Spec. No. 159-B
Date: Jan. 22, 1942
Revised: Feb. 4, 1942
June 25, 1942

MODEL SPECIFICATION

ENGINE, AIRCRAFT: MODEL V-1710-73

ALLISON DIVISION
General Motors Corporation
Indianapolis, Indiana

(ALLISON MODEL DESIGNATION V-1710-F4R)

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ENGINE, AIRCRAFT: MODEL V-1710-73

Allison Division of General Motors Corporation

(Allison Model Designation V-1710-F4R)

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 18.

B. TYPE AND MODEL.

B-1. This specification covers the requirements for the V-1710-73 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:

42136 Engine Assembly, Complete - (Showing Accessory Drive Oil Seals)

42135-B Installation Drawing (Showing clearances for engine accessories and their removal)

36905-E	Priming System Assembly
37791-B	Carburetor, PD12K2 Bendix-Stromberg
40600-J	Spark Plug Assembly AC-LS85
40601-B	Spark Plug Assembly Champion C34S
42354	Terminal, Spark Plug (Contact)
40208	Lubrication System Diagram
41809	Magneto
42290	Radio Shielding Assembly
37583-B	Manifold Assem. - Spark Plug Cooling R.H.
37584-B	Manifold Assem. - Spark Plug Cooling L.H.
33536-K	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. **The engine shall be model tested in accordance with AN-9502 with the exception to par. F-3b of AN-9504 (Torsional Vibration) that the vibration amplitude measured at the rear of the crankshaft shall not exceed ±1.25° for the 1 1/2 order single node vibration, and ± 0.35 for the 6th order 2 node vibration.**

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	1258.0 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	1345.0 lbs.

E-5. Performance Characteristics. - The use of an automatic manifold pressure regulator shall be a requirement in the installation of this engine. The ratings specified herein and the curves specified herein and shown on Pages 13 to 17 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.

880	B.H.P. at 2600 R.P.M. at sea level
1000	B.H.P. at 2600 R.P.M. normal rating at 10,800 ft.
1325	B.H.P. at 3000 R.P.M. take-off for five minutes
1150	B.H.P. at 3000 R.P.M. Military rating at 12,000 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, 16, & 17.

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	145 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 - 450 H.P.

E-5h.(1); E-5h(1)(a); E-5h.(1)(b). - Coolant Pump Data required shall be furnished as part of this specification after completion of model test.

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-6. Engine Performance.- (Ref. AN-9500, Par. D-6) The complete engine shall function satisfactorily up to the service ceiling of the airplane (not to exceed 34,000 ft.).

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	36-3/4 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. Par. F-3g Carburetor) The oil for filling the carburetor shall conform to Allison Division Spec. 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) - Dehydrator plugs conforming to Allison Division drawing No. 42288 shall be installed in the crankcase breather as soon as they can be made available. The crankcase breather elbow Part No. AN-850-16, shall be attached to the engine for shipment.

(4) (Ref. Par. F-3o., 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 succesfully 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 8.8:1 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 - (Ref., AN-9500, Par. D-23c) High tension ignition cable with saturated moisture resistant braid in conformance with U.S. Army Spec. No. 95-32152 shall be used on all distributor head to spark plug leads.

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. 42135, 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. - (Reference 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 and Pressure Pumps. - (Reference, AN-9500, Par. D-24e and D-24f.) - Provided no air traps exist in the external scavenging system, the engine scavenging system shall adequately scavenge the engine for extended periods of time under normal operating conditions, with a back pressure on the scavenging system not to exceed a maximum of 30 pounds per square inch at maximum flow, and two pounds per square inch at minimum idling speeds when using either Grade 1100 or Grade 1120 oil, conforming to Spec. AN-VV-O-446 at an inlet viscosity of 100 plus or minus 5 Saybolt Universal seconds. The oil pressure pump shall function properly when its inlet pressure is 88% or more of the absolute atmospheric pressure, and 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. 42135.

E-24q. Crankcase Breathers. - Ample breathing capacity shall be provided in accordance with Par. D-24q., of Specification 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-12K2 injection carburetor in accordance with AN-9515 except for the following:

(1) (Reference, Par. D-7, Strainer) - The carburetor shall meet requirements except that foreign material is not removed with the strainer.

