

Model Turbo Wasp (cont'd)	JT3D-1	JT3D-1A	JT3D-1MC6	JT3D-1A-MC6
Principal dimensions: Length, In. (Maximum including front-mounted compressor bleed control)	136.64	--	--	--
Width	53.00	--	--	--
Height	56.00	--	--	--
Weight (dry), lb. (includes basic engine with all essential access, but excluding starter optional access, drives, exhaust nozzle, power source for the ignition system, and oil supply tank). (See NOTE 7)	4145	--	4540	--
Center of gravity, in. Aft of front mount area centerline	15.65	--	16.40	--
Below engine centerline	1.10	--	1.00	--
Ignition*	GLA 40355, or GLA 40799 & 40692, 48016, 42723, 42721, 42722, 41540, with two igniters; Champion AA- 37S or AA-72S; AC JC-571 or JB-3	--	GLA 40478, 48016, 40355, 42721, 42722, 41540, with two igniters; Champion AA-37S or AA-72S; AC JC-571 or JB-3	--
*GLA is now Simmonds Precision Corporation, Engine Systems Division				
NOTES	All applicable	--	--	--

Model Turbo Wasp	JT3D-1-MC7	JT3D-1A-MC7	JT3D-3	JT3D-3B
Type Turbofan	Dual axial, 15 stage compressor, 4 stage turbine and 8 cannular combustion chambers	--	--	--
Rating				
Maximum continuous static thrust at sea level, lb.	14,500	--	16,400	--
Takeoff static thrust at sea level, lb. (see NOTE 8)				
Dry (5 minutes)	17,700	--	18,000	--
With water injection (2½ minutes)	17,000	--	18,000	--
Fuel control	Hamilton JFC-25	--	--	--
Fuel pump*	Chandler Evans 9444, 9455, 9478	--	Chandler Evans 9455 for (B), 9452 for (D), 9477 for (D), 9478 for (B)	Chandler Evans 9455 or 9459 for (B), 9452 for (B or D), or 9458 for (D), 9477 for (D), 9478 for (B)
Air bleed control	Holley A12117 or PWA P/N 635996, 635997	--	PWA P/N 432976 for (B), 448610 for (D), 538991 for (B, 9th Bleed), 563881 for (B, 12th Bleed), 548997 for (D, 12th Bleed)	PWA P/N 432976, or 452457 for (B), 448610 or 452455 for (D), 538991 for (B, 9th Bleed), 563881 for (B, 12th Bleed), 548997 for (D, 9th bleed), 560339 for (D, 12th Bleed)

"- -" indicates "same as preceding model"

"—" indicates "does not apply"

*D - Douglas Installation

B - Boeing Installation

Model Turbo Wasp (cont'd)	JT3D-1-MC7	JT3D-1A-MC7	JT3D-3	JT3D-3B
Fuel	See NOTE 14	--	--	--
Oil (See NOTE 15)	Synthetic type conforming to PWA Spec. 521 as revised	--	--	--
Principal dimensions: Length, In. (Maximum including front-mounted compressor bleed control)	136.64	--	--	--
Width	53.00	--	--	--
Height	56.00	--	--	--
Weight (dry), lb.(includes basic engine with all essential access, but excluding starter optional access, drives, exhaust nozzle, power source for the ignition system, and oil supply tank). (See NOTE 7)	4165	--	4190	4340 for 12th Stage Bleed or 4320 for 9th Stage Bleed
Center of gravity, in. Aft of front mount area centerline	15.77	--	18.41	19.00
Below engine centerline	1.07	--	1.10	.90
Ignition*	GLA 40355, 40816, 41468, 42721, 42722, 41540, with two igniters; Champion AA-37S or AA-72S; AC JC-571 or JB-3	--	GLA 40355, 40479 or 40799 and 40692 with two igniters; Champion AA-37S or AA-72S; AC JC-571 or JB-3	--
*GLA is now Simmonds Precision Corporation, Engine Systems Division				
NOTES	All applicable	--	--	--

