



ICAO ENGINE nvPM EMISSIONS DATA SHEET

SUBSONIC ENGINES

ENGINE IDENTIFICATION: CF34-8E5A1 BYPASS RATIO (-): 5.1
 UNIQUE ID NUMBER: 01P08GE198 PRESSURE RATIO π_{co} (-): 24.9
 COMBUSTOR: LEC
 ENGINE TYPE: TF RATED OUTPUT F_{oo} (kN): 62.5

REGULATORY DATA

CHARACTERISTIC VALUES:	LTO_{mass}/F_{oo} (mg/kN)	LTO_{num}/F_{oo} (particles/kN)	NVPM MASS CONCENTRATION ($\mu\text{g}/\text{m}^3$)
LTO/ F_{oo} AND MAX nvPM _{mass}	42.9	4.24E+14	1577
AS % OF CAEP/10 LIMIT	-	-	18.4
AS % OF CAEP/11 LIMIT (InP)	1.3	2.2	
AS % OF CAEP/11 LIMIT (NT)	5.2	4.3	

MEASURED DATA

MODE	POWER SETTING (% F_{oo})	TIME minutes	FUEL FLOW kg/s	EMISSIONS INDICES*		NVPM MASS CONCENTRATION PEAK nvPM _{mass} ($\mu\text{g}/\text{m}^3$)
				EI_{mass} (mg/kg)	EI_{num} (particles/kg)	
TAKE-OFF	100	0.7	0.688	43.9	3.72E+14	
CLIMB OUT	85	2.2	0.561	6.5	1.09E+14	
APPROACH	30	4.0	0.188	1.1	1.87E+12	
IDLE	7	26.0	0.064	1.3	1.74E+12	
LTO TOTAL (kg, mg, number of particles)			248	1931	1.91E+16	-
NUMBER OF ENGINES				1	1	1
NUMBER OF TESTS				3	3	3
AVERAGE LTO/ F_{oo} VALUES (mg/kN, particles/kN)				30.9	3.05E+14	-
MAX EI VALUES (mg/kg, particles/kg) AND MAX MASS CONC. ($\mu\text{g}/\text{m}^3$)				43.9	3.72E+14	1226

* Emissions Indices are corrected for thermophoretic loss and fuel hydrogen content

DATA FOR EMISSIONS INVENTORIES (ESTIMATIONS FOR ENGINE EXIT PLANE VALUES)

MODE	POWER SETTING (% F_{oo})	CORRECTED EMISSIONS INDICES	
		EI_{mass_SL} (mg/kg)	EI_{num_SL} (particles/kg)
TAKE-OFF	100	53.7	1.21E+15
CLIMB OUT	85	8.3	3.95E+14
APPROACH	30	1.2	3.28E+12
IDLE	7	1.4	3.77E+12

AMBIENT CONDITIONS

	From	To	FUEL	
BAROMETER (kPa)	98.1	98.6	HEAT OF COMBUSTION (MJ/kg)	43.19
TEMPERATURE (K)	290.7	296.3	HYDROGEN CONTENT (%mass)	13.67
HUMIDITY (kg water/kg dry air)	0.0033	0.0048	AROMATICS CONTENT (%vol)	17.5
			NAPHTHALENE CONTENT (%vol)	0.23
			SULPHUR CONTENT (ppm by mass)	77

MANUFACTURER: General Electric Company
 TEST ORGANIZATION: General Electric Company
 TEST LOCATION: PTO, Site 3B
 TEST DATES: 17/04/2017-18/04/2017

REMARKS

1. GE Aviation Report R2018AE311/Rev. 0
2. Engine S/N 902-647/1