

<p align="center">U. S. DEPARTMENT OF TRANSPORTATION</p> <p align="center">FEDERAL AVIATION ADMINISTRATION</p> <p align="center">TYPE CERTIFICATE DATA SHEET NO. E3GL</p>	<p>E3GL Revision 20 Williams International Co. L.L.C. June 6, 2016</p>
	<p>FJ44-1A FJ44-3A FJ44-1AP FJ44-3A-24 FJ44-2A FJ44-3AP FJ44-2C FJ44-4A FJ44-4A-32 FJ33-5A</p>

Engines of models described here that conform with this data sheet (which is part of Type Certificate No. E3GL) and other approved data on file with the FAA, 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 FAA approved manufacturer's manuals and other FAA approved instructions.

TYPE CERTIFICATE HOLDER: Williams International Co., L.L.C., Walled Lake, Michigan 48390-0200 USA

I. MODEL	FJ44-1A	FJ44-1AP
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 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 a full length bypass duct and an exhaust mixer.
RATINGS Note 1. Maximum Continuous, lb. Takeoff (5 minutes), lb.	1,900 at 59° F 1,900 at 72° F	1,950 at 59° F 1,965 at 72° F
CONTROL SYSTEM	Hydro-mechanical Fuel Control Unit	Dual Channel Full Authority Digital Electronic Control (FADEC) and Fuel Delivery Unit (FDU).
FUEL PUMP	See Engine Assembly Part No. identified in Note 15.	Integral with Fuel Delivery Unit (FDU).
PRINCIPAL DIMENSIONS Length Overall, inches (cm) Between flanges, inches (cm) Height (Overall) , inches (cm) Forward flange outer diameter, inches (cm) Aft flange outer diameter, inches (cm)	53.4 (135.9) 40.3 (102.4) 29.6 (75.2) 20.9 (53.1) 21.7 (55.1) See Installation Instructions identified in Note 15 for complete dimensional details.	57.9 (147.1) 41.4 (105.2) 31.1 (79.0) -- --
DRY WEIGHT Note 5	460 lb. maximum.	468 lb. maximum.

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Legend - - indicates same as previous model - indicates does not apply

II. MODEL	FJ44-2A	FJ44-2C
ENGINE TYPE	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 Note 1. Maximum Continuous, lb. Takeoff (5 minutes), lb.	2,300 at 59° F 2,300 at 72° F	2,400 at 59° F 2,400 at 72° F
CONTROL SYSTEM	Single Channel Electronic Control Unit (ECU) and Hydromechanical Metering Unit (HMU).	Integrated Fuel Control Unit (IFCU).
FUEL PUMP	See Engine Assembly Part No. identified in Note 15.	Integral with Integrated Fuel Control Unit (IFCU).
PRINCIPAL DIMENSIONS	See Installation Instructions identified in Note 15 for complete dimensional details.	
Length Overall, inches (cm)	59.8 (151.9)	--
Between flanges, inches (cm)	47.3 (120.1)	--
Height (Overall) , inches (cm)	29.6 (75.2)	--
Forward flange outer diameter, inches (cm)	21.8 (55.4)	--
Aft flange outer diameter, inches (cm)	21.7 (55.1)	--
DRY WEIGHT Note 5	530 lb. maximum.	520 lb. maximum.

III. MODEL	FJ44-3A	FJ44-3A-24	FJ44-3AP
ENGINE TYPE	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 Note 1. Maximum Continuous, lb. Takeoff (5 minutes), lb.	2,820 at 53° F 2,820 at 79° F	2,490 at 59° F 2,490 at 72° F	3052 at 53° F 3052 at 72° F
CONTROL SYSTEM	Dual Channel Full Authority Digital Electronic Control (FADEC) and Fuel Delivery Unit (FDU).		
FUEL PUMP	Integral with Fuel Delivery Unit (FDU).		
PRINCIPAL DIMENSIONS	See Installation Instructions identified in Note 15 for complete dimensional details.		
Length Overall, inches (cm)	62.4 (158.5)	--	--
Between flanges, inches (cm)	48.0 (121.9)	--	--
Height (Overall) , inches (cm)	31.1 (79.0)	--	31.6 (80.3)
Forward flange outer diameter, inches (cm)	23.0 (58.4)	--	--
Aft flange outer diameter, inches (cm)	21.7 (55.1)	--	--
DRY WEIGHT Note 5	535 lb. maximum.	--	516 maximum

