

Spec. No. 1166-B
Date: May 11, 1942
Revised June 20, 1942
August 1, 1942

MODEL SPECIFICATION

ENGINE, AIRCRAFT: MODEL V-1710-87

ALLISON DIVISION
General Motors Corporation
Indianapolis, Indiana

(ALLISON MODEL DESIGNATION V-1710-F21R)

MODEL SPECIFICATION

ENGINE, AIRCRAFT: MODEL V-1710-87

Allison Division of General Motors Corporation

(Allison Model Designation V-1710-F21R)

A. APPLICABLE SPECIFICATIONS.

A-1. The following specifications of the issue in effect on date of invitation for bids shall form a part of this specification:

A-1a. Army-Navy Specification.

AN-9500 Engines, Aircraft; General Specification and applicable specifications of the issues indicated on Page 16.

B. TYPE AND MODEL.

B-1. This specification covers the requirements for the V-1710-87 engine.

C. MATERIAL AND WORKMANSHIP.

C-1. The requirements for material and workmanship shall be as specified in Specification AN-9500.

D. GENERAL REQUIREMENTS.

D-1. See Section E.

E. DETAIL REQUIREMENTS.

E-2. Drawings. - The following Allison Division drawings form part of this specification:

43206 Engine Assembly, Complete - (Showing Accessory Drive Oil Seals)

43205-B Installation Drawing (Showing clearances for engine accessories and their removal)

43325 Priming System Assembly
 42112 Carburetor, PD12K7 Bendix-Stromberg
 40600-J Spark Plug Assembly AC-LS85
 40601-B Spark Plug Assembly Champion C34S
 42354-C Terminal, Spark Plug (Contact)
 40208 Lubrication System Diagram
 41809-D Magneto
 42268 Radio Shielding Assembly
 37583-D Manifold Assem. - Spark Plug Cooling R.H.
 37584-D Manifold Assem. - Spark Plug Cooling L.H.
 33536-P Nut - Magneto Cable Shielding Conn.
 42348 Shielding - Spark Plug Cable - Intake
 42347 Shielding - Spark Plug Cable - Exhaust
 36411-F Nut #50 Prop. Shaft Thread Protector
 41616-C Bag - Engine Shipping
 42288-B Plug-Crankcase Dehydrator

E-3. Acceptance. Approval of this engine was based upon Model Tests of V-1710-51-55 (F1OR & L) and -39 (F3R). Dive tests as required in Par. F-3g (2) of AN-9502 shall be conducted at the contractor's plant on a separate engine. (Ref. Par. F-3, AN-9502)

E-4 Weight. The total dry weight of the engine complete shall not exceed the values indicated below:

Basic engine, including integral supercharger, supercharger drive mechanism, propeller reduction gears, coolant pump and piping on the engine, engine lubrication system oil pumps, starter connection, including starter dog, tachometer drives, fuel pump drive, generator drive, vacuum

pump drives, propeller governor drive and all piping and controls between engine parts	1266.0 lbs.
Carburetor and Injection Nozzle	32.0
Carburetor Screens and Gaskets	1.0
Magneto, Shielded	13.0
Ignition Distributors (included in Shielding Assembly)	
Radio Shielded Ignition Assembly, complete with Cable and Distributors	31.0
Spark Plugs	7.0
Priming System on Engine	1.0
Cooling Air Deflectors and Baffles	None
Accessory Drive Covers	2.0
TOTAL DRY WEIGHT OF ENGINE	1353.0 lbs.

E-5. Performance Characteristics. - The ratings specified herein and the curves specified herein and shown on Pages 13 to 16 shall constitute the power and specific fuel consumption guarantees. The terms used and the standard conditions shall be in accordance with applicable definitions contained in AN-9502.

E-5a. Ratings. - The engine shall be rated as follows, using fuel conforming to Specification AN-VV-F-781 (Amend. No. 5) and oil conforming to AN-VV-O-446, Grade 1120.

1100	B.H.P. at 2600 R.P.M. at sea level.
1100	B.H.P. at 2600 R.P.M. normal rating at 3000 ft.
1325	B.H.P. at 3000 R.P.M. take-off for five minutes.
1325	B.H.P. at 3000 R.P.M. military rating at 2,500 ft.
3120	R.P.M. rated overspeed dive R.P.M.

E-5b. Curves. - The following curves shall be furnished as part of this specification:

- E-5b.(1). Horsepower vs Altitude at Rated Speeds as shown on Page 13.
- E-5b.(2) BHP vs Altitude at Full Throttle (Various Speeds) as shown on Page 14.
- E-5b.(3) Specific Fuel Consumption Curves as shown on Pages 15 and 16.

