TYPE CERTIFICATE DATA SHEET Nº EM-9303

Type Certificate Holder:

WILLIAMS INTERNATIONAL CO.
2280 E. West Maple Road
Walled Lake, MI 48390
USA

EM-9303-03

Sheet 01

WILLIAMS INTERNATIONAL

FJ44-1A, FJ44-2A
FJ44-2C, FJ44-3A,
FJ44-1AP, FJ44-3A-24,
FJ44-4A

25 March 2011

Engines of models described here that conform with this data sheet which is part of Type Certificate No. 9303, meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Brazilian Aeronautical Regulations provided they are installed, operated, and maintained as prescribed by the approved manufacturer's manuals and other ANAC approved instructions.

MODELS	FJ44-1A	FJ44-2A	FJ44-2C	FJ44-3A
ENGINE TYPE	Twin spool turbofan with a single-stage fan and single-stage axial compressor direct driven by a two-stage turbine, a single stage centrifugal compressor driven by a single-stage turbine, an annular combustor and a full length bypass duct.	Twin spool turbofan with a single-stage fan and three stage axial compressor direct driven by a two-stage turbine, a single-stage centrifugal compressor driven by a single-stage turbine, an annular combustor, a full length bypass duct and an exhaust mixer.		
RATINGS (See Note 1)				
Maximum Continuous, kg (lb)	862 (1 900)	1 043 (2 300)	1 089 (2 400)	1 279 (2 820)
Takeoff (5 minutes), kg (lb)	862 (1 900)	1 043 (2 300)	1 089 (2 400)	1 279 (2 820)

Legend: "--" Same as preceding "-" Not applicable

CONTROL SYSTEM

	FJ44-1A	FJ44-2A	FJ44-2C	FJ44-3A
Fuel Control	High Pressure Rotor (N2) Speed Governing Hydromechanical Metering Unit (HMU). See Engine Assembly Part Number identified in Note 18.	Single Channel Electronic Control Unit (ECU) with High Pressure Rotor (N2) Speed Governing Hydromechanical Metering Unit (HMU). See Engine Assembly Part Number identified in Note 18.	High Pressure Rotor (N2) Speed governing Integrated Fuel Control Unit (IFCU). See Engine Assembly Part Number identified in Note 18.	Dual Channel Full Authority Digital Electronic Control (FADEC) coupled with Fuel Delivery Unit (FDU). See Engine Assembly Part Number identified in Note 18.

FUEL

Fuel Specifications	See Operating Instructions or Line Maintenance Manual identified in Note 18 for approved fuel specifications.		
Fuel Additives	See Note 12.		
Fuel Pump	Centrifugal/Gear. See Engine Assembly Part Number identified in Note 18.	Integral with Fuel Control	Integral with Fuel Control
Motive Flow	See Note 9.		

OIL

Oil Specification	Synthetic conforming to MIL-L-23699. See Operating Instructions or Maintenance Manual identified in Note 18 for approved oil brands.
Oil Reservoir	Integral. See Installation Instructions identified in Note 18 for capacity and installed usable quantity.

IGNITION

Exciter	Quantity of two. See Engine Assembly Part Number identified in Note 18.
Igniter Plug	Quantity of two. See Engine Assembly Part Number identified in Note 18.

PRINCIPAL DIMENSIONS	FJ44-1A	FJ44-2A	FJ44-2C	FJ44-3A
Length Overall, cm (in)	135.4 (53.3)	151.9 (59.8)	- -	158.5 (62.4)
Between flanges, cm (in)	102.4 (40.3)	120.1 (47.3)	- -	121.9 (48.0)
Height (Overall) , cm (in)	75.2 (29.6)	- -	- -	79.0 (31.1)
Forward flange outer diameter, cm (in)	53.1 (20.9)	55.4 (21.8)	- -	58.4 (23.0)
Aft flange outer diameter, cm (in)	55.1 (21.7)	- -	- -	55.1 (21.7)
	See Installation Instructions identified in Note 18 for complete dimensional details.			
DRY WEIGHT				
Total Engine, kg (lb) (Includes gearbox and airframe mounted equipment identified in Note 8)	209 (460) maximum	240 (530) maximum	236 (520) maximum	243 (535) maximum
Basic engine, kg (lb) (Includes gearbox mounted equipment identified in Note 8)	209 (460) maximum	238 (525) maximum	236 (520) maximum	239 (528) maximum
C.G. LOCATION	See Installation Instructions identified in Note 18 for center of gravity location.			