Model Turbo Wasp	JT3D-3C	JT3D-7	JT3D-7A
Type Turbofan	Dual axial, 15 stage compressor, 4 stage turbine and 8 cannular combustion chambers	--	--
Rating			
Maximum continuous static thrust at sea level, lb.	16,400	17,390	--
Takeoff static thrust at sea level, lb. (see NOTE 8)			
Dry (5 minutes)	18,000	19,285	--
With water injection (2½ minutes)	18,000	19,285	--
Fuel control	Hamilton JFC-25	--	--
Fuel pump*	Chandler Evans 9455 or 9459 for (B), 9452 for (B or D), or 9458 for (D), 9477 for (D), 9478 for (B)	Chandler Evans 9478 for (B), 9477 for (D)	--
Air bleed control	PWA P/N 432976, or 452457 for (B), 448610 or 452455 for (D), 538991 for (B, 9th Bleed), 563881 for (B, 12th Bleed), 548997 for (D, 9th Bleed), 560339 for (D, 12th Bleed)	PWA P/N 563881 for (B), 563883 for (D, Long Duct), 560339 for (D, Short Duct)	--
Fuel	See NOTE 14	--	--
Oil (See NOTE 15)	Synthetic type conforming to PWA Spec. 521 as revised	--	--

"- -" indicates "same as preceding model"

"—" indicates "does not apply"

*D - Douglas Installation

B - Boeing Installation

Model Turbo Wasp	JT3D-3C	JT3D-7	JT3D-7A
Principal dimensions: Length, In. (Maximum including front-mounted compressor bleed control)	136.64	--	--
Width	53.00	--	--
Height	56.00	--	--
Weight (dry), lb. (includes basic engine with all essential access, but excluding starter optional access, drives, exhaust nozzle, power source for the ignition system, and oil supply tank). (See NOTE 7)	4340 for 12th Stage Bleed or 4320 for 9th Stage Bleed	4340	--
Center of gravity, in. Aft of front mount area centerline	19.00	--	--
Below engine centerline	.90	--	--
Ignition*	GLA 40355, 40479 or 40799 and 40692 with two igniters; Champion AA-37S or AA-72S; AC JC-571 or JB-3	GLA 41540, 42721 or 40799, 42723, 42562, 48016, and 40692 with two igniters; Champion AA-72S; AC JB-3	--
*GLA is now Simmonds Precision Corporation, Engine Systems Division			
NOTES	All applicable	--	--

"- -" indicates "same as preceding model"

"—" indicates "does not apply"

*D - Douglas Installation

B - Boeing Installation

Certification basis CAR 13 effective June 15, 1956, as amended by 13-1, 13-2, 13-3
Type Certificate No. 1E8 issued July 22, 1960 (JT3D-1, JT3D-1-MC6); Model JT3D-1-MC7 added
February 10, 1961; Model JT3D-3 added May 16, 1961; Model JT3D-3B added March 29, 1963; Model
JT3D-7 added April 19, 1967; Models JT3D-1A, JT3D-1A-MC6, JT3D-1A-MC7, JT3D-3C, and JT3D-
7A added June 10, 1977.
Date of Application for Type Certificate December 29, 1959 (JT3D-1); March 22, 1960 (JT3D-1-MC6);
September 15, 1960 (JT3D-1-MC7, JT3D-3); March 20, 1963 (JT3D-3B); March 28, 1966 (JT3D-7);
February 28, 1977 (JT3D-1A, JT3D-1A-MC6, JT3D-1A-MC7, JT3D-3C, and JT3D-7A).