E-5e. Specific Oil Consumption. - The specific oil consumption shall not exceed .025 lb./BHP/hr. at normal rated power and speed, .025 lb./BHP/hr. at 70 per cent normal rated power and 89 per cent normal rated speed.

E-5h. Coolant Flow and Heat Rejection. - The following guarantee is given for the coolant flow and heat rejection to the coolant:

Conditions:

Operation	On dynamometer for 5 minutes
Power	Take-off (1325 BHP)
Speed	Take-off (3000 RPM)
Fuel Consumption	Guaranteed Specific
Oil Inlet Temp.	185°F.
Oil Pressure	65 p.s.i.
Coolant Outlet Temp.	250°F.
Oil Flow	150 lb./min.
Air Blast on Engine	60°F. at 10 M.P.H.

Guarantee:

Coolant flow not to exceed - 265 G.P.M.
Heat rejection to coolant not to exceed - 430 H.P.

E-5h.(1); E-5h(1)(a); E-5h.(1)(b). - The engine manufacturer shall furnish sufficient coolant pump ~~data~~ for proper installation and operation in the airplane.

E-5i. Oil Flow and Heat Rejection. - The following guarantee is given for the oil flow and heat rejection to the oil:

Conditions:

Operation	On dynamometer for 5 minutes
Power	Take-off (1325 BHP)
Speed	Take-off (3000 RPM)
Fuel Consumption	Guaranteed Specific
Oil Inlet Temp.	185°F.
Oil Pressure	65 p.s.i.
Coolant Outlet Temp.	250°F.
Coolant Flow	265 G.P.M.
Air Blast on Engine	60°F. at 10 M.P.H.

Guarantee:

Oil flow not to exceed - 150 lb./min.
Heat rejection to oil not to exceed - 150 H.P.

E-7. Propeller. - The engine shall have a number 50 propeller shaft end. Provision shall be made for a governor type of propeller control mechanism of the hydromatic type.

E-12. Overall Dimensions. - The overall dimensions of the engine shall not exceed the following:

Length	85-7/8 inches
Width	29-9/32 inches
Height	36-27/32 inches

E-14. Preparation for Storage. - The engine shall be prepared for storage in accordance with AN-F-E-568 with the following exceptions:

- (1) (Ref. F-3g - Carburetor) The oil for filling the carburetor shall conform to Allison Division Specification ES-10.
- (2) (Ref. Par. F-3h., Intake Manifold) - The dehydrator bags shall be placed on the top of the carburetor screen and the carburetor sealed by securing a gasketed cover to the carburetor.
- (3) (Ref. Par. F-3n., Crankcase) - A dehydrator plug conforming to Allison Division drawing No.42288 shall be installed in an appropriate opening of the crankcase as soon as it can be made available.
- (4) (Ref. Par. F-30., Propeller Shaft) - A propeller shaft thread cap conforming to Allison Division Drawing No.36411 shall be installed.
- (5) (Ref. Par. F-4a., Packing Procedure) - The engine bag shall conform to Allison Division Drawing No. 41616.
- (6) (Ref. Par. F-4a(1) - After removing the engine from the engine case it shall be possible to reheat seal the openings which must be cut in the engine bag to insert the lifting hooks.
- (7) (Ref. Par. F-4b.) - The engine shipping case shall conform to Allison Division Drawing No.37780 which provides a window through which the indicator card may be inspected instead of a hinged door.

E-16b. Parts List of the Engine. - The parts list applicable in all details to the engine which successfully completes Government tests shall constitute a requirement of this specification.

E-18. Propeller Drive. - The engine shall be equipped with a reduction gear ratio of 2.00:1. The direction of propeller rotation when viewed from the anti-propeller end shall be clockwise.

E-19. Impeller Gear. - The impeller gear ratio shall be 7.48:1 and the impeller shall be 9-1/2 inches in diameter.

E-20. Pistons. - The engine shall be fitted with pistons of 6.65:1 compression ratio.

E-23a(1) Spark Plugs. - The engine shall be fitted with Champion C34S or AC-LS85 spark plugs.

E-23b. Radio Shielded Ignition Assemblies. - The engine shall be equipped with Allison designed radio shielded ignition assemblies with the following exceptions to AN-9510:

(1) (Ref., Par.D-1e., - Mounting Lugs)- Mounting clamps shall be provided in place of integral, soldered, or welded mounting lugs.

(2) (Ref., Par. E-8, Capacitance)- The capacitance between the shielding and each ignition cable contained therein shall not exceed 175 micro-microfarads.

(3) (Ref., Par. E-1a., Single Cable Conduits)- Single cable conduit connections shall be as shown on Allison Drawing Nos. 33536, 42347, and 42348.

