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ARMY AIR FORCES
MATERIEL CENTER

MEMORANDUM REPORT ON

Pursuit Single Engine - P-39N-1, A.C. No. 42-4400 NRR-da
Date November 24, 1942

SUBJECT: Flight Tests

SECTION Flight

Contract No.

Expenditure Order No. 430-487SERIAL No. FS-M-19-1510-A

Purchase Order No.

A. Purpose

- Report on climb and take-off tests of Bell P-39N-1 airplane at the manufacturer's plant. Airplane equipped with Allison V-1710-85 engine and three-bladed constant speed propeller, blade design No. A-20-156-17, blade angle range 28° - 63° at 42 inch radius. Gross weight at take-off was 7301 pounds with c.g. at 28.8 percent, wheels up. Landing gear retracted; wing flaps neutral; carburetor cold; mixture auto-rich; one 37 mm cannon, four .30 caliber wing guns, and two .50 caliber nose guns in place with a corresponding ammunition load of 30 rounds of 37 mm ammunition, 300 rounds of .30 caliber ammunition per gun and 200 rounds of .50 caliber ammunition per gun. Radio and radio mast and antenna in place with belly tank shackle without sway bracing in place. Horsepowers obtained from power curve V-1710-83 and -85 dated September 19, 1942 (2.23:1 propeller gear ratio; 9.6:1 blower gear).

B. Test Results

- Climb data:
Prestone and oil cooler flaps wide open; blast tubes closed; mixture control in the automatic rich position. Throttle set for 57 inches Hg. at 3000 RPM or wide open when below.

Altitude	Speed		b.h.p.	Rate of Climb Ft/Min.	Time of Climb Min.
	MPH	RPM			
S.L.	160	3000	1355	3980	0
5,000	173	3000	1375	4240	1.22
7,500	178.5	3000	1390	4360	1.80
10,000	183	3000	1265	3900	2.41
15,000	192	3000	1060	3230	3.82

Prestone temperature does not meet Air Corps requirements in climb. Highest observed prestone temperature in climb was 126°C at 12,000 feet at 1225 b.h.p. with a free air temperature of -12°C. Anticipated prestone out temperature for Air Corps "hot day" 152°C.

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- 2. Distance required to take-off from a macadam runway and clear a 50-foot obstacle with one-third wing flaps setting (15°) was 1060 feet (average of three best trials) at 2800 RPM and 50.5 inches Hg. manifold pressure. Average ground roll was 660 feet.
- 3. See E.S.M.R. No. FS-M-19-1487-A dated October 17, 1942, for balance of performance.

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Prepared by *Nathan R. Rosengarten*
NATHAN R. ROSENGARTEN, 1st Lt., A.C.
(Name)

Approved by *J. M. Gillespie*
J. M. GILLESPIE, Colonel, A.C.
Chief, Flight Section

Concurrence:

Approved by *W. E. Lamar*
W. E. LAMAR, 1st Lt., A.C.
Flight Research
Approved by *F. O. Carroll*
F. O. CARROLL, Brig. Gen., A.C.
Chief, Exp. Engr. Section

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