

DEPARTMENT OF COMMERCE  
CIVIL AERONAUTICS ADMINISTRATION

E-257  
Revision 1  
PRATT & WHITNEY  
Twin Wasp E1  
December 14, 1949

AIRCRAFT ENGINE SPECIFICATION

Engines of models described herein conforming with this specification and approved data on file with the Civil Aeronautics Administration are rated as airworthy for use in certificated aircraft in accordance with pertinent specifications and the manufacturers' installation, operation, repair, and overhaul instructions.

Manufacturer Pratt and Whitney Aircraft  
Division of United Aircraft Corp.  
East Hartford, Conn.

Model	Twin Wasp E1
Type	14RA-16:7 reduction gearing.
Rating (7:1 impeller gear ratio)	
Maximum continuous hp, rpm, in. Hg. at:	
Critical altitude (ft.)	1400-2700-44.5-6900
Sea level	1400-2700-46.5-S.L.
Take-off (5 minutes) hp, rpm, in. Hg. at:	(dry)
Critical altitude (ft.)	1650-2800-53.0-3000
Sea level	1650-2800-54.0-S.L. (with anti-detonant injection)
Critical altitude (ft.)	1800-2800-53.0-2700
Sea level	1800-2800-54.0-S.L.
Fuel (Minimum grade aviation gasoline)	Grade 100/130
Bore and stroke, in.	5.75 x 6.00
Displacement, cu. in.	2181
Compression ratio	6.7:1
Weight (dry), lbs.	1870
C.G. location (dry)	
Forward of main crankcase rear face, in.	9.3
Below propeller shaft C.L., in.	.9
Propeller shaft, SAE No.	51
Carburetion	Bendix AR-48C1 carburetor
Ignition, dual	Scintilla S14LN-14 magnetos
Ignition timing, °BTC	20 (Manual shift to 35 for cruise)
Certification basis	Type certificate No. 257
Production basis	Production Certificate No. 2

NOTE 1. Maximum permissible cylinder head, barrel, and oil inlet temperatures are 540°F, 300°F, and 212°F respectively. The cylinder head temperature is measured with a well type thermocouple.

NOTE 2. The following accessory drives are provided:

	Rotation *	Speed *	Maximum Torque (in. lbs.)		Max. Overhang Moment, lb. in.
			Continuous	Static	
Starter	CC	3.0	—	5400	300
Generator	C	3.0	500	2200	350
Vacuum or hydraulic pump - (2 provided)	C	1.342	875 (for one)	3850 (for one)	350
			1475 (total both)	6550 (total both)	
Power take-off	C	3.0	1500	6600	350
Propeller governor	C	.897	125	825	—

"C" - Clockwise, viewing pad.  
"CC" - Counter clockwise viewing pad.  
"Speed" - Times crankshaft speed.

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NOTE 3. The Bendix AR-48 carburetor incorporates a built-in fuel pump. Minimum fuel pump outlet pressure to properly supply the engine are as follows:

16 psi up to 1100 BHP  
16 to 18 psi for 1100 to 1650 BHP (straight line variation with hp.)  
18 psi for 1650 to 1800 BHP

NOTE 4. The Twin Wasp E1 engine incorporates a built-in torquemeter and water injection equipment. For the 1800 BHP take-off rating, AD1 flow of 7 lbs/min. is required. The AD1 fluid may be composed of any one of the four following fluids by volume.

- |  |   |                               |
|--|---|-------------------------------|
| (1) Methyl alcohol 50%, water 50%  | } |                               |
| (2) Methyl alcohol 60%, water 40%  | } | Per Pratt & Whitney Spec. 509 |
| (3) Methyl alcohol 25%, Ethyl alcohol 25%, water 50%   | } |                               |
| (4) Methyl alcohol 60 parts, water 40 parts, Anti corrosion oil 1 part<br>(per British Spec. D-Eng. R.D. 2470, dated 1-8-46) | } |                               |

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