MODELS	FJ44-1AP	FJ44-3A-24	FJ44-4A	
ENGINE TYPE	Twin spool turbofan with a single-stage fan and single-stage axial compressor direct driven by a two-stage turbine, a single stage centrifugal compressor driven by a single-stage turbine, an annular combustor and a full length bypass duct and an exhaust mixer.	Twin spool turbofan with a single-stage fan and three stage axial compressor direct driven by a two-stage turbine, a single-stage centrifugal compressor driven by a single-stage turbine, an annular combustor, a full length bypass duct and an exhaust mixer.	Twin spool turbofan engine with a single-stage fan and three-stage axial compressor direct driven by a two-stage turbine, a single-stage centrifugal compressor driven by a single-stage turbine, an annular combustion chamber, a full length bypass duct and an exhaust mixer.	

RATINGS (See Note 1)	FJ44-1AP	FJ44-3A-24	FJ44-4A
Maximum Continuous, kg (lb)	885 (1 950)	1 130 (2 490)	1 562 (3 443)
Takeoff (5 minutes), kg (lb)	891 (1 965)	1 130 (2 490)	1 642 (3 621)

CONTROL SYSTEM

Fuel Control	Dual Channel Full Authority Digital Electronic Control (FADEC) coupled with Fuel Delivery Unit (FDU). See Engine Assembly Part Number identified in Note 18

FUEL

Fuel Specifications	See Operating Instructions or Maintenance Manual identified in Note 18 for approved fuel specifications.
Fuel Additives	See Note 12.
Fuel Pump	Integral with Fuel Delivery Unit (FDU).
Motive Flow	See Note 9.

OIL

Oil Specification	Synthetic conforming to MIL-L-23699. See Operating Instructions or Maintenance Manual identified in Note 18 for approved oil brands.
Oil Reservoir	Integral. See Installation Instructions identified in Note 18 for capacity and installed usable quantity.

IGNITION

Exciter	Quantity of two. See Engine Assembly Part Number identified in Note 18.
Igniter Plug	Quantity of two. See Engine Assembly Part Number identified in Note 18.

PRINCIPAL DIMENSIONS	FJ44-1AP	FJ44-3A-24	FJ44-4A
Length Overall, cm (in)	147.1 (57.9)	158.5 (62.4)	174.3 (68.6)
Between flanges, cm (in)	105.2 (41.4)	121.9 (48.0)	134.1 (52.8)
Height (Overall) , cm (in)	79.0 (31.1)	--	82.0 (32.3)
Forward flange outer diameter, cm (in)	53.1 (20.9)	58.4 (23.0)	67.1 (26.4)
Aft flange outer diameter, cm (in)	55.1 (21.7)	--	60.5 (23.8)

See Installation Instructions identified in Note 18 for complete dimensional details.

DRY WEIGHT	FJ44-1AP	FJ44-3A-24	FJ44-4A
Total Engine, kg (lb) (Includes gearbox and airframe mounted equipment identified in Note 8)	212 (468) maximum	243 (535) maximum	304 (670) maximum
Basic engine, kg (lb) (Includes gearbox mounted equipment identified in Note 8)	209 (461) maximum	240 (528) maximum	301 (663) maximum

C.G. LOCATION

See Installation Instructions identified in Note 18 for center of gravity location.

IMPORT REQUIREMENTS

Each engine imported separately and/or spare parts must be accompanied by an Airworthiness Certificate for Export and/or an Airworthiness Approval Tag respectively, issued by the FAA, attesting that the particular engine and/or parts were submitted to the governmental quality control before delivery and are in conformity with the ANAC approved type design.

CERTIFICATION BASIS

Brazilian Type Certificate No. 9303 based on the RBAC (Brazilian Requirements for Civil Aviation) 33, which endorses the FAA 14 CFR Part 33.

FJ44-1A

RBAC/FAR 33, effective 01 February 1965 including Amendments 33-1 through 33-14.
RBAC/FAR 34, effective 10 September 1990.

FJ44-2A

RBAC/FAR 33, effective 01 February 1965 including Amendments 33-1 through 33- 15.
RBAC/FAR 34, effective 01 September 1990 including Amendments 34-1 through 34-2.

