

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION TYPE CERTIFICATE SHEET NO. E9NE	TCDS NUMBER E9NE REVISION: 12 DATE: December 13, 2010 PRATT & WHITNEY MODELS: JT8D-209 JT8D-217 JT8D-217A JT8D-217C JT8D-219
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Engines of models described herein conforming with this data sheet (which is part of Type Certificate Number E9NE) 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 (TC) HOLDER: Pratt & Whitney
 United Technologies Corporation
 East Hartford, Connecticut 06108

I. MODELS	JT8D-209	JT8D-217	JT8D-217A	JT8D-217C	JT8D-219
TYPE	Dual, axial 14-stage compressor / four-stage turbine / nine can-annular combustion chambers / exhaust mixer				
RATINGS					
Sea Level Static Thrust (lbs)					
Maximum continuous	16,000	18,000	--	--	18,900
Normal takeoff (5 min.) (See NOTE 19 and NOTE 21)	18,500	20,000	--	--	21,000
Maximum takeoff (5 min.) (See NOTES 19, 20 and 21)	19,250	20,850	--	--	21,700
FUEL CONTROL	Hamilton Standard JFC60-6	--	--	--	--
FUEL PUMP	Argo-Tech Corp P/N 384300	--	--	--	--
PRESSURE RATIO BLEED CONTROL	PW, P/N 777537	--	PW, P/N 790312	--	--
IGNITION	Bendix Type TCFN-2 of Simmonds Type 49988 exciter with two igniters; Champion AA-72S, AC JB-3				
FUEL	See Note 11	--	--	--	--

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LEGEND: "--" INDICATES "SAME AS PRECEDING MODEL" "--" NOT APPLICABLE

I. MODELS (cont.)	JT8D-209	JT8D-217	JT8D-217A	JT8D-217C	JT8D-219
OIL	See Note 12	--	--	--	--
PRINCIPAL DIMENSIONS:					
Length, in.	154.20	--	--	--	--
Width, in.	59.20	--	--	--	--
Height, in.	67.30	--	--	--	--
CENTER OF GRAVITY, INCHES					
(Reflects engines which incorporates the high pressure containment shield identified in Service Bulletin 6053 and the 6th stage bleed system identified in EC 86HA037.)					
Aft of front mount area centerline	22.4	23.0	--	23.2	--
Below engine centerline	2.1	--	--	--	--
WEIGHT (DRY)					
Basic engine, (lbs) (includes all essential accessories, with fuel heater, oil tank, and fuel-oil cooler, but excludes starter, exhaust nozzle, and power source for the ignition system. (*See Note 22, **23, ***24)	4,588	4,623	--	4,684* 4,646** 4,750***	-- -- --
Airframe Brackets, (lbs). (See Note 25)	20	--	--	10	--
Transition Duct, (lbs)	85	--	--	--	--

NOTES 1-20

CERTIFICATION BASIS

JT8D-209 14 CFR Part 33 effective February 1, 1965, as amended by 33-1, 33-2, 33-3, 33-4, 33-5, 33-6. Exemption Numbers 2479 and 2743

JT8D-217, -217A 14 CFR Part 33 effective February 1, 1965, as amended by 33-1, 33-2, 33-3, 33-4, 33-5, 33-6. Exemption Number 2897

JT8D-217C, -219 14 CFR Part 33 effective February 1, 1965, as amended by 33-1, 33-2, 33-3, 33-4, 33-5, 33-6. Exemption Number 2897-1. Equivalent Level of Safety (ELOS) No. 8040-ELOS-10-NE04 to 14 CFR §33.87 (b)(2)(ii) is also applicable for JT8D-217C and -219 Models that incorporate the High Horsepower Extraction Option (Note 24).

<u>MODEL</u>	<u>DATE OF APPLICATION</u>	<u>DATE OF TYPE CERTIFICATE NO. E9NE ISSUED/REVISED</u>
JT8D-209	April 20, 1977	June 22, 1979
JT8D-209A	December 2, 1977	Canceled October 31, 1981
JT8D-217	October 27, 1978	October 31, 1980
JT8D-217A	February 16, 1981	October 30, 1981
JT8D-219	January 25, 1983	February 22, 1985
JT8D-217C	November 25, 1985	February 26, 1986

PRODUCTION BASIS

Production Certificate No. 2

NOTES

	JT8D-209	JT8D-217	JT8D-217A	JT8D-217C	JT8D-219
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NOTE 1. Rotor Speeds - Maximum permissible engine operating speeds for the engine rotors are as follows:

Low Pressure rotor (N1), rpm					
Normal takeoff (ARTS armed)	7,850	7,770	8,080	8,080	8,120
All other operating conditions	8,150	--	8,350	--	--
High pressure rotor (N2), rpm					
Normal takeoff (ARTS armed)	12,150	12,285	12,350	--	--
All other operating conditions	12,370	12,550	--	--	--