E-23c. High Tension Ignition Cable.- (Reference AN-9500, Par. D-23c.) -High tension ignition cable conforming to U.S. Army Specification 95-32152 shall be used on all distributor head to spark plug leads, with the exception to paragraph E-7a that the marking shall be accomplished by stamping the date on the external surface of the cable instead of an interwoven thread. All other high tension cable shall conform to AN-J-C-56.

E-23d. Magnetos. - The engine shall be equipped with one Scintilla Type DFLN6 magneto in accordance with AN-9511 with the following exceptions:

(1) (Ref., Par.D-1b(1)., Threads) - Connections for the high tension terminals are 15/16-18 threads.

(2) (Ref., Par. E-1b(2)., Type D Magneto) - The heads of screws for securing the bearing retainer in the flange project beyond the .125" minimum recess in pilot specified in Figure No. 3.

(3) (Ref., Par. E-2c., Normal Operating Temperature) - The temperature rise of this magneto is 55.5°C.(100°F.) above room temperature.

(4) (Ref., Par. E-2d., Endurance, F-4a(11)b.)-(Elevated Temperature Run) - This magneto will not meet the temperature requirements specified except for very short periods of time.

(5) (Ref., Par. E-3e., Simulated Service)-F-4a(10)a., Rain and Spray Test) - The magneto will not meet the requirements when subjected to the test specified in this paragraph. The installation of this magneto on a liquid-cooled V engine requires and permits maximum ventilation in breaker cover.

E-23f. Cooling. (Reference, AN-9500, Par. D-23f.) - The engine shall be so designed as to permit the installation of adequate

means for cooling the magnetos to required maximum temperature of 80°C.(176°F.). Provision for cooling the spark plugs and the spark plug elbows shall consist of air ducts, as shown on Installation Drawing No. 43205, and drawing Nos. 37583 and 37584, to which the airplane manufacturer shall connect. For flight and ground operation, spark plug elbows shall be satisfactory, provided the ignition wire temperature measured in the elbow does not exceed 115°C.(239°F.) and provided the cable furnished in accordance with U.S. Army Spec. 95-32152 does not fail below this temperature.

E-24c. Oil Leakage Test. (Ref. AN-9500, Par. D-24c) With a mixture of equal parts of aviation gasoline and oil conforming to AN-VV-O-446, Grade 1100, supplied to the pressure oil pump inlet under a head of 36 inches the total flow of oil into the engine shall not exceed 0.2 pounds per hour.

E-24e. Scavenging System. The engine scavenging system shall adequately scavenge the oil under the following conditions:

- (a) No air traps exist in the external scavenging systems.
- (b) Operating conditions are normal.
- (c) Maximum back pressure on scavenge pumps:
Max. Flow 40 p.s.i.
Min. Idle 10 p.s.i.

Note: Since the gear type pump will not "prime" when air locked, the back pressures given above shall be permissible if not more than 2 p.s.i. of the pressure is due to a spring loaded relief valve. The reason is to permit free passage of air under airlock conditions.

- (d) Oil - grade 1100 or 1120 of AN-VV-O-446.
- (e) Viscosity of Inlet oil - 100 \pm 5 S.U.S.

E-24f Pressure Pump. In addition to the requirements of Par. D-24f of AN-9500, the oil pressure pump shall function satisfactorily when the inlet pressure is 82% or more of the absolute atmospheric pressure down to a minimum of 8 inches Hg. absolute, when no air leaks exist in the external oil inlet line.

E-24g. Oil Cleaner. The engine shall be equipped with one Automatic Cuno No. 10863, oil strainer, and shall meet the requirements of AN-9500 Par. D-24g under normal operating conditions.

E-24j. Provision for Oil Connections. The oil inlet connection shall be a 2 in., 4-stud opening as shown on Installation Drawing No. 43205.

E-24q. Crankcase Breathers. Ample breathing capacity shall be provided in accordance with Par. D-24q., of Spec. AN-9500; however, the airplane manufacturer shall locate the front and rear breather outlets to maintain a crankcase pressure measured at the front within the limits of +8 to -4 inches of water on any

new or modified airplane installation. It is desired that the pressure at the front breather be held to 2 to 6 inches of water higher than pressure at the rear breather to provide proper ventilation through the engine from front to rear.

