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ARMY AIR FORCES
MATERIEL ~~ENGINEER~~ COMMANDMEMORANDUM REPORT ON
P-39Q-5 Airplane, AAF No. 42-19615

WEB:ew:47

Date 9 October 1943

SUBJECT: Flight Tests

SECTION Flight

Contract No.

Expenditure Order No. 430-4-87

SERIAL No Eng-47-1651-A

Purchase Order No.

A. Purpose

1. To report on flight tests of the Bell P-39Q-5 airplane, AAF No. 42-19615 at Wright Field.

B. Factual Data and Test Results

1. The airplane is equipped with an Allison V-1710-85 engine and three bladed constant speed Aero-propeller, blade design No. A-20-156-17 with a high angle of 63° and low angle of 28° at the 42 inch station.

Horsepowers were obtained from the V-1710-81, 83, 85 power curves dated September 29, 1942 with 2.0:1 and 2.23:1 propeller gear ratio and 9.6:1 supercharger gear ratio.

2. The airplane was tested in the following condition: Take-off gross weight was 7871 pounds with the c.g. at 30.02 percent M.A.C., wheels up and 29.42 percent M.A.C. wheels down. The airplane was ballasted for ten additional gallons of fuel, to give 120 gallons total, by addition of 60 pounds ballast in the cockpit. The two externally mounted caliber .50 wing guns, their fairing, brackets, and equivalent weight of ammunition were removed. Additional ballast was installed to compensate for this removal. Also ballasted for 200 rounds (60 pounds) in each of two caliber .50 nose guns and 30 rounds (90 pounds) in the 37 mm nose cannon. All other normal combat provisions and equipment, and belly tank shackle without sway bracing, in place.

Wheels up, wing flaps neutral, carburetor cold, mixture auto-rich unless otherwise specified.

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3. High speed at 11,000 feet (critical altitude for P39N with 57 inches manifold pressure and 3000 R.P.M.)

Wide open throttle and 3000 R.P.M., oil shutters in the flush position. Coolant shutters open to 2.9 inches of gap from the flush position, corresponding to approximately six turns from wide open.

Altitude Ft.	Speed MPH	BHP from Chart	Manifold Pressure "Hg.	Test Coolant Shutter Position Inches open from Flush
11,000	385.0	1340	54.5	2.9

Performance previously obtained, with the two external caliber .50 wing guns on and the airplane at the same weight, gave the following results:

Altitude Ft.	Speed MPH	BHP from Chart	Manifold Pressure "Hg.	Test Coolant Shutter Position Inches open from Flush
11,000	372.5	1340	54.5	2.9

4. Climb Data

Wide open throttle and 3000 R.P.M., oil shutters and coolant shutters wide open.

Altitude Ft.	Speed MPH	BHP from Chart	Manifold Pressure "Hg.	Rate of Climb Ft/Min.	Time to Climb Min.
0	171	- 1310 .7	55.0	3470	0
5,000	185	1330 .7	55.0	3540	1.43
* 8,100	191	1350 .7	55.0	3580	2.29
10,000	193	- 1255 .69	51.2	3307	2.85
15,000	197	1040 .63	42.6	2640	4.54
20,000	200	- 870 .52	35.5	2007	6.71
25,000	203	720 .52	29.3	1365	9.72
30,000	206	- 580 .5	24.0	725	14.66
S/C 34,900	208	450 .5	19.2	100	29.6
A/C 35,700	---	---	---	0	---

* Critical altitude in climb for 55 inches Hg. at 3000 R.P.M.

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The above results should not be directly compared with the results obtained in previous climbs with the two external wing guns in place.

Considerable engine trouble was experienced while attempting to obtain climbs with the guns off and as can be seen from the above results, the engine was not developing full war emergency power.

Flight test made on the XP-63 airplane with the two externally mounted wing guns on and off indicate that an increase of only approximately 110 Ft/Min. in rate of climb is obtained by removing the guns. Such a figure is close to the limits of climb determination accuracy. Since the wing gun installation on the P-39Q-5 is similar to that on the XP-63, it is probable that the removal of the wing guns on the P-39Q-5 has no greater effect than that determined for the XP-63.

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Incl.: 1 Summary Sheet

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