

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

E2NE
Pratt & Whitney
PT6A-20A
PT6A-27
PT6A-28
PT6A-34

April 15, 1975

TYPE CERTIFICATE DATA SHEET NO. E2NE

Engines of models described herein conforming with this data sheet (which is a part of type certificate No. E2NE) and other approved data on file with the Federal Aviation Administration meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Federal Aviation Regulations provided they are installed, operated, and maintained as prescribed by the approved manufacturer's manuals and other approved instructions.

Type Certificate Holder United Aircraft Corporation
Pratt & Whitney Aircraft Division
East Hartford, Connecticut 06108

Model	<u>PT6A-20A</u>	<u>PT6A-27, -28</u>	<u>PT6A-34</u>
Type	Free turbine turboprop 3 axial plus one centrifugal stage compressor	- - - -	- - - -
	Single annular combustion chamber	- -	- -
	Single stage gas generator turbine	- -	- -
	Single stage power turbine	- -	- -
Reduction gear ratio	.0668:1	.0663:1	- -
Ratings (see Note 3)			
Maximum continuous at sea level			
Equivalent shaft hp	579	715	783
Shaft hp	550	680	750
Jet thrust, lb.	72	90	82
Output rpm	2200	- -	- -
Gas generator rpm	38,100	- -	- -
Takeoff (5 min.) at sea level			
Equivalent shaft hp	579	715	783
Shaft hp	550	680	750
Jet thrust, lb.	72	90	82
Output rpm	2200	- -	- -
Gas generator rpm	38,100	- -	- -
Maximum reverse			
Shaft hp	500	620	750
Output rpm (maximum)	2100	- -	- -
Output shaft	Flanged, 4.250" B.C., 8 holes .594± .005" diameter (See UACL Drawing 3008400)	- -	- -
Control system (see Note 11)	Bendix gas generator fuel control DP- F2	- -	- -
	Bendix ambient temperature compensator TS-E2	—	—
	Power turbine governor Woodward 8210	- -	- -

Note: Power turbine governor is integral with propeller governor.

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Model	<u>PT6A-20A</u>	<u>PT6A-27, -28</u>	<u>PT6A-34</u>
Fuel Pump	Pesco/Sundstrand 024800	- -	- -
Fuel Heater	Optional Steward Warner 8426B or United Aircraft Products UA525193	Standard UAP UA52193-6	- - - -
Fuel	All models - Fuels conforming to PWA Specification No. 522 and CPW 46, and later revisions and ASTM Specification ES-2-74. See Notes 8 and 12 for additional data.		
Oil	Synthetic type conforming to the current CPW 202, PWA 521 Type I or PWA 521 Type II specifications. See Note 9 for additional data.		
Oil tank capacity (gallons)	2.3	- -	- -
Usable oil tank capacity (gallons)	1.5	- -	- -
Principal Dimensions			
Length, in.	61.89	- -	- -
Nominal diameter, in.	18.06	- -	- -
Maximum radius, in. (excluding exhaust ports)	10.85	- -	- -
Weight (dry), lb. (includes basic engine, fuel and ignition system but excludes ignition power source)	289	300	303
C.G. location (dry weight)			
Forward of mount plane, in.	4.58	3.04	3.02
Below engine centerline, in.	0.42	0.32	0.32
Right of engine centerline, in.	0.08	0.20	0.20
Ignition system	Dual glow plug system, Champion AGF2-5, AGF2-6, or AC GC-6. UACL dual ballast tube regulator.	Dual glow plug system, Champion AGF2-5, AGF 2-6, or AC GC-6. UACL dual ballast tube regulator, or dual spark plug system, Champion FHE-182, Bendix plug 10-380700-1, Bendix exciter TCLN-28.	
NOTES	1 thru 15	- -	- -

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

"—" indicates "does not apply."

Certification basis: FAR 33 effective February 1, 1965, as amended by 33-1, 33-2, 33-3, 33-4, and 33-5.

Model	Date of Application	Date Type Certificate No. Issued/Revised
PT6A-20A	May 29, 1974	July 30, 1974
PT6A-27	May 29, 1974	July 18, 1974
PT6A-28	May 29, 1974	July 18, 1974
PT6A-34	May 29, 1974	September 11, 1974

Production basis: Production Certificate No. 2

NOTE 1.

Maximum permissible temperatures:

Gas temperature, measure rated interturbine temperatures as indicated by the average of the integral thermocouples.

	<u>PT6A-20A</u>	<u>PT6A-27</u>	<u>PT6A-28</u>	<u>PT6A-34</u>
Takeoff	1380°F (750°C)	1336°F (725°C)	1380°F (750°C)	1455°F (790°C)
Minimum continuous	1380°F (750°C)	1336°F (725°C)	1380°F (750°C)	1455°F (790°C)
Starting transient (2 sec.)	1944°F (1090°C)	1994°F (1090°C)	1994°F (1090°C)	1994°F (1090°C)

Oil temperature - Continuous

Minus 40°F (-40°C) to 210°F (99°C) except for:

- (i) MIL-L-7808 (where approved; see Note 9) for which the maximum allowable temperature is 185°F (85°C)
- (ii) Limited periods of 5 minutes at 220°F (104°C) are allowable.

NOTE 2.

Fuel and oil pressure limits:

Fuel: Minimum pressure at inlet to the engine fuel system shall not be less than 5 p.s.i. above true vapor pressure of the fuel. For emergency operation, with airframe boost pump inoperative, it must be such that vapor liquid ratio does not exceed 0.1 for continuous operation and does not exceed 0.3 for more than 10 hours in a pump overhaul life.

Maximum pressure at inlet to fuel system: 50 p.s.i.g.

