



# ICAO ENGINE EXHAUST EMISSIONS DATA BANK

## SUBSONIC ENGINES

ENGINE IDENTIFICATION: Trent 1000-D  
UNIQUE ID NUMBER: 12RR057  
ENGINE TYPE: TF

BYPASS RATIO: 9.3  
PRESSURE RATIO ( $\pi_{00}$ ): 43.8  
RATED OUTPUT ( $F_{00}$ ) (kN): 334.7

### REGULATORY DATA

CHARACTERISTIC VALUE:	HC	CO	NOx	SMOKE NUMBER
$D_p/F_{00}$ (g/kN) or SN	0.0	10.0	65.5	6.5
AS % OF ORIGINAL LIMIT	0.2 %	8.5 %	51.3 %	38.2 %
AS % OF CAEP/2 LIMIT (NOx)			64.2 %	
AS % OF CAEP/4 LIMIT (NOx)			69.2 %	
AS % OF CAEP/6 LIMIT (NOx)			75.7 %	
AS % OF CAEP/8 LIMIT (NOx)			84.3 %	

### DATA STATUS

- PRE-REGULATION  
x 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 (% $F_{00}$ )	TIME minutes	FUEL FLOW kg/s	EMISSIONS INDICES (g/kg)			SMOKE NUMBER
				HC	CO	NOx	
TAKE-OFF	100	0.7	2.508	0	0.5	53.53	3.3
CLIMB OUT	85	2.2	2.048	0	0.48	39.98	3.8
APPROACH	30	4.0	0.668	0	0.65	13.77	3.9
IDLE	7	26.0	0.247	0.03	7.41	5.72	0.5
LTO TOTAL FUEL (kg) or EMISSIONS (g)			921	12	3138	20854	-
NUMBER OF ENGINES				4	4	4	4
NUMBER OF TESTS				8	8	8	8
AVERAGE $D_p/F_{00}$ (g/kN) or AVERAGE SN (MAX)				0.03	9.38	62.31	5.98
SIGMA ( $D_p/F_{00}$ in g/kN, or SN)				0.04	2.53	0.81	2.26
RANGE ( $D_p/F_{00}$ in g/kN, or SN)				0 - 0.08	6.33 - 12.18	61.52 - 63.28	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 B engines
- DNS170301
- 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)