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WAR DEPARTMENT
AIR CORPS, MATERIEL DIVISION

MEMORANDUM REPORT ON
Bell P-39D, A.C. No. 41-6926

MPM-da

Date August 14, 1942

SUBJECT: Intake Manifold without
Back-fire Screens

SECTION: Flight Section

SERIAL NO: PHQ-M-19-1453-A

CLASSIFICATION CANCELLED
AUTH AR 380-6 D-I-80-3
BY: *lmm*
DATE: 12 April 1944

Contract No.
Expenditure Order No. 430-4-62
Purchase Order No.

A. Purpose

1. Preliminary report on comparative high speed tests of P-39D airplane equipped with standard intake manifold including both individual intake port and manifold "T" back-fire screens and new design intake manifold without any back-fire screens. Airplane equipped with Allison V-1710-35 engine and three-bladed constant speed propeller, blade design No. 614-1C1.5-21. Tests conducted with wheels up, wing flaps neutral, carburetor cold, mixture control automatic rich, prestone and oil cooler flaps in the flush position, radio antenna and armament with barrels taped consisting of 37 mm. cannon, two .50-caliber synchronized and four .30-caliber wing guns in place.

B. Test Results

1. Level flight speeds at 16,000 feet at 2990 RPM at wide open throttle was 354.5 MPH with the original intake system and 367 MPH with the new design manifold.

C. Remarks

1. Brake horsepower figures are not listed since the engine has not been calibrated on the dynamometer stand when equipped with the new design intake manifold.
2. Results listed are not corrected to standard conditions for the same reason but are directly comparable because free air temperature and pressures at the test level were practically identical.
3. Estimated increase in engine horsepower under test conditions with the new manifold is approximately 100 b.h.p. in military rated power, critical altitude approximately 2500 feet.

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C. Remarks - Continued

4. Intake manifolds:

- a. Original system with both individual port and "T" back-fire screens. Intake duct from carburetor - Part No. 34167-BB, tee ducts - Part No. 40041-J, Port manifolds - Nos. 40773 and 40772.
- b. New design system without any back-fire screens. Intake duct from carburetor - Part No. 42791, tee ducts - Part No. 42790, Port manifolds, -Part Nos. 36085-G and 36086-G.

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Concurrence:

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