E-25 Fuel Metering System. The engine shall be equipped with one Bendix-Stromberg Model PD-12K7 injection carburetor in accordance with AN-9515 except for the following:

- (1) (Ref. Par. D-7, Strainer) - The carburetor shall meet requirements except that foreign material is not removed with the strainer.
- (2) (Ref. Par. D-17, Mixture Control) - The mixture control positions are located as follows:
 - (A) Idle cut-off full forward.
 - (B) Automatic lean directly back of A.
 - (C) Automatic rich directly back of B.
 - (D) Full rich directly back of C.
- (3) (Ref. Par. D-26, Protective Treatment of Steel Parts) Cadmium plated parts shall have a minimum plating thickness of .0003".
- (4) (Ref. Par. D-32a(1), Metering Characteristics) - Sea Level - The carburetors shall meet requirements except that at 30 to 70 per cent of airflow for normal rated power and speed the variation in fuel/air ratio shall be plus or minus 2 per cent.
- (5) (Ref. Par. D-3b(1) Metering Characteristics, Master Carb.) At take-off power and speed, the carburetor shall contain a setting which in the rich mixture control position will furnish mixture strengths within +4 -0 per cent of the guaranteed fuel consumption.
- (6) (Ref. Par. D-32b(13) Carburetor Heat on Test) The complete airflow to the carburetor shall be heated to avoid icing conditions on test. Duplication of the airplane method of admitting warm air shall not be attempted.
- (7) (Ref. Par. D-32c, Metering Characteristics of Production Carburetors.) The carburetors shall meet requirements except that at 30 to 70 per cent of airflow for normal rated power and speed the variation in fuel/air ratio shall be plus or minus 2 per cent.
- (8) (Ref. Par. F-4e(3) Metering Tests of Production Carburetors) A procedure for air box testing production carburetors, in accordance with War Department, Air Corps, Materiel Division letter of April 29, 1938, Serial No. E-57-809-16.

shall be used, the procedure being as follows:

Mixture readings are obtained on the normal rated power and speed propeller load curve, using the following points; such points are subject to change to agree with individual carburetor specifications:

<u>AIRFLOW</u>	<u>METERING TOLERANCE</u>	<u>MIXTURE CONTROL POSITION</u>			
Take-off airflow	±2%	Auto.Rich	Auto.Lean	Full Rich	
100% rated power airflow	"	"	"	"	"
75% " " "	"	"	"	"	"
62-1/2% " " "	"	"	"	Auto.Lean	
50% " " "	"	"	"	"	Full Rich
35% " " "	"	"	"	"	"
22-1/2% " " "	±5%	"	"	"	"
15% " " "	"	"	"	"	"
10% " " "	"	"	"	"	"
Airflow at min. idling speed	"	"	"	Idle cut-off.	

In addition, carburetors designed for automatic altitude compensation are checked at an airflow equivalent to 50% of normal rated power airflow with the mixture control in the automatic rich position and readings are taken at air box pressures of 0, 4, 8, and 14 inches of Hg. less than atmospheric pressure.

E-26. Fuel Priming System. - Provision shall be made for priming the engine with fuel from a separately installed priming pump and lead line, supplied by the airplane manufacturer and attached to the engine priming connection.

E-29. Coolant Pump. - The coolant pump shall be supplied with an internal spring loaded packing. Replacement of the packing is made by disassembly of the pump. No provision shall be made for external packing adjustment.

E-30. Coolant Temperature. - The cooling liquid outlet temperature for liquid cooled engines shall be 121°C.(250°F.).

E-31a(3) Supercharger Drain Valve. - (Reference, AN-9500, Par. D-31a(3)) - A fuel aspirator without a valve shall be the only provision made for automatic drainage of the induction system.

E-32a. Exhaust Flanges. (Reference AN-9500, Par. D-32a). - Exhaust flanges and gaskets in accordance with Installation Drawing No. 43205 shall be supplied, but shall not be included in the engine dry weight. Flanges and gaskets shall be shipped with, or separate from the engine, at the request of the procuring agency.

E-36. Accessory Drives. - The gear ratio of each accessory drive to the engine crankshaft, based on the lowest normal rated speed of the engine, the maximum permissible torque in inch-pounds for continuous operation, the maximum permissible static torque in inch-pounds, and the direction of rotation when looking at the end of the accessory drive shaft in the engine shall be as follows:

<u>ACCESSORY DRIVES</u>	<u>RATIO TO CRANKSHAFT</u>	<u>TORQUE RATINGS IN.-LBS.</u>		<u>ROTATION</u>
		<u>CONTINUOUS</u>	<u>STATIC</u>	
<u>Starter</u>	1.000:1	-	16200	C
<u>Generator</u>	1.440:1	600	6000	C
<u>Fuel Pump</u>	0.864:1	25	450	CC
<u>Vacuum Pump (Rear)</u>	1.440:1	150	2250	C
<u>Vacuum Pump (Side)</u>	1.440:1	150	2250	CC
<u>Tachometer (Two drives)</u>	0.500:1	2.5	12.5	C
<u>Propeller Governor</u>	0.845:1	15	150	CC
<u>Gun Synchronizer</u>	.500:1	10	200	CC

NOTE: CC indicates counterclockwise rotation.
C indicates clockwise rotation.