IV. MODEL	FJ44-4A	FJ44-4A-32
ENGINE TYPE	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 Note 1. Maximum Continuous, lb. Takeoff (5 minutes), lb.	3,443 at 46° F 3,621 at 79° F	3,227 at 68° F 3,230 at 90° F
CONTROL SYSTEM	Dual Channel Full Authority Digital Electronic Control (FADEC) and Fuel Delivery Unit (FDU).	
FUEL PUMP	Integral with Fuel Delivery Unit (FDU).	
PRINCIPAL DIMENSIONS		
Length Overall, inches (cm)	68.6 (174.3)	--
Between flanges, inches (cm)	52.8 (134.1)	--
Height (Overall) , inches (cm)	32.3 (82.0)	--
Forward flange outer diameter, inches (cm)	26.4 (67.1)	--
Aft flange outer diameter, inches (cm)	23.8 (60.5)	--
	See Installation Instructions identified in Note 15 for complete dimensional details.	
DRY WEIGHT Note 5	670 lb maximum	670 lb maximum

V. MODEL	FJ33-5A
ENGINE TYPE	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 Note 1. Maximum Continuous, lb. Takeoff (5 minutes), lb.	1,846 to 46° F 1,846 to 60° F
CONTROL SYSTEM	Dual Channel Engine Control Unit (ECU) and Fuel Control Unit (FCU).
FUEL PUMP	Integral with Fuel Control Unit (FCU).
PRINCIPAL DIMENSIONS	
Length Overall, inches (cm)	42.7 (108.5)
Between flanges, inches (cm)	38.6 (98.2)
Height (Overall) , inches (cm)	25.1 (63.7)
Forward flange outer diameter, inches (cm)	18.4 (46.6)
Aft flange outer diameter, inches (cm)	17.9 (45.5)
	See Installation Instructions identified in Note 15 for complete dimensional details.
DRY WEIGHT Note 5	319 lb maximum

ALL MODELS

OIL Oil Specification	Synthetic conforming to MIL-L-23699. See Operating Instructions or Maintenance Manual identified in Note 15 for approved oil brands.
Oil Reservoir	Integral. See Installation Instructions identified in Note 15 for capacity and installed usable quantity.
FUEL Fuel Specification	See Operating Instructions or Maintenance Manual identified in Note 15 for approved fuel specifications.
IGNITION Exciter	See Engine Assembly Part No. identified in Note 15.
Igniter Plug	See Engine Assembly Part No. identified in Note 15.
C.G. LOCATION	See Installation Instructions identified in Note 15 for center of gravity location.
PRODUCTION BASIS	Production Certificate 334CE

