P-40F

~~CONFIDENTIAL~~

WAR DEPARTMENT

~~AIR CORPS MATERIEL DIVISION~~

ARMY AIR FORCES, MATERIEL CENTER

LHS-da

MEMORANDUM REPORT ON

Pursuit Single Engine P-40F, AAF No. 41-13601

SUBJECT: Performance Test

Date July 11,1942

SECTION Flight Section

SERIAL No. PHQ-M-19-1440-A

Contract No.

Expenditure Order No. 430-4-77

Purchase Order No.

A. Purpose

1. Report on performance tests of P-40F airplane equipped with Packard-Merlin V-1650-1 engine and three-bladed constant speed propeller, design No. 89301-3, blade angle range 26.5° to 56.5° at 42 inch radius. Gross weight as tested, 8450 pounds. Except where otherwise stated, landing gear retracted; wing flaps neutral; carburetor cold; cabin closed; cooling shutters in flush position in level flight, wide open in climb; six .50 caliber guns in place with openings taped; wing bomb shackles with sway braces installed. b.h.p. figures obtained from preliminary power charts furnished by Power Plant Laboratory.

B. Test Results

1. High speeds, mixture control auto-rich.

Altitude	True Speed m.p.h.	r.p.m.	b.h.p.	Blower	Throttle
9,800	320	2650	1080	Low	Part
12,800	350.5	3000	1240	Low	Wide (Critical Alt.)
16,700	336.5	2650	1010	High	Part
19,270	364.5	3000	1105	High	*Wide (Critical Alt.)

*Airplane is 3.5 m.p.h. faster with mixture control adjusted for maximum power.

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2. Cruising speeds.

Altitude	True Speed	r.p.m.	b.h.p.	Blower
9,800	284.5	2340	810	Low
9,800	269.	2340	723	Low
9,800	252.	2250	648	Low
9,800	242.	1850	600	Low
16,150	302.	2340	758	High
16,150	288.5	2340	677	High
16,150	272.5	2230	606	High
16,150	240.	1850	508	High

3. Fuel consumption at 300 m.p.h. at 2450 r.p.m. at 15,000 feet was 353 pounds per hour (0.444 lbs/bhp/hr) at 795 b.h.p.; throttle wide open in low blower ratio with mixture control set in automatic lean position.

4. Climb results: Throttle open to 48" Hg. manifold pressure or wide open when below 48" Hg. in both high and low blower ratios; high blower used above 13,000 feet.

	Altitude	True Speed m.p.h.	r.p.m.	b.h.p.	Rate of Climb Ft./Min.	Time of Climb Min.
	0	149	2850	1135 .51 SFC	2100	0
	5,000	164	2850	1180	2160	2.35
	9,600	176	2850	1240	2210	4.45
	13,000	185	2850	1090	1780	6.2
	15,000	191	2850	1085	1860	7.25
	20,000	205	2850	980	1480	10.2
	25,000	213.5	2850	835	1000	14.25
	30,000	222	2850	680	530	21.0
S/C	34,400	229	2850	-	100	37.5
A/C	35,500	-	2850	-	0	-

5. Results of take-off and landing tests obtained by the Photographic method will be reported by the Aircraft Laboratory. Take-offs were made with wing flap settings from neutral to full down to determine minimum take-off ground roll. Lateral control is poor at the slow speed take-offs, also when taking off with one-half or greater wing flap deflection full rudder trim is required plus additional force on rudder pedals.

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6. Carburetor heat tests at 2280 r.p.m. at 2000 feet pressure altitude, free air temperature +17° C; carburetor air temperature with heat control in full cold position at 33" Hg. manifold pressure was + 24° C; with same throttle setting and heat control in full hot position, carburetor air was 46° C, intake manifold pressure 31.9" Hg.

7. Carbon monoxide tests were obtained at 2320 r.p.m. and 34" Hg. with mixture control in auto-rich position. No appreciable amount of carbon monoxide was present.

8. Determination of airspeed indicator and sea level altimeter installation errors with pitot static openings located approximately 23 inches in from left wing tip and 17-1/2 inches ahead of leading edge of wing at that point. Wheels up, wing flaps neutral.

Indicated Airspeed m.p.h.	Indicator vs. Water Column m.p.h.	Calibrated Airspeed m.p.h.	Airspeed Installation Error m.p.h.	Altimeter Error Ft.
270	268.5	277	- 8.5	-175
250	248	255.5	- 7.5	-155
230	229	235	- 6.	-130
210	209	214.5	- 5.5	-110
190	188.5	193	- 4.5	- 85
170	168.5	172	- 3.5	- 60
150	148.5	150.5	- 2.	- 40
130	129	129.5	- 0.5	- 15

Concurrence:

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