PATUXENT RIVER, MD.

FINAL REPORT

of

EVALUATION OF MAXIMUM PRACTICABLE COMBAT POWER RATING FOR THE MODEL F6F-3 AIRPLANE

on

MODEL F6F-3 AIRPLANES NOS. 04934, 41420, 42633
(TED NO. PTR 0414)

held

2 FEBRUARY 1944 to 3 FEBRUARY 1945

by

FLIGHT TEST

at

U. S. NAVAL AIR STATION
PATUXENT RIVER, MD.

for

POWER PLANT DESIGN BRANCH
BUREAU OF AERONAUTICS

PROJECT PILOTS:

W. W. KELLY
Lt., USNR

L. E. FLINT
Lt., USN

PROJECT ENGINEER:

W. W. BOESEWETTER
Lt. (jg), USNR

SENIOR PROJECT ENGINEER:

F. E. ELLIS
Lt. Comdr., USNR

SENIOR PROJECT OFFICER:

E. M. OWEN
Lt. Comdr., USN

APPROVED:

C. E. GIESE
Comdr., USN

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REFERENCES

(a) BuAer restr. ltr. Aer-E-41-CCS (37324) dated 22 Feb 1944 (Test Directive).

(b) NAS Patuxent River conf. report NA83, VF6F-3, PTR 2116 (FT) dated 7 April 1944.

(c) NAS Patuxent River restr. ltr. NA83, VF6F-3, PTR 0414 (FT) (603) dated 16 June 1944.

(d) NAS Patuxent River conf. ltr. NA83, VF6F-3, PTR 0414 (FT) (44125) dated 21 June 1944.

(e) NAS Patuxent River restr. ltr. NA83, VF6F-3, PTR 0414 (FT) (805) dated 29 Aug 1944.

(f) NAS Patuxent River restr. ltr. NA83, VF6F-3, VF4U-1, PTR 0414, PTR 0415 (FT) (634) dated 27 June 1944.

(g) NAS Patuxent River restr. ltr. NA83/071, VF6F-3, PTR 0414 WWB/vba (FT) dated 16 Jan 1945.

(h) BuAer TWX 031423 E-413-CCS dated 2 Jan 1944.

(i) BuAer restr. ltr. Aer-E-411-EPGB (182617) dated 24 Oct 1944.

(j) NAS Patuxent River restr. ltr. NA83/198 VF6F-3, PTR 0414 JEL/mdw (FT) dated 26 Feb 1945.

NAVY DEPARTMENT
BUREAU OF AERONAUTICS
WASHINGTON 25, D.C.

Aer-E-41-CCS

RESTRICTED

22 Feb 1944

37324

From: Chief, BuAer.
To: C.O., NAS, Patuxent River, Md.
Attn: Director of Tests.

Subj: Project No. PTR 0414 - Model F6F-3 Airplane; Evaluation of Maximum Practicable War Emergency Rating for.

Ref: (a) PTR 2122 - Accelerated Service Test of F6F-3 Airplane with water injection.

1. The subject project is hereby established to determine by a series of flight endurance tests at progressively higher powers the maximum practicable power available for combat emergency use in the F6F-3 airplane.

2. Two airplanes, bunos. 04934 and 41420, are allocated for use on this project. These airplanes shall not be used for any other purpose than the tests stipulated herein prior to completion of this project. Two additional new R-2800-10W engines are also being provided.

3. The following alternate flight schedules shall be followed:

Schedule A

(a) Take-off 2700 RPM 54.0".
(b) Climb at neutral military power than low blower WEP to critical altitude for this rating. It is desired that the climb require 5 minutes of WEP at lowest practicable airspeed, and external drag of wing flaps or landing gear may be used to obtain most adverse cooling conditions and to hold down rate of climb.
(c) Descent and level flight at lowest altitude consistent with safety in the event of complete engine failure. This period to consist of 30 minutes at neutral maximum cruise (2150 RPM/34.0" auto-lean).

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(d) Low blower WEP for 5 minutes at altitude attained in (c).

(e) Low blower military power for 15 minutes at altitude attained in (c).

(f) Level flight and landing approach for 30 minutes at Maximum Cruise Power in (c).

Schedule B

(a) Take-off 2700 RPM/54.0".

(b) Climb at neutral and low blower military then high blower WEP to critical altitude for this rating. It is desired that the climb be conducted in the manner described in Schedule A (b) in order to utilize full 5 minutes at WEP in high blower.

(c) Thirty minutes maximum cruise level flight at (b) altitude in low blower (2100 RPM/34.0" auto-lean).

(d) High-blower WEP for 5 minutes at (b) altitude.

(e) High-blower military power for 15 minutes at (b) altitude.

(f) Level flight and landing approach for 30 minutes at maximum cruise (low and neutral).

4. Schedules A and B shall be alternated, and the endurance test at each regulator setting shall consist of 30 flights totalling 45 hours. Check power plant visually after each 1.5 hour flight. After every three flights remove spark plugs from master rod cylinders and also from two hottest running cylinders, if other than master rod cylinders, to check visually the condition of the piston head and cylinder walls. Test shall be terminated immediately upon evidence of piston burning or cylinder wall scoring. Strainers shall also be check at this time. Upon completion of 45 hours endurance the engine shall be removed and completely disassembled for inspection. Engines shall be forwarded to the AEL, NAMC, Phila., Pa., for final disassembly and inspection.

5. Prior to each endurance test at a given regulator setting, sufficient calibration flights shall be conducted to insure proper regulator adjustment, and to determine low and high blower critical altitudes for maximum rate of climb and Vmax level. Torquemeter nose shall be installed for calibration flights, while standard nose shall be re-installed for endurance

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test. The torquemeter is overloaded structurally and booster pump capacity is marginal at the emergency powers being tested. Consequently, measured torque may be expected to be approximate at the higher powers. Accurate measurement of airspeed and rate of climb at the higher ratings must be depended upon, therefore, to permit an evaluation of the advantages of the higher ratings. Airplanes shall be instrumentated sufficiently to permit evaluation of airplane and power plant performance as accurately as possible and to detect evidence of engine malfunctioning. Operating time at high powers during calibration flight period shall be held to a minimum practicable. New engines shall be given ground and flight run-in totalling at least 10 hours prior to initiation of endurance test.

6. Endurance tests shall be conducted in the following sequence:

(a) Subject first airplane to endurance test with regulator setting already established by reference (a) (31.5" $\pm$ .2" Hg. carburetor inlet pressure with water on).

(b) Subject second airplane to endurance test with 32.8" $\pm$ .2" Hg. regulator setting provided (a) test is satisfactory. Calibration flights of second airplane may proceed while (a) test is in progress. Install new engine in first airplane while (b) endurance is in progress.

