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ARMY AIR FORCES
MATERIEL CENTER

MEMORANDUM REPORT ON
Pursuit Twin Engine P-38G-1, A.C. No. 42-12687 LHS:da:19

Date February 10, 1943

SUBJECT: Performance Tests

SECTION Flight

SERIAL No. FS-M-19-1538-A

Contract No.
Expenditure Order No. 431-4-29
Purchase Order No.

A. Purpose.

1. Report on performance of P-38G-1 equipped with V-1710-51 and -55 engines and three bladed constant speed propellers, design Nos. 88996-18 and 89303-18, blade angle range 22.7° to 57.7° at 42 inch radius. Take-off gross weight 13,900 pounds, c.g. location wheels up, 30.9 percent m.a.c. Tested with one 20 mm. cannon (50 rounds of ammunition) and two.50 caliber guns (400 rounds), radio antenna (three wire) in place, and with 180 gallons of fuel. Wheels up, wing flaps neutral, prestone and oil cooler shutters in the faired position for level flight and wide open in climb. Mixture control auto-rich for high speeds and climb. Brake horsepower figures in this report were obtained from power curves.

B. Test Results.

1. Level flight speeds at 3000 RPM.

Altitude	True Speed MPH	b.h.p. per Engine	Estimated Gr. Wt. pounds	Manifold Pressure "Hg.	Remarks
5,000	346.5	1220	13,550	44.7	
5,000	355.5	1320	13,550	48.0	
*14,700	378.0	1220	13,525	44.7	
**22,600	404.0	1225	13,500	44.7	
24,400	403.0	1175	13,450	43.2	Carb. Air Temperature Limiting Factor.
30,000	396.0	980	13,400	36.0	Turbo RPM Limiting Factor.

*1320 b.h.p. can not be used at this level due to carburetor air temperature limitation (57°C).

**Critical altitude of turbo installation for 44.7 inches HG. manifold pressure. Carburetor air temperature is the limiting factor.

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2. Power calibration at 5,000 feet.

True Speed MPH	b.h.p. per Engine	RPM	Estimated Gr. Wt. pounds
346	1150	2800	13,270
332	1000	2600	13,110
310	800	2280	13,670
284	600	2000	13,540
266	475	1800	13,490
248	360	1600	13,460
236	290	1600	13,430

3. Power calibration at 24,400 feet.

True Speed MPH	b.h.p. per Engine	RPM	Estimated Gr. Wt. pounds
404	1150	2800	13,550
392	1000	2600	13,410
366	800	2280	13,330
352	690	2200	13,270
331	525	2000	13,210
316	410	2000	13,150

4. Climb data at 3000 RPM.

Altitude	True Speed MPH	Ave. b.h.p. per Engine	Rate of Climb Ft/Min.	Time of Climb Min.	Intake Man.Pr. "Hg.	Limiting Factor
S.L.	156	1200	3300	0	44.7	--
6,000	171	1210	3660	1.71	44.7	--
10,000	181	1210	3630	2.81	44.7	--
15,000	196	1210	3500	4.21	44.7	--
20,000	219	1195	3280	5.68	44.7	Carb. Temp.
25,000	230	1090	2680	7.36	40.6	Carb. Temp.
30,000	246	985	2100	9.46	36.0	Carb. Temp. and Turbo RPM.
35,000	264	690	1200	12.48	27.2	Turbo RPM.
S/C 39,400	280	—	100	22.04	—	Turbo RPM.
A/C 39,700	—	—	0	—	—	—

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5. Stalling speeds, gross weight 13,360 pounds.

Wheels and Flaps	Up	Up	Up	Down	Down	Down
b.h.p. per engine	Off	500	800	Off	505	810
Cal. speed MPH	92	82	80	71	58	56
RPM	—	2000	2280	—	2000	2280

6. Determination of airspeed indicator and altimeter installation errors. Airspeed mounted on a mast with static openings 15 inches below wing, 96 inches in from wing tip, 24-3/4 inches back of leading edge. Wheels and flaps up.

Indicated Airspeed MPH	Indicator vs. Water Column MPH	Calibrated Airspeed MPH	Airspeed Installation Error MPH	Altimeter Installation Error Ft. (S.L.)
330	327.5	318.0	+9.5	—
300	296.5	290.0	+6.5	+180
270	266.5	263.0	+3.5	+130
240	236.0	234.5	+1.5	+ 80
210	207.5	208.0	-0.5	+ 30
180	179.0	182.5	-3.5	- 20
150	149.5	156.0	-6.5	- 70

7. Results of take-off and landing tests obtained by the photographic method will be reported by the Aircraft Laboratory.

8. It will be noted that the same speeds were obtained at 2800 RPM at 5000 feet and 24,400 feet that were obtained at 3000 RPM and with less b.h.p. Torque meters are not available for the Allison engines and it is therefore not possible to determine how much of this is due to loss of propeller efficiency or if the engine power charts are inaccurate.

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9. Carburetor air intercooling is sufficient to permit operation on an Air Corps "hot day" under any of the conditions listed in this report. Prestone cooling does not meet Air Corps cooling requirements.

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Concurrence:

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