

FJ44-3A TURBOFAN ENGINE
ACCEPTANCE TEST PERFORMANCE SUMMARY
IN ACCORDANCE WITH DOCUMENT 73332 Rev. C
WILLIAMS INTERNATIONAL CO., L.L.C.

Eng P/N: 67000-200	Eng S/N: 141687	Eng Bld: REV 1	Test Date: 02/06/2017
ATRC Ver: CP362.01	Date: 1/2/13	Thrust Tare: 9	Test Cell: B08
CFG Ver: CP354.00.B08.00	Date: 12/17/2009	Pc1: 1.9960	Oil Type: Mobil Jet II
Acq Ver: CP318.02	Date: 04/08/2015	Pc2: 2.0450	Exh Noz: TL-99958 s/n 004
Inlet: TL-99999	Inlet Cd: 0.933	Inlet Dia: 20.644	SPLHV: 18400
Fuel Type: Tank 8 JET A	Spec Grav: 0.8112	Temp Slope: 0.00040000	LHV: 18505
Dir: FJ44-3A CP354/170206062647			

N1 TRIM

N1 Trim Increments (-10 rpm/incr.) 2 incr.
N1 Trim Speed (SLS, 79F Dry Day, Uninst) 17774 rpm

ITT TRIM

ITT Trim Increments (2.5 Deg. R/incr.) 9 incr.
Trimmed ITT 1934 Deg. R

PERFORMANCE AT N1 TRIM SPEED (Referred to Sea Level Static, 79F Dry Day, Uninstalled)

Parameter	Actual	Allowable	Deviation
Referred FN	2869 lbf	2866 (min) 2907 (max)	0
Referred ITT	1912 R	1970 (max)	0
Referred N2	40480 rpm	N/A	N/A

PERFORMANCE AT RATED THRUST (Referred to Sea Level Static, 79F Dry Day, Uninstalled)

Parameter	Actual	Allowable	Deviation
Referred SFC	0.497 lbm/hr/lbf	0.510 (max)	0.000

GROUND IDLE THRUST (Referred to Sea Level Static, 79F Dry Day, Uninstalled)

Parameter	Actual	Max Allowable	Deviation
Referred FN	144 lbf	171 (max)	0
Referred N2	23120 rpm	N/A	N/A

ACCELERATION TIME (Flight Idle to 95% Rated Thrust)

Parameter	Actual	Max Allowable	Deviation
Time (Corr. to STD)	4.4 seconds	5.1	0.0
TT2	26.1 F	N/A	N/A
PT2	14.245 PSIA	N/A	N/A

MECHANICAL SYSTEMS PERFORMANCE (Steady-State)

Parameter	Actual	Allowable	Deviation
Max Main Oil Temp	147.3 F	275.0	0.0
Min Main Oil Press	40.3 psig	35.0	0.0
Max Main Oil Press	79.8 psig	90.0	0.0

Parameter	Actual	Allowable	Deviation
Oil Consumption	<u>0.003</u> gal/hr	0.023 (max)	<u>0</u>
Engine Dry Weight	_____ lb	518.5 (max)	_____

Total Engine Run Time 1999.20
Total Engine Cycles 2411.00

**ENGINE NOT WEIGHED
THIS SHIPMENT**

Engineering *Carl T. [Signature]* Date: 2/7/17

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Eng P/N: 67000-200	Eng S/N: 141687	Eng Bld: REV 1	Test Date: 02/06/2017
ATRC Ver: CP362.01	Date: 1/2/13	Thrust Tare: 9	Test Cell: B08
CFG Ver: CP354.00.B08.00	Date: 12/17/2009	Pc1: 1.9960	Oil Type: Mobil Jet II
Acq Ver: CP318.02	Date: 04/08/2015	Pc2: 2.0450	Exh Noz: TL-99958 s/n 004
Inlet: TL-99999	Inlet Cd: 0.933	Inlet Dia: 20.644	SPLHV: 18400
Fuel Type: Tank 8 JET A	Spec Grav: 0.8112	Temp Slope: 0.00040000	LHV: 18505
Dir: FJ44-3A CP354/170206062647			

