



# ICAO ENGINE EXHAUST EMISSIONS DATA BANK

## SUBSONIC ENGINES

\*\* DATA SUPERSEDED \*\* SEE SHEET: 20CM101

ENGINE IDENTIFICATION: LEAP-1B28 BYPASS RATIO: 8.6  
UNIQUE ID NUMBER: 18CM084 PRESSURE RATIO ( $\pi_{oo}$ ): 41.5  
ENGINE TYPE: TF RATED OUTPUT ( $F_{oo}$ ) (kN): 130.4

### REGULATORY DATA

CHARACTERISTIC VALUE:	HC	CO	NOx	SMOKE NUMBER
$D_p/F_{oo}$ (g/kN) or SN	1.2	21.9	67.0	1.5
AS % OF ORIGINAL LIMIT	5.9 %	18.6 %	54.4 %	6.8 %
AS % OF CAEP/2 LIMIT (NOx)			68.0 %	
AS % OF CAEP/4 LIMIT (NOx)			74.4 %	
AS % OF CAEP/6 LIMIT (NOx)			81.7 %	
AS % OF CAEP/8 LIMIT (NOx)			91.6 %	

### DATA STATUS

- PRE-REGULATION  
x CERTIFICATION  
- REVISED (SEE REMARKS)

### TEST ENGINE STATUS

x NEWLY MANUFACTURED ENGINES  
x DEDICATED ENGINES TO PRODUCTION STANDARD  
- OTHER (SEE REMARKS)

### EMISSIONS STATUS

x DATA CORRECTED TO REFERENCE  
(ANNEX 16 VOLUME II)

### CURRENT ENGINE STATUS

(IN PRODUCTION, IN SERVICE UNLESS OTHERWISE NOTED)  
- OUT OF PRODUCTION  
- OUT OF SERVICE

### MEASURED DATA

MODE	POWER SETTING (% $F_{oo}$ )	TIME minutes	FUEL FLOW kg/s	EMISSIONS INDICES (g/kg)			SMOKE NUMBER
				HC	CO	NOx	
TAKE-OFF	100	0.7	1.061	0.05	0.18	60.67	0.94
CLIMB OUT	85	2.2	0.864	0.04	0.14	29.58	0.85
APPROACH	30	4.0	0.277	0.05	1.2	11.24	1.07
IDLE	7	26.0	0.098	0.57	14.62	4.64	0.8
LTO TOTAL FUEL (kg) or EMISSIONS (g)			378	97	2339	7534	-
NUMBER OF ENGINES				1	1	1	1
NUMBER OF TESTS				3	3	3	3
AVERAGE $D_p/F_{oo}$ (g/kN) or AVERAGE SN (MAX)				0.74	17.94	57.78	1.16
SIGMA ( $D_p/F_{oo}$ in g/kN, or SN)				0.09	0.77	1.38	0.29
RANGE ( $D_p/F_{oo}$ in g/kN, or SN)				0.66 to 0.86	6.97 to 18.36	6.39 to 59.15	0.34 to 0.90

### ACCESSORY LOADS

POWER EXTRACTION 0 (kW) AT ALL POWER SETTINGS  
STAGE BLEED 0 % CORE FLOW AT ALL POWER SETTINGS

### ATMOSPHERIC CONDITIONS

BAROMETER (kPa)	98.02 to 98.16
TEMPERATURE (K)	290.9 to 296.5
ABS HUMIDITY (kg/kg)	0.0048 to 0.0079

### FUEL

SPEC	JET A
H/C	1.9
AROM (%)	14.8

MANUFACTURER: GE Aviation  
TEST ORGANIZATION: GE Aviation  
TEST LOCATION: PTO, Ohio, USA  
TEST DATES: FROM 08 Mar 16 TO 09 Mar 16

### REMARKS

1. Ref. GE REPORT R2013AE1161
2. Engine S/N 602-109/1
3. SMOKE NUMBER for each LTO mode is average of max SN for test points around that power setting
4. AVERAGE SN (MAX) is average of maximum smoke number measured from all points on each run
5. Certification in accordance with Part III, Chapter 2, of Amendment 8 of ICAO Annex 16 Vol. II.
6. NOx levels in accordance with Part III, Chapter 2, 2.3.2 e) (CAEP/8)

If REVISED, this data supersedes databank UID

Compliance with fuel venting requirements: x ('x' if complies, PR if pre-regulation)