E-36a. Starter. - The starter mounting pad and drive shall be Type I in accordance with Specification AN-9517. The direction of rotation when looking at the starter dog attached to the engine shall be clockwise.

E-36a.(1) (Reference, AN-9517, Par. E-4b) Starter clearance shall be provided as shown on Installation Drawing No. 43205.

E-36c. Power Take-off Drive. - A power take-off drive shall not be provided for driving gear box assembly.

E-36e. Gun Synchronizing Impulse Generators - Ref. AN-9500, Par. D-36e. - Provision shall be made for driving two Air Corps Type E-8 gun synchronizing generators by an external spline drive in conformance with AN-9520 with the exception that the face of the mounting pad shall be positioned in a plane perpendicular to the longitudinal axis of the crankshaft; and holes to provide vapor lubrication through the pad shall be provided as shown on Install. Dwg.No.43205. An Allison type gun synchronizer No. 37560 & 37561 may be installed by the removal of an adapter necessary for the installation of the AN type synchronizer.

E-36e.(1) Gun Synchronizing Impulse Generators shall not be furnished.

E-36f. Vacuum and Hydraulic Mechanism Oil Pump - Two mounting pads shall be provided in accordance with AN-9521 with the exception that the slotted drive adapter and adapter flange as shown in Figure 2 shall not be furnished.

F. METHODS OF SAMPLING, INSPECTION, AND TESTS

F-1. The requirements for sampling, inspection and tests shall be as shown in Specification AN-9500.

G. PACKAGING, PACKING, AND MARKING FOR SHIPMENT

G-1. The requirements for packaging, packing and marking for shipment shall be as shown in Specification AN-9500.

TO FIND ACTUAL HORSEPOWER FROM ALTITUDE, RPM, MANIFOLD PRESSURE AND AIR INLET TEMP
SEA LEVEL PERFORMANCE

- 1 LOCATE A ON FULL THROTTLE ALTITUDE CURVE FOR GIVEN RPM & MANIFOLD PRESS.
- 2 LOCATE B ON SEA LEVEL CURVE FOR RPM & MANIFOLD PRESSURE & TRANSFER TO C.
- 3 CONNECT A & C BY STRAIGHT LINE & READ HORSEPOWER AT GIVEN ALTITUDE D.
- 4 MODIFY HORSEPOWER AT D FOR VARIATION OF AIR INLET TEMPERATURE T_a FROM STANDARD ALTITUDE TEMPERATURE T_s BY FORMULA--

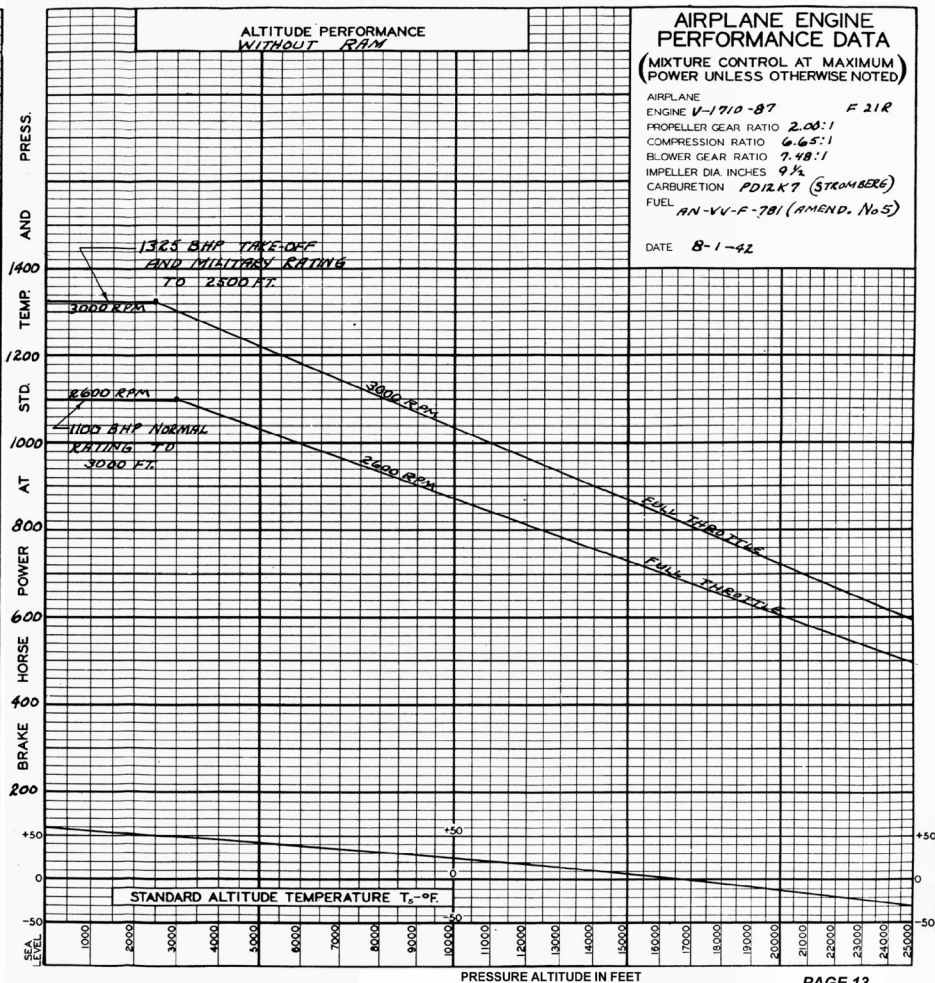
$$[HP \text{ AT } D] \times \sqrt{\frac{460 + T_s}{460 + T_a}} = \text{ACTUAL HP}$$