Data Points

PARAMETER	DATA					
	2	3	4	5	6	7
Data Point Number	2	3	4	5	6	7
Percent N1TO	26.50	81.84	87.95	93.24	96.97	100.30
Power Lever Angle	17.62	37.48	41.21	44.97	47.96	66.75
Referred N1 Speed	4763	14711	15812	16764	17435	18035
Referred N2 Speed	23120	37651	38655	39513	40164	40723
Referred Thrust	144.5	1722.9	2079.7	2433.1	2721.5	2983.9
Referred Fuel Flow	133.6	843.4	1017.2	1196.4	1348.3	1494.6
Referred SFC	0.925	0.490	0.489	0.492	0.495	0.501
Referred ITT (R)	1192	1679	1757	1829	1884	1934
Referred Airflow	17.5	58.3	64.1	69.2	73.2	76.3
Overall Press Ratio	2.48	12.14	14.11	16.07	17.69	19.17
Reynolds Number Index	1.05044	1.04870	1.04843	1.04759	1.04711	1.04695
Specific Humidity	0.00238	0.00246	0.00250	0.00252	0.00254	0.00256
Theta Referred to 79 F	0.90248	0.90291	0.90295	0.90336	0.90362	0.90361
Delta	0.96938	0.96833	0.96815	0.96790	0.96780	0.96764
Net Thrust (lbf)	140.0	1668.3	2013.5	2355.0	2633.9	2887.4
Average Fuel Flow (lb/hr)	121.4	765.4	923.0	1085.6	1223.6	1356.2
Air Flow (lbm/sec)	17.8	59.4	65.2	70.4	74.4	77.6
CDP (psia)	35.3	172.8	200.7	228.6	251.6	272.6
N1 Speed (rpm)	4528	13990	15037	15947	16587	17158
N2 Speed (rpm)	22002	35838	36794	37620	38245	38777
Inlet Temperature (F)	26.5	26.7	26.7	26.9	27.1	27.1
Fuel Temperature (F)	39.1	35.7	36.8	36.8	37.4	38.0
Dewpoint (F)	20.2	21.0	21.3	21.5	21.7	21.8
Average ITT (F)	628	1072	1144	1210	1261	1306
Inlet Delta Press. (psia)	0.093	1.121	1.381	1.647	1.883	2.079
Cell Pressure (psia)	14.246	14.231	14.228	14.224	14.223	14.220
Oil Temperature (F)	147.3	137.2	139.1	140.6	141.4	142.3
Oil Pressure (psig)	40.3	73.5	75.3	77.0	78.6	79.8
Oil Tank Pressure (psig)	8.4	16.5	18.4	20.1	21.6	23.1
Date	02/06/17	02/06/17	02/06/17	02/06/17	02/06/17	02/06/17
Time	09:25:48	09:30:29	09:33:42	09:37:18	09:40:45	09:44:29

FJ44-3A TURBOFAN ENGINE
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IN ACCORDANCE WITH DOCUMENT 73332 Rev. C
WILLIAMS INTERNATIONAL CO., L.L.C.

Eng P/N: 67000-200	Eng S/N: 141687	Eng Bld: REV 1	Test Date: 02/06/2017
ATRC Ver: CP362.01	Date: 1/2/13	Thrust Tare: 9	Test Cell: B08
CFG Ver: CP354.00.B08.00	Date: 12/17/2009	Pc1: 1.9960	Oil Type: Mobil Jet II
Acq Ver: CP318.02	Date: 04/08/2015	Pc2: 2.0450	Exh Noz: TL-99958 s/n 004
Inlet: TL-99999	Inlet Cd: 0.933	Inlet Dia: 20.644	SPLHV: 18400
Fuel Type: Tank 8 JET A	Spec Grav: 0.8112	Temp Slope: 0.00040000	LHV: 18505
Dir: FJ44-3A CP354/170206062647			

VIBRATION SURVEY (PEAK LEVELS)

Parameter	Actual	Max Allowable	Deviation
Max 1E HP rad vib	0.56 ips @ 37.760 krpm	1.10	0.00
Max 1E LP rad vib	0.23 ips @ 12.528 krpm	0.25	0.00

Engineering

Chris T. Lingo

Date:

2/7/17

FJ44-3A TURBOFAN ENGINE
ACCEPTANCE TEST PERFORMANCE SUMMARY
IN ACCORDANCE WITH DOCUMENT 73332 Rev B
WILLIAMS INTERNATIONAL CO., L.L.C.