(2) (Reference, 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) (Reference, Par. D-26, Protective Treatment of Steel Parts) - Cadmium plated parts shall have a minimum plating thickness of .0003".

(4) (Reference, 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) (Reference, 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) (Reference, 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) (Reference, 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) (Reference, 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:

AIRFLOW	METERING TOLERANCE	MIXTURE CONTROL POSITION		
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. 42135 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:

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

NOTE: CC indicates counter-clockwise rotation.
C indicates clockwise rotation.

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

E-36a(1) (Ref. AN-9517, Par. E-4b) Clearance shall be provided as shown on Installation Drawing No. 42135.

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

E-36e. Pad and Drive for Gun Synchronizer Impulse Generator. Provision shall not be made for driving Gun Synchronizing Impulse Generators

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

E-36f. Vacuum and Hydraulic Mechanism Oil Pump.- Two type II mounting pads and drives shall be furnished in accordance with AN-9521 with the exception to Par. E-3b that the slotted adapter bushing shall not be furnished as required in Figure 2 of AN-9521.

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 Spec. AN-9500.

AIRPLANE ENGINE PERFORMANCE DATA

(MIXTURE CONTROL AT MAXIMUM POWER UNLESS OTHERWISE NOTED)

AIRPLANE
ENGINE Y-1710-73 (F4)
PROPELLER GEAR RATIO 2.00:1
COMPRESSION RATIO 6.65:1
BLOWER GEAR RATIO 3.70:1
IMPELLER DIA INCHES 9.2
CARBURETION PD-12K2
FUEL SPEC. AN-VV-F-781 WITH OCTANE RATING AS SPECIFIED IN AMEND. No 6.
DATE JAN. 22, 1942 REV. JUNE 24, 1942

ALTITUDE PERFORMANCE WITHOUT RAM

BRAKE HORSE POWER AT STD TEMP AND PRESS

1800
1600
1400
1200
1000
800
600
400
200

B.H.P. @ CONSTANT MANIFOLD PRESSURE

TAKE OFF RATING FOR 5 MIN.

MILITARY RATING

3000 R.P.M.

NORMAL RATING

NORMAL RATING @ SEA LEVEL

2600 R.P.M.

FULL THROTTLE CRANKSHAFT R.P.M.
3000
2600

TAKE OFF RATING - 1325 B.H.P. @ 3000 R.P.M. @ SEA LEVEL
MILITARY RATING - 1150 B.H.P. @ 3000 R.P.M. @ 12,000 FEET
NORMAL RATING - 880 B.H.P. @ 2600 R.P.M. @ SEA LEVEL
NORMAL RATING - 1000 B.H.P. @ 2600 R.P.M. @ 10,900 FEET

STANDARD ALTITUDE TEMPERATURE T_s °F.

+50
0
-50

SEA LEVEL

1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 11000 12000 13000 14000 15000 16000 17000 18000 19000 20000 21000 22000 23000 24000 25000

PRESSURE ALTITUDE IN FEET

SEA LEVEL PERFORMANCE

TO FIND ACTUAL HORSEPOWER FROM ALTITUDE, R.P.M., MANIFOLD PRESSURE AND AIR INLET TEMP.

1 LOCATE A ON FULL THROTTLE ALTITUDE CURVE FOR GIVEN R.P.M. & MANIFOLD PRESS.
2 LOCATE B ON SEA LEVEL CURVE FOR R.P.M. & 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 FROM STANDARD ALTITUDE TEMPERATURE T_s BY FORMULA -

[HP AT D] x $\sqrt{\frac{460 + T_s}{460 + T}}$ = ACTUAL HP

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

CORRECTIONS FOR VARIATION OF CARB. INLET TEMP. T FROM 60° SHOULD BE MADE BY THE FORMULA -

CORRECT H.P. x $\left(\frac{520}{460+T}\right)^{0.50}$ = CORRECTED H.P.

