

FEDERAL AVIATION AGENCY

E-247
Revision 8
PRATT & WHITNEY
Wasp Major TSB3-G
VSB11-G (See NOTE 5)
B5, B6, B7, B13, CB2, B14

March 21, 1960

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 Major	TSB3-G	B5	CB2	B6
Type	28EA, reduction gearing	.375:1	--	--	--
Rating				(Also see NOTE 9)	
(With low imp. gear ratio)		6.375:1	--	--	--
Max. continuous, ip, rpm, in.Hg., at:					
Critical alt. (ft.)		2800-2550-53.0-1200	2850-2550-54.0-300	--	2650-2550-50.0-2800
Sea level press. alt.		2800-2550-53.5-S.L.	2850-2550-54.5-S.L.	--	2650-2550-50.5-S.L.
Takeoff (5 min.), hp, rpm, in.Hg., at:		(dry)	--	--	--
Critical alt. (ft.)		(app. 1000 ft. below S.L.)	--	--	3000-2700-56.0-1300
Sea level press. alt.		3250-2700-60.0 S.L.	--	--	3000-2700-56.0-S.L.
Critical alt. (ft.)		(with anti-det. inj.) (app. 1500 ft. below S.L.)	--	--	3250-2700-56.5-500
Sea level pressure, altitude		3500-2700-60.0 S.L.	--	--	3250-2700-56.5-S.L.
(With high imp. gear ratio)		—	—	—	—
Max. continuous, hp, rpm, in.Hg., at: Critical alt. (ft.)		—	—	—	—
Fuel (min. grade aviation gasoline)		108/135	--	--	100/130
Lubricating oils		See P&WA Service Bulletin No. 1183	--	--	--
Bore and stroke, in.		5.75 X 6.00	--	--	--
Displacement, cu. in.		4363	--	--	--
Compression ratio		6.70:1	--	--	--
Weight (dry), lbs.		3450	3584	3670	3450
Center of gravity location (dry)					
Fwd of rear face of blower suction, in.		29.3	29.0	--	29.3
Above propeller shaft C.L., in.		0.0	--	--	--
Propeller shaft, SAE No.		60A	--	--	--
Carburetion		Stromberg PR-3008-3	--	--	--
Ignition, dual		7 Scintilla D4NM-2 high tension eng.	4 Scintilla S14NM-15 low tension eng.	--	7 Scintilla D4NM-2 high tension eng.
Ignition timing, °BTC		20	--	--	--
		(20° manual cruise)	--	--	(25° manual cruise)
Spark plugs		See Note 10	--	--	--
NOTES		1,2,3,4,6,7,8,10	1,2,3,4,6,7,8,10	1,2,3,4,6,7,8,9,10	1,2,3,4,6,7,10

"- -" indicates "same as preceding model."
"—" indicates "does not apply."

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Model	Wasp Major	B7	B13	B14
Type	28EA, reduction gearing	.375:1	.425:1	- -
Rating				
	(With low imp. gear ratio)	6.375:1	6.95:1	- -
	Max. continuous, ip, rpm, in.Hg., at:			
	Critical alt. (ft.)	2650-2550-50.0-2800	2650-2550-49.5-6500	- -
	Sea level press. alt.	2650-2550-50.5-S.L.	2650-2550-51.0-S.L.	-
	Takeoff (5 min.), hp, rpm, in.Hg., at:	(dry)	- -	- -
	Critical alt. (ft.)	3000-2700-56.0-1300	3250-2700-60.0-2200	3250-2700-61.0-1700
	Sea level press. alt.	3000-2700-56.0-S.L.	3250-2700-60.5-S.L.	3250-2700-61.5-S.L.
		(with anti-det. inj.)		
	Critical alt. (ft.)	3250-2700-56.5-500	3500-2700-60.5-1300	3500-2700-61.5-3000
	Sea level pressure, altitude	3250-2700-56.5-S.L.	3500-2700-60.5-S.L.	3500-2700-62.0-S.L.
	(With high imp. gear ratio)	—	9.07:1	- -
	Max. continuous, hp, rpm, in.Hg., at: Critical alt. (ft.)	—	2300-2550-50.0-18300	2000-2550-43.5-23850
			2300-2550-52.5-10000	2000-2550-46.5-10000
Fuel (min. grade aviation gasoline)		100/130	115/145	108/135
Lubricating oils		See P&WA Service Bulletin No. 1183	- -	- -
Bore and stroke, in.		5.75 X 6.00	- -	- -
Displacement, cu. in.		4363	- -	- -
Compression ratio		6.70:1	- -	- -
Weight (dry), lbs.		3584	3555	- -
Center of gravity location (dry)				
	Fwd of rear face of blower suction, in.	29.0	27.8	- -
	Above propeller shaft C.L., in.	- -	- -	- -
Propeller shaft, SAE No.		60A	- -	- -
Carburetion		Stromberg PR-3008-3	- -	- -
Ignition, dual		4 Scintilla S14RN-15 low tension eng.	7 Scintilla D14RN-2 high tension eng.	- -
Ignition timing, °BTC		(25° manual cruise)	(20° manual cruise)	- -
	(manual or normal??)			
Spark plugs		See NOTE 10	- -	- -
NOTES		1,2,3,4,6,7,10	1,2,4,5,10	- -

"- -" indicates "same as preceding model."

"—" indicates "does not apply."