Oil:

Operating range

PT6A-20A

28000 rpm gas generator speed and above, with an oil temperature of 140° - 160°F.

65 - 85 p.s.i.g.

Below 28000 rpm

40 p.s.i.g. minimum

PT6A-27, -28

27000 rpm gas generator speed and above, with an oil temperature of 140° - 160°F.

80 - 100 p.s.i.g.

Below 27000 rpm

40 p.s.i.g. minimum

PT6A-34

27000 rpm gas generator speed and above, with an oil temperature of 140° - 160°F

85 - 100 p.s.i.g.

Below 27000 rpm

40 p.s.i.g. minimum

NOTE 3.

The engine ratings are based on static sea level conditions. Compressor inlet air (dry) 59°F, 29.92 in.Hg. Compressor intake screen installed. No external accessory loads and no airbleed. Takeoff and Maximum Continuous ratings for each model are available to the following Air Inlet Temperatures:

<u>Model</u>	<u>A.I.T. °F.</u>
PT6A-20A	70°F
PT6A-27	71°F
PT6A-28	71°F
PT6A-34	87°F

NOTE 4. Accessory Drive Provisions (all models)

The following accessory drive provisions are available and are included in the basic engine weight:

Driven by Gas Generator Turbine	Rotation Facing Drive Pad	Speed Ratio (to Turbine)	Maximum Torque (in.-lb.)		Maximum Overhang (in.-lb.)	Weight (Pounds)
			Continuous	Static		
Tachometer, Accessory Gearbox	CC	0.112	7.0	100	10	—
Starter and/or generator	C	0.293	170	1600	150	—
Vacuum pump drive*	CC	0.103	60	800	25	0.5
Hydraulic pump drive*	CC	0.203	150	800	25	1.1
Aircraft accessory drive*	C	0.321	135	800	25	1.5
Driven by Power Turbine						
Tachometer R.G.B.	C	0.1263	7.0	100	10	—
Propeller governor	C	0.1263	50	850	25	—
Propeller hydraulic overspeed governor*	C	0.1263	50	850	25	0.5

C - Clockwise

CC - Counterclockwise

*Additional optional drives which are available with increases shown to basic engine weight.

The hydraulic pump drive requires the aircraft accessory drive to complete the train.

Cabin pressurization may be provided by the approved combination of the Beech Aircraft Corporation gearbox no. 50-99003 with the Godfrey Engineering Type 9 Cabin Supercharger, mounted directly on the accessories gearbox.

The PT6A-27 and -28 engines are approved for operation with an accessory mounted on the reduction gearbox and belt-driven from the propeller assembly provided that the accessory is mounted and driven in accordance with the locating dimensions and weight prescribed in Sheet 5 of drawing number 3018500, revision dated August 20, 1973.

NOTE 5. External airbleed shall not exceed 5-1/4%. A maximum of 1.5 lb./min. may be bled during starting. Bleed air meets the requirements of Paragraph 3.18 of MIL-E-5007C.

NOTE 6. Maximum Allowable Torque

The maximum allowable steady state and acceleration torques, as measured by the torquemeter, are:

<u>Model</u>	<u>Continuous ft./lb.</u>	<u>Acceleration ft./lb.</u>
PT6A-20A	1315	1800
PT6A-27	1628	1800
PT6A-28	1786	1950
PT6A-34	1970	2100

NOTE 7. The output shaft maximum overspeed limit is 110 percent at all ratings, and may be employed to complete a flight in an inflight emergency. 100 percent output shaft speeds are defined as 2200 rpm.

Gas generator speeds of up to 102.7 percent are permissible for 10 seconds and to 101.6 percent for unlimited periods subject to applicable temperature and other limits. 100 percent gas generator speed is defined as 37500 rpm.

NOTE 8. Emergency use of ML-G-5572, Grades 80/87, 91/98, 100/130, and 115/145 is permitted for a total time period not exceeding 150 hours, or 450 hours using a 1:3 mixture of aviation gasoline and aviation kerosene during any one overhaul period. It is not necessary to purge the unused fuel from the system when changing fuel types.

NOTE 9. Approved brands or oil are listed in UACL Service Bulletin No. 1001 for the PT6A-20A, PT6A-27, PT6A-28, and PT6A-34.

- NOTE 10. These engines meet FAA requirements for operation in icing conditions when the intake system conforms with the UACL Installation Manual instructions for the inertial separation of snow and icing particles; when the alternative approved alcohol system is used flight in visible moisture is restricted as specified in the UACL installation Manual.
- NOTE 11. Fuel control and power turbine governor part numbers approved for each engine model are listed in the applicable parts catalog.
- NOTE 12. Fuel anti-icing additives conforming to specifications 3GP526A, PFA 55MB, MIL-I-27686D or MIL-I-27686E may be used, at a concentration not exceeding 0.15 percent by volume.
- NOTE 13. Certain engine parts are life-limited. These limits are listed in FAA approved UACL Turboprop Engine Overhaul Manuals 3011403 (PT6A-20A) and 3013243 (PT6A-27, -28, and -34).
- NOTE 14. Maximum fuel system inlet temperature for starting and operating is 135°F (57°C). For operation, minimum inlet temperature is -65°F (-54°C). For starting, minimum inlet temperature is -65°F (-54°C) for Jet B and JP4, -30°F (-34°C) for Jet A and JP1, and -15°F (-20°C) for JP5.
- NOTE 15. The above models incorporate the following characteristics:

<u>Model</u>	<u>Characteristics</u>
PT6A-20A	Basic model.
PT6A-27	Features revised engine parts and higher ratings.
PT6A-28	Similar to PT6A-27 except for igher inter-turbine temperature limit.
PT6A-34	Similar to PT6A-27 except incorporates a compressor turbine similar to PT6T-3 for higher rating.

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