MANIFOLD PRESSURE @ NORMAL RATING - 36.4 IN. HG.
MANIFOLD PRESSURE @ TAKE-OFF - 61 IN. HG.

26 28 30 32 34 36 38 40 42 44 46 48 50

ABSOLUTE MANIFOLD PRESSURE ALTITUDE, IN HG

TO FIND ACTUAL HORSEPOWER FROM ALTITUDE, R.P.M., MANIFOLD PRESSURE AND AIR INLET TEMP.

1 LOCATE A ON FULL THROTTLE ALTITUDE CURVE FOR GIVEN R.P.M. & MANIFOLD PRESS.
2 LOCATE B ON SEA LEVEL CURVE FOR R.P.M. & 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 FROM STANDARD ALTITUDE TEMPERATURE T_s BY FORMULA -

HP AT D $\times \sqrt{\frac{460 + T}{460 + T_s}}$ = ACTUAL HP

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

SEA LEVEL PERFORMANCE

ALTITUDE PERFORMANCE WITHOUT RAM

ESTIMATED FULL THROTTLE B.HP. @ ALTITUDE

MILITARY RATING
1150 B.H.P. @ 12,000 FT.
42 IN. HG. @ 3,000 R.P.M.

3000 R.P.M. @ 42 IN. HG.

2600 R.P.M. @ 37.2 IN. HG.

PART THROTTLE
CONSTANT MANIFOLD PRESS.

TAKE-OFF RATING - 1325 B.H.P.
18.51 IN. HG. @ 3,000 R.P.M.

DATA BELOW THIS LINE FOR MAXIMUM POWER MIXTURE. FOR BEST ECONOMY REDUCE ALTITUDE 2,500 FT.

NORMAL RATING @ SEA LEVEL
850 B.H.P. @ 2,600 R.P.M. - 36.4 IN. HG.

(THESE ESTIMATED CURVES TO BE REVISED AFTER COMPLETE ALTITUDE CALIBRATION)

BRAKE HORSE POWER AT STD PRESS AND TEMP

NORMAL RATED ALTITUDE

MANIFOLD PRESS. - IN. HG.

CRANKSHAFT R.P.M.

STANDARD ALTITUDE TEMPERATURE T_s - °F.