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:

	JT3D-1, -1A	JT3D-1-MC6, -1A-MC6	JT3D-3	JT3D-3B, -3C	JT3D-7, -7A
	<u>JT3D-1-MC7, -1A-MC7</u>				
Low pressure compressor (N1), r.p.m.	6,800	--	6,850	--	--
High pressure compressor (N2), r.p.m.	10,200	10,250	10,300	10,300	10,300

NOTE 2. Maximum permissible temperatures are as follows:

	<u>JT3D-1</u>	<u>JT3D-1A</u>	<u>JT3D-3</u>
	JT3D-1-MC6	JT3D-1A-MC6	
	<u>JT3D-1-MC7</u>	<u>JT3D-1A-MC7</u>	<u>JT3D-3B</u>
Turbine outlet gas temperatures:			
Takeoff (5 minutes)	(530°C) 985°F	(520°C) 968°F	(555°C) 1031°F
Maximum continuous	(460°C) 860°F	(450°C) 842°F	(490°C) 914°F
Maximum for acceleration	(530°C) 985°F	(520°C) 968°F	(555°C) 1031°F
Starting	(450°C) 842°F	(450°C) 842°F	(450°C) 842°F
	<u>JT3D-3C</u>	<u>JT3D-7</u>	<u>JT3D-7A</u>
Takeoff (5 minutes)	(545°C) 1013°F	(575°C) 1067°F	(565°C) 1049°F
Maximum continuous	(480°C) 896°F	(510°C) 950°F	(500°C) 932°F
Maximum for acceleration	(545°C) 1013°F	(575°C) 1067°F	(565°C) 1049°F
Starting	(450°C) 842°F	(450°C) 842°F	(450°C) 842°F

Oil inlet (for all models) (132°C) 270°F continuous operation
(143°C) 290°F transient operation
Transient operation above (132°C) 270°F is limited to 15 minutes.

External engine components, max. 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 1.5 p.s.i. below fuel tank pressure, whichever is the higher, with a maximum of 50 p.s.i. above ambient atmospheric pressure.

Oil pressure: At idle 35 p.s.i. minimum
Operation range 40 to 60 p.s.i.

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

Of primary (engine) airflow:

Low compressor:

Idle to maximum continuous 2.0%
Takeoff 2.2%
Intermittent 2.75% at idle reducing to 2.5% at maximum continuous

High compressor:

Idle to maximum continuous 5.5%
Takeoff 2.0%
Intermittent 6.5% at idle through maximum continuous
Intermittent at takeoff 4.18%

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. (dry) and 90°F and 29.92 in. hg. (wet) for JT3D-1, JT3D-1-MC6, JT3D-1A, JT3D-1A-MC6, JT3D-1-MC7, JT3D-1A-MC7, and JT3D-3.

Compressor inlet air at 84°F and 29.92 in. hg. (dry) and 100°F and 29.92 in. hg. (wet) for the JT3D-3B, JT3D-3C, JT3D-7, and JT3D-7A.

Jet nozzle exhaust pipe and fan exit nozzle per P&WA Drawing 374201.

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 speed limits not exceeded.

NOTE 6. The following accessory drive provisions are incorporated:

Drive	Rotation*	Speed Ratio to Turbine Shaft	Torque (in. lb.)		Overhang (in. lb.)
			Continuous	Static	
<u>Low Rotor</u>					
Tachometer	C	.679:1	7	50	—
<u>High Rotor</u>					
Starter	C	.700:1	—	7800	625
Generator	C	.802:1	**	6600	3500
Fluid power pump	C	.342:1	1000	4400	500
Tachometer	C	.435:1	7	50	—
<u>Optional Drives***</u>					
Fuel pump	C	.708:1	300	2200	500
Water pump	C	.700:1	300	2200	500

*C - Clockwise

**Maximum allowable continuous torque values are equivalent to 160 horsepower at any engine speed above sea level idle.

*** Optional drives are available at increased dry weight.

- NOTE 7. (a) The water regulator, piping and brackets are supplied by P&WA. Basic engine weight should be increased by 25 lb. when these parts are incorporated.
- (b) The optional engine mounted P&WA oil tank, Part Number 407965, weighs approximately 35 lbs.
- (c) The optional engine mounted thrust reverser, Part Number 399000, weighs 1180 lbs.

