



ICAO ENGINE EXHAUST EMISSIONS DATA BANK

SUBSONIC ENGINES

**** DATA SUPERSEDED ** SEE SHEET: 3RR028**

ENGINE IDENTIFICATION: RB211-535E4 BYPASS RATIO: 4.1
UNIQUE ID NUMBER: 1RR014 PRESSURE RATIO (π_{oo}): 25.4
ENGINE TYPE: MTF RATED OUTPUT (F_{oo}) (kN): 176.1

REGULATORY DATA

CHARACTERISTIC VALUE:	HC	CO	NOx	SMOKE NUMBER
D_p/F_{oo} (g/kN) or SN	2.6	32.6	84.6	2.0
AS % OF ORIGINAL LIMIT	13.3 %	27.6 %	93.1 %	9.8 %
AS % OF CAEP/2 LIMIT (NOx)			116.4 %	
AS % OF CAEP/4 LIMIT (NOx)			141.8 %	
AS % OF CAEP/6 LIMIT (NOx)			161.1 %	
AS % OF CAEP/8 LIMIT (NOx)			193.8 %	

DATA STATUS

- PRE-REGULATION
- CERTIFICATION
x 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_{oo})	TIME minutes	FUEL FLOW kg/s	EMISSIONS INDICES (g/kg)			SMOKE NUMBER
				HC	CO	NOx	
TAKE-OFF	100	0.7	1.860	0.04	1.01	52.7	-
CLIMB OUT	85	2.2	1.510	0.01	1.23	36.2	-
APPROACH	30	4.0	0.570	0.04	1.71	7.5	-
IDLE	7	26.0	0.190	1	15.44	4.3	-
LTO TOTAL FUEL (kg) or EMISSIONS (g)			711	307	5134	13633	-
NUMBER OF ENGINES				1	2	2	2
NUMBER OF TESTS				3	5	5	5
AVERAGE D_p/F_{oo} (g/kN) or AVERAGE SN (MAX)				1.69	28.6	76.9	1.7
SIGMA (D_p/F_{oo} in g/kN, or SN)				0.09	3.5	1.3	0.3
RANGE (D_p/F_{oo} in g/kN, or SN)				1.59-1.77	24.6-33.4	75.0-78.9	1.5-2.3

ACCESSORY LOADS

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

ATMOSPHERIC CONDITIONS

BAROMETER (kPa)	100.8-101.2
TEMPERATURE (K)	285 - 298
AHS HUMIDITY (kg/kg)	0.0058-0.0087

FUEL

SPEC	AVTUR
H/C	1.91
AROM (%)	20

MANUFACTURER: Rolls Royce Ltd
TEST ORGANIZATION: Rolls Royce Ltd
TEST LOCATION: SINFIN-Derby
TEST DATES: FROM 02 Jul 84 TO 01 Apr 91

REMARKS

HC data remeasured.

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

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