(c) Subject first airplane to endurance test with 33.9" $\pm$ .2" Hg. regulator setting provided (b) test is satisfactory. Install new engine in second airplane while (c) endurance test is in progress.

(d) Subject second airplane to endurance test with 35.0" $\pm$ .2" Hg. regulator setting provided (c) test is satisfactory.

(e) Further increases may be warranted, depending upon the results of the foregoing tests.

7. Increased WEP above the initial nominal setting of 31.5" will require increasing water flow rates which can be obtained

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by installation of larger water metering jets and increase in fuel and water pressure setting. A Pratt & Whitney representative will be made available to install the necessary water jets and to make necessary adjustments in fuel and water pressure and in the auxiliary supercharger regulators. The following nominal engine limits are established for operation at WEP:

Cylinder-head	:	270°C.
barrel	:	177°C.
Oil Inlet	:	105°C.
Carburetor Air	:	60°C.
Minimum oil pressure	:	55 psi.

Maintenance of adequate oil pressure at altitude is of prime importance, and test run shall be terminated if the above specified minimum value cannot be maintained. All testing shall be conducted with an anti-detonant mixture of 60% alcohol - 40% water. WEP speed rating at all powers is 2700 RPM. However, during high blower critical altitude runs, it will be desirable to evaluate relative propeller efficiency by checking level flight performance at 2600 and 2500 RPM, also.

8. In the event that the airplane as delivered does not have sufficient water tank capacity to permit full 10 minutes WEP operation as specified in para. 3, an auxiliary water tank to provide the necessary capacity shall be installed in the test airplane.

9. The subject project is hereby assigned class "A" priority. It is requested that the bureau (Power Plant Design Branch) be informed immediately in the event of any failure, and that a letter report be submitted upon completion of each endurance test. Project PTR 2122 is hereby cancelled and superseded by this project.

S. B. SPANGLER
Captain, USN
By direction Chief of Bureau

2-660 2531

INTRODUCTION Reference (a) established Project TED No. PTR 0414 to determine by a series of flight endurance tests at progressively higher powers the maximum practicable power available for combat emergency use in the model F6F-3 airplane and to evaluate the gain in performance realized from the higher powers. Reference (a) outlined the manner and sequence in which the endurance and performance tests would be conducted. Two airplanes, No. 04934 and No. 41420, were allocated for use on this project.

Performance characteristics of the normal combat power setting (31.5" Hg. - carburetor impact pressure setting) had previously been accomplished on the model F6F-3 airplane No. 04934 under BIS 2116 and reported on by reference (b). The endurance phase at a regulator setting of 31.5" Hg. was accomplished on model F6F-3 airplane No. 04934, and a report submitted, reference (c).

Performance characteristics were obtained and a report submitted (reference (d)) on model F6F-3 airplane No. 41420 using a regulator setting of 32.8" Hg. The endurance phase at the 32.8" Hg. setting was carried out and a report submitted (reference (e)) using model F6F-3 airplane No. 41420. The last half of this endurance phase was made in accordance with a new schedule as suggested in reference (f).

The endurance phase at 33.9" Hg. was accomplished on model F6F-3 airplane No. 41420, engine No. P-16303 and a report submitted, reference (g). The performance phase at 33.9" Hg. regulator setting was begun on model F6F-3 airplane No. 04934. Shortly after the start of the tests a forced landing was made and considerable damage done to the aircraft. The airplane was replaced by model F6F-3 No. 42633. Performance trials at 33.9" Hg. on this airplane were unsuccessful due to a deficiency in engine power in auxiliary blower and the engine (No. P-16458) removed. A new engine (No. P-17940) was installed and performance characteristics at 33.9" Hg. and 35" Hg. regulator settings were successfully completed. The results obtained during this last phase are included in this report.

In accordance with reference (h) no endurance flights were made at the 35" Hg. setting in view of the prevailing atmospheric temperatures making the results inconclusive.

Flight tests to investigate detonation characteristics of the engine using aviation fuel Spec. AN-F-28 and also using N-77 fuel were accomplished under this project in accordance with reference (i). The report of these tests has been forwarded to the Bureau of Aeronautics (reference (j)).

PURPOSE OF TEST The purpose of these tests was to determine by a series of flight endurance tests at progressively higher powers the maximum practicable power available for combat emergency use in the F6F-3 airplane and to determine the performance benefit derived from the higher powers.

METHOD OF TEST The airplanes were equipped with the standard instruments plus certain special instrumentation required to more accurately determine engine operating conditions. This included fuel flow and water flow meters, carburetor impact pressure gage, gate valve indicator, water pressure gage, fuel nozzle pressure gage, cylinder head temperature gages for all cylinders and a torquemeter.

The performance tests were conducted with the airplane loaded to a gross weight corresponding to that of a normal overload fighter. A summary of the loading for airplane No. 42633 is as follows:

Gross weight - lbs.....	12,386
Fuel - gal.....	175
"Water" - Reserve fuel tank - gals..	42
Oil - gal.....	16
.50 caliber guns.....	6
Ammunition - rounds.....	2400

All endurance flights were made with a universal centerline drop tank installed in addition to the above loading.

Performance data were obtained and reduced to standard conditions in accordance with Standard Flight Test methods.

In the endurance phases of the tests two definite alternate flight schedules were followed until a total of 5 hours of combat power time at the desired regulator setting had been obtained or until an engine failure occurred. The two schedules were alternated so as to have approximately the same high power time in both blowers. The original schedule used was as given in reference (a). The flight schedule used in the later tests is given in reference (f) and is summarized as follows:

SCHEDULE "A"

1. A military power climb in neutral blower from S.L. to 2000 ft.

2. A combat power climb in low blower from 2000 ft. to the low blower climb shift critical for the particular carburetor impact pressure setting involved.

3. A shift made to high blower at the altitude attained in Item 2, above, and the climb continued in combat power, high blower for 6000 ft. or until a total of 5 minutes of low and high blower combat power has elapsed.

4. The climb continued from the altitude reached in Item 3 in military power high blower to 20,000 ft. and operation further continued in level flight at that altitude for a total military power time of 15 minutes.

5. Power reduced to normal rated power or full throttle low blower, and a 5 minute run made at this altitude.

6. Reduce power to maximum cruise, low blower, level flight, for 20 minutes at the same altitude on Items 4 and 5.

7. A rated power descent in low blower to the combat power high blower critical altitude, or that altitude at which carburetor air temperature may be maintained below 55°C as determined by performance calibration flights. The run in rated power was for a period of 5 minutes.

8. A shift to high blower, combat power for 5 minutes at the altitude obtained in Item 7.

9. Shift to low blower, maximum cruise for 20 minutes during which time a partial descent to the field will be made.

SCHEDULE "B"

Items 1, 2, and 3 are the same as Items 1, 2, and 3 of Schedule "A".