CERTIFICATION BASIS

FJ44-1A	(1) 14 CFR Part 33, effective February 1, 1965 including Amendments 33-1 through 33-14. (2) 14 CFR Part 34, effective September 10, 1990.
FJ44-1AP	<u>72100-200:</u> (1) 14 CFR Part 33, effective February 1, 1965 including Amendments 33-1 through 33-20 (2) Engine Emissions: 14 CFR Part 34, effective September 10, 1990, as amended by 34-1 through 34-4. In addition, 40 CFR Part 87, effective December 19, 2005. (3) Equivalent level of safety (ELOS) No. 8040-ELOS-05-NE-01 with respect to 14 CFR Part 33.28(b) and 33.68 (See Note 13) <u>72100-201:</u> (1) 14 CFR Part 33, effective February 1, 1965 including Amendments 33-1 through 33-20, and: <ul style="list-style-type: none"> • 14 CFR 33.5 at Amendment 26 • 14 CFR 33.7 at Amendment 30 • 14 CFR 33.17 at Amendment 29 • 14 CFR 33.28 at Amendment 26 • 14 CFR 33.29 (a) through (g) at Amendment 26 • 14 CFR 33.75 at Amendment 24 (2) Fuel Venting and Exhaust Emissions Standards 14 CFR Part 34 Amendment 34-5, effective December 31, 2012 and 40 CFR Part 87, effective July 18, 2012
FJ44-2A	(1) 14 CFR Part 33, effective February 1, 1965 including Amendments 33-1 through 33-15. (2) 14 CFR Part 34, effective September 10, 1990 including Amendments 34-1 through 34-2.
FJ44-2C	(1) 14 CFR Part 33, effective February 1, 1965 including Amendments 33-1 through 33-16. (2) 14 CFR Part 34, effective September 10, 1990 including Amendments 34-1 through 34-3.
FJ44-3A	(1) 14 CFR Part 33, effective February 1, 1965 including Amendments 33-1 through 33-20. (2) Engine Emissions: 14 CFR Part 34, effective September 10, 1990, as amended by 34-1 through 34-4. In addition, 40 CFR Part 87, effective December 19, 2005. (3) Equivalent level of safety (ELOS) with respect to 14 CFR Part 33.28(b) and 33.68 (See Note 13)
FJ44-3A-24	(1) 14 CFR Part 33, effective February 1, 1965 including Amendments 33-1 through 33-20. (2) Engine Emissions: 14 CFR Part 34, effective September 10, 1990, as amended by 34-1 through 34-4. In addition, 40 CFR Part 87, effective December 19, 2005. (3) Equivalent level of safety (ELOS) No. 8040-ELOS-NE-02 with respect to 14 CFR Part 33.28(b) and 33.68 (See Note 13)
FJ44-3AP	(1) 14 CFR Part 33, effective February 1, 1965 including Amendments 33-1 through 33-30 (2) Engine Emissions: 14 CFR Part 34, effective September 10, 1990, as amended by 34-1 through 34-4. In addition, 40 CFR Part 87, effective December 19, 2005
FJ44-4A	(1) 14 CFR Part 33, effective February 1, 1965 including Amendments 33-1 through 33-28 (2) Engine Emissions: 14 CFR Part 34, effective September 10, 1990, as amended by 34-1 through 34-4. In addition, 40 CFR Part 87, effective December 19, 2005 (3) An Equivalent Level Of Safety Finding has been made for the following regulation: 14 CFR § 33.83 Vibration Test (documented in ELOS Memo 8040-ELOS-09-NE03).

FJ44-4A-32	(1) 14 CFR Part 33, effective February 1, 1965 including Amendments 33-1 through 33-30 (2) Fuel Venting and Exhaust Emissions Standards 14 CFR Part 34 Amendment 34-5, effective December 31, 2012, and 40 CFR Part 87, effective July 18, 2012 (3) An Equivalent Level Of Safety Finding has been made for the following regulation: 14 CFR § 33.83 Vibration Test (documented in ELOS Memo 8040-ELOS-09-NE03).
FJ33-5A	(1) 14 CFR Part 33, effective February 1, 1965 including Amendments 33-1 through 33-33 (2) Fuel Venting and Exhaust Emissions Standards 14 CFR Part 34 Amendment 34-5A, effective October 23, 2013, and 40 CFR Part 87, effective July 18, 2012 (3) An Equivalent Level Of Safety Finding has been made for the following regulation: 14 CFR § 33.83 Vibration Test (documented in ELOS Memo AT08224CH-E-P-2).

APPLICATION

	Application Date	Type Certificate Date
FJ44-1A	8 December 1989	26 March 1992
FJ44-1AP	28 January 2004	1 June 2005
FJ44-2A	13 October 1994	7 July 1997
FJ44-2C	29 September 1998	25 April 2000
FJ44-3A	6 Feb 2002	30 July 2004
FJ44-3A-24	11 Nov 2004	9 Sep 2005
FJ44-3AP	6 July 2010	12 May 2011
FJ44-4A	1 Feb 2006	2 Feb 2010
FJ44-4A-32	14 June 2011	13 March 2013
FJ33-5A	December 13, 2012	June 6, 2016

NOTE 1. ENGINE RATINGS.

