# ICAO ENGINE EXHAUST EMISSIONS DATA SHEET

## SUBSONIC ENGINES

| | | |
|---|---|---|
| ENGINE IDENTIFICATION: | RB211-22B | |
| UNIQUE ID NUMBER: | 1RR002 | |
| COMBUSTOR: | Package 1 | |
| ENGINE TYPE: | TF | |

| | |
|---|---|
| BYPASS RATIO: | 4.7 |
| PRESSURE RATIO ($\pi_{oo}$): | 25.0 |
| RATED THRUST ($F_{oo}$) (kN): | 182.5 |

REGULATORY DATA

| CHARACTERISTIC VALUE: | HC | CO | $NO_X$ | SMOKE NUMBER |
|---|---|---|---|---|
| $D_p/F_{oo}$ (g/kN) or SN | 154.9 | 222.0 | 57.5 | 18.9 |
| AS % OF ORIGINAL LIMIT | 790.4 | 188.2 | 63.9 | 94.3 |
| AS % OF CAEP/2 LIMIT ($NO_X$) | | | 79.9 | |
| AS % OF CAEP/4 LIMIT ($NO_X$) | | | 97.5 | |
| AS % OF CAEP/6 LIMIT ($NO_X$) | | | 110.8 | |
| AS % OF CAEP/8 LIMIT ($NO_X$) | | | 133.5 | |

DATA STATUS

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

TEST ENGINE STATUS

| | |
|---|---|
| x | NEWLY MANUFACTURED ENGINES |
| - | 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 (DATE: | - ) |

MEASURED DATA

| MODE | POWER SETTING ($\%F_{oo}$) | TIME (minutes) | FUEL FLOW (kg/s) | EMISSIONS INDICES (g/kg) | | | |
|---|---|---|---|---|---|---|---|
| | | | | HC | CO | $NO_X$ | SMOKE NUMBER |
| TAKE-OFF | 100 | 0.7 | 1.866 | 0.36 | 2.48 | 34.32 | 14.7 |
| CLIMB OUT | 85 | 2.2 | 1.542 | 0.39 | 4.14 | 25.63 | 12.9 |
| APPROACH | 30 | 4.0 | 0.553 | 7.73 | 26.38 | 8.05 | 8.0 |
| IDLE | 7 | 26.0 | 0.277 | 65.37 | 93.17 | 2.70 | 3.1 |
| LTO TOTAL FUEL (kg) or EMISSIONS (g) | | | 847 | 29381 | 44799 | 10142 | - |
| NUMBER OF ENGINES | | | | 3 | 3 | 3 | 1 |
| NUMBER OF TESTS | | | | 4 | 4 | 4 | 1 |
| AVERAGE $D_p/F_{oo}$ (g/kN) or AVERAGE SN (MAX) | | | | 132.8 | 205.3 | 54.3 | 14.7 |
| SIGMA ($D_p/F_{oo}$ in g/kN, or SN) | | | | 8.2 | 8.0 | 4.4 | |
| RANGE ($D_p/F_{oo}$ in g/kN, or SN) | | | | 122-140 | 197-212 | 48-57 | |

ACCESSORY LOADS

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

ATMOSPHERIC CONDITIONS

| BAROMETER (kPa) | 99.3-100.3 |
|---|---|
| TEMPERATURE (K) | 287-291 |
| ABS HUMIDITY (kg/kg) | 0.008 |

FUEL

| SPEC | DERD 2494 |
|---|---|
| H/C | 1.94 |
| AROM (%) | 20 |

| | |
|---|---|
| MANUFACTURER: | Rolls-Royce plc |
| TEST ORGANIZATION: | Rolls-Royce Ltd |
| TEST LOCATION: | Derby |
| TEST DATES: | 01/06/1979-01/08/1979 |

REMARKS

1. Package 1 combustor.

Compliance with Fuel Venting requirements:      -      ('x' if complies, 'PR' if pre-regulation, '-' if information is not available)