4. At the conclusion of the combat power climb a shift to low blower was made and a descent in military power made to an altitude at or slightly below low blower military power critical, and operation continued in level flight at that altitude for a total of 15 minutes.

5. Power reduced to normal rated power or full throttle, neutral blower, and a 5 minute run made at this altitude.

6. Power reduced to maximum cruise, neutral blower for 20 minutes at the same altitude as Items 4 and 5.

7. A rated power descent at low blower to the combat power low blower critical altitude, or that altitude at which carburetor air temperature may be maintained below 55°C as determined by performance calibration flights. The run at rated power was for a period of 5 minutes.

8. A 5 minute combat power run at the altitude obtained in Item 7.

9. Shift to neutral blower, maximum cruise power for 20 minutes during which time a partial descent to the field was made.

RESULTS OF TEST

1. Summary of combat power performance of model F6F-3 airplane No. 42633 as an overload fighter. Gross weight = 12,386 lbs.

A. Maximum Speed:

(1) At normal combat power RPM (2700) with No. 25 drill size water jet

Carburetor impact pressure setting - ins. Hg.....	31.5	32.8	33.9	35
Airplane critical altitude - ft:				
High blower.....	18,000	16,900	16,000	15,080
Low blower.....	13,100	12,000	11,020	10,150
Maximum speed at airplane critical alt. - MPH:				
High blower.....	381	382	382	382.5
Low blower.....	372.5	373	373.5	374
Brake horsepower available:				
High blower.....	1942	2015	2078	2140
Low blower.....	2108	2185	2250	2315
Manifold pressure - ins. Hg.				
High blower.....	57.7	60.0	62	63.8
Low blower.....	58.1	60.3	62.2	64.1

(2) At normal combat power RPM (2700) with No. 18 drill size water jet

Carburetor impact pressure setting - ins. Hg.....	31.5	32.8	33.9	35
Airplane critical altitude - ft:				
High blower.....	17,800	16,650	14,650	14,750
Low blower.....	12,720	11,630	10,720	9,800

Maximum speed at crit. alt. - MPH:				
High blower.....	378.5	379.5	380	380
Low blower.....	369.5	370	370	370.5
Brake horsepower available:				
High blower.....	1920	2000	2060	2120
Low blower.....	2085	2153	2215	2275
Manifold pressure - ins. Hg.:				
High blower.....	57.4	59.8	61.8	63.7
Low blower.....	58.1	60.4	62.3	64.4

(3) At 2600 RPM with No. 18 drill size water jet (High blower only)

Carburetor impact pressure setting - ins. Hg.....	31.5	32.8	33.9	35
Airplane critical altitude - ft.....	18,100	17,000	16,100	15,200
Maximum speed at airplane critical altitude - MPH.....	377.5	378.5	379.0	379.0
Brake horsepower available....	1890	1960	2020	2080
Manifold pressure - ins. Hg...	56	58.2	60	61.8

(4) At 2500 RPM with No. 18 drill size water jet (High blower only)

Carburetor impact pressure setting - ins. Hg.....	31.5	32.8	33.9	35
Airplane crit. alt. - ft.....	18,300	17,200	16,300	15,500
Maximum speed at critical alt. - MPH.....	376.5	377.5	378	378
Brake horsepower available....	1845	1935	1980	2050
Manifold pressure - ins. Hg...	54.5	56.6	58.3	60.0

B. Climb:

(1) At normal combat power RPM (2700) with No. 18 drill size water jet

Carburetor impact pressure ins. Hg.....	31.5	32.8	33.9	35
Climb critical altitude - ft.:				
High blower.....	15,600	14,500	13,500	12,500
Low blower.....	10,600	9,500	8,500	7,500
Maximum rate of climb - FPM:				
High blower.....	2720	2850	2970	3080
Low blower.....	3090	3220	3350	3470

2. Summary of engine operating time:

Phase	Airplane Number	Carb. Impact Press."Hg.	Combat Power Time-Hrs.	Military Power Time-Hrs.	Rated Power Hrs.	Cruise Power Hrs.	Engine Number
Endurance	04934	31.5	4.6	6.5	----	----	*P-15094
Endurance	41420	32.8	5.1	8.1	2.5	27.7	*P-16310
Perform.	42633	33.9	2.3	6.1	----	----	*P-16458
Perform.	42633	33.9 & 35	8	----	----	----	*P-17940
Endurance	41420	33.9	5	8.9	3.7	31.4	*P-16303

* Sent to AEL NAMC for inspection.

DISCUSSION Performance characteristics have been obtained on model F6F-3 No. 42633 at all supercharger regulator settings specified, namely, 31.5, 32.8, 33.9, and 35" Hg. Performance data had previously been obtained at the 31.5" Hg. and 32.8" Hg. settings on different airplanes and under different loading conditions and are not directly comparable. Accordingly, so that a direct comparison of the performance benefits obtained with the various regulator settings could be made, the complete performance was obtained using airplane No. 42633 and is included in this report.

Difficulty was encountered in obtaining combat power climbs at the correct regulator setting, particularly at the higher combat powers. During a combat power climb the carburetor impact pressure appeared to fall off prematurely below the actual climb critical as the gate valve approached the full open position. In several cases the impact pressure appeared to lag sufficiently from the time the "water" was turned on and the climb started that the required impact pressure was not obtained before the climb critical was reached and the full benefit of the higher settings could not be realized. This condition could be alleviated to some extent in actual practice by placing the "water" injection system in operation and allowing time for the impact pressure to build up before beginning the climb. The accelerated service trials were begun on model F6F-3 No. 04934 at a setting of 31.5" Hg. with the original schedule as given in reference (a). This schedule was followed in starting the endurance phase at the 32.8" Hg. setting and 15 flights were made. At this time a new schedule was suggested by Flight Test to replace the schedule given in reference (a).

The original directive set up two schedules wherein combat power climbs were made for 5 minutes below the critical with wheels and flaps down so as to operate under the most adverse conditions possible. There were many instances during this first set of runs when the carburetor air temperature exceeded 60°C and the hottest cylinder head exceeded 270°C in attempting to climb in either blower for 5 minutes at altitudes below the critical. The new schedule is summarized in the Method of Test portion of this report.

In attempting to accomplish the climbs listed in the two revised schedules it was necessary to increase the climb speed to 190-200 MPH with cowl flaps opened 1/2 to keep the cylinder head temperatures within limits. No excessive carburetor air temperatures were encountered during combat power climbs in low blower. In the high combat power climbs from 12,000 feet, where 12,000 feet is the low blower climb shift critical for a regulator setting of 32.8" Hg., to an altitude of 18,000 feet or until a total of 5 minutes of combat power had been expended, the carburetor air temperatures generally exceeded 50°C observed.