Engine ratings are based on a calibrated test stand, under the conditions specified below:

- (1) Sea level static standard day conditions
- (2) No customer bleed or customer power extraction
- (3) 0% inlet total pressure loss, using an exhaust nozzle as specified in the Installation Instructions identified in Note 15.
- (4) Jet A fuel
- (5) 0% humidity

Variation of the rated thrust with ambient temperature is included in the Installation Instructions identified in Note 15.

Note 15 lists multiple engine assembly part numbers for some engine models. These additional part numbers are for variants of the basic engine that include Integrated Propulsion System components such as inlets, bleed or exhaust systems. These components are part of the engine type design and are approved per 14 CFR Part 33. While some of these variants may have engine thrust reduced from that identified in accordance with the conditions identified above, the base engine model in all cases produces the rated thrust published in this TCDS. See the Installation Instructions identified in Note 15 for the thrust associated with each unique engine assembly part number.

NOTE 2. TEMPERATURE LIMITS.**MAXIMUM INTERTURBINE TEMPERATURE (ITT).**

*10 minutes for OEI operations conducted in accordance with Note 13.

MODEL	FJ44-1A	FJ44-1AP	FJ44-2A	FJ44-2C
Takeoff, °F (°C) 5 minutes	1,508 (820)*	1,571 (855)*	1,508 (820)	1,508 (820)*
	1,530 (832) for 10 secs	-	1,535 (835) for 10 secs	--
Maximum Continuous, °F (°C)	1,465 (796)	1,535 (835)	1,481 (805)	--
Starting, °F (°C)	See Operating Instruction identified in Note 15.			

MODEL	FJ44-3A FJ44-3A-24	FJ44-3AP	FJ44-4A FJ44-4A-32	FJ33-5A
Takeoff, °F (°C) 5 minutes	1,610 (877)*	1,601 (872)*	1,571 (855)*	1,583 (862)
	1,635 (891) for 10 secs	1,611 (877) for 10 secs	No transient permitted	1,611 (877) for 10 secs
Maximum Continuous, °F (°C)	1,545 (840)	1,552 (844)	1,535 (835)	1,537 (836)
Starting, °F (°C)	See Operating Instruction identified in Note 15.			

OIL TEMPERATURE. Measured at oil cooler exit.

MODEL	FJ44-1A	FJ44-1AP	FJ44-2A	FJ44-2C	FJ44-3A FJ44-3A-24 FJ44-3AP	FJ44-4A FJ44-4A-32	FJ33-5A
Maximum, °F (°C)	250 (121)	275 (135)	275 (135)	--	275 (135)	--	275 (135)
		300 (149) for 5 mins when operating below 80% N2	300 (149) for 5 mins when operating below 80% N2	300 (149) for 5 mins when operating below 80% N2	300 (149) for 5 minutes when operating below 80% N2	--	300 (149) for 5 minutes when operating below 80% N2
Minimum, °F (°C)	-40 (-40) Start and Idle	--	-40 (-40) Start and Idle	--	-40 (-40) Start and Idle	--	-40 (-40) Start and Idle
	50 (10) Takeoff	--	50 (10) Takeoff	--	50 (10) Takeoff	--	50 (10) Takeoff

ENGINE EXTERNAL AMBIENT TEMPERATURE. Certain external and/or airframe mounted engine components have temperature limitations other than those listed here. See Installation Instructions identified in Note 15.