FJ44-2C

RBAC/FAR 33, effective 01 February 1965 including Amendments 33-1 through 33- 16.
RBAC/FAR 34, effective 10 September 1990 including Amendments 34-1 through 34-3.

FJ44-3A

RBAC/FAR 33, effective 01 February 1965 including Amendments 33-1 through 33-20.
RBAC/FAR 34, effective 10 September 1990 including Amendments 34-1 through 34-3.
Equivalent level of safety with respect to RBAC/FAR 33.28(b) and 33.68 (See Note 13)

FJ44-1AP

RBAC/FAR 33, effective 01 February 1965 including Amendments 33-1 through 33-20.
RBAC/FAR 34, effective 10 September 1990 including Amendments 34-1 through 34-3.
Equivalent level of safety with respect to RBAC/FAR 33.28(b) and 33.68 (See Note 13)

CERTIFICATION BASIS (Cont.)

FJ44-3A-24

RBAC/FAR 33, effective 01 February 1965 including Amendments 33-1 through 33-20.
RBAC/FAR 34, effective 10 September 1990 including Amendments 34-1 through 34-3.
Equivalent level of safety with respect to RBAC/FAR 33.28(b) and 33.68 (See Note 13)

FJ44-4A

RBAC/FAR 33, effective February 1, 1965, including Amendments 33-1 through 33-21 and 33-23 through 33-28.
RBAC/FAR 34, effective September 10, 1990, including Amendments 34-1 through 34-4.

Model	Application Date	Type Certificate Date
FJ44-1A	01 March 1991	10 February 1993
FJ44-2A	13 September 1993	03 November 2000
FJ44-2C	05 January 2004	01 April 2005
FJ44-3A	05 January 2004	01 April 2005
FJ44-1AP	04 October 2005	25 July 2006
FJ44-3A-24	04 October 2005	25 July 2006
FJ44-4A	02 December 2010	25 March 2011

PRODUCTION BASIS

FAA Production Certificate 334CE.

NOTES:

NOTE 1 Engine Ratings:

Engine ratings are based on static un-installed thrust stand performance at the following conditions:

- 0% humidity
- sea level ambient pressure (29.92 in. Hg)
- no aircraft gearbox accessory loads
- no aircraft air bleed
- 0% inlet total pressure loss
- using an exhaust nozzle as specified in the Installation Instructions identified in Note 18.
- the flat rate temperature as shown below

NOTE 1 (Cont.)

Flat Rate Temperatures, °C (°F):

MODEL	FJ44-1A	FJ44-2A	FJ44-2C	FJ44-3A
Maximum Continuous	15 (59) and below	--	--	12 (53) and below
Takeoff	22 (72) and below	--	--	26 (79) and below

MODEL	FJ44-1AP	FJ44-3A-24	FJ44-4A	
Maximum Continuous	15 (59) and below	--	8 (46) and below	
Takeoff	22 (72) and below	--	26 (79) and below	

One Engine Inoperative (OEI) Operation:

For the following engine models, the rated takeoff thrust and its associated operating limitations may be used for up to 10 minutes in the event one engine on a multi-engine airplane becomes inoperative during takeoff:

- FJ44-1A
- FJ44-1AP
- FJ44-2C
- FJ44-3A
- FJ44-3A-24
- FJ44-4A

NOTE 2

Temperature Limits, °C (°F):

Maximum Interturbine Temperature (ITT):

MODEL	FJ44-1A	FJ44-2A	FJ44-2C	FJ44-3A
Takeoff	832 (1 530) for 10 sec. 820 (1 508) in 5 min.(*)	820 (1 508) for 5 min. 835 (1 535) for 10 sec.	-- --	877 (1 610) for 5 min.(*) 891 (1,635) for 10 sec.
Maximum Continuous	796 (1 465)	805 (1 481)	--	840 (1,545)
Starting	See Operating Instruction identified in Note 18.			
(*) 10 minutes for OEI operations conducted in accordance with Note 1.				

NOTE 2 (Cont.)