[APPROXIMATELY 1% CORRECTION FOR EACH 10°F. VARIATION FROM T_s]

ALTITUDE PERFORMANCE WITHOUT RAIN
AIRPLANE ENGINE PERFORMANCE DATA
 (MIXTURE CONTROL AT MAXIMUM POWER UNLESS OTHERWISE NOTED)

AIRPLANE ENGINE V-1710-87 F 21R
 PROPELLER GEAR RATIO 2.08:1
 COMPRESSION RATIO 6.65:1
 BLOWER GEAR RATIO 7.48:1
 IMPELLER DIA. INCHES 9 1/2
 CARBURETION PD1K7 (STROMBERG)
 FUEL AN-VV-F-781 (AMEND. No 5)

DATE 8-1-42



ABSOLUTE MANIFOLD PRESSURE, IN. HG.

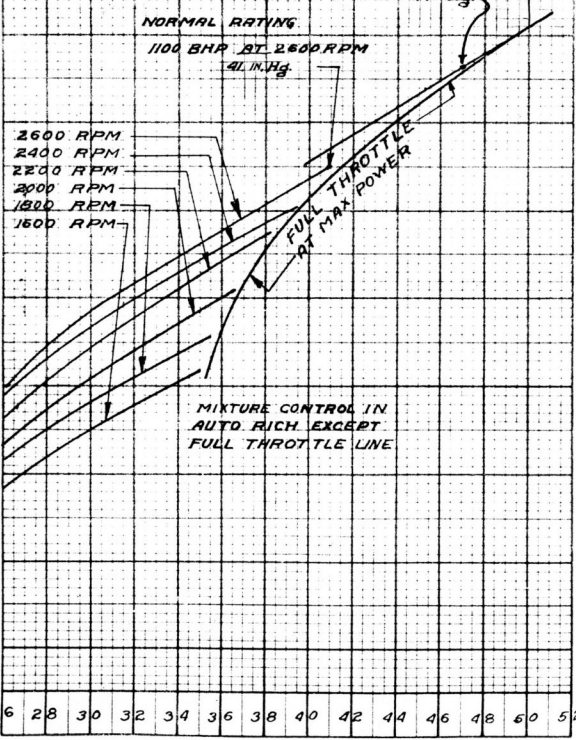
PRESSURE ALTITUDE IN FEET

TO FIND ACTUAL HORSEPOWER FROM ALTITUDE, RPM, MANIFOLD PRESSURE AND AIR INLET TEMP

SEA LEVEL PERFORMANCE

LOCATE A ON FULL THROTTLE ALTITUDE CURVE TO FIND RPM & MANIFOLD PRESSURE LOCATE B ON PRESSURE ALTITUDE CURVE & MOUNTED CURVE TO FIND RPM & MANIFOLD PRESSURE AT ALTITUDE TO FIND ACTUAL HORSEPOWER AT ALTITUDE