MODEL	FJ44-1A	FJ44-1AP	FJ44-2A	FJ44-2C	FJ44-3A FJ44-3A-24 FJ44-3AP	FJ44-4A FJ44-4A-32	FJ33-5A
Maximum, °F (°C)	250 (121)	300 (149)	250 (121)	300 (149)	300 (149)	--	300 (149)
Minimum, °F (°C)	-65 (-54)	--	-65 (-54)	--	-65 (-54)	--	-65 (-54)
Minimum Starting, °F (°C)	-40 (-40)	--	-40 (-40)	--	-40 (-40)	--	-40 (-40)

NOTE 3. FUEL INLET AND OIL PRESSURE LIMITS.

FUEL PRESSURE. Measured at fuel pump or fuel control inlet. See Installation Instructions identified in Note 15 for pressure limitations.

OIL PRESSURE. Measured at oil cooler exit.

MODEL	FJ44-1A	FJ44-1AP	FJ44-2A FJ44-2C
Maximum, psig	90 100 for 5 mins at or above high pressure rotor (N2) speed of 32,960 rpm	120 130 for 5 mins at or above high pressure rotor (N2) speed of 32,960 rpm	90 100 for 5 mins at or above high pressure rotor (N2) speed of 32,960 rpm
Minimum, psig	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 mins from idle to high pressure rotor (N2) speed of 32,960 rpm	-- -- 23 for 5 mins from idle to high pressure rotor (N2) speed of 32,960 rpm	-- -- --

MODEL	FJ44-3A FJ44-3A-24	FJ44-3AP	FJ44-4A FJ44-4A-32
Maximum, psig	110 120 for 5 mins at or above high pressure rotor (N2) speed of 32,960 rpm	120 130 for 5 mins at or above high pressure rotor (N2) speed of 32,960 rpm	-- 130 for 5 mins at or above high pressure rotor (N2) speed of 29,960 rpm
Minimum, psig	45 above high pressure rotor speed (N2) of 32,960 rpm 35 from idle to high pressure rotor speed (N2) of 32,960 rpm 23 for 5 mins from idle to high pressure rotor (N2) speed of 32,960 rpm	-- -- --	40 above high pressure rotor speed (N2) of 29,960 rpm 30 from idle to high pressure rotor speed (N2) of 29,960 rpm 23 for 5 mins from idle to high pressure rotor (N2) speed of 29,960 rpm

MODEL	FJ33-5A
Maximum, psig	120 130 for 5 mins
Minimum, psig	45 above high pressure rotor speed (N2) of 41,200 rpm 35 from idle to high pressure rotor speed (N2) of 41,200 rpm 23 for 5 mins from idle to high pressure rotor (N2) speed of 41,200 rpm

NOTE 4. ACCESSORY DRIVE AND MOUNTING PROVISIONS.

The following information applies to the engine accessory gearbox drives for FJ44-1A, FJ44-1AP, FJ44-2A, FJ44-2C, FJ44-3A, FJ44-3A-24 and FJ44-3AP models. See Installation Instructions identified in Note 15 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 Moment (in-lb.)
				Continuous	Overload **	Static +		
Starter Generator	MS3326-2(AS)	Clockwise	0.2859	See Installation Instructions identified in Note 15	See Installation Instructions identified in Note 15	-660	38	210
High Speed Accessory ++	MS3325	Clockwise	0.1906	58	85	100	5 15 (FJ44-3AP)	15 55 (FJ44-3AP)
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 19.
** 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 No. identified in Note 15 to determine the pad configuration for the specific engine part number

The following information applies to the engine accessory gearbox drives for FJ44-4A and FJ44-4A-32 models. See Installation Instructions identified in Note 15 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 Moment (in-lb.)
				Continuous	Overload **	Static +		
Starter Generator	MS3326-2(AS)	Clockwise	0.3146	See Installation Instructions identified in Note 15	See Installation Instructions identified in Note 15	-660	38	220
High Speed Accessory	MS3326-2(AS)	Counter-Clockwise	0.3146	See Installation Instructions identified in Note 15	See Installation Instructions identified in Note 15	125	38	220
Low Speed Accessory	AND200001 TYPE XI-B	Clockwise	0.1506	135	195	135	10	50

* 100% High Pressure Rotor Speed (N2) is identified in Note 19.
** 5 minutes maximum in any 4-hour operating period
+ Start or breakaway torque is negative for torque into drive pad