Certification basis Type Certificate No. 247
Production basis Production Certificate No. 2

NOTE 1. Maximum permissible cylinder head, barrel, and oil inlet temperatures, 480 °F, 325°F, and 212°F, respectively, except CB2 which has maximum permissible cylinder head temperature of 510 °F. The cylinder head temperature is measured with a well-type thermocouple.

NOTE 2. The following accessory provisions are available:

	Rotation*	Speed**	Max. Torque (in. lbs.)		Max. Overhang (ibs. in.)
			Continuous	Static	
Starter	C	3.0	—	12000	300
Generator (3 provided)	C	3.0	500	2200	350
Fuel pump	CC	.80	50	600	—
Propeller governor (B13 only)	CC	.956	125	825	—
Propeller governor (B3-0, B5)	CC	.984	125	1300	—
Propeller governor (B6, B7, CB2 & modified B3-G***)	CC	.964	125	825	—
Power takeoff (on rear face and is optional)	C	3.0	1500	5400	75

*C - Clockwise, viewing pad. CC - Counter clockwise, viewing pad.

**Speed - Times crankshaft speed.

***Applies only to TSB3-G engines incorporating strengthened pinion cage hubs for use with Curtiss Electric propellers.

- NOTE 3. The TSB3-G, B5, B6, B7 and CB2 engines are eligible for use with a turbosupercharger. Accordingly, the ratings listed above are based on 100 °F carburetor air temperature with 31 in.Hg. exhaust back pressure for sea level ratings and standard atmospheric exhaust back pressures for altitude ratings. To maintain "Maximum Continuous" power under conditions with higher carburetor air temperature and/or higher exhaust back pressure, the manifold pressure may be increased up to a maximum of 56 in.Hg. for the TSB3-G, B6, and CB2 and to 53 in.Hg. for the B5 and B7 to compensate for loss of power provided neither 43 in. (abs.) Hg. exhaust back pressure nor 130 °F carburetor air temperature is exceeded.
- NOTE 4. The takeoff rating for the TSB3-G, B5, B6, B7 and CB2 engines with anti-detonant injection is eligible when the engines are equipped with water injection regulator no. 106455. Anti-detonant fluid of 12.8 lbs/min. are required at 3500 BHP and 11.8 lbs/min. at 3250 BHP. This fluid may be composed of any of the following solutions by volume:
1. Methyl Alcohol 50%, water 50%
 2. Methyl Alcohol 60%, water 40%
 3. Methyl Alcohol 25%, Ethyl alcohol 25%, Water 50%
- } Per Pratt & Whitney Specification 509
4. Methyl Alcohol 60%, water 40% anticorrosion oil 1%, per British Specification D-Eng. R.D. 2470, dated January 8, 1946.
- NOTE 5. Specifications formerly listed for Model VSB11-G have been omitted since all of these engines have been converted to Model B13 engines. Engines Nos. P774 to 777, P811 to 817, P916, 917, 920 to 924 differ from other B13 engines in that they incorporated originally, early design types of the following parts: Cylinder heads; main oil pump; ignition harness; intake valves; guides, washers, and cam follower rollers.
- NOTE 6.
- (a) The B5 engine is identical to the single-speed, single-stage TSB3-G engine except for the fuel used, and the power ratings.
 - (b) The B6 engine is a conversion model from the TSB3-G, and incorporates essentially a new power section, nose section (including torquemeter and reduction gears), and low tension ignition system. TSB3-G cylinders, supercharger, and rear sections are retained.
 - (c) The B7 engine is identical to the B6 engine except for the fuel used and the power ratings.
 - (d) The CB2 engine is a further modified version of the B6 engine, incorporating "C" type cylinders with improved cooling provisions.
 - (e) The B14 is similar to the B13 except for the fuel used and the power ratings.
- NOTE 7. A manifold pressure regulator may be employed at an additional weight of 12 lbs.
- NOTE 8. Ignition timing may be manually advanced to 28 ° BTC for cruise operation.
- NOTE 9. The CB2 engine is eligible for operation on grade 100/130 fuel at the following reduced ratings:
- | | <u>HP</u> | <u>RPM</u> | <u>HP</u> | <u>ALT.</u> |
|--|-----------|------------|-----------|-------------|
| Maximum continuous | | | | |
| Critical altitude | 2650 | 2550 | 50.0 | 3000 |
| S.L. pressure, altitude | 2650 | 2550 | 50.5 | S.L. |
| Takeoff (dry) | | | | |
| Critical altitude | 3000 | 2700 | 56.0 | 1700 |
| S.L. pressure, altitude | 3000 | 2700 | 56.0 | S.L. |
| Takeoff (with anti-detonant injection) | | | | |
| Critical altitude | 3250 | 2700 | 56.5 | 900 |
| S.L. pressure, altitude | 3250 | 2700 | 56.5 | S.L. |
- NOTE 10. The following spark plugs are approved on these engines:
- | | |
|----------|--|
| AC | 161, 171, 181, 261, 271, 281 |
| BG | 240, 245, 340, 341, 345, 346, RB19R-2, RB27R, RB27R-1, RB39R. |
| Champion | REA32N, REB32N, RHA32N, RHB32N, RHA32E, RHB32E, R37S-1, REA37N, REB37N, RHA37N, RHB37N, RHA37E, RHB37E, R56S, R111, R115 |

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