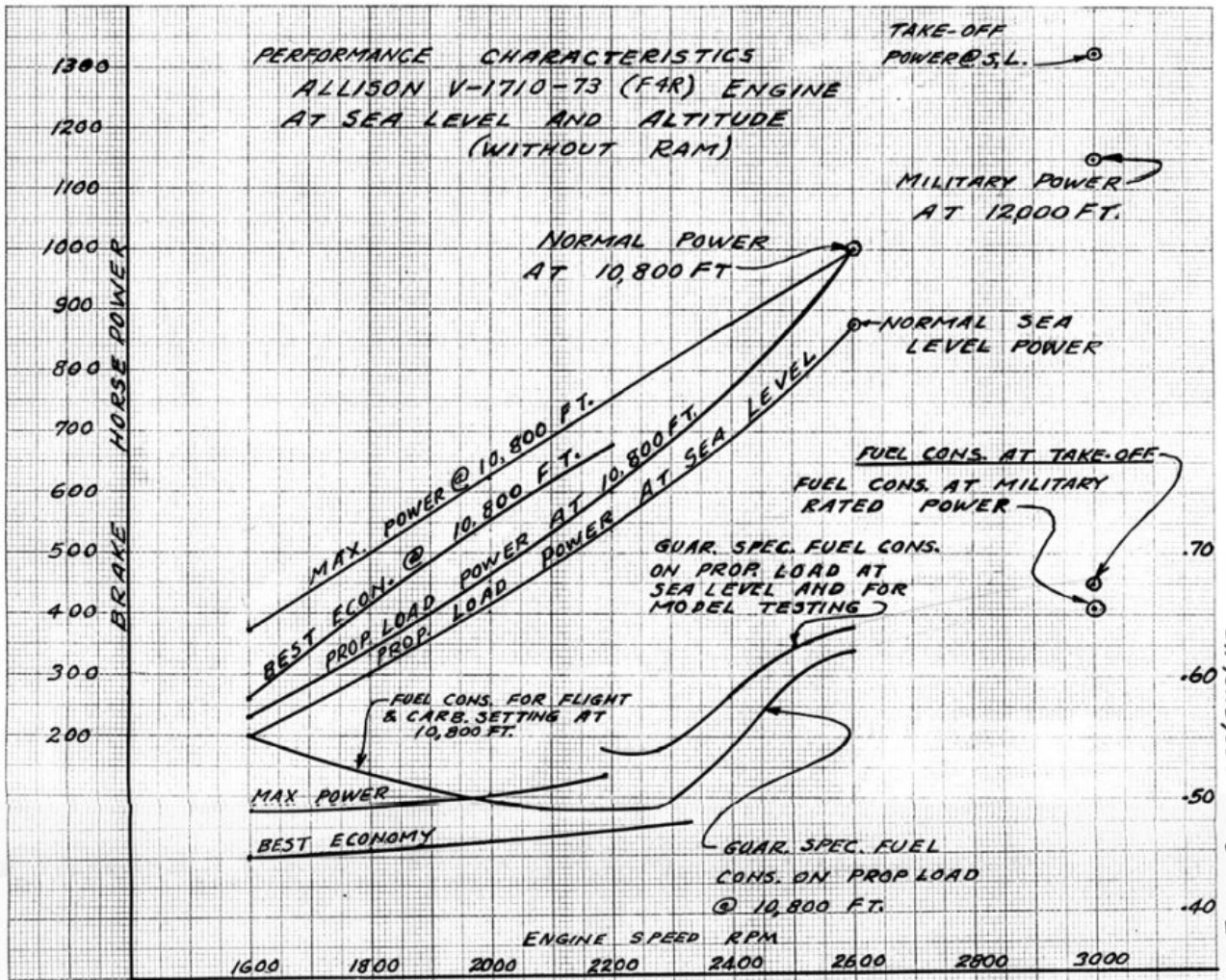
SEA LEVEL 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 11000 12000 13000 14000 15000 16000 17000 18000 19000 20000 21000 22000 23000 24000

AIRPLANE ENGINE PERFORMANCE DATA

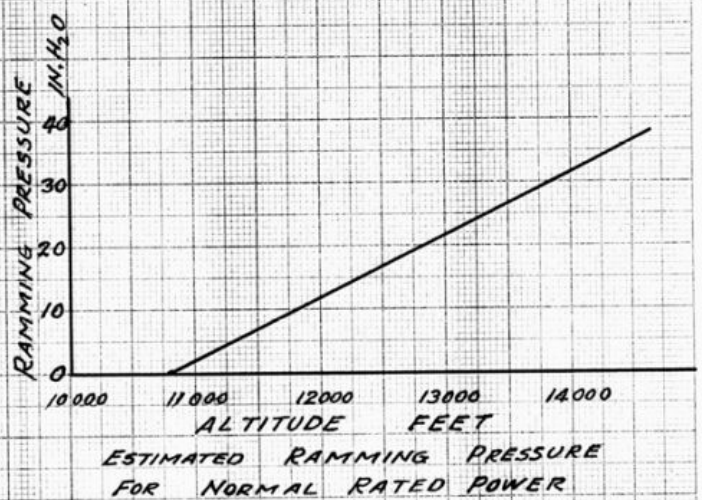
(AT GUARANTEED MINIMUM SPECIFIC FUEL CONS.)

AIRPLANE
ENGINE V-1710-73 (F4)
PROPELLER GEAR RATIO 2.0:1
COMPRESSION RATIO 6.65:1
BLOWER GEAR RATIO 8.80:1
IMPELLER DIA INCHES 9½
CARBURETION PD12K2
FUEL SPEC. AN-VV-F-781 WITH OCTANE RATING AS SPECIFIED IN AMEND. No. 5.
DATE JUNE 25-1942

NORMAL RATING
1,000 B.H.P. @ 10,800 FT.
37.2 IN. HG. @ 2,600 R.P.M.