The following information applies to the engine accessory gearbox drives for FJ33-5A model. See Installation Instructions identified in Note 15 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 Moment (in-lb.)
				Continuous	Overload **	Static +		
Starter Generator	MS3326-2(AS)	Clockwise	0.22885	See Installation Instructions identified in Note 15	See Installation Instructions identified in Note 15	-660	38	210
Accessory	MS3325-1 (AS)	Clockwise	0.15257	See Installation Instructions identified in Note 15	See Installation Instructions identified in Note 15	100	15	55

* 100% High Pressure Rotor Speed (N2) is identified in Note 19.
 ** 5 minutes maximum in any 4-hour operating period
 + Start or breakaway torque is negative for torque into drive pad

NOTE 5. MODEL DESCRIPTION.

Model FJ44-1A is the engine basic model.

Model FJ44-1AP engine 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.

Model FJ44-2A engine 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.

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

Model FJ44-3A engine 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.

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

Model FJ44-3AP engine is similar to the Model FJ44-3A, with a new IP Compressor rotor and corresponding stators (3 stages).

Model FJ44-4A engine is similar to the Model FJ44-3AP, with larger diameter and thrust rating.

Model FJ44-4A-32 is identical to Model FJ44-4A except that the engine has a reduced takeoff rating by incorporating reduced thrust schedules in the FADEC.

Model FJ33-5A is similar to the Model FJ44-3AP, with smaller diameter and thrust rating. In addition, a new FADEC system consisting of dual channel Engine Control Unit (ECU) and Fuel Control Unit (FCU) has been incorporated.

For each engine model, there may be differences in the engine configuration, based upon specific airframe installation requirements. See Engine Assembly Part No. identified in Note 15 for specific engine configuration and complete dry weight details. Engine dry weight includes gearbox and airframe mounted equipment of the basic engine model.

NOTE 6. INTEGRATED PROPULSION SYSTEM

Note 15 lists multiple engine assembly part numbers for some engine models. These additional part numbers are for variants of the basic engine that include Integrated Propulsion System components such as inlets, bleed or exhaust systems which have been provided as part of the engine type design, based upon specific airframe installation requirements.

NOTE 7. INTENTIONALLY LEFT BLANK**NOTE 8. SPECIAL ANTI-ICING OR DE-ICING REQUIREMENTS**

The FJ44-1A and FJ44-2C engines meet the 14 CFR Section 33.68 induction system icing requirements without use of an active anti-icing system.

The FJ44-2A, FJ44-3AP, FJ44-4A, FJ44-4A-32 and FJ33-5A engines meet the 14 CFR Section 33.68 induction system icing requirements and require an aircraft supplied source of power to anti-ice the TT2 sensor. Aircraft power requirements are provided in the Installation Instructions identified in Note 15.

The FAA has approved a finding of equivalent level of safety (ELOS) for the FJ44-1AP, FJ44-3A and FJ44-3A-24 engines related to compliance of the engine with the requirements of 14 CFR Section 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 15.

NOTE 9. ENGINE MOUNT SYSTEM PROVISIONS.

See Installation Instructions identified in Note 15 for engine mount dimensions and load limits.

NOTE 10. INTENTIONALLY LEFT BLANK**NOTE 11. SPECIAL INSTALLATION REQUIREMENTS****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 15.

LIGHTNING PROTECTION

The specific aircraft requirements related to lightning protection of the FJ44-1AP, FJ44-3A, FJ44-3A-24, FJ44-3AP, FJ44-4A, FJ44-4A-32, and FJ33-5A engines control systems are identified in the Engine Installation Instructions listed in Note 15.

ELECTROMAGNETIC INTERFERENCE (EMI)

The specific aircraft requirements related to EMI for the FJ44-1AP, FJ44-3A, FJ44-3A-24, FJ44-3AP, FJ44-4A, FJ44-4A-32, and FJ33-5A engines control systems are identified in the Engine Installation Instructions listed in Note 15.

