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WAR DEPARTMENT
AIR CORPS, MATERIEL DIVISION

CLASSIFICATION CHANGED

TO: *Restricted*
AUTH: *AR-38-5 + 1/2 HTSC off*
BY: *PC*
DATE: *4-4-46* *Dist. 80-3*

MEMORANDUM REPORT ON

Pursuit Single Engine (P-40E), A.C. No. 40-384 LHS-BC

Date September 25, 1941

SUBJECT: Performance

SECTION: Flying Branch

Contract No. W-535 AC-12414

SERIAL No. PHQ-M-19-1300-A

Expenditure Order No. 430-4-61

Purchase Order No.

A. Purpose

1. Report on performance of Curtiss P-40E. Airplane equipped with Allison V-1710-39 engine (backfire screens in intake ports) and 3-bladed constant speed propellers, blade design No. 89301-3. Gross weight as tested approximately 8011 lbs. with belly tank removed; c.g. location wheels up 28.5% m.a.c.; landing gear retracted; wing flaps neutral; radio antenna installed; prestone and oil cooler shutters flush with cowling in level flight, wide open in climb; six 50 cal. wing guns with uncovered openings in wings in place. Weight of belly tank and fuel 366 lbs. (capacity 52 gals.).

2. Test Results

a. High speed tests:

Altitude Ft.	True Speed MPH	R.P.M.	B.H.P.	Throttle Position	Test Condition
11,400	342	3000	1150	Wide	Belly tank removed
15,300	340	3000	990	Wide	Belly tank removed
15,300	319	3000	965	Wide	Belly tank installed
15,300	316	2600	820	Wide	Belly tank removed
15,300	298	2600	800	Wide	Belly tank installed

b. Cruising speeds and fuel consumption, mixture control in automatic lean position:

Note 8011# based on calculated Wt. Empty of
5982# (Curtiss Report 8279)
P-40E #29 (AC 40-410 had Wt. Empty of 6069#
G.W. of AC 40-384 is therefore more nearly 8098#

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Altitude Ft.	True Speed MPH	R.P.M.	B.H.P.	Fuel Cons. Gals/Hr at 6.0 Lbs Fuel per Gal.	Throttle Position	Belly Tank
15,300	297	2280	715	-	Wide	Removed
15,300	278	2280	700	-	Wide	Installed
15,300	293.5	2280	694	64.2	Part	Removed
15,300	276.5	2280	694	-	Part	Installed
15,300	274.5	2200	600	-	Part	Removed
15,300	257	2200	600	-	Part	Installed
15,300	250	2050	502	38.8	Part	Removed
15,300	234	2050	502	-	Part	Installed
15,300	219	1975	400	-	Part	Removed
15,300	206	1975	400	-	Part	Installed
15,300	197	1835	335	27.8	Part	Removed
15,300	186	1835	335	-	Part	Installed
5300	276	2280	750	-	Part	Removed
5300	263	2280	750	-	Part	Installed
5300	271.5	2280	724	63	Part	Removed
5300	259	2280	724	-	Part	Installed
5300	247	2200	600	-	Part	Removed
5300	234	2200	600	-	Part	Installed
5300	221	2050	493	-	Part	Removed
5300	210	2050	493	-	Part	Installed
5300	208	1985	450	-	Part	Removed
5300	198	1985	450	-	Part	Installed
5300	158	1800	314	24.6	Part	Removed

c. Climb data; propeller set for 3000 rpm for first 5 min.
with throttle open to 43.9" Hg. manifold pressure or
wide when below.

Altitude Ft.	True Speed MPH	R.P.M.	B.H.P.	Rate of Climb Ft/Min.	Time of Climb Min.
0	146	3000	1020	2100	0
5000	158.5	3000	1070	2260	2.3
10,000	170.5	3000	1120	2400	4.44
11,300	173.5	3000	1065	2250	5.0
15,000	177.5	2600	795	1370	7.38
20,000	187	2600	655	880	11.82
25,000	196.5	2600	555	480	19.42
S/C 30,000	205	2600	470	100	40.1
A/C 31,350	-	2600	-	0	-

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d. Results of take-off and landing tests will be reported by the Aircraft Laboratory.

e. Determination of airspeed indicator and altimeter installation errors with wheels and flaps up. Barometric pressure at time of test 29.45" Hg. Airspeed static openings located 22" in from wing tip and 17" fore leading edge of wing:

Indicated Airspeed MPH	Indicator Vs Water Column MPH	Calibrated Airspeed MPH	Airspeed Installation Error MPH	Altimeter Installation Error Ft.
275	274	284.5	-10.5	-200
250	248	257.5	-9.5	-160
225	222	231	-9	-130
200	196	203	-7	-105
175	172	177	-5	-80
150	147	152	-5	-60

f. Carbon monoxide tests at 2250 rpm and 31" Hg. Manifold pressure with mixture control in full rich position:

	CO Content %
Pilot's face position, cabin closed, heater off -	.0015
Pilot's face position, cabin open approx. 2", heater off -	.0015
Sample of air from cockpit heater with heater "on"	.000
Sample of air from cockpit ventilator, heater "off"	.0005

g. B.H.P. figures obtained from temporary power curve dated 6-11-41 furnished by Power Plant Laboratory for V-1710-35 and -39 engines equipped with backfire screens, Allison Part No. 40043 plus 40240, installed.

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