WAR DEPARTMENT
AIR CORPS, MATERIEL DIVISION

MEMORANDUM REPORT ON
Pursuit Single Engine (P-39C), A.C. No. 40-2990

MRR-BC

Date September 22, 1941

SUBJECT: Flight Tests - Critical Altitude and High Speed

SECTION Flying Branch

Contract No. 535 AC-13383

SERIAL No. PHQ-M-19-1297-A

Expenditure Order No. 430-4-40

Purchase Order No.

A. **Purpose**

1. Report on flight tests conducted at the manufacturer's plant on Bell P-39C. Airplane equipped with Allison V-1710-35 engine with a blower gear ratio 9.6:1 and a propeller reduction gear of 2.0:1; and a three-bladed 10 ft. high speed propeller, blade design No. 101330. Gross weight as tested 7303 lbs., c.g. location, wheels up, 27.2% m.a.c.; wing flaps neutral; carburetor cold; one exhaust stack per cylinder; prestone and oil cooler flaps flush with cowling in level flight; radio antenna in place; airplane camouflaged and all cracks glazed as noted; 37 mm gun not in place with special spinner without cannon opening.

B. **Test results with noted differences since test of July 17, 1941:**

a. **Propeller:**
   1. High speed 10' 0"; 101330 blade design
   2. Special propeller spinner with pointed nose and no cannon opening
   3. Special fairing around blast tubes

b. **Engine:**
   1. Blower gear ratio, 9.6:1
   2. Propeller reduction gear, 2.0:1
   3. No cooler tubes to plugs
   4. Ceramic outboard plugs

c. **Wing:**
   1. P-39D wings
   2. No wing guns, special leading edge covers where wing guns would be
   3. Wing butt gap filled with plasticine
   4. Special adjustable (with adjustment control removed) oil and prestone inlet ducts
   5. All wing gaps and cracks filled in and glazed over to give a smooth surface

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d. Empennage:
1. Special small elevators and rudder
2. Small fillets on under side of stabilizer
3. No fillets on upper side of stabilizer
4. Aerodynamic balance of elevators and rudder changed (reduced)
5. Special fin and stabilizer

e. Fuselage:
1. All cracks and seams filled in
2. Entire airplane glazed
3. Shortened antenna, from carburetor, air scoop to fin
4. Glazed cabin roof
5. Special fuselage covering behind carburetor air scoop

1. True airspeeds at wide open throttle conditions:

Press. Alt. Ft.	Outside Temp. °C.	Density Alt. Ft.	True Airspeed MPH	R.P.M.	Man. Press.	Carb. Air Temp. °C.	Throttle Position
15,390	-2	16,950	402	3000	45.9	14	Wide open
16,685	-4	18,300	401	3000	43.4	11	Wide open
18,385	-8	19,920	406	3000	41.5	9	Wide open
19,185	-10	20,700	398	3000	39.8	7	Wide open
20,190	-11	21,700	397.9	3000	38.3	4	Wide open

Note: Power curves were not available at time of test. For this reason data obtained were not corrected to a standard day. Under standard conditions, at the altitudes corresponding to the density altitudes at which the speeds were obtained, the horse power available would be less than was obtained in the test resulting in a corresponding decrease in speed.

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