Temperature Limits, °C (°F):

Maximum Interturbine Temperature (ITT):

MODEL	FJ44-1AP	FJ44-3A-24	FJ44-4A	
Takeoff	855 (1 571) for 5 min.(*)	877 (1 610) for 5 min.(*) 891 (1,635) for 10 sec.	855 (1 571) for 5 min.(*) No transient permitted.	
Maximum Continuous	796 (1 535)	840 (1,545)	835 (1 535)	
Starting	See Operating Instruction identified in Note 18.			
(*) 10 minutes for OEI operations conducted in accordance with Note 1.				

Oil Temperature, °C (°F): Measured at oil cooler exit.

MODEL	FJ44-1A	FJ44-2A	FJ44-2C	FJ44-3A
Maximum	121 (250)	135 (275) 149 (300) for 5 min.	-- --	-- 149 (300) for 5 min.(*)
Minimum	-40 (-40) start and idle 10 (50) takeoff	-- --	-- --	-- --
(*) 10 minutes for OEI operations conducted in accordance with Note 1.				

MODEL	FJ44-1AP	FJ44-3A-24	FJ44-4A	
Maximum	135 (275) 149 (300) for 5 min.(*)	-- --	-- --	
Minimum	-40 (-40) start and idle 10 (50) takeoff	-- --	-- --	
(*) 10 minutes for OEI operations conducted in accordance with Note 1.				

NOTE 2 (Cont.)

Engine External Ambient Temperature, °C (°F):

Certain external and/or airframe mounted engine components have temperature limitations other than those listed here. See Installation Instructions identified in Note 18.

MODEL	FJ44-1A	FJ44-2A	FJ44-2C	FJ44-3A
Maximum	121 (250)	--	149 (300)	--
Minimum	-54 (-65)	--	--	--
Minimum Starting	-40 (-40)	--	--	--

MODEL	FJ44-1AP	FJ44-3A-24	FJ44-4A	
Maximum	149 (300)	--	--	
Minimum	-54 (-65)	--	--	
Minimum Starting	-40 (-40)	--	--	

NOTE 3

Maximum Speeds:

Speed Limitations, rpm (%):

MODEL	FJ44-1A	FJ44-2A	FJ44-2C	FJ44-3A
Low Pressure Rotor (N1)	18 000 (104.4) 18 160 (105.3) for 20 sec.	18 150 (105.2) 18 350 (106.4) for 30 sec.	18 300 (106.1) 18 500 (107.3) for 30 sec.	18 500 (102.8) 18 700 (103.9) for 20 sec.
High Pressure Rotor (N2)	40 900 (99.3) No transient permitted	40 700 (98.8) --	40 900 (99.3) --	41 200 (100.0) 41 500 (100.7) for 20 sec.

MODEL	FJ44-1AP	FJ44-3A-24	FJ44-4A	
Low Pressure Rotor (N1)	17 700 (102.6) No transient permitted.	18 500 (102.8) 18 700 (103.9) for 20 sec.	17 139 (104.8) 17 303 (105.8) for less than 2 min.	

NOTE 3 (Cont.)

MODEL	FJ44-1AP	FJ44-3A-24	FJ44-4A	
High Pressure Rotor (N2)	41 200 (100.0) No transient permitted	41 200 (100.0) 41 500 (100.7) for 20 sec.	37 773 (100.9) 38 045 (101.6) for less than 2 min.	

Reference (100%) Shaft Speeds:

MODEL	FJ44-1A	FJ44-2A	FJ44-2C	FJ44-3A	FJ44-1AP	FJ44-3A	FJ44-4A
100 % Low Pressure Rotor (N1), rpm	17 245	--	--	18 000	17 245	18 000	16 360
100% High Pressure Rotor (N2), rpm	41 200	--	--	--	--	--	37 450

NOTE 4

Thrust Setting:

Setting of engine thrust is based on low pressure rotor speed (N1). See Operating Instructions identified in Note 18.

NOTE 5

Pressure Limits:

Fuel Pressure, psig:

Measured at fuel pump or fuel control inlet. See Installation Instructions identified in Note 18 for pressure limitations.

Oil Pressure, psig:

Measured at oil cooler exit.

MODEL	FJ44-1A	FJ44-2A	FJ44-2C	FJ44-3A
Maximum	90	--	--	--
	100 for 5 min. at or above high pressure rotor (N2) speed of 32 960 rpm	--	--	--

NOTE 5 (Cont.)

Oil Pressure, psig:

Measured at oil cooler exit.

