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ARMY AIR FORCES
MATERIEL CENTER COMMAND
ENGINEERING DIVISION

MEMORANDUM REPORT ON

RJW:rsr:57

Date 27 March 1944

SUBJECT: Preliminary 7-1/2 Hour War Emergency Rating Test of the Allison V-1710-91 Engine Operated on Grade 104/150 Fuel and AC-EX433 Spark Plugs.

SECTION: Power Plant Laboratory

Contract No.
Expenditure Order No. 531-243
Purchase Order No.

SERIAL No. ENG-57-531-267 *MB*

A. Purpose.

1. To report on the results of the 7-1/2 hour preliminary War Emergency Rating test of the Allison V-1710-91 engine, No. A-047669, conducted at Power Plant Laboratory, Engineering Division, Wright Field on Torque Stand No. 4. The test was conducted between 1 March 1944 and 4 March 1944.

B. Factual Data.

1. The preliminary test was run with ram and carburetor air temperature regulated from the Torque Stand blowers. The exhaust pressures were maintained at a higher pressure than the ram as no turbo supercharger was used.

2. The engine satisfactorily completed the War Emergency Rating test at a rating of 2000 b.h.p. at 3000 r.p.m. and 75 inches manifold pressure, in accordance with the Army Specification on War Emergency Approval Test, without major incident.

3. At the completion of the test, visual and magnetic inspection revealed upon disassembly, that the only defects were in the main bearings. These showed signs of scoring which, it is believed, was due to foreign particles suspended in the oil delivered to the bearings. (See Exhibit A.)

4. For further detailed data on the test, see Appendix I.

C. Conclusions.

1. The Allison V-1710-91, No. A-047669, satisfactorily completed a 7-1/2 hour preliminary War Emergency Approval Test at a rating of 2000 b.h.p. at 3000 r.p.m. and 75 inches manifold pressure as conducted.

Classification cancelled
or referred to

AUTH:

CD 356

By

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CENTRAL FILES

11X-512-10K
X-4528-Allison V-1710-Engine-Report

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2. The PD-12K7 carburetor, Parts List No. 395003-5, used with the V-1710-91 engine does not give sufficient fuel flow at War Emergency Rated Powers to maintain a fuel air ratio that will prevent the engine from detonating.

D. Recommendations.

1. It is recommended that the Allison V-1710-91 engine be considered as having successfully passed the preliminary War Emergency Test as conducted in accordance with the Army Specification on War Emergency Approval Testing.

2. However, it is recommended that the PD-12K7 carburetor, Parts List No. 395003-5, be modified to allow a minimum fuel air ratio of .098 with an air flow of 15,000 lbs./hr.

3. It is further recommended that a War Emergency Rating be established using a P-33J intercooler, and a B-33 turbo supercharger operating at 75 inches manifold pressure and 3000 r.p.m. with compressor air intake and cooling air intake temperatures at a standard Army "hot day" of 100°F.

B. Description.

The carburetor, a PD-12-K7, No. 157095A, was modified to permit a higher fuel flow as needed for this test. The power enrichment jet was increased from 1700 cc to the 2100 cc. The nozzle was drilled to a 0.0250 inch diameter and a long range mixture control plate was incorporated.

Special cold running plugs, AC-24153 were used during the 7-1/2 hour War Emergency Test.

Concurrence:

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