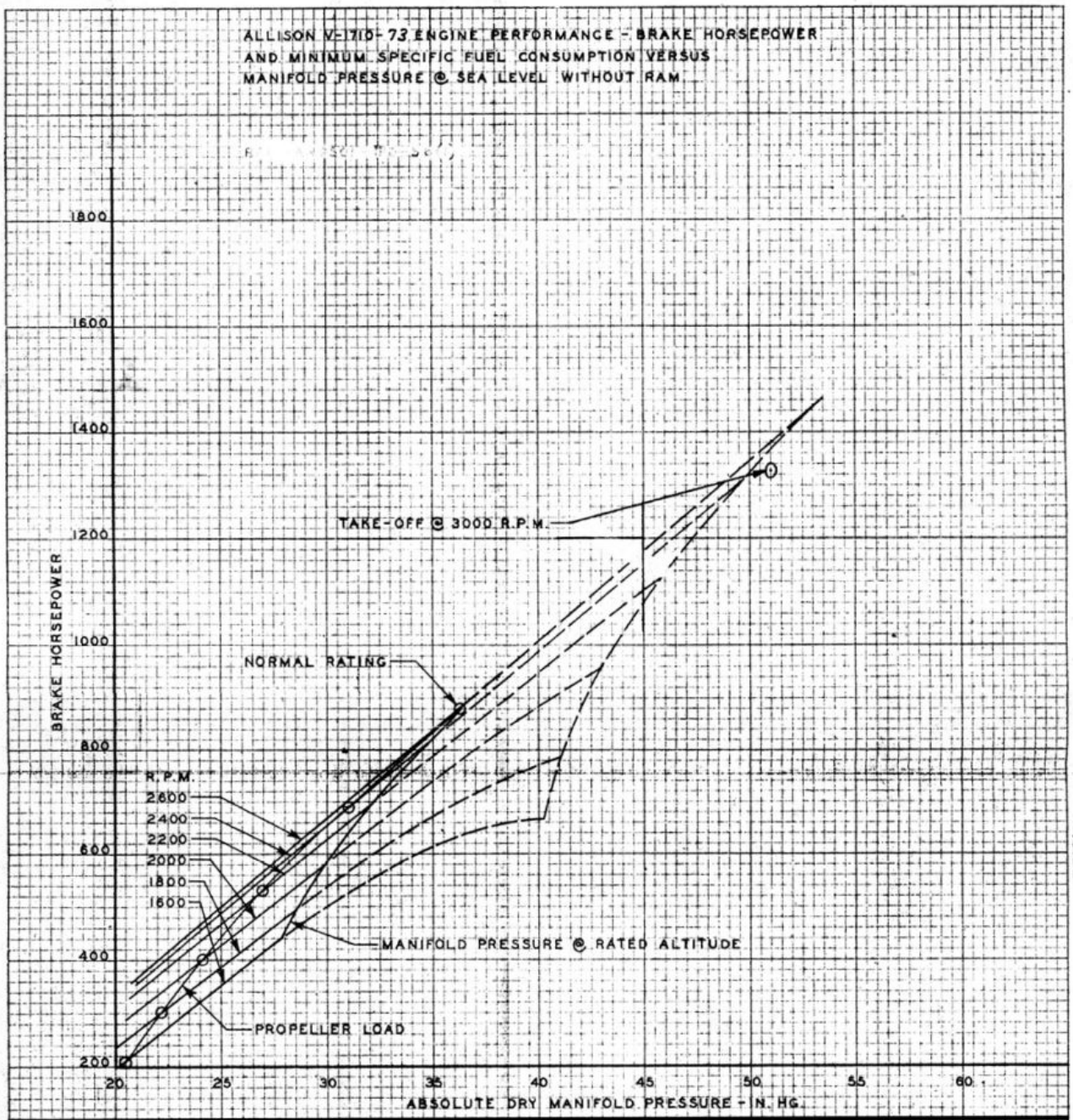


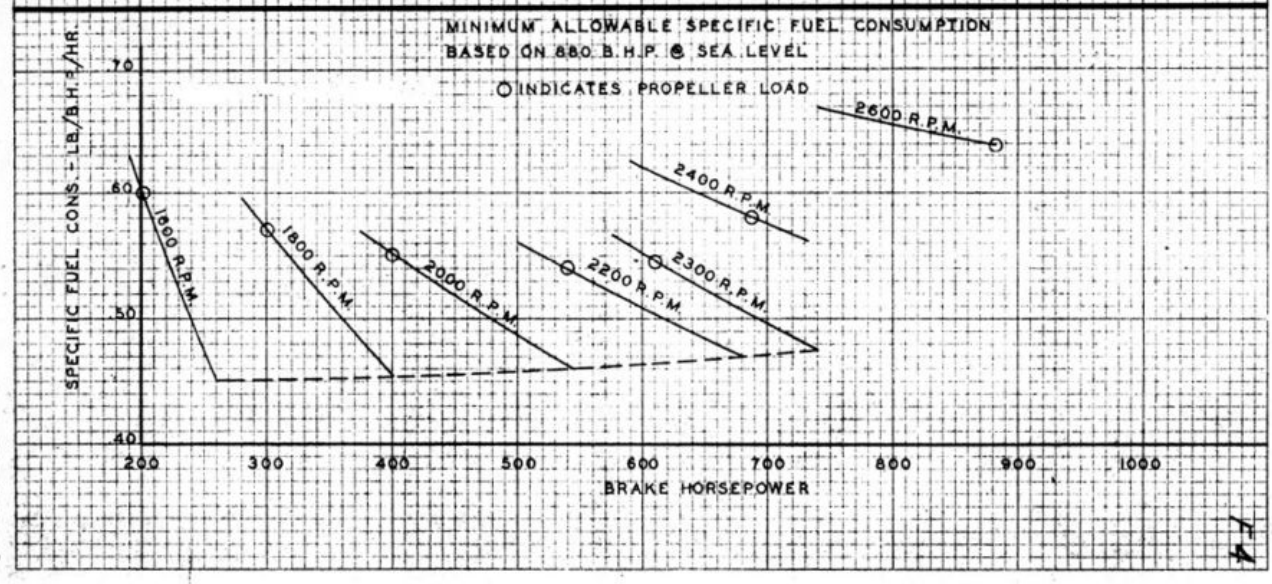
GUAR. SPEC. FUEL CONS. ON PROP. LOAD	
% NOR. BHP	LBS/BHP/HR.
100 %	0.64
90 %	0.62
80 %	0.59
75 %	0.57
65 %	0.54
TAKE-OFF	0.675
MILITARY	0.655



ESTIMATED RAMMING PRESSURE FOR NORMAL RATED POWER

ALLISON V-1710-73 ENGINE PERFORMANCE - BRAKE HORSEPOWER AND MINIMUM SPECIFIC FUEL CONSUMPTION VERSUS MANIFOLD PRESSURE @ SEA LEVEL WITHOUT RAM