TIME LIMITED DISPATCH.

Dispatch of an aircraft employing the FJ44-1AP, FJ44-3A, FJ44-3A-24, FJ44-3AP, FJ44-4A, FJ44-4A-32 or the FJ33-5A engine is allowed with certain engine control system faults present subject to the limitations identified in the Airworthiness Limitations Section (ALS) of the appropriate Maintenance Manual listed in Note 15.

NOTE 12. INTENTIONALLY LEFT BLANK**NOTE 13. SPECIAL OPERATING PROCEDURES AND LIMITATIONS****ENGINE POWERSETTING**

Setting of engine thrust is based on low pressure rotor speed (N1). See Operating Instructions identified in Note 15.

ONE ENGINE INOPERATIVE (OEI) OPERATION.

For the following engine models, the rated takeoff thrust and its associated 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	FJ44-3A-24
FJ44-1AP	FJ44-3AP
FJ44-2C	FJ44-4A
FJ44-3A	FJ44-4A-32

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, FJ44-3AP, FJ44-4A, FJ44-4A-32 and FJ33-5A engines. See Operating Instructions identified in Note 15 for the approved icing inhibitors and allowable concentration levels.

Anti-static. See Operating Instructions identified in Note 15 for the approved anti-static additives and allowable concentration levels.

Biocide. See Operating Instructions identified in Note 15 for the approved biocide additives and allowable concentration levels

LIMITED USE FUEL OPERATION.

ASTM D910, Grade 100LL is approved for use on certain engine models. Refer to the Operating Instructions identified in Note 15 for limits on duration, fuel temperature and fuel pressure.

NOTE 14. INTENTIONALLY LEFT BLANK

NOTE 15. APPLICABLE DOCUMENTS.

Model	Engine Assembly Part Number	Installation Instructions	Operating Instructions	Line Maintenance Manual	Line Maintenance Manual Elite	Engine Manual
FJ44-1A	45700-104	50772	50771	50773	110506	50774
FJ44-1AP	72100-200	75274	75274	73568	120645	73569
	72100-201	75274-201	75274-201	73568	120645	73569
FJ44-2A	56000	56208	56209	56210	110507	59870
	56000-103	56208	56209	56210	110507	59870
	56000-104	56208	56209	56210	110507	59870
FJ44-2C	60500	63784	63785	64135	110508	74118
	60500-103	63784	63785	64135	110508	74118
FJ44-3A	67000-200	68583	68584	68585	120644	68659
	67000-202	68583-202	68584-202	68585-202	-	68659
FJ44-3A-24	75000-200	68583	68584	68585	120644	68659
FJ44-3AP	111000	111366	--	111339	-	111341
	111000-202	111366-202	--	111339-202	123809	111341
FJ44-4A	73200-200	110675	--	110990	-	110992
FJ44-4A-32	127000-200	119190	--	110990	-	110992
FJ33-5A	79400-201	112471	--	111343-201	-	111345

NOTE 16. INTENTIONALLY LEFT BLANK

NOTE 17. LIFE LIMITED PART INFORMATION

Certain rotor parts are life limited. These limits and the associated flight profile are listed in the Maintenance Manual identified in Note 15.

NOTE 18. INTENTIONALLY LEFT BLANK

NOTE 19. MAXIMUM SPEEDS.

SPEED LIMITATIONS.

MODEL	FJ44-1A	FJ44-1AP	FJ44-2A	FJ44-2C
Low Pressure Rotor (N1), rpm (%)	18,000 (104.4)	18,055 (104.69)	18,150 (105.2)	18,300 (106.1)
	18,160 (105.3) for 20 secs	No transient permitted	18,350 (106.4) for 30 secs	18,500 (107.3) for 30 secs
High Pressure Rotor (N2), rpm (%)	40,900 (99.3)	41,200 (100.0)	40,700 (98.8)	40,900 (99.3)
	No transient permitted	--	No transient permitted	--