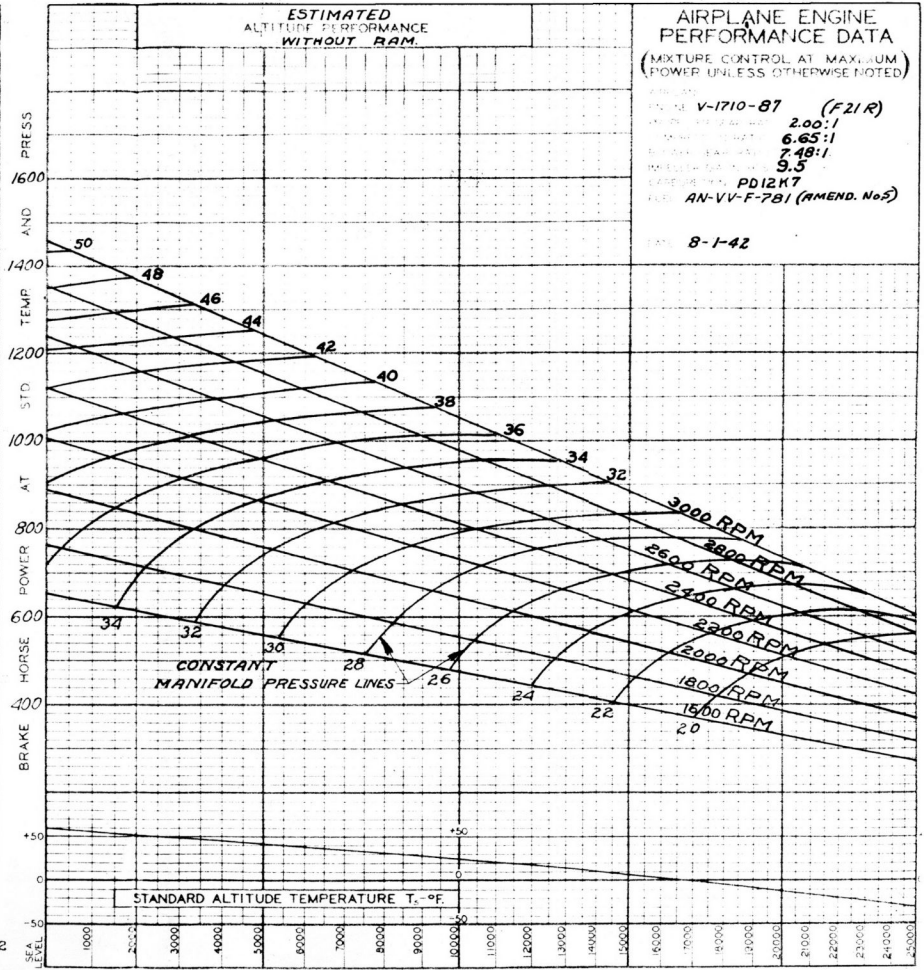
DE AT $\sqrt{\frac{P}{P_0}}$ X V ACTUAL AIR SPEED APPROXIMATELY 1% CORRECTION FOR EACH 1000 FEET



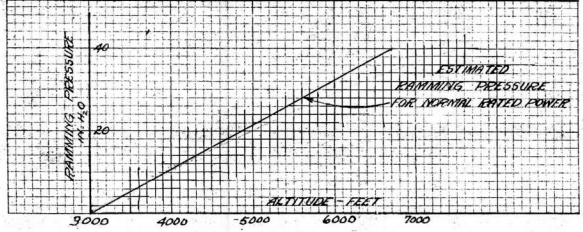
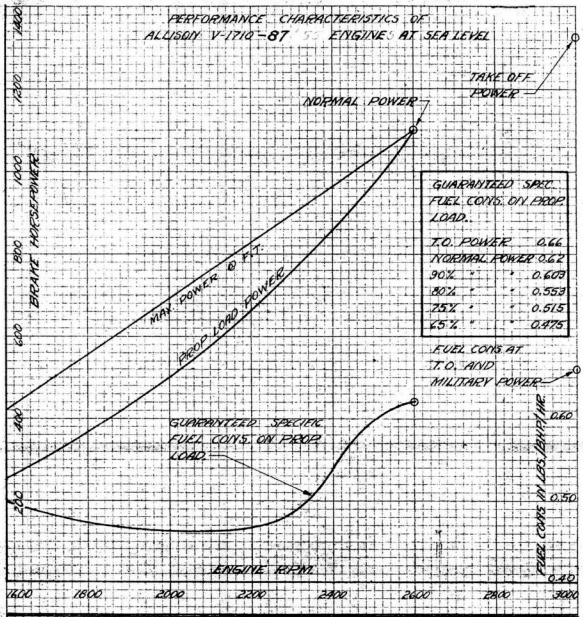
ESTIMATED ALTITUDE PERFORMANCE WITHOUT RAM

AIRPLANE ENGINE PERFORMANCE DATA
(MIXTURE CONTROL AT MAXIMUM POWER UNLESS OTHERWISE NOTED)