MODEL	FJ44-1A	FJ44-2A	FJ44-2C	FJ44-3A
Minimum	45 above high pressure rotor speed (N2) of 32 960 rpm	--	--	--
	35 from idle to high pressure rotor speed (N2) of 32 960 rpm	--	--	--
	25 for 5 min. from idle to high pressure rotor speed (N2) of 32 960 rpm	23 for 5 min. from idle to high pressure rotor speed (N2) of 32 960 rpm	--	--

MODEL	FJ44-1AP	FJ44-3A-24	FJ44-4A	
Maximum	120	90	120	
	130 for 5 min. at or above high pressure rotor speed (N2) of 32 960 rpm	100 for 5 min. at or above high pressure rotor (N2) speed of 32 960 rpm	130 for 5 min. at or above high pressure rotor speed (N2) of 29 960 rpm	
Minimum	45 above high pressure rotor speed (N2) of 32 960 rpm	--	40 above high pressure rotor speed (N2) of 29 960 rpm	
	35 from idle to high pressure rotor speed (N2) of 32 960 rpm	--	30 from idle to high pressure rotor speed (N2) of 29 960 rpm	
	23 for 5 min. from idle to high pressure rotor speed (N2) of 32 960 rpm	--	23 for 5 min. from idle to high pressure rotor speed (N2) of 29 960 rpm	

NOTE 6 Accessory Drives:

The following information applies to the engine accessory drives for all engine models, excepting for FJ44-4A model. See Installation Instructions identified in Note 18 for mounting pad dimensions and power extraction limits.

Drive	Pad Spec.	Rotation Direction, Facing Pad	Speed Ratio Driven/N2*	Max. Torque (in-lb.)			Max. Wt (lb.)	Max. Overhung (in-lb.)
				Continuous	Overload **	Static +		
Starter Generator	MS3326-2(AS)	Clockwise	0.2859	See Installation Instructions	See Installation Instructions	-660	38	210
High Speed Accessory ++	MS3325	Clockwise	0.1906	58	85	100	5	15
Low Speed Accessory ++	AN20001 Type XI-1B	Clockwise	0.1092	101	150	100	10	30

* 100% High Pressure Rotor Speed (N2) is identified in Note 3.
** 5 minutes maximum in any 4-hour operating period
+ Start or breakaway torque is negative for torque into drive pad
++ Engine comes equipped with either a low speed or a high speed accessory drive pad. See Engine Assembly Part Number identified in Note 18 to determine the pad configuration for the specific engine part number

The following information applies to the engine accessory drives for engine model FJ44-4A, only. See Installation Instructions identified in Note 18 for mounting pad dimensions and power extraction limits.

Drive	Pad Spec.	Rotation Direction, Facing Pad	Speed Ratio Driven/N2*	Max. Torque (in-lb.)			Max. Wt (lb.)	Max. Overhung (in-lb.)
				Continuous	Overload **	Static +		
Starter Generator	MS3326-2(AS)	Clockwise	0.31469	See Installation Instructions	See Installation Instructions	-660	38	220
High Speed Accessory	MS3326-2(AS)	Counter-clockwise	0.3146	See Installation Instructions	See Installation Instructions	125	38	220
Low Speed Accessory	AND20001 Type XI-B	Clockwise	0.1506	135	195	135	10	50

* 100% High Pressure Rotor Speed (N2) is identified in Note 3.
** 5 minutes maximum in any 4-hour operating period
+ Start or breakaway torque is negative for torque into drive pad

NOTE 7 Engine Model Configuration:

FJ44-1A: is the engine basic model.

FJ44-2A: is similar to model FJ44-1A except that a new fan, two additional stages of IP compression, an exhaust mixer, and an electronic fuel control unit (EFCU) have been incorporated.

FJ44-2C: is similar to model FJ44-2A except that an integrated hydromechanical fuel control (IFCU) has been incorporated.

FJ44-3A: is similar to model FJ44-2C except that a new fan, IP compressor rotor (3 stages), new LP turbines and a Dual Channel Full Authority Digital Electronic control (FADEC) have been incorporated.

FJ44-1AP: is similar to model FJ44-1A except that a new fan has been incorporated and the LP turbines and Dual Channel Full Authority Digital Electronic Control (FADEC) of the FJ44-3A Model have been incorporated.

FJ44-3A-24: is identical to model FJ44-3A except that engine is de-rated by incorporating reduced thrust schedules in the FADEC.

