

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

E3EA
Revision 6
Pratt & Whitney Aircraft
Turbo Wasp
TF33-P-7
TF33-P-7A
JT3D-5A

January 24, 1979

TYPE CERTIFICATE DATA SHEET NO. E3EA

Engines of models described herein conforming with this data sheet (which is part of type certificate No. E3EA) and other approved data on file with the Federal Aviation Administration meet the minimum standards for use in certified aircraft in accordance with pertinent aircraft data sheets 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 Technologies Corporation
East Hartford, Connecticut 06108

Model	Turbo Wasp	<u>TF33-P-7, TF33-P-7A</u>	<u>JT3D-5A</u>
Type	Turbofan	Dual axial, 16 stage compressor, 4-stage turbine and 8 cannular combustion chambers.	- -

Ratings

Maximum continuous static thrust at sea level, lb.	18,000	- -
Takeoff static thrust at sea level, (5 min.) lb.	21,000	- -
Fuel control	Hamilton Standard JFC25-18	- -
Fuel pump	Chandler Evans MFP70	- -
Air bleed valve and control assembly	PWA 478287, 587971	- -
Air bleed valve control assembly	PWA 478063, 587969	- -
Bleed reset control	PWA 587973	- -
Fuel	See Note 10.	- -
Oil	See Note 11.	- -
Principal Dimensions:		
Length, in. (maximum)	142.58	- -
Diameter (maximum)	54.10	- -
Radial projection (maximum)	32.60	- -
Weight (dry), lb. (includes basic engine with all essential access. including oil tank, fuel-oil cooler and fuel heater system, but excluding starter, exhaust nozzle and power source for the ignition system.)	4650	4675
Center of gravity, in.		
Aft of front mount area center line	18.45	- -
Below engine center line	1.03	- -
Ignition	GLA 41469, 42590, 43317 exciters with two igniters: Champion AA 725 or AC JB-3.	

NOTES All applicable. - -
"- -" indicates "same as preceding model."

Certification basis CAR 13 effective June 15, 1956, as amended by 13-1, 13-2, 13-3, 13-4, 13-5. Type Certificate No. E3EA issued March 26, 1963 (TF33-P-7, JT3D-5A); July 3, 1974 (TF33-P-7A). Date of Application for Type Certificate: August 16, 1961 (TF33-P-7), January 18, 1963 (JT3D-5A), February 25, 1974 (TF33-P-7A). Type Certificate canceled January 24, 1979.

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Production basis

Production Certificate No. 2

NOTE 1. Maximum permissible engine operating speeds at takeoff and maximum continuous for the engine rotors are as follows:

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	TF33-P-7A	
Low pressure compressor (N ₁), rpm	6870	- -
High pressure compressor (N ₂), rpm	10095	- -

NOTE 2. Maximum permissible temperatures are as follows:

Turbine outlet gas temperature		
Takeoff	(555°C) 1030°F	- -
Maximum continuous	(488°C) 910°F	(510°C) 950°F
Maximum for acceleration	(555°C) 1030°F	- -
Starting	(455°C) 850°F	- -
Oil inlet	(121°C) 250°F continuous operation	- -

External engine components, maximum temperature (limiting temperature of specific components are as specified in the engine installation and operating manual.)

NOTE 3. Fuel and oil pressure limits are as follows:

Fuel pressure	At inlet to engine system pump, 7.5 p.s.i. above absolute fuel vapor pressure or 2.0 below fuel tank pressure, whichever is higher, with a maximum of 50 p.s.i. above absolute ambient atmosphere pressure.	
Oil pressure:	At idle	35 p.s.i. minimum
	Operating range	40 to 55 p.s.i.

NOTE 4. Maximum permissible air bleed extraction is as follows:

Percent of primary engine airflow:	
Takeoff	3.5%
Maximum continuous and below	6.5%
Intermittent	7.7% at idle through maximum continuous
Intermittent at takeoff	5.8%

NOTE 5. The ratings are based on static test stand operation under the following conditions:

Compressor inlet air at 59°F and 29.92 in.hg.
 Jet nozzle and fan exit nozzle per P&WA Drawing 434501 (TF33-P-7, TF33-P-7A) or 424201 (JT3D-5A).
 P&WA bellmouth on air inlet.
 No aircraft accessory loads or air extraction.
 No anti-icing airflow.
 Turbine outlet gas temperature limits and engine rotor speeds limits not exceeded.

NOTE 6. The following accessory drive provisions are incorporated:

Drive	Rotation Clockwise	Speed Ratio to Turbine Shaft	Torque (in.-lb.)		Overhang (in.-lb.)
			Continuous	Static	
<u>Low Rotor</u> Tachometer	C	.618:1	7	50	—
<u>High Rotor</u> Starter	C	.700:1	—	*	625
Generator	C	.802:1	**	6600	4000
Fluid power pump	C	.342:1	1000	4400	400
Additional accessory drive	C	.700:1	300	2200	500
Tachometer	C	.435:1	7	50	—

*Maximum starter torque 720 lb. ft.

Shear section will fall at 1300 - 0 + 200 lb. ft.

**The maximum allowable continuous torque values are equivalent to 160 horsepower at any engine speed at or above sea level ground idle.

- NOTE 7. Power setting, power checks, and control of engine output in all operations is to be based upon P&WA engine charts referring to turbine discharge section gas pressures. Pressure probes are included in the engine assembly for this reason.
- NOTE 8. These engines meet FAA requirements for adequate turbine disc integrity and rotor blade containment and do not require external armoring. These engines have demonstrated satisfactory operation in icing conditions as defined in 4b.1(b) 7 and 8.
- NOTE 9. The maximum continuous static thrust at sea level at minus 6°F ambient temperature and below is 21,000 lbs. The engine installation and operating manual should be consulted for variation in thrust between standard day and minus 6°F.
- NOTE 10. The following fuels are eligible for these engines:
TF33-P-7, TF33-P-7A
 Primary fuel - MIL-T-5624-H-1 Grade JP-4.
 Alternate fuel - MIL-T-5624-H-1 Grade JP-5 and fuels conforming to P&WA Specification No. 522D.
 Emergency fuel - Fuel consisting of 97 percent of fuel conforming to ML-G-5572, Grade 115/145 and 3 percent oil conforming to MIL-L-6082B, Grade 1100.
- JT3D-5A
 JP-1, JP-4, and JP-5 fuels conforming to P&WA Specification No. 522 and P&WA Service Bulletin 2016, latest issue, may be used separately or mixed in any proportions without adversely affecting the engine operation or power output. No fuel control adjustment is required when switching fuel types.
- Phillips PFA-55MB anti-icing additive at the use concentration not in excess of 0.15% volume is approved for use in fuels conforming to P&WA Specification No. 522D.
- NOTE 11. The following oils are eligible for these engines:
TF33-P-7, TF33-P-7A
 MIL-L-7808D or MIL-L-23699
- JT3D-5A
 Synthetic type conforming to P&WA Specification 521 as revised.
 P&WA Turbojet Engine Service Bulletin No. 238 lists approved brand oils.
- NOTE 12. The JT3D-5A 21,000 lb. takeoff static thrust at sea level is extended to 84°F ambient temperature.
- NOTE 13. The following engines were manufactured under this Type Certificate.
- | <u>Engine Model</u> | <u>Serial Numbers</u> |
|---------------------|-----------------------|
| TF33-P-7 | P650901 thru P651900 |
| | P659651 thru P659999 |
| | P660000 thru P660122 |

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