V-1710-87 (F21R)
2.00:1
6.65:1
7.48:1
9.5
PD12K7
AN-VV-F-7B1 (AMEND. No 5)
8-1-42



PERFORMANCE CHARACTERISTICS OF
ALUSOY V-1710-87 ENGINE AT SEA LEVEL

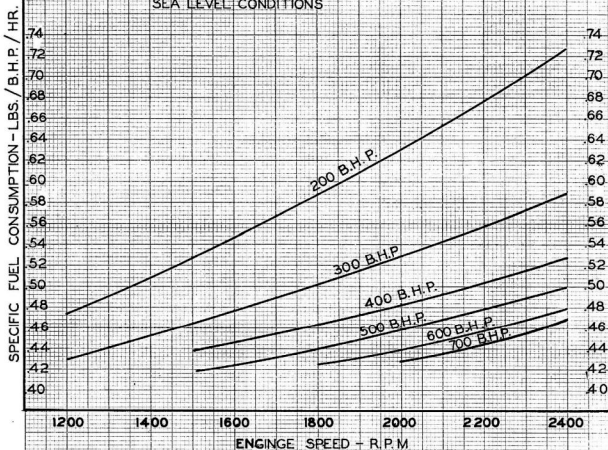


6-20-42

PRELIMINARY DATA ON
MINIMUM SPECIFIC FUEL
CONSUMPTION

ALLISON V-1710-87 ENGINE

BASED ON STANDARD
SEA LEVEL CONDITIONS



Specifications as of dates listed below shall be applicable to this model specification. Any specification revisions and/or amendments issued prior to date of bid for this model engine and after the particular dates listed below shall not be applicable.

Army-Navy Spec.	AN-9500a	March 30, 1940
" " "	AN-9501a	March 30, 1940
" " "	*AN-9502a	March 30, 1940
" " "	*AN-9503a	March 30, 1940
" " "	*AN-9504	March 1, 1939
" " "	(2)*AN-9506	March 1, 1939
" " "	(3)*AN-9507	March 1, 1939
A-N Aero Spec.	*AN-P-4	Feb. 13, 1942
Army-Navy Spec.	AN-9510a	July 31, 1940
" " "	AN-9511a	July 31, 1940
" " "		March 1, 1939
" " "	AN-9513	March 1, 1939
" " "	*AN-9515a	March 30, 1940
" " "	AN-9516	March 1, 1939
" " "	AN-9517	March 1, 1939
" " "	AN-9518	March 1, 1939
" " "	AN-9519	March 1, 1939
" " "	(2)*AN-9520	March 1, 1939
" " "	*AN-9521	March 1, 1939
" " "	AN-9533	March 1, 1939
U.S. Army	95-32152	Nov. 5, 1941
A-N Aero Spec.	AN-F-E-568	Nov. 27, 1941
" " "	*AN-GGG-S-126	July 5, 1939
" " "	(2)*AN-QQ-M-181	March 24, 1939
" " "	*AN-VV-C-566	August 1, 1939
" " "	(5)*AN-VV-F-781	Sept. 26, 1940
" " "	AN-VV-O-446	Dec. 15, 1941
" " "	AN-J-C-56	Oct. 10, 1941
Army-Navy Drwg.	AN-4033	March 1, 1939
Army-Navy Drwg.	AN-4034	Feb. 25, 1939
Army-Navy Drwg.	AN-4037	March 1, 1939
Army-Navy Drwg.	AN-4060	
Army-Navy Drwg.	AN-4062	
Army-Navy Drwg.	AN-7511	
AND Drwgs.	AND-10201	April 12, 1940

Note: *(Asterisk) and preface number in () (parentheses) indicate that the specification has been amended and the particular amendment that is applicable.

REVISION RECORD 166-B

This revision was made to incorporate provision for dive tests as required in model test specification intended for installation in dive bombing aircraft.

The following detailed changes were made:

Page 1 Revision date, August 1, 1942, was added.

Par. E-2 Drawings

43205-A changed to 43205-B

Note: The installation drawing was changed to show holes for vapor lubrication in the face of the mounting pad for gun synchronizer.

36905-E changed to 43325 Priming System Assembly.

Par. E-3 Acceptance

The following was added to the paragraph:
"Dive tests as required in Par. F-3g (2) of AN-9502 shall be conducted at the contractor's plant on a separate engine. (Ref. Par. F-3, AN-9502.)"

Par. E-5a Ratings

"(Amendment No. 5)" was added to the fuel specification in order to identify the octane rating required.

Par. E-24e Scavenging System

Paragraph reworded to allow greater back pressure on scavenging system and to state reason for the low back pressure requirements at idling speeds.

The pressure pump material has been included in Par. E-24f below.

Par. E-24f Pressure Pump

Guarantees have been extended to include satisfactory functioning at 82% atmospheric pressure down to a minimum of 8 in. Hg. instead of 88% down to a minimum of 10 in. Hg.

REVISION RECORD 166-B

- 2 -

Par. E-36e Gun Synchronizing Impulse Generators

The following was added to the end of the first sentence:

"and holes to provide vapor lubrication through the pad shall be provided as shown on Installation Drawing No. 43205."

Page 13 Performance Curves

Amendment No. 5 added to the fuel specification and the date changed to indicate that the page was revised.

Page 14 Performance Curves

Same changes as on Page 13.