In Schedule A at the conclusion of the combat power climb at approximately 18,000 feet, it was impossible to settle down to military power in high blower merely by bringing back the throttle to the stop and shutting off the water since the carburetor air temperature would be approximately 50°C and it is estimated that several minutes of operation would be required in military power before it would reach a value below the military power limit of 43°C. Therefore, it was necessary to retard the throttle further and reduce the manifold pressure to approximately 35" Hg. for a period exceeding 1 minute to reduce the carburetor air temperature to 45°C or below. No difficulty in this connection was encountered in Schedule B since at the end of the combat power climb a shift was made to low blower and the carburetor air temperature immediately dropped to a value below the limit.

It is to be noted that the high blower military power critical is at an altitude considerably above the high blower combat power criticals and that in the case of the higher combat power criticals, they are below the low blower military critical. For example: Let us assume the following data to illustrate: Regulator setting - 28.1" Hg. dry, 33.9" Hg. wet., altitude - 16,000 ft., low blower, military power, MAP - 53.5" Hg. It is desired to go into combat power. The water injection system will be put into operation and the following things will occur: Water flow will be normal, fuel flow will decrease and an increase in manifold pressure in the order of 1" Hg. will occur because at 16,000 feet the airplane is approximately 1000 feet below its low blower critical. The valve will be opened to its full open position due to the resetting of the supercharger regulator by the "water" pressure. The altitude in low blower at which full combat power could be obtained is 10,000 feet so the only alternative would be to shift to high blower and the manifold pressure would then increase to approximately 62" Hg. After the need for maximum speed had ended or the supply of "water" depleted, the throttle would be retarded to military power and a shift back to low blower made to obtain an increase in power at 16,000 feet altitude and also to lower the carburetor air temperature to a safe value for military power operation.

Some difficulty has been encountered with the C34S spark plugs installed during these tests. The life of these spark plugs seems to be materially reduced by extensive use of combat power. Several spark plug failures have occurred. In the later tests the spark plugs were changed after approximately 1 hour of combat power and no spark plug failures occurred.

A low water pressure of approximately 10-13 pounds per square inch will actuate the supercharger regulator and reset the deck pressure to its reset value. At the same time this water pressure is not sufficient to move the derichment valve to derich the mixture. The result is that the fuel flow will increase approximately 20%, the water flow will be normal, and the engine will cut-out or load up due to the excessive amount of liquid being injected into it.

The endurance phase at a setting of 33.9" Hg. was accomplished with little difficulty under atmospheric conditions generally below NACA standard, and the endurance phases at 31.5" Hg. and 32.8" Hg. were conducted with greater difficulty, with an engine failure at the 31.5" Hg. setting under atmospheric conditions approaching those of Navy summer standard.

The important factor affecting engine reliability at any carburetor impact pressure setting is the high outside air temperatures encountered at the altitude necessary to obtain that setting in conjunction with the lowering effectiveness of the present intercooler installation at the airflow required.

CONCLUSIONS The increase in maximum speed obtained when operating at the 35" Hg. setting instead of the 31.5" Hg. setting was negligible, being only 1.5 MPH.

However, it is to be noted that at any altitude below the critical for the 35" Hg. setting (low blower) a gain of 12 to 14 MPH in speed was obtained when going from the 31.5 to the 35" Hg. setting.

The rate of climb is appreciably increased by the use of higher combat power ratings. The rate of climb at the low blower critical altitudes has been increased from 3090 FPM at 10,600 feet with the 31.5" Hg. setting to 3570 FPM at 7500 feet with the 35" Hg. setting. The difference in rate of climb at 7500 feet between the two settings was 330 FPM.

There was very little difference in the maximum speeds observed in high blower at full throttle due to reducing the RPM from 2700 to 2500 and no appreciable effect upon the propeller efficiencies was noted within the range of altitudes tested. However, this reduction in RPM resulted in a decrease in fuel water flow of approximately 8% with an average reduction in carburetor air temperature of 6°C.

RECOMMENDATIONS It is recommended that:

1. Some means be provided to indicate when the carburetor air temperature exceeds 55°C.

2. The derichment valve in the carburetor and the reset mechanism in the supercharger regulator be modified to operate at the same water pressure.

3. A new type of water regulator be devised to increase the water-air flow at the higher settings and also to preserve the relatively low water air flows at the lower settings.

4. The causes of the failures of the C34S spark plugs be investigated.

Encls: (HW)
1. Seven (7) Performance Curves, Photo PTR Nos. 15802, 15803, 20554, 20555, 20557, 20553, and 20558.
2. Ten (10) Photographs, PTR Nos. 2766, 2768, 2767, 3016, 7921, 7920, 8052, 8961, 8960, and 8959.

