

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                                                                     |      |

Certification basis Type Certificate No. 143

Production basis Production Certificate No. 2

NOTE 1. Maximum permissible temperatures are as follows:

|                      |                        |                  |
|----------------------|------------------------|------------------|
| <u>Cylinder Head</u> | <u>Cylinder Barrel</u> | <u>Oil Inlet</u> |
| 500°F.               | 300°F.                 | 200°F.           |

NOTE 2. Fuel and oil pressure limits:

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

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NOTE 3. The following accessory drives are provided:

|                  | Direction of Rotation<br>(Clockwise or Counter-Clockwise) | Speed Ratio<br>(Times Crankshaft Speed) | Maximum Torque<br>(in. lb.) |        | **Maximum Overhang<br>(in.-lb.) |
|------------------|-----------------------------------------------------------|-----------------------------------------|-----------------------------|--------|---------------------------------|
|                  |                                                           |                                         | Cont.                       | Static |                                 |
| 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                              |
| Governor         | 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:

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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