



# ICAO ENGINE EXHAUST EMISSIONS DATA BANK

## SUBSONIC ENGINES

ENGINE IDENTIFICATION: RB211-535E4B  
UNIQUE ID NUMBER: 5RR039  
ENGINE TYPE: MTF

BYPASS RATIO: 4.1  
PRESSURE RATIO ( $\pi_{00}$ ): 27.9  
RATED OUTPUT ( $F_{00}$ ) (kN): 191.7

### REGULATORY DATA

CHARACTERISTIC VALUE:	HC	CO	NOx	SMOKE NUMBER
$D_p/F_{00}$ (g/kN) or SN	0.4	36.5	53.8	9.4
AS % OF ORIGINAL LIMIT	2.2 %	30.9 %	56.1 %	47.5 %
AS % OF CAEP/2 LIMIT (NOx)			70.2 %	
AS % OF CAEP/4 LIMIT (NOx)			84.5 %	
AS % OF CAEP/6 LIMIT (NOx)			96.0 %	
AS % OF CAEP/8 LIMIT (NOx)			114.1 %	

### DATA STATUS

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

### TEST ENGINE STATUS

- 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)  
x OUT OF PRODUCTION (DATE: - )  
- OUT OF SERVICE

### MEASURED DATA

MODE	POWER SETTING (% $F_{00}$ )	TIME minutes	FUEL FLOW kg/s	EMISSIONS INDICES (g/kg)			SMOKE NUMBER
				HC	CO	NOx	
TAKE-OFF	100	0.7	2.070	0.07	0.33	25.88	7.3
CLIMB OUT	85	2.2	1.640	0	0.26	19.3	6.8
APPROACH	30	4.0	0.550	0.05	2.43	8.65	0.6
IDLE	7	26.0	0.190	0.14	18.24	4.58	0.46
LTO TOTAL FUEL (kg) or EMISSIONS (g)			732	54	5812	8927	-
NUMBER OF ENGINES				1	1	1	1
NUMBER OF TESTS				3	3	3	3
AVERAGE $D_p/F_{00}$ (g/kN) or AVERAGE SN (MAX)				0.28	29.7	46.4	7.3
SIGMA ( $D_p/F_{00}$ in g/kN, or SN)				-	-	-	-
RANGE ( $D_p/F_{00}$ in g/kN, or SN)				0.16 - 0.54	29.45 - 29.91	44.9 - 48.0	6.9 - 7.9

### ACCESSORY LOADS

POWER EXTRACTION 0 (kW)  
STAGE BLEED 0 % CORE FLOW

AT - POWER SETTINGS  
AT - POWER SETTINGS

### ATMOSPHERIC CONDITIONS

BAROMETER (kPa)	100.7 - 101.2
TEMPERATURE (K)	281 - 287
AHS HUMIDITY (kg/kg)	.0058 - .0064

### FUEL

SPEC	AVTUR
H/C	1.931
AROM (%)	17.6

MANUFACTURER: Rolls-Royce plc  
TEST ORGANIZATION: Rolls-Royce plc  
TEST LOCATION: Hucknall  
TEST DATES: FROM May 99 TO -

### REMARKS

1. Data from certification report DNS63281.
2. Phase 5 combustor

If REVISED, this data supersedes databank UID  
Compliance with fuel venting requirements:

0 ('x' if complies, PR if pre-regulation)