

90

WAR DEPARTMENT
AIR CORPS, MATERIEL DIVISION

MEMORANDUM REPORT ON
Pursuit 1-Engine (XP-39B) A.C. No. 38-326

EKW-BC
Date August 13, 1940

SUBJECT: Comparative Speed Tests

SECTION Flying Branch

Contract No. AC-10341
Expenditure Order No. 430-1-27
Purchase Order No. _____

SERIAL No. PHQ-M-19-1126-A

1. Purpose

- a. Comparative speed tests of XP-39B airplane with and without 50 cal. guns and 37 mm cannon installed. Airplane equipped with Allison V-1710-37 engine and 3-bladed constant speed propeller, blade design No. 614CC1.5. Landing gear retracted, wing flaps neutral, carburetor cold. Prestone shutters wide open. Gross weight 6459 lbs.

2. Factual Data

- a. The speeds listed in this report are for the purpose of comparing armament installations only. The ramming type intake scoop was not connected to the carburetor and was out of line on the speed tests but was properly installed for the service ceiling and take-off and landing tests.
- b. Speeds in level flight at 12,000 ft. density altitude at 2600 rpm:

B.H.P.	Cannon and	37 m.m. Cannon	37 m.m. Cannon
	50 Cal. Gun	in Place	
	Openings Closed	But 50 Cal. Gun	Guns Installed
		Openings Closed	
900	335	334	333
850	328.5	328	327
750	315	315	313.5
650	300.5	300.5	299

- c. Airplane service ceiling is 36,000 ft.
- d. Results of take-off and landing tests obtained by the photographic method will be reported by the Aircraft Laboratory.

MEMO REPORT - Serial No. PHQ-M-19-1126-A
August 13, 1940

3. Pilot's Comments:

- a. Prestone temperatures are excessive in climb; during the first climb to 34,000 ft. the prestone-out temperature reached 130° C., which is above the boiling point of the liquid at that altitude. Release of pressure in the system would result in sudden and complete loss of prestone.

Following the first climb the airplane was brought down to 18,000 ft. in a slow speed glide and the second climb started from there; at 22,000 ft. there were noises in the front end which sounded like a dry bearing. The climb was discontinued at 26,000 ft. because of the noise and excessive prestone temperatures. It appears possible that the noise was a result of oil congealing during the glide.

- b. The best indicated speed for take-off is between 90 and 110 mph, the airplane accelerates rapidly up to 80 mph, but beyond that point the nose wheel has a tendency to dig in and the acceleration is slow. It is believed that the take-off characteristics could be improved by lengthening the nose wheel strut without causing porpoising on landings and that the landing characteristics might also be improved, since with full application of brakes on landings the main wheels skid due to the high load on and resulting deflection of the nose wheel strut, and it appears possible to obtain a shorter ground roll using only part brakes. The ground observer also reported the main wheels and struts shake when brakes are applied during landings.

Ernest K. Warburton
Prepared by ERNEST K. WARBURTON, Capt., A.C.
(Name)

George J. Eppright
Approved by GEORGE J. EPPRIGHT, Capt., A.C.,
Acting Chief, Flying Branch

F. O. Carroll
Approved by F. O. CARROLL, Major, Air Corps,
Chief, Exp. Engr. Sec.

Concurrence:

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Distribution: Chief, Exp. Engr. Sec. ✓
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