



ICAO ENGINE EXHAUST EMISSIONS DATA BANK

SUBSONIC ENGINES

ENGINE IDENTIFICATION: Trent 1000 -N3

UNIQUE ID NUMBER: 19RR094

ENGINE TYPE: TF

BYPASS RATIO: 8.9

PRESSURE RATIO (π_{oo}): 48.7

RATED OUTPUT (F_{oo}) (kN): 358.1

REGULATORY DATA

| CHARACTERISTIC VALUE: | HC | CO | NOx | SMOKE NUMBER |
|--|-------|-------|--------|--------------|
| D _p /F _{oo} (g/kN) or SN | 0.0 | 8.3 | 74.1 | 16.4 |
| AS % OF ORIGINAL LIMIT | 0.0 % | 7.1 % | 53.9 % | 98.2 % |
| AS % OF CAEP/2 LIMIT (NOx) | | | 67.4 % | |
| AS % OF CAEP/4 LIMIT (NOx) | | | 71.0 % | |
| AS % OF CAEP/6 LIMIT (NOx) | | | 76.9 % | |
| AS % OF CAEP/8 LIMIT (NOx) | | | 84.6 % | |

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)

- 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 | 2.721 | 0 | 0.43 | 59.3 | 7.6 |
| CLIMB OUT | 85 | 2.2 | 2.222 | 0 | 0.44 | 44.55 | 10.2 |
| APPROACH | 30 | 4.0 | 0.712 | 0 | 0.59 | 14.72 | 9.4 |
| IDLE | 7 | 26.0 | 0.260 | 0 | 6.13 | 6.61 | 1.8 |
| LTO TOTAL FUEL (kg) or EMISSIONS (g) | | | 983 | 0 | 2760 | 25036 | - |
| NUMBER OF ENGINES | | | | 3 | 3 | 3 | 6 |
| NUMBER OF TESTS | | | | 7 | 7 | 7 | 8 |
| AVERAGE D _p /F _{oo} (g/kN) or AVERAGE SN (MAX) | | | | 0 | 7.71 | 69.93 | 15.3 |
| SIGMA (D _p /F _{oo} in g/kN, or SN) | | | | 0 | 1.37 | 1.26 | 1.7 |
| RANGE (D _p /F _{oo} in g/kN, or SN) | | | | 0 - 0 | 6.25 - 8.96 | 68.47 - 70.73 | 12.1 - 16.8 |

ACCESSORY LOADS

POWER EXTRACTION0(kW)AT-POWER SETTINGS

STAGE BLEED0% CORE FLOWAT-POWER SETTINGS

ATMOSPHERIC CONDITIONS

| | |
|----------------------|-------------------|
| BAROMETER (kPa) | 98.9 - 102.1 |
| TEMPERATURE (K) | 275.0 - 304.6 |
| ABS HUMIDITY (kg/kg) | 0.00308 - 0.01935 |

FUEL

| | |
|----------|------|
| SPEC | - |
| H/C | 1.91 |
| AROM (%) | 17.2 |

MANUFACTURER:Rolls-Royce

TEST ORGANIZATION:Rolls-Royce

TEST LOCATION:Derby

TEST DATES:FROM 07 Feb 11TO 30 Nov 17

REMARKS

1. Data from Certification Report EDNS01000615769
2. Certification in accordance with Part III, Chapter 2, of Amendment 8 of ICAO Annex 16 Vol. II.
3. 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)