FJ44-4A: is similar to model FJ44-3A, whit a higher work and larger diameter IP Compressor design and corresponding stators which increases core flow.

For each engine model number, there may be minor differences in the engine configuration based upon specific airframe installation requirements. See Engine Assembly Part Number identified in Note 18 for specific engine configuration.

NOTE 8 Standard Equipment:

Engine dry weight includes the following standard equipment. Engine dry weight dry does not include starter or generator.

Engine Gearbox Mounted Equipment:

MODEL	FJ44-1A	FJ44-2A	FJ44-2C	FJ44-3A
Lubrication Pump	Standard equipment	--	--	--
Fuel Control	Standard equipment (HMU)	--	Standard Equipment (IFCU)	Integral with IFCU
Fuel Pump	Standard Equipment	--	Integral with IFCU	Standard Equipment (FDU)
Permanent Magnet Alternator (PMA)	#	#	#	Integral with FDU

Legend: "--" Same as preceding "#" Not applicable

NOTE 8 (Cont.)

Engine Gearbox Mounted Equipment:

MODEL	FJ44-1AP	FJ44-3A-24	FJ44-4A	
Lubrication Pump	Standard equipment	--	--	
Fuel Control	Standard equipment (FDU)	--	--	
Fuel Pump	Integral with FDU	--	--	
Permanent Magnet Alternator (PMA)	Integral with FDU	--	--	

Airframe Mounted Equipment:

MODEL	FJ44-1A	FJ44-2A	FJ44-2C	FJ44-3A
TT2 Sensor	#	Standard Equipment	#	#
TT2/PT2 Sensor	#	#	#	Standard Equipment
ECU	#	Standard Equipment	#	#
FADEC	#	#	#	Standard Equipment

MODEL	FJ44-1AP	FJ44-3A-24	FJ44-4A	
TT2 Sensor	#	#	Standard Equipment	
PT2 Sensor	#	#	Standard Equipment	
TT2/PT2 Sensor	Standard Equipment	--	#	
ECU	#	#	#	
FADEC	Standard Equipment	--	Standard Equipment	

NOTE 9

Motive Flow:
Fuel from the motive flow port on the fuel control unit may be extracted to drive jet or turbine pumps in the airplane fuel system. See Installation Instructions identified in Note 18.

NOTE 10 Bleed Extraction:

High Pressure Bleed:

Flow rates expressed as percent are based on engine core airflow rate. See Installation Instructions identified in Note 18 for bleed extraction limits during operation with One Engine Inoperative (OEI).

MODEL	FJ44-1A	FJ44-2A	FJ44-2C	FJ44-3A
Maximum, Both Ports	13.0%	45 lb./min. or 12.0% whichever is less	45 lb./min. or 12.0% whichever is less	50 lb./min. or 20.0% whichever is less
Maximum, One Port	6.5%	45 lb./min. or 6.0% whichever is less	45 lb./min. or 6.0% whichever is less	50 lb./min. or 10.0% whichever is less
Minimum	0%	--	--	0.020 sq. in. sharp edge orifice, equivalent flow
Maximum, Starting	0.222 sq. in sharp edge orifice, equivalent flow	--	--	--

MODEL	FJ44-1AP	FJ44-3A-24	FJ44-4A	
Maximum, Both Ports	37.5 lb./min. or 12.0% whichever is less	50 lb./min. or 20.0% whichever is less	47 lb./min	
Maximum, One Port	37.5 lb./min. or 6.0% whichever is less	50 lb./min. or 10.0% whichever is less	47 lb./min	
Minimum	0%	0.053 sq. in. sharp edge orifice, equivalent flow	0%	
Maximum, Starting	0.222 sq. in. sharp edge orifice, equivalent flow	--	0.269 sq. in. sharp edge orifice, equivalent flow	

IP Compressor Bleed:

IP compressor bleed is optional for the engine models identified below. See Engine Assembly Part Number identified in Note 18 for specific engine configuration. Bleed flow is limited to the flow which can be extracted from the single bleed port when discharged to ambient static pressure. See Operating Instructions identified in Note 18 to determine effect of the bleed on engine performance.

IP compressor bleed is available on the FJ44-2A and FJ44-2C engine models.