PHOTO PTR. 15802

MODEL F6F-3 AIRPLANE No. 42633

PERFORMANCE CHARACTERISTICS AT COMBAT POWER - "IB WATER JET

OVERLOAD FIGHTER GROSS WEIGHT 12386#

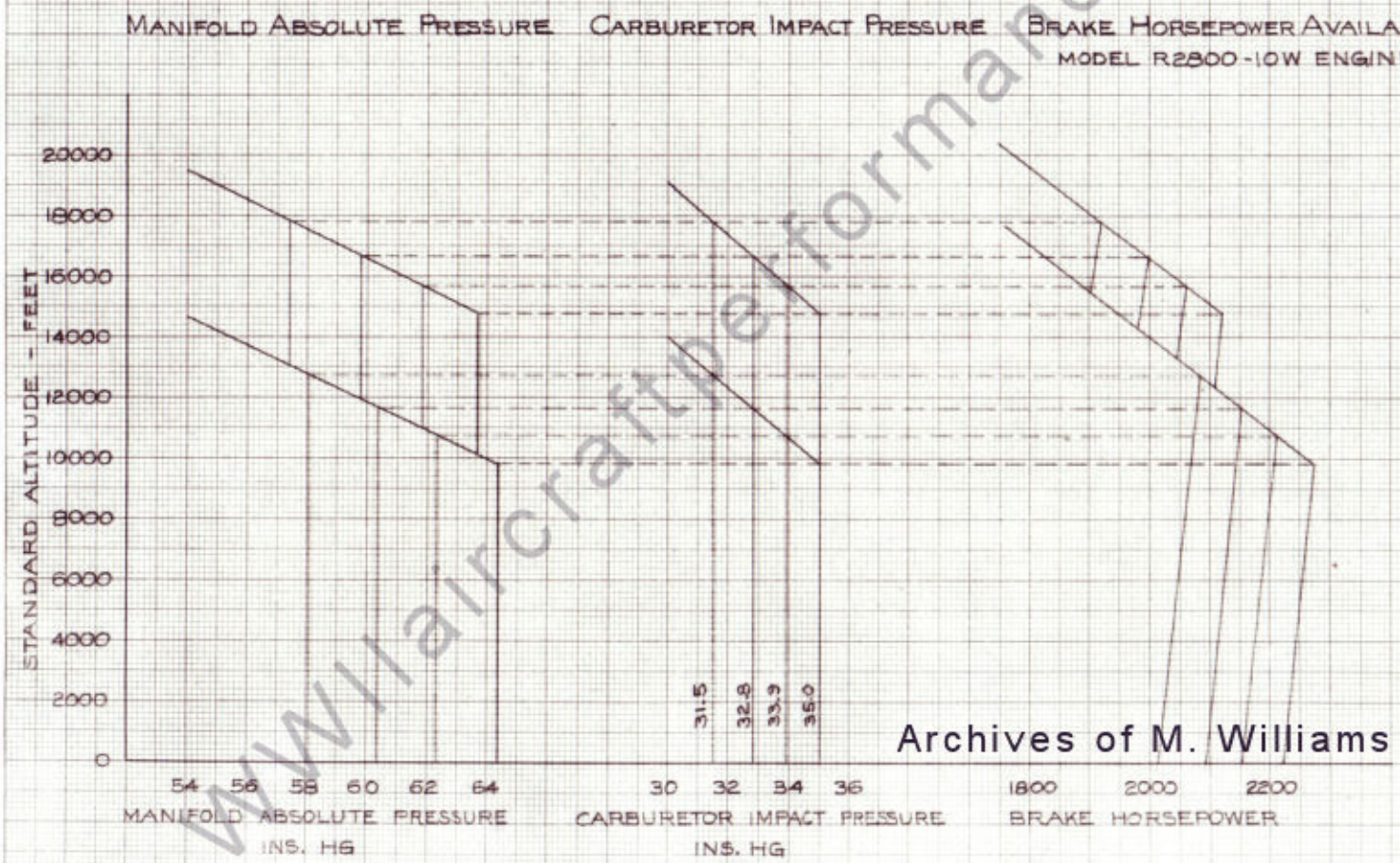
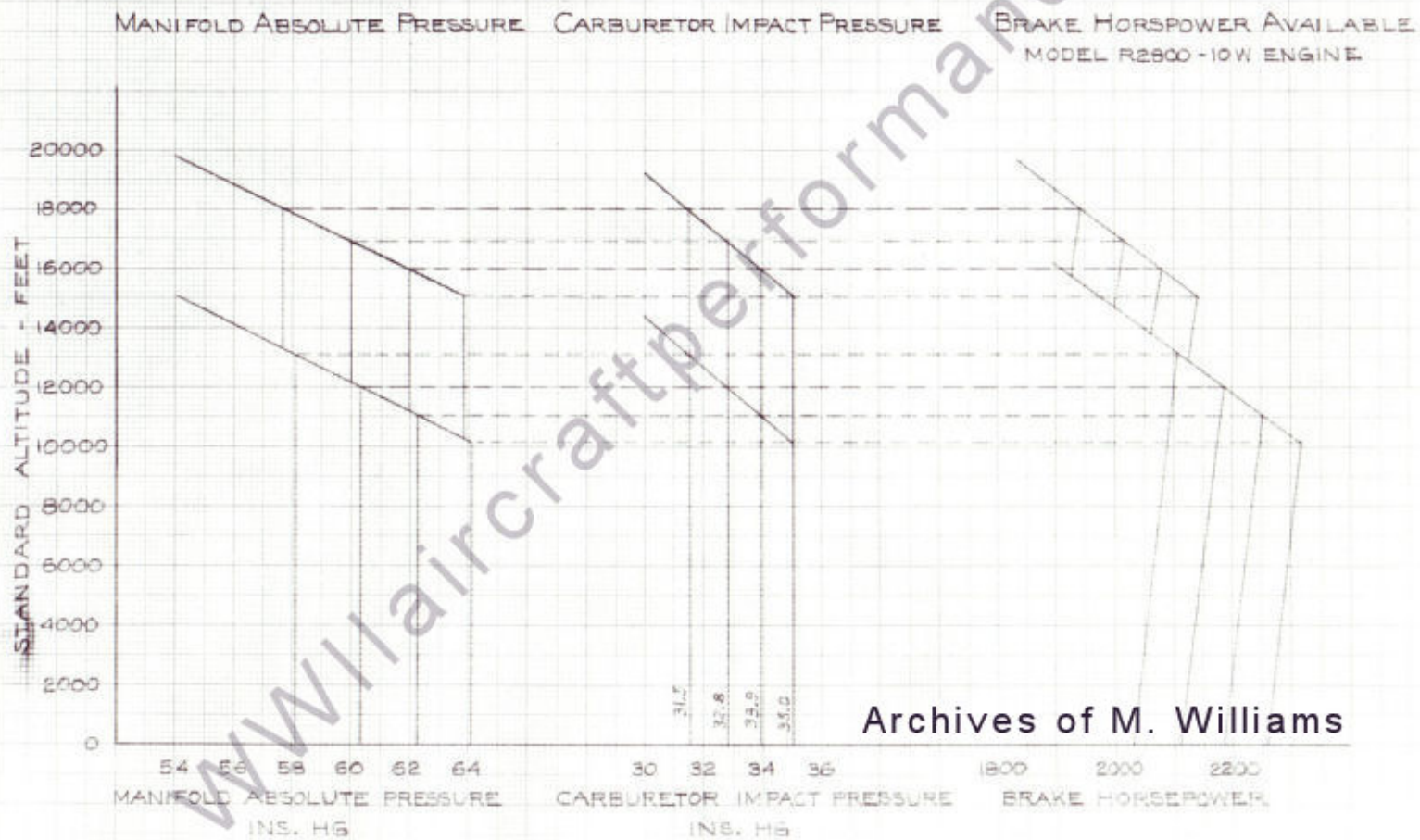