NOTE 8. For water injection operation, the following water flow rate is utilized:

Constant water flow - lb./min.	360 (417 for JT3D-3, JT3D-3B, and JT3D-7)
Feed pressure - p.s.i.	350 - 437

Water alone is specified and should contain no more than 10 (PPM) parts per million impurities. Use of water is limited to takeoff operation up to an altitude of 10,000 feet (JT3D-1, -MC-6, -MC-7, -3) and 14,000 feet (JT3D-3B, -7) at the minimum ambient temperature as listed in the engine installation and operating manual. Takeoff using both water injection and dry takeoff power are limited to a maximum period of 5 minutes including operation with water injection for not more than 2½ minutes. With water injection the takeoff static thrust rating at sea level of 17,000 lb. (JT3D-1, JT3D-1-MC6, JT3D-1-MC7) and 18,000 lb. (JT3D-3) is extended to 90°F ambient temperature, 18,000 lb. (JT3D-3B) is extended to 100°F ambient temperature, and 19,000 lb. (JT3D-7) is extended to 100°F ambient temperature.

- NOTE 9. 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 10. 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 4b.1(b) 7 and 8.
- NOTE 11. The serial number suffix "B" designates engines for the Boeing aircraft and the suffix "D" designates engines for the Douglas aircraft. Differences in these engines involve differences in the routing of external engine lines.
- NOTE 12. The maximum continuous static thrust at sea level at 24°F (JT3D-1, JT3D-1-MC6, JT3D-1-MC7, JT3D-1A, JT3D-1A-MC6, JT3D-1A-MC7) and 35°F (JT3D-3, JT3D-3B, JT3D-3C, JT3D-7, JT3D-7A) ambient temperature and below is 17,000 lb. (JT3D-1, JT3D-1-MC6, JT3D-1-MC7, JT3D-1A, JT3D-1A-MC6, JT3D-1A-MC7), 18,000 lb. (JT3D-3, JT3D-3B, JT3D-3C), and 19,000 lb. (JT3D-7, -7A). The engine installation and operating manual should be consulted for variation in thrust between standard day and 24°F (JT3D-1, JT3D-1-MC6, JT3D-1-MC7, JT3D-1A, JT3D-1A-MC6, JT3D-1A-MC7), 35°F (JT3D-3, JT3D-3B, JT3D-3C, JT3D-7, JT3D-7A).

NOTE 13. The above models incorporate the following general characteristics:

<u>JT3 Model</u>	<u>Characteristics</u>
D-1	Basic model.
D-1A	Same as D-1 except for low smoke combustion system and no water injection system.
D-1-MC6	JT3C-6 engine converted to a JT3D-1 configuration.
D-1A-MC6	Same as D-1-MC6 except for low smoke combustion system and no water injection system.
D-1-MC7	JT3C-7 engine converted to a JT3D-1 configuration.
D-1A-MC7	Same as D-1-MC7 except for low smoke combustion system and no water injection system.
D-3	Same as D-1 except for increased ratings with improved engine parts.
D-3B	Same as D-3 except for 18,000 lb. takeoff static thrust at sea level extended to 84°F (dry) and 100°F (wet) ambient temperature and other minor changes with improved engine parts.
D-3C	Same as D-3B except for low smoke combustion system and no water injection system.
D-7	Same as D-3B except for 19,285 and 17,390 lb. takeoff and maximum continuous static thrust at sea level with improved engine parts.
D-7A	Same as D-7 except for low smoke combustion system and no water injection system.

NOTE 14. The following engines do not meet the emission requirements of SFAR 27:

<u>Model</u>	<u>Serial No.</u>
JT3D-3B	P668901
	P668902

NOTE 15. JP-1, JP-4, and JP-5 fuels conforming to P&WA Specification No. 522 and P&WA Service Bulletin No. 2016, latest revision, 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 fuel conforming to P&WA Specification No. 522, latest revision.

NOTE 16. P&WA Turbojet Engine Service Bulletin No. 238 lists approved brand oils.

NOTE 17. Certain engine parts are life limited. These limits are listed in the FAA-Approved Pratt & Whitney Aircraft JT3D Series Turbofan Overhaul Manual Part No. 411568, Fits and Clearances Section, and Time Limits Section; and Pratt & Whitney Aircraft JT3D-7 Overhaul Manual Part No. 615105, Fits and Clearances Section, and Time Limits Section.

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