NOTE 2. Temperatures - Maximum permissible temperatures are as follows:

Turbine outlet gas temperature, °C/°F:

Maximum takeoff (5 min)	570/1058	625/1157	--	--	--
Normal takeoff (5 min)	550/1022	590/1094	--	--	--
Maximum continuous	530/986	580/1076	--	--	--
Maximum for acceleration-- Maximum takeoff (2 min)		630/1166	--	--	--
Normal takeoff (2 min)		595/1103	--	--	--

Turbine outlet gas temperature at start-up, °C/°F:

Ground	500/932	--	--	--	--
In-Flight	570/1058	625/1157	--	--	--

Oil inlet temperature, °C/°F:

Continuous operation	135/275	--	--	--	--
Transient operation	165/329	--	--	--	--

Transient operation above 135°C (275°F), is limited to 15 minutes. External engine component maximum limiting temperatures are specified in the Installation Handbook, Part A.

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

Fuel Pressure - At inlet to engine system pump, not less than 5 psig above true vapor pressure of the fuel and not greater than 50 psig with a vapor liquid ratio of zero.

Oil Pressure - Minimum 35 psig
Normal Range 40-55 psig

Note: During cold weather starting, oil pressure in excess of 55 psig may be evidenced until oil viscosities are reduced by increasing oil temperature. Engine operation is limited to idle power when oil pressure is in excess of 55 psig during cold weather starts.

NOTE 4. Air Bleed Extraction - Maximum permissible air bleed extraction is as follows:
Percentage of Primary Engine Airflow

<u>Station</u>	<u>Individual Bleeding at a Single Station</u>		<u>Simultaneous Bleeding of Two or More Stations</u>	
	<u>Normal</u>	<u>Maximum</u>	<u>Normal</u>	<u>Maximum</u>
High-Pressure Bleed:				
At and below 90 percent maximum continuous thrust	8.0	8.0	8.0	8.0
Above 90 percent maximum continuous thrust	3.5	*5.5	3.5	*5.5
Eight-Stage Bleed:				
At and below maximum continuous thrust	4.0	4.0	4.0	4.0
Above maximum continuous thrust	2.75	*3.25	2.75	*3.25
Low Pressure Bleed:				
At 20% maximum continuous thrust and above	3.5	3.5	3.5	3.5
Below 20% maximum continuous thrust	2.8	2.8	2.8	2.8

NOTE: The above limits apply when the bleed is taken from all available bleed ports of any one bleed station.

The allowable eighth-stage bleed is in addition to the bleed used to anti-ice the engine inlet guide vanes and the airframe supplied nose cone.

Percentage of Secondary Airflow

Fan Air bleed:				
At and below maximum continuous thrust	3.0	*4.0	3.0	3.0
Above maximum continuous thrust	2.0	2.0	2.0	2.0

*Usable only when required by a malfunction and only until the next landing.

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.
- Nozzle exhaust pipe per P&WA 46701.
- P&WA bellmouth on air inlet.
- No aircraft accessory loads or air extraction.
- No anti-icing air flow.
- Turbine outlet gas temperature limits and engine rotor speed limits not exceeded.

NOTE 6. The following accessory drive provisions are incorporated:

<u>Drive</u>	<u>Rotation</u>	<u>Speed Ratio to Turbine Shaft</u>	<u>Torque (lb-in.)</u>		<u>Overhang (in.-lb.)</u>
			<u>Cont.</u>	<u>Static</u>	
Low-Pressure					
Rotor N1:					
Tachometer	C	0.511:1	7	50	---
High-Pressure					
Rotor N2:					
Starter	C	0.597:1	*	*	625
Generator	C	0.700:1	1500	6600**	2500
Fluid Power Pump	C	0.292:1	1000	4400	400
Tachometer	CC	0.343:1	7	50	---

C - Clockwise: CC - Counterclockwise

* - Maximum starter torque - 550 lb-ft. The shear section will fail at 850 - 0 + 100 lb-ft.

** - Maximum torque when used as a starter, 410 lb-ft.

NOTE 7. Power setting, power checks, and control of engine output in all operations is to be based upon Pratt & Whitney Aircraft 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 disk integrity and rotor blade containment and do not require external armoring. These engines have demonstrated satisfactory operation in icing conditions as defined in Federal Aviation Regulation 33.68.

NOTE 9. DELETED.

NOTE 10. The maximum continuous static thrust at sea level at 19°F temperature and below is 19,250 pounds (JT8D-209), 20,850 pounds (JT8D-217, -217A, -217C) and 21,700 pounds (JT8D-219) respectively. The Engine Installation Handbook, Part A, should be consulted for variation in thrust between standard and 19°F.