Eng P/N: 67000-200
Prog Ver: CP275.02
Acq Ver: CP169.03
ATP Ver: CP333.00
ATP Doc: 77438 Rev NC
Fuel Type: JETA

Eng S/N: 141687
Date: 09/16/05
Date: 06/15/00
Date: 11/10/05
Inlet Sn: I 3603
LHV: 18618

Eng Bld: 1
Thrust Tare: 6.1
Pc1: 2.0010
Pc2: 2.0230
Inlet Cd: 0.933
Spec Grav: 0.7904

Test Date: 02/09/09
Test Cell: 05
Oil Type: MOBIL JET2
Exh Noz: TL99958
Inlet Dia: 20.64
Temp Slope: 0.00040800
Dir: 0902091409

N1 TRIM

Trim Increments (-10 rpm/incr.) 7 incr.
N1 Trim Speed (SLS, 79F Dry Day, Uninst) 17724 rpm

PERFORMANCE @ N1 TRIM SPEED (Referred to Sea Level Static, 79F Dry Day, Uninstalled)

Parameter	Actual	Allowable	Deviation
Referred FN	2869 lbf	2866 (min) 2907 (max)	0 0
Referred ITT	1942 R	1970 (max)	0
Referred N2	40181 rpm	N/A	N/A

PERFORMANCE @ 2820 lbf RATED THRUST (Referred to Sea Level Static, 79F Dry Day, Uninstalled)

Parameter	Actual	Allowable	Deviation
Referred SFC	0.500 lbm/hr/lbf	0.510 (max)	0.000

GROUND IDLE THRUST (Referred to Sea Level Static, 79F Dry Day, Uninstalled)

Parameter	Actual	Max Allowable	Deviation
Referred FN	134 lbf	164	0
Referred N2	22843 rpm	N/A	N/A

ACCELERATION TIME (FI to 95% Rated Thrust)

Parameter	Actual	Max Allowable	Deviation
Time (Corr. to STD)	4.9 seconds	5.7	0.0
TT2	39.9 F	N/A	N/A
PT2	12.330 psia	N/A	N/A

MECHANICAL SYSTEMS PERFORMANCE (Steady-State)

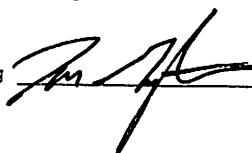
Parameter	Actual	Allowable	Deviation
Max Main Oil Temp	142.7 F	275.0	0.0
Min Main Oil Press	40.0 psig	35.0	0.0
Max Main Oil Press	79.7 psig	90.0	0.0

Parameter	Actual	Allowable	Deviation
Oil Consumption	<u>0.007</u> gal/hr	0.023 (max)	<u>0.0</u>
Engine Dry Weight	<u>516.5</u> lb	518.5 (max)	<u>0.0</u>

Total Engine Run Time 2:54

Total Engine Cycles 20.5

Engineering



ME
8613

Date: 2-10-09

FJ44-3A TURBOFAN ENGINE
ACCEPTANCE TEST PERFORMANCE SUMMARY
IN ACCORDANCE WITH DOCUMENT 73332 Rev B
WILLIAMS INTERNATIONAL CO.

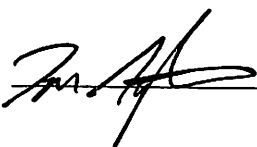
Eng P/N: 67000-200	Eng S/N: 141687	Eng Bld: 1	Test Date: 02/09/09
Prog Ver: CP275.02	Date: 09/16/05	Thrust Tare: 6.1	Test Cell: 05
Acq Ver: CP169.03	Date: 06/15/00	Pc1: 2.0010	Oil Type: MOBIL JET2
ATP Ver: CP333.00	Date: 11/10/05	Pc2: 2.0230	Exh Noz: TL99958
ATP Doc: 77438 Rev NC	Inlet Sn: I 3603	Inlet Cd: 0.933	Inlet Dia: 20.64
Fuel Type: JETA	LHV: 18618	Spec Grav: 0.7904	Temp Slope: 0.00040800

