# ICAO ENGINE EXHAUST EMISSIONS DATA BANK

## SUBSONIC ENGINES

ENGINE IDENTIFICATION: RB211-524G
UNIQUE ID NUMBER: 1RR010
ENGINE TYPE: MTF

BYPASS RATIO: 4.25
PRESSURE RATIO ($\pi_{oo}$): 32.1
RATED OUTPUT ($F_{oo}$) (kN): 253

REGULATORY DATA

| CHARACTERISTIC VALUE: | HC | CO | NOx | SMOKE NUMBER |
|---|---|---|---|---|
| $D_p/F_{oo}$ (g/kN) or SN | 2.8 | 28.8 | 96.9 | 5.0 |
| AS % OF ORIGINAL LIMIT | 14.2 % | 24.4 % | 93.0 % | 27.3 % |
| AS % OF CAEP/2 LIMIT (NOx) | | | 116.2 % | |
| AS % OF CAEP/4 LIMIT (NOx) | | | 136.1 % | |
| AS % OF CAEP/6 LIMIT (NOx) | | | 153.4 % | |
| AS % OF CAEP/8 LIMIT (NOx) | | | 178.4 % | |

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) HC | CO | NOx | SMOKE NUMBER |
|---|---|---|---|---|---|---|---|
| TAKE-OFF | 100 | 0.7 | 2.620 | 0.39 | 0.59 | 58.71 | 3.03 |
| CLIMB OUT | 85 | 2.2 | 2.080 | 0.27 | 0.43 | 40.54 | 3.62 |
| APPROACH | 30 | 4.0 | 0.700 | 0.37 | 1.01 | 9.56 | 1.82 |
| IDLE | 7 | 26.0 | 0.260 | 0.89 | 13.74 | 4.63 | 0.21 |
| LTO TOTAL FUEL (kg) or EMISSIONS (g) | | | 958 | 540 | 5926 | 21075 | - |
| NUMBER OF ENGINES | | | | 2 | 1 | 1 | 1 |
| NUMBER OF TESTS | | | | 3 | 3 | 3 | 3 |
| AVERAGE $D_p/F_{oo}$ (g/kN) or AVERAGE SN (MAX) | | | | 2.14 | 23.49 | 83.57 | 3.9 |
| SIGMA ($D_p/F_{oo}$ in g/kN, or SN) | | | | 0.28 | 0.34 | 1.39 | 0.37 |
| RANGE ($D_p/F_{oo}$ in g/kN, or SN) | | | | 1.87-2.44 | 23.13-23.81 | 82.34-85.08 | 3.7-4.3 |

ACCESSORY LOADS

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

ATMOSPHERIC CONDITIONS

| | |
|---|---|
| BAROMETER (kPa) | 101 |
| TEMPERATURE (K) | 283 - 286 |
| ABS HUMIDITY (kg/kg) | 0.006 |

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 Apr 87 TO Oct 92

REMARKS

HC data remeasured.

If REVISED, this data supersedes databank UID
Compliance with fuel venting requirements: 0 ('x' if complies, PR if pre-regulation)