PHOTO PTR. 15803

MODEL F6F-3 AIRPLANE No. 42633

PERFORMANCE CHARACTERISTICS AT COMBAT POWER - "25 WATER JET

OVERLOAD FIGHTER GROSS WEIGHT 12386#



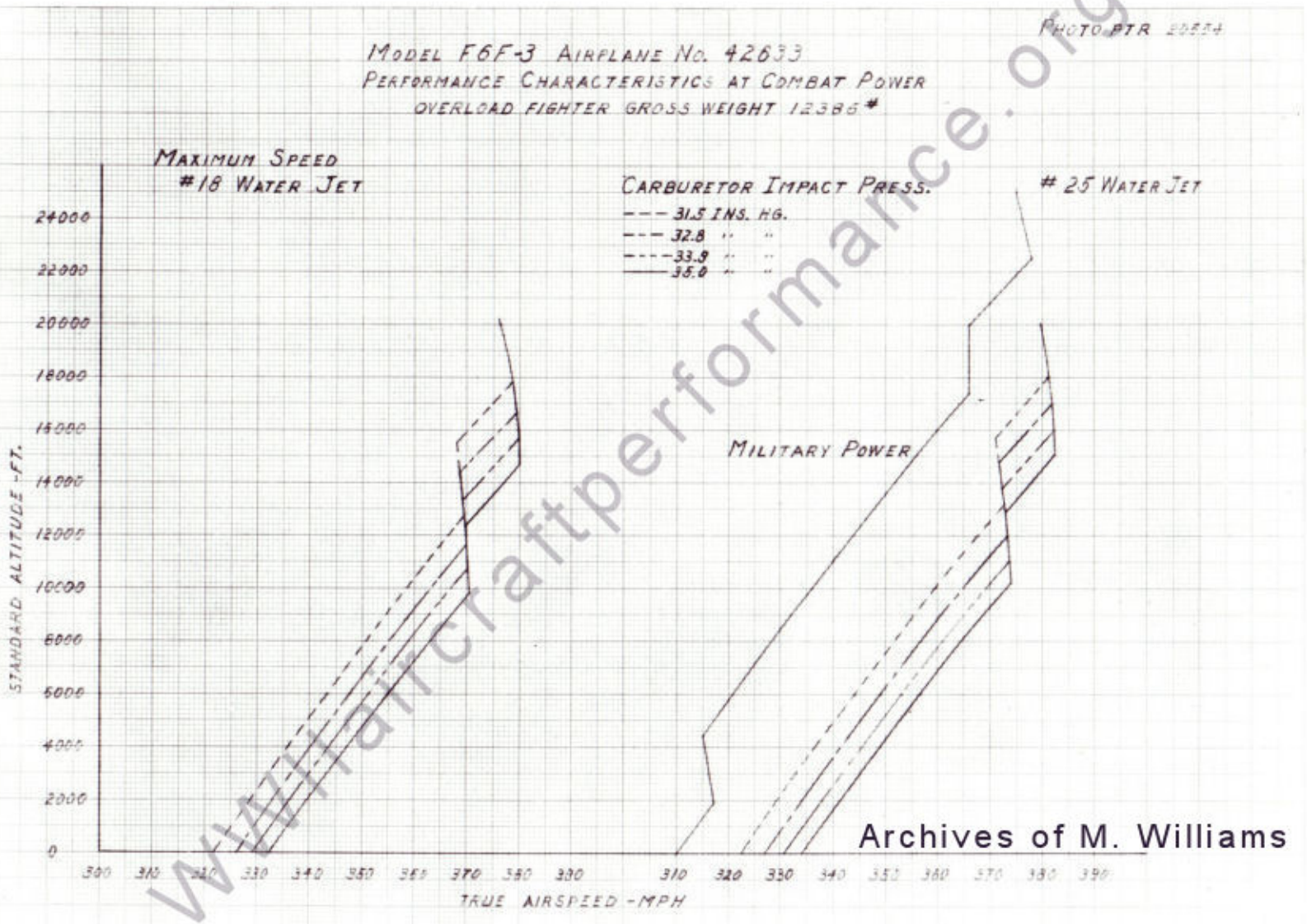


PHOTO PTR 20655

MODEL F6F-3 AIRPLANE NO. 42633
PERFORMANCE CHARACTERISTICS AT COMBAT POWER IN HIGH BLOWER
EFFECT OF RPM ON PERFORMANCE CHARACTERISTICS

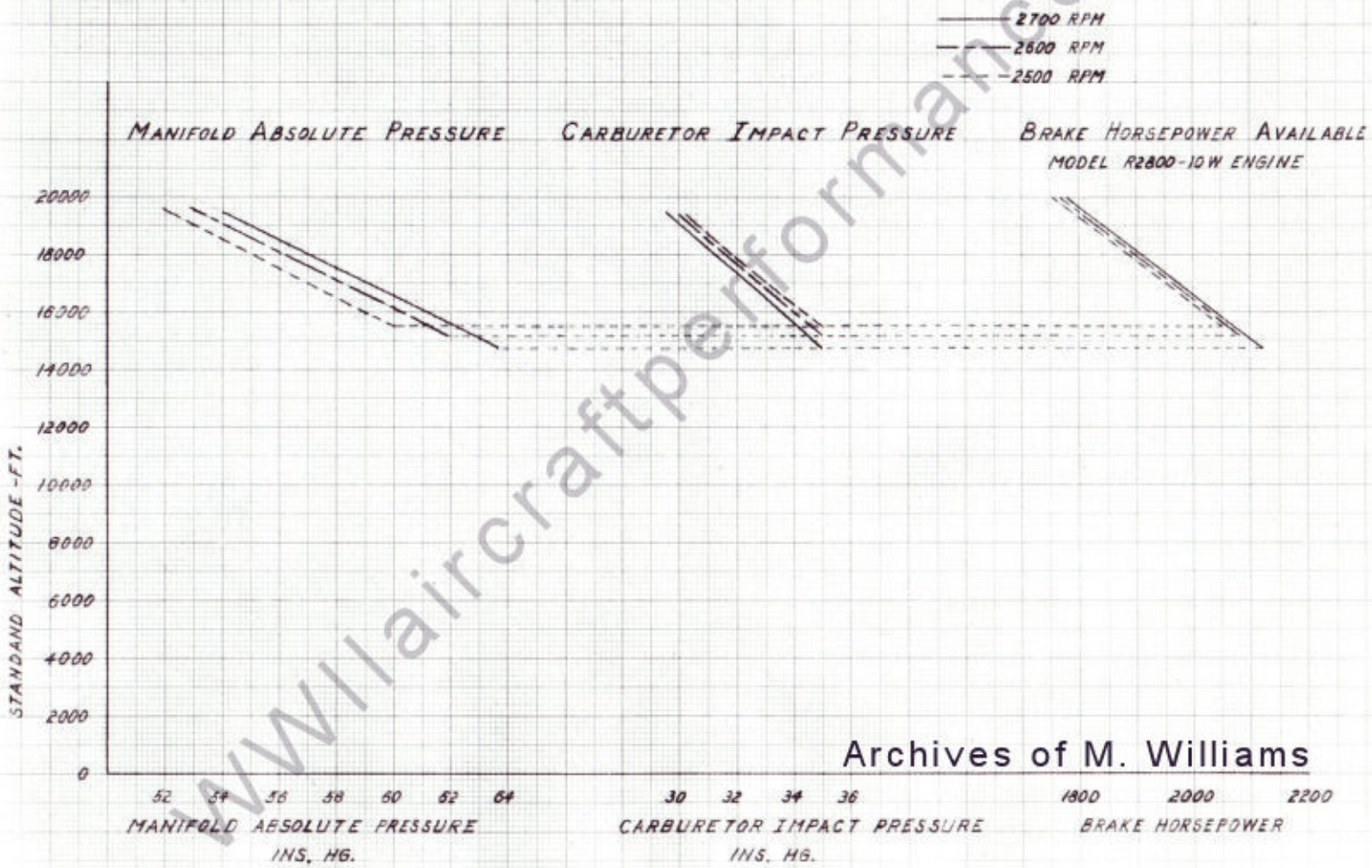


PHOTO PTR 20557

MODEL F6F-3 AIRPLANE No. 42633
PERFORMANCE CHARACTERISTICS AT COMBAT POWER IN HIGH BLOWER
EFFECT OF RPM ON MAX. SPEED, WATER FLOW, FUEL FLOW #18 JET