VIBRATION SURVEY (PEAK LEVELS) FROM VIB TEST DIRECTORY: 0902091837_FJ44-3A_vib

PARAMETER	ACTUAL		MAX ALLOWABLE	DEVIATION
Max 1E HP rad vib	0.47 IPS	38065 RPM	1.10	0.00
Max 1E LP rad vib	0.10 IPS	12602 RPM	0.25	0.00
Max 1/2ELP INTERSTAGE** (10200 - 13200 N1 RPM)	0.04 IPS	12705 RPM	0.13	0.00
Max 1/2ELP REAR MOUNT** (10200 - 13200 N1 RPM)	0.07 IPS	12849 RPM	0.18	0.00
Max 1ELP START VIB** (1500 - 2700 N1 RPM)	0.08 IPS	3067 RPM	0.20	0.00

** (REF ED W-8576)

ENGINEERING



ME
3613

Date 2-10-09

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Prog Ver: CP275.02
Acq Ver: CP169.03
ATP Ver: CP333.00
ATP Doc: 77438 Rev NC
Fuel Type: JETA

Eng S/N: 141687
Date: 09/16/05
Date: 06/15/00
Date: 11/10/05
Inlet Sn: I 3603
LHV: 18618

Eng Bld: 1
Thrust Tare: 6.1
Pc1: 2.0010
Pc2: 2.0230
Inlet Cd: 0.933
Spec Grav: 0.7904

Test Date: 02/09/09
Test Cell: 05
Oil Type: MOBIL JET2
Exh Noz: TL99958
Inlet Dia: 20.64
Temp Slope: 0.00040800
Dir: 0902091409

PARAMETER	DATA					
	4	5	6	7	8	9
DATA POINT NUMBER	4	5	6	7	8	9
PERCENT N1TO	25.23	82.13	88.30	93.21	97.31	100.03
POWER LEVER ANGLE	17.42	36.39	42.44	44.65	48.32	69.44
REFERRED N1 SPEED	4687	15253	16419	17335	18096	18603
REFERRED N2 SPEED	22843	37873	38938	39793	40541	41105
REFERRED Fuel Flow	138.10	948.23	1152.27	1348.58	1536.46	1680.98
REFERRED THRUST	134	1910	2316	2697	3052	3312
REFERRED ITT (R)	1211	1750	1836	1910	1975	2022
REFERRED AIRFLOW	1.9	62.3	67.9	73.3	77.6	80.7
REFERRED SFC	1.032	0.497	0.498	0.500	0.503	0.507
N1 SPEED	4519	14709	15814	16694	17427	17916
N2 SPEED	22010	36501	37485	38301	39021	39566
AVERAGE ITT (F)	674	1180	1257	1325	1386	1430
AIRFLOW	1.6	54.0	59.0	63.7	67.4	70.1
NET THRUST	112	1601	1941	2261	2558	2776
FUELFLOW	110.28	756.78	918.12	1074.21	1223.81	1338.94
CDP (PSIA)	30.0	162.9	191.6	219.1	245.7	265.2
OVERALL PRESS RATIO	2.43	13.22	15.56	17.79	19.95	21.53
INLET TEMP. (F)	39.8	40.1	38.9	38.7	38.7	38.8
DEWPOINT (F)	36.9	36.9	36.9	36.7	36.7	36.8
FUEL TEMP. (F)	40.9	40.5	40.4	40.5	40.7	40.8
CELL PRESSURE	12.330	12.319	12.317	12.316	12.316	12.315
INLET PRESSURE	12.329	11.204	10.961	10.690	10.451	10.252
SPECIFIC HUMIDITY	0.00549	0.00550	0.00550	0.00546	0.00546	0.00546
REYNOLDS NO. INDEX	0.87922	0.87785	0.88034	0.88067	0.88061	0.88044
DELTA	0.83902	0.83825	0.83813	0.83808	0.83803	0.83798
THETA79	0.92725	0.92772	0.92550	0.92518	0.92519	0.92529
OIL TEMPERATURE	142.7	138.8	138.6	137.3	135.6	135.1
OIL PRESSURE	40.0	73.7	75.8	77.6	78.9	79.7
OIL TANK PRES (PSIG)	7.7	15.1	16.8	18.3	19.7	20.7
DATE	02/09/09	02/09/09	02/09/09	02/09/09	02/09/09	02/09/09
TIME	18:07:00	18:12:08	18:17:01	18:22:00	18:27:00	18:32:00