NOTE 10 Fan Bleed:

(Cont.) Fan bleed is optional for the engine models identified below. See Engine Assembly Part Number identified in Note 18 for specific engine configuration. Bleed flow is limited to the flow which can be extracted form one bleed port when discharged to ambient static pressure See Operating Instructions identified in Note 18 to determine effect of bleed on engine performance. Fan bleed is available on the following engine models:

- FJ44-1AP
- FJ44-2A
- FJ44-2C
- FJ44-3A
- FJ44-3A-24
- FJ44-4A

NOTE 11 Limited Use Fuel Operation:

ASTM D910, Grade 100LL is approved for use on certain engine models. Refer to the Operating Instructions identified in Note 18 for limits on duration, fuel temperature and fuel pressure.

NOTE 12 Fuel Additives:

Icing Inhibitor: The use of icing inhibitor is required for the FJ44-1A and FJ44-2A engines. The use of icing inhibitors is optional for the FJ44-1AP, FJ44-2C, FJ44-3A, FJ44-3A-24 and FJ44-4A engines models. See Operating Instructions identified in Note 18 for the approved icing inhibitors and allowable concentration levels.

Anti-static: See Operating Instructions (Note 18) for the approved anti-static additives and allowable concentration levels.

Biocide: See Operating Instructions (Note 18) for the approved biocide additives and allowable concentration levels.

NOTE 13 Additional airframe considerations: Anti-Icing, De-Icing and Power Supply Requirements:

The FJ44-1A and FJ44-2C engines meet the RBAC/FAR 33.68 induction system icing requirements without use of an active anti-icing system.

The FJ44-2A engine meets the RBAC/FAR 33.68 induction system icing requirements and requires an aircraft supplied source of power to anti-ice the TT2 sensor. Aircraft power requirements are provided in the Installation Instructions identified in Note 18.

The FAA has approved a finding of equivalent level of safety (ELOS) for the FJ44-3A, FJ44-1AP and FJ44-3A-24 engines related to compliance of the engine with the requirements of RBAC/FAR 33.28(b) and 33.68 as related to the TT2/PT2 sensor power supplied by the aircraft. The ELOS identifies specific requirements for aircraft supplied power to the TT2/PT2 heater and/or air data requirements that must be met by the airframe manufacturer. The specific aircraft requirements related to this ELOS are identified in the engine Installation Instructions listed in Note 18.

NOTE 14 Power Ratings for High Customer Bleed Air Usage:

Use of significant amounts of high pressure bleed air, such as for aircraft anti-icing, requires reduced thrust settings. See Operating Instructions identified in Note 18.

NOTE 15 Rotor Disk Integrity and Blade Containment:

This engine meets RBAC/FAR 33 requirements for rotor disk integrity and blade containment. Certain rotor parts are life limited. These limits and the associated flight profile are listed in the Line Maintenance Manual identified in Note 18.

NOTE 16 Time Limited Dispatch:

Dispatch of an aircraft employing the FJ44-3A, FJ44-1AP, FJ44-3A-24 or FJ44-4A engine is allowed with certain engine control system faults present subject to the limitations identified in Chapter 5 of the Airworthiness Limitations Section (ALS) of the appropriate Line Maintenance Manual listed in Note 18.

NOTE 17 Engine Mount System:

See Installation Instructions identified in Note 18 for engine mount dimensions and load limits.

NOTE 18 Applicable Documents:

MODEL	FJ44-1A	FJ44-2A	FJ44-2C	FJ44-3A
Engine Assembly Part Number	45700-104	56000 56000-103 56000-104	60500 60500-103	67000-200 67000-202
Installation Instructions	50772	56208	63784	68583 68583-202
Operating Instructions	50771	56209	63785	68584 68584-202
Line Maintenance Manual	50773	56210	64135	68585 68585-202
Hot Section Maintenance Manual	110506	110507	110508	#
Engine Manual	50774	59870	74118	68659

NOTE 18 (Cont.)

Applicable Documents:

MODEL	FJ44-1AP	FJ44-3A-24	FJ44-4A	
Engine Assembly Part Number	72100-200	75000-200	73200-200	
Installation Instructions	75274	68583	110675	
Operating Instructions	75274	68584	110675	
Line Maintenance Manual	73568	68585	110990	
Hot Section Maintenance Manual	#	#	#	
Engine Manual	73569	68659	110992	

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