NOTE 11. The following fuels are approved for these engines:
Fuels and fuel additives conforming to the latest applicable issue for FAA approved Pratt & Whitney Service Bulletin No. 2016 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.

NOTE 12. The following oils are approved for these engines: brand name oils listed in Pratt & Whitney Service Bulletin No. 238. (Synthetic type conforming to Pratt & Whitney Aircraft Specification 521, as revised).

NOTE 13. All these engines meet the January 1, 1984, fuel venting emission requirements of SFAR-27.

NOTE 14. All these engines meet the January 1, 1984, smoke and gaseous emission requirements of SFAR-27.

NOTE 15. Certain engine parts are life limited. These limits are listed in the FAA approved Pratt & Whitney Aircraft JT8D-200 Series Turbofan Engine Manual, Part No. 773128, Time Limit Section. See NOTE 20 when using the JT8D-219 auxiliary maximum takeoff rating.

NOTE 16. Maximum permissible inlet distortion limit for these engines is specified in the Installation Handbook, Part A.

NOTE 17. Information regarding transient rotor shaft over-speed rpm and number of overspeed occurrences, as well as transient gas over-temperature and number of over-temperature occurrences, is specified in the Maintenance Manual, Part No. 773127.

- NOTE 18. The JT8D-217 is the same as JT8D-209 except for incorporation of a cooled high pressure turbine and improved engine parts. JT8D-217A is the same as JT8D-217 except for 20,000 pounds of static takeoff thrust at sea level flat rated to 84°F ambient temperature and improved engine parts. The JT8D-219 is the same as the JT8D-217A except that it incorporates improved parts including longer fan blades and an improved cooled high pressure turbine to permit increases in the thrust ratings. The JT8D-217C is the same as the JT8D-219 except that it has -217A ratings and operating limits.
- NOTE 19. A thrust setting limited to 19,250 lbs. (JT8D-209), 20,850 lbs. (JT8D-217, -217A, -217C) and 21,700 lbs. (JT8D-219) static thrust at sea level, flat rated to 84°F ambient temperature has been established as maximum takeoff thrust rating. A thrust setting limited to 18,500 lbs. (JT8D-209), 20,000 lbs. (JT8D-217) static thrust at sea level, flat rated to 77°F ambient temperature and 20,000 lbs. (JT8D-217A-217C) and 21,000 lbs. (JT8D-219) static thrust at sea level, flat rated to 84°F ambient temperature has been established as normal takeoff thrust rating for normal takeoff operation.
- When the automatic reset mechanism in the fuel control is armed, operation to the Normal Takeoff Rating Operating limits will prevent the engine from exceeding the Maximum Takeoff Rating Operating Limits when the reset mechanism is actuated.
- The time limit at the Normal takeoff Rating is five minutes and shall include any time accumulated above the Normal Takeoff Rating.
- NOTE 20. A thrust setting is limited to 21,700 lbs. static thrust at sea level, flat rated to 90.4°F ambient temperature has been established as auxiliary maximum takeoff for the JT8D-219 engine model. The auxiliary maximum takeoff setting provides additional hot day performance on the JT8D-219 engine model only and is achieved by manual setting of the power lever only, with the automatic reset mechanism disarmed (off).
- The part life accounting procedure is the same as for the maximum takeoff rating except that a two for one cycle penalty must be applied to the sixth stage compressor disk whenever the auxiliary maximum takeoff rating is applied.
- NOTE 21. The 5 minute takeoff time may be extended to 10 minutes for one engine inoperative or shutdown for engines which have incorporated all the features specified in Pratt & Whitney Aircraft Turbojet Engine Service Bulletin Numbers 5514, 5643 and Alert Service Bulletin Number A6196.
- Note 22. For MD80 installations. Reflects Boeing approval of increased engine weight up to 4704 lbs including airframe brackets. Also includes SB5871, 6th stage bleed system (32 lbs); SB6053, HPT containment (65 lbs); SB6346, improved HPT containment (22 lbs); and SB6478, Improved forward fan case, approved for MD80 aircraft by STC00228BO (34 lbs).
- Note 23. For Super 27 installations. Includes SB6053, HPT containment (65 lbs); SB6346, Improved HPT containment (22 lbs); and SB6491, improved forward fan case (34 lbs).
- Note 24. For Boeing 707 installations. Includes SB5871, 6th stage bleed system (32 lbs); SB6053, HPT containment (65 lbs); SB6346, improved HPT containment (22 lbs); and SB6491, Improved forward fan case (34 lbs) as well as the following features: External Modification Option for B707 Top Mount (17 lbs); Nickel HPC Disks and Spacer Option (10 lbs); and High Horsepower Extraction Option (60 lbs).
- Note 25. For Boeing 707 installations add 10 lbs for airframe brackets (instead of 20 lbs for all other installations).

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