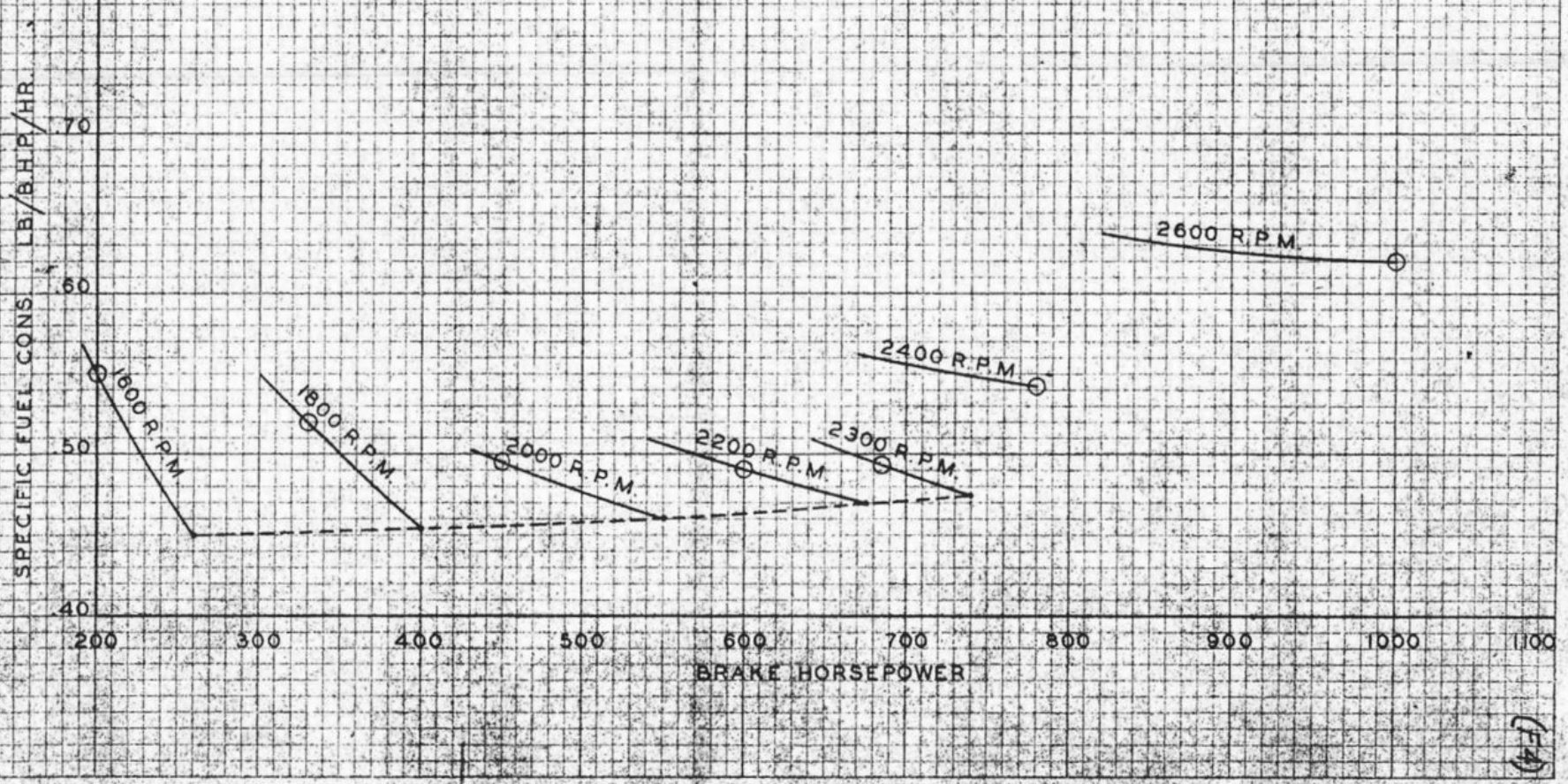




ALLISON V-1710-73 ENGINE PERFORMANCE @ 10,800 FEET
ALTITUDE GUARANTEED MIN. SPECIFIC FUEL CONS.
VERSUS B.H.P. FOR VARIOUS CRANKSHAFT SPEEDS (WITHOUT RAM)

1000 B.H.P. @ 10,800 FEET

O INDICATES PROPELLER LOAD



(F4)

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
" " "	*AN-9510a	July 31, 1940
" " "	AN-9511a	July 31, 1940
" " "	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
A-N Aero Spec.	AN-F-E-568	Nov. 27, 1941
" " "	*AN-GGG-S-126	July 5, 1939
" " "	*AN-J-C-56	Oct. 10, 1941
" " "	*AN-P-4	Jan. 14, 1942
" " "	(2)*AN-QQ-M-181	March 24, 1939
" " "	*AN-VV-C-566	August 1, 1939
" " "	*AN-VV-F-746	Oct. 5, 1940
" " "	*AN-VV-F-748	Sept. 22, 1941
" " "	(5)*AN-VV-F-781	Sept. 26, 1940
" " "	AN-VV-O-446	Dec. 15, 1941
U. S. Army Spec.	95-32152	Nov. 5, 1941
Army-Navy Dwg.	AN-4033	March 1, 1939
" " "	AN-4034	Feb. 25, 1939
" " "	AN-4037	June 10, 1940
AND Dwg.	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.