



# ICAO ENGINE EXHAUST EMISSIONS DATA BANK

## SUBSONIC ENGINES

ENGINE IDENTIFICATION: Trent 1000-L2 BYPASS RATIO: 9.2  
UNIQUE ID NUMBER: 12RR069 PRESSURE RATIO ( $\pi_{oo}$ ): 44.1  
ENGINE TYPE: TF RATED OUTPUT ( $F_{oo}$ ) (kN): 334.7

### REGULATORY DATA

| CHARACTERISTIC VALUE:      | HC    | CO    | NOx    | SMOKE NUMBER |
|----------------------------|-------|-------|--------|--------------|
| $D_p/F_{oo}$ (g/kN) or SN  | 0.0   | 10.0  | 65.1   | 6.5          |
| AS % OF ORIGINAL LIMIT     | 0.2 % | 8.5 % | 50.8 % | 38.2 %       |
| AS % OF CAEP/2 LIMIT (NOx) |       |       | 63.5 % |              |
| AS % OF CAEP/4 LIMIT (NOx) |       |       | 68.4 % |              |
| AS % OF CAEP/6 LIMIT (NOx) |       |       | 74.7 % |              |
| AS % OF CAEP/8 LIMIT (NOx) |       |       | 83.1 % |              |

### 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 (% $F_{oo}$ ) | TIME minutes | FUEL FLOW kg/s | EMISSIONS INDICES (g/kg) |              |               | SMOKE NUMBER |
|---|-----------------------------|--------------|----------------|--------------------------|--------------|---------------|--------------|
|   |                             |              |                | HC                       | CO           | NOx           |              |
| TAKE-OFF  | 100                         | 0.7          | 2.503          | 0                        | 0.5          | 52.65         | 3.3          |
| CLIMB OUT                                       | 85                          | 2.2          | 2.053          | 0                        | 0.48         | 39.86         | 3.8          |
| APPROACH  | 30                          | 4.0          | 0.666          | 0                        | 0.67         | 13.67         | 3.9          |
| IDLE  | 7                           | 26.0         | 0.247          | 0.03                     | 7.37         | 5.74          | 0.5          |
| LTO TOTAL FUEL (kg) or EMISSIONS (g)            |                             |              | 922            | 12                       | 3131         | 20735         | -            |
| NUMBER OF ENGINES                               |                             |              |                | 4                        | 4            | 4             | 4            |
| NUMBER OF TESTS                                 |                             |              |                | 8                        | 8            | 8             | 8            |
| AVERAGE $D_p/F_{oo}$ (g/kN) or AVERAGE SN (MAX) |                             |              |                | 0.03                     | 9.36         | 61.96         | 5.98         |
| SIGMA ( $D_p/F_{oo}$ in g/kN, or SN)            |                             |              |                | 0.04                     | 2.52         | 0.83          | 2.26         |
| RANGE ( $D_p/F_{oo}$ in g/kN, or SN)            |                             |              |                | 0 - 0.08                 | 6.32 - 12.14 | 61.13 - 62.91 | 3 - 8.3      |

### ACCESSORY LOADS

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

### ATMOSPHERIC CONDITIONS

|                      |                   |
|----------------------|-------------------|
| BAROMETER (kPa)      | 98.9 - 102.1      |
| TEMPERATURE (K)      | 284.1 - 293.2     |
| ABS HUMIDITY (kg/kg) | 0.00432 - 0.00968 |

### FUEL

|          |      |
|----------|------|
| SPEC     | -    |
| H/C      | 1.9  |
| AROM (%) | 17.4 |

MANUFACTURER: Rolls-Royce  
TEST ORGANIZATION: Rolls-Royce  
TEST LOCATION: Derby  
TEST DATES: FROM 24 Sep 09 TO 03 Aug 12

### REMARKS

- Representative of Package C1 engines
- DNS183412
- Certification in accordance with Part III, Chapter 2, of Amendment 7 of ICAO Annex 16 Vol. II.
- 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)