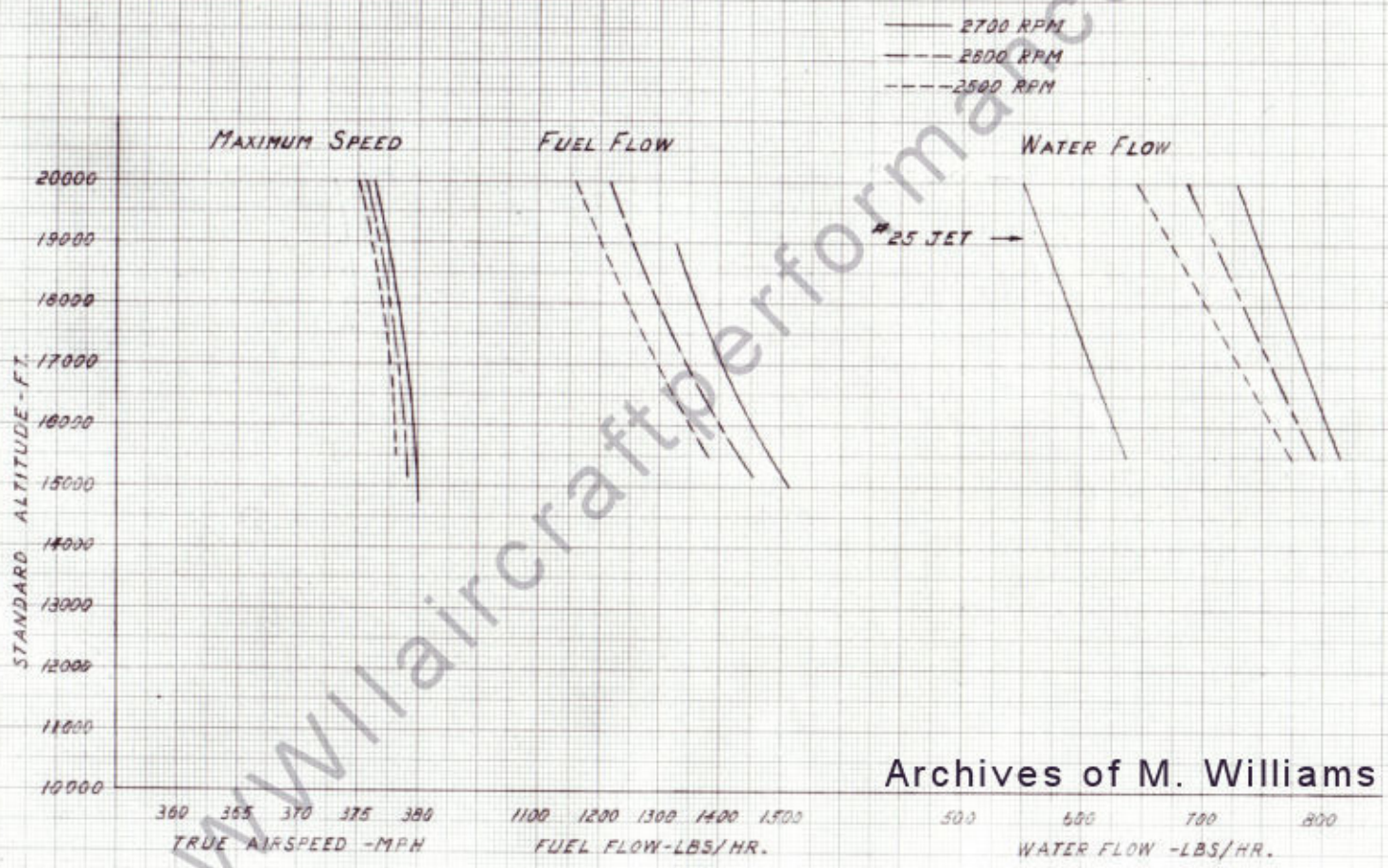
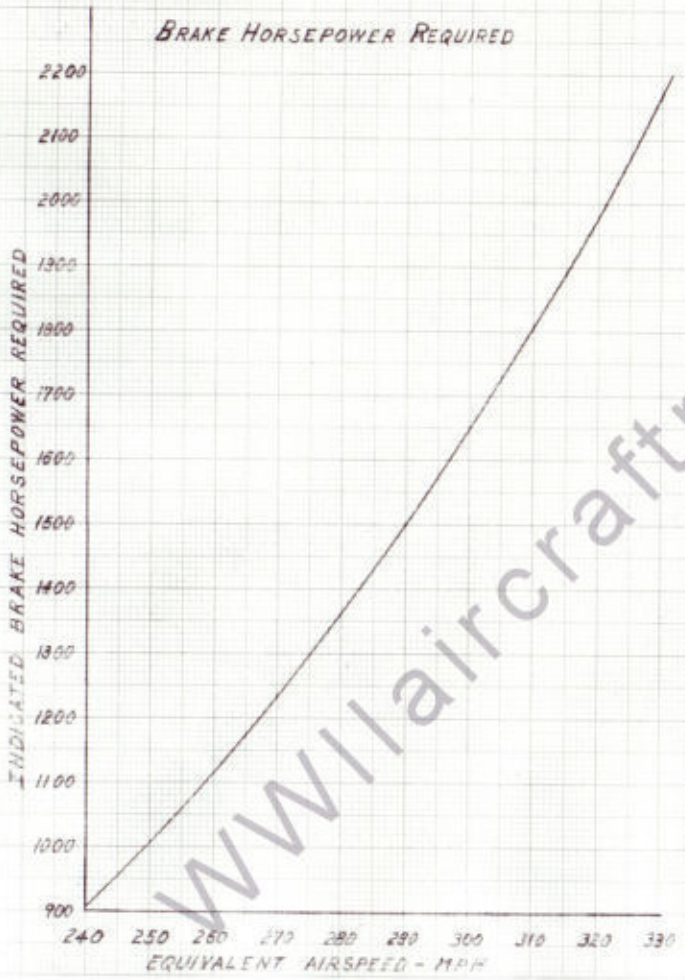
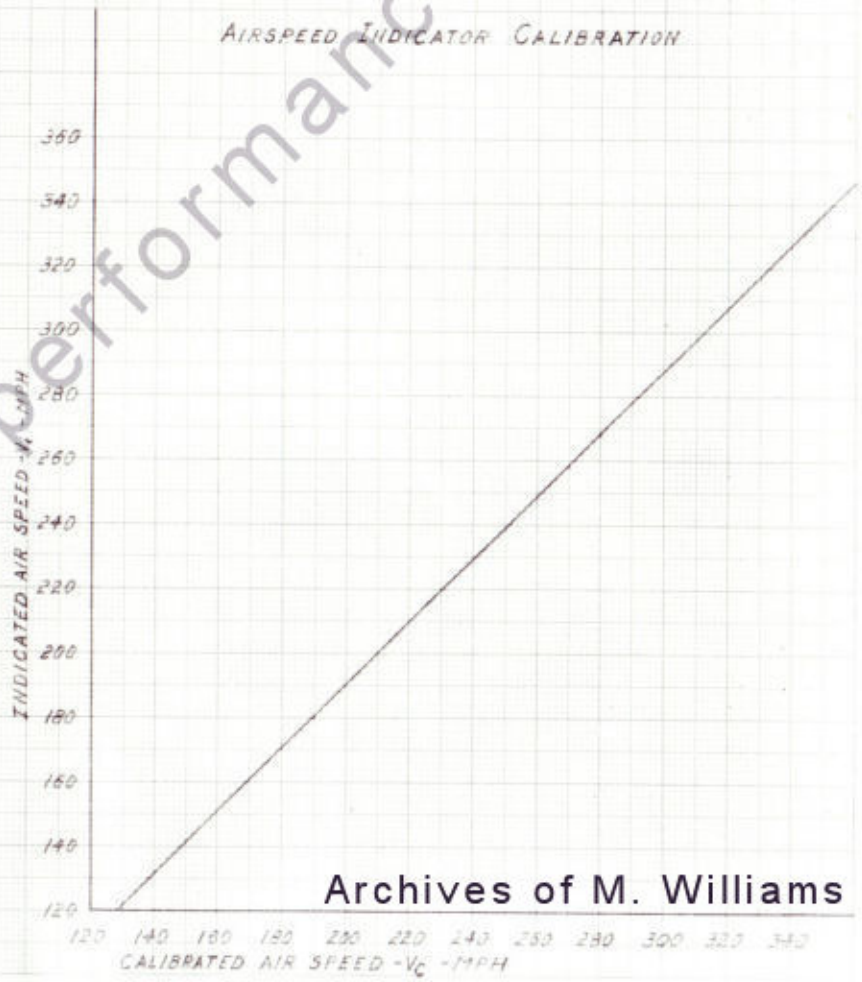
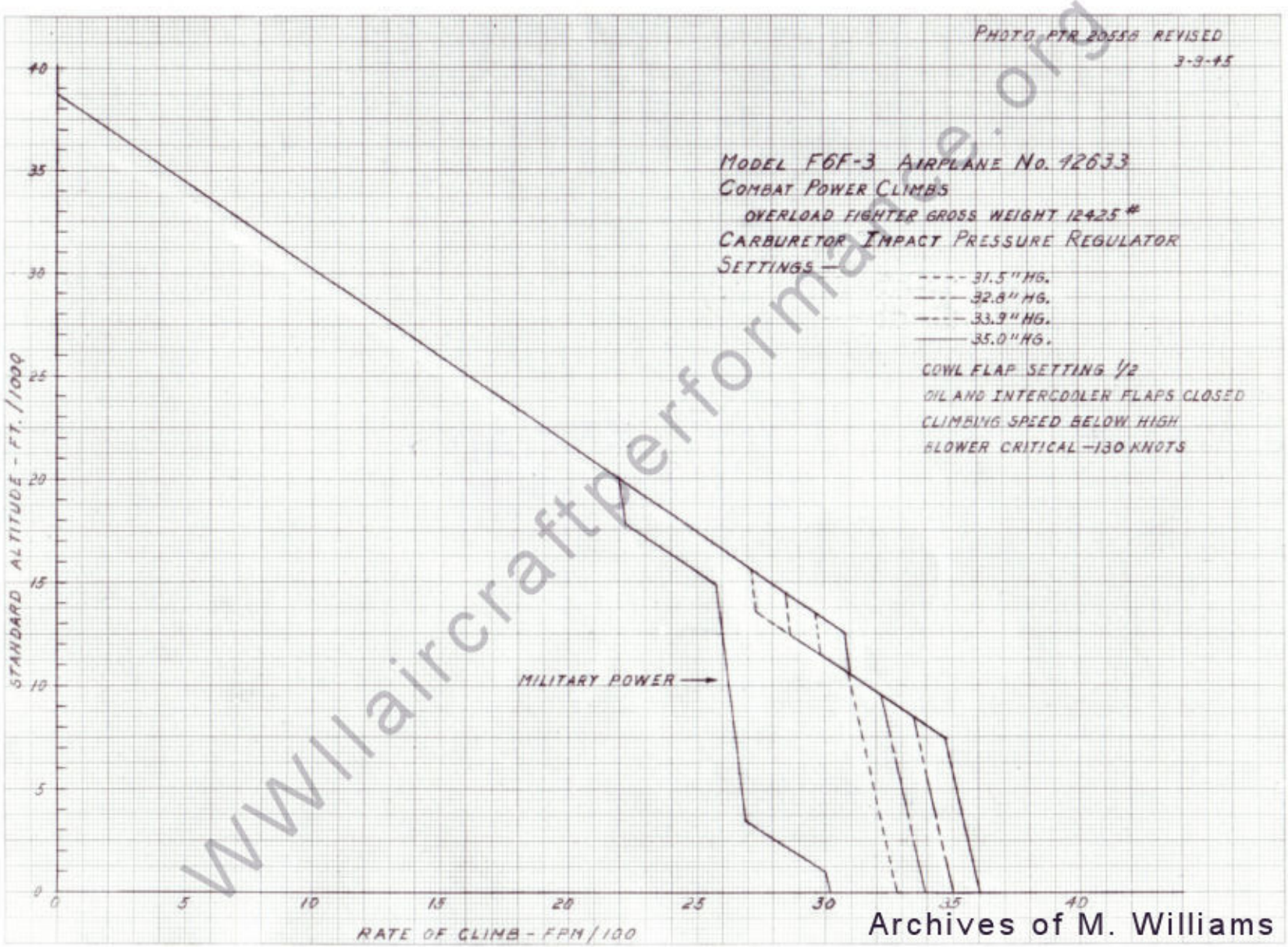


PHOTO PTR 20553

MODEL F6F-3 AIRPLANE No. 42633
PERFORMANCE CHARACTERISTICS AT COMBAT POWER
OVERLOAD FIGHTER GROSS WEIGHT 12386 LBS.







Model F6F-3, No. 04934 -
3/4 Right Front View

Photo.PTR 2766
1-23-44

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