MODEL	FJ44-3A FJ44-3A-24	FJ44-3AP	FJ44-4A FJ44-4A-32	FJ33-5A
Low Pressure Rotor (N1), rpm (%)	18,500 (102.8) 18,700 (103.9) for 20 secs	18,853 (104.74) 19,033 (105.74) for 30 secs	17,139 (104.8) 17,303 (105.8) for less than 2 mins	23,566 (104.74) 23,791 (105.74) for 30 secs
High Pressure Rotor (N2), rpm (%)	41,200 (100.0) 41,500 (100.7) for 20 secs	41,550 (100.85) 41,850 (101.58) for 30 secs	37,773 (100.9) 38,045 (101.6) for less than 2 mins	51,703 (100.39) 51,844 (100.67) for 30 secs

REFERENCE (100%) SHAFT SPEEDS.

MODEL	FJ44-1A/1AP	FJ44-2A/2C	FJ44-3A FJ44-3A-24 FJ44-3AP	FJ44-4A FJ44-4A-32	FJ33-5A
100 % Low Pressure Rotor (N1), rpm	17,245	17,245	18,000	16,360	22,500
100% High Pressure Rotor (N2), rpm	41,200	41,200	41,200	37,450	51,500

NOTE 20. INTENTIONALLY LEFT BLANK**NOTE 21. BLEED EXTRACTION.**

HIGH PRESSURE BLEED. Flow rates expressed as percent are based on engine core airflow rate. 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 15.

See Installation Instructions identified in Note 15 for bleed extraction limits during operation with One Engine Inoperative (OEI).

MODEL	FJ44-1A	FJ44-1AP	FJ44-2A	FJ44-2C
Maximum, Both Ports	13.0%	40.8 lb./min. or 12.0% whichever is less	45 lb./min. or 12.0% whichever is less	--
Maximum, One Port	6.5%	40.8 lb./min or 6.0% whichever is less	45 lb./min or 6.0% whichever is less	--
Minimum	0%	--	--	--
Maximum, Starting	0.222 square inch sharp edge orifice, equivalent flow	--	--	--

MODEL	FJ44-3A	FJ44-3A-24	FJ44-3AP
Maximum, Both Ports	50 lb./min. or 20.0% whichever is less	--	59 lb./min. or 20.0% whichever is less
Maximum, One Port	50 lb./min. or 10.0% whichever is less	--	59 lb./min. or 10.0% whichever is less
Minimum (ground idle and above)	0.020 square inch sharp edge orifice, equivalent flow	0.053 square inch sharp edge orifice, equivalent flow	0%
Maximum, Starting	0.222 square inch sharp edge orifice, equivalent flow	--	--

MODEL	FJ44-4A	FJ44-4A-32	FJ33-5A
Maximum, Both Ports	47 lb./min.	41 lb./min. or 20.0% whichever is less	40 lb./min
Maximum, One Port	47 lb./min.	41 lb./min. or 10.0% whichever is less	40 lb./min
Minimum (ground idle and above)	0%	- -	0%
Maximum, Starting	0.269 square inch sharp edge orifice, equivalent flow	- -	0.142 square inch sharp edge orifice, equivalent flow

IP COMPRESSOR BLEED. IP compressor bleed is optional for the engine models identified below. See Engine Assembly Part No. identified in Note 15 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 15 to determine effect of bleed on engine performance.

FJ44-2A

FJ44-2C

FAN BLEED. Fan bleed is optional for the engine models identified below. See Engine Assembly Part No. identified in Note 15 for specific engine configuration. Bleed flow is limited to the flow which can be extracted from one bleed port when discharged to ambient static pressure. See Operating Instructions identified in Note 15 to determine effect of bleed on engine performance.

FJ44-1AP

FJ44-3A

FJ44-4A

FJ33-5A

FJ44-2A

FJ44-3A-24

FJ44-4A-32

FJ44-2C

FJ44-3AP

NOTE 22. ROTOR BLADE CONTAINMENT

All engine models meet the 14 CFR Part 33 requirements for rotor disk integrity and blade containment.

- END -