Earhart's S3H1 Wasp Engines

FEDERAL AVIATION AGENCY

E-143
Revision 4
Pratt & Whitney
WASP S3H1
August 7, 1973

AIRCRAFT ENGINE SPECIFICATION

Engines of models described herein conforming with this specification and approved data on file with the Federal Aviation Agency meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft specifications and applicable portions of the Civil Air Regulations provided they are installed, operated, and maintained as prescribed by the approved manufacturer's manuals and other approved instructions.

Manufacturer — Pratt & Whitney Aircraft
Division of United Aircraft Corporation
East Hartford, Connecticut

Model	Wasp	S3H1
Type		9RA - Direct drive
Rating (Impeller gear ratio)		10:1
Maximum continuous, hp., rpm, in.Hg., at:		
Critical altitude (ft.)		550-2200-32.5-5000
Sea level pressure altitude (ft.)		550-2200-34.0-S.L.
Takeoff (5 minutes), hp., rpm, in.Hg., at:		
Critical altitude (ft.)		600-2250-35.5-3000
Sea level pressure altitude (ft.)		600-2250-36.0-S.L. (See Note 5)
Fuel (minimum grade aviation gasoline)		80/87
Lubricating oil		See P&WA Service Bulletin No. 1183
Bore and stroke, in.		5.75 X 5.75
Displacement, cu. in.		1344
Compression ratio		6:1
Weight (dry), lb.		865
Propeller shaft, SAE No.		40
Carburetion		Stromberg NA-Y9B, C, H, E1 with 2-3/4 in. venturis or PD-9D1 with 2-1/2 in. venturis
Ignition, Dual		Scintilla SB9R or Bosch SB9RU2 and SB9RU3 magnetos
Timing, °BTC		25
Spark plugs		See Note 6
Notes		1, 2, 3, 4, 5, 6

Continuous power with 80/87 fuel

Takeoff power with 80/87 octane fuel

Certification basis — Type Certificate No. 143

Production basis — Production Certificate No. 2

NOTE 1. Maximum permissible temperatures are as follows:

Cylinder Head	Cylinder Barrel	Oil Inlet
500°F.	300°F.	200°F.

NOTE 2. Fuel and oil pressure limits:

Fuel pressure (psi)	3-6
Oil pressure (psi)	70-90

NOTE 3. The following accessory drives are provided:

	Direction of Rotation (Clockwise or Counter-Clockwise)	Speed Ratio (Times Crankshaft Speed)	Maximum Torque (in. lb.) Cont.	Static	**Maximum Overhang (in.-lb.)
Starter	CC	1.0	2300	10,000	180
Generator	C	1.5	100	300	183
Generator (opt.)	C	2.0	150	900	183
Fuel pump	CC	1.0	150	450	10
Aux. accessory	CC	1.0	*150	450	10
Tachometer R.H.	C	.5	15	45	10
L.H.	CC	.5	15	45	10
Goverrnor	C	1.144	60	250	-
Vacuum pump	C	1.5	*100	300	10

**Maximum combined drive load of vacuum pump and fuel pump must not exceed 150 in.-lb.*
***Maximum allowable accessory moments in in.-lb., provided no destructive accessory drive or mounting pad forces resulting from accessory vibration are present.*
Early Wasp engines incorporate tongue and groove vacuum and fuel pump drives. All later engines have spline type drives.

NOTE 4. Eligible with automatic power and mixture control when the NA-Y9C carburetor is used at a weight increase of 12 pounds.

NOTE 5. (a) Ratings are based upon the best power mixture strength and 450°F cylinder head temperature.
(b) With the use of grade 91/96 fuel, the following ratings may be used:

No increase in power by using higher octane fuel

Maximum continuous, hp, rpm, in.Hg., at:
Critical altitude (ft.) 550-2200-33.0-4500
Sea level pressure altitude (ft.) 550-2200-34.0-S.L.
Takeoff (one minute), hp, rpm, in.Hg., at:
Critical altitude (ft.) 600-2250-36.0-2300
Sea level pressure altitude (ft.) 600-2250-36.5-S.L.

NOTE 6. The following spark plugs are approved on this engine:

AC	SR-83P, S-86R, HSR-86, HSR-83P
Autolite	SH-2K, SH-2M, SH-20
BG	321S, 417S, SS485A, RB485S, 706SR
Champion	C27S, ED41N, EM41N, RC26S, RED39N, REM39N, RHD39M, RHM39N

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