



## ICAO ENGINE EXHAUST EMISSIONS DATA SHEET

## SUBSONIC ENGINES

ENGINE IDENTIFICATION: Trent 1000-A  
UNIQUE ID NUMBER: 12RR055  
COMBUSTOR: Phase5 Tiled  
ENGINE TYPE: TF

BYPASS RATIO: 9.5  
PRESSURE RATIO ( $\pi_{00}$ ): 41.0  
RATED THRUST ( $F_{00}$ ) (kN): 310.9

REGULATORY DATA \*\* DATA SUPERSEDED \*\* SEE FOLLOWING UID FOR REVISED DATA: 12RR061

CHARACTERISTIC VALUE:	HC	CO	NO <sub>x</sub>	SMOKE NUMBER
$D_p/F_{00}$ (g/kN) or SN	0.1	11.7	58.4	6.5
AS % OF ORIGINAL LIMIT	0.3	9.9	47.8	37.5
AS % OF CAEP/2 LIMIT (NO <sub>x</sub> )			59.8	
AS % OF CAEP/4 LIMIT (NO <sub>x</sub> )			65.5	
AS % OF CAEP/6 LIMIT (NO <sub>x</sub> )			72.0	
AS % OF CAEP/8 LIMIT (NO <sub>x</sub> )			80.8	

## 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 (DATE: - )

## MEASURED DATA

MODE	POWER SETTING (% $F_{00}$ )	TIME (minutes)	FUEL FLOW (kg/s)	HC	CO	NO <sub>x</sub>	SMOKE NUMBER
TAKE-OFF	100	0.7	2.282	0.00	0.51	46.42	3.5
CLIMB OUT	85	2.2	1.877	0.00	0.46	35.57	4.2
APPROACH	30	4.0	0.625	0.00	0.75	13.20	3.6
IDLE	7	26.0	0.237	0.05	8.45	5.47	0.5
LTO TOTAL FUEL (kg) or EMISSIONS (g)			863	17	3395	17262	-
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)				0.1	10.9	55.5	6.0
SIGMA ( $D_p/F_{00}$ in g/kN, or SN)				0.1	2.9	0.9	2.3
RANGE ( $D_p/F_{00}$ in g/kN, or SN)				0-0.1	7.5-14.13	54.68-56.38	3-8.3

## ACCESSORY LOADS

POWER EXTRACTION 0 (kW)  
STAGE BLEED 0 (% CORE FLOW)

AT - POWER SETTINGS  
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 plc  
TEST ORGANIZATION: Rolls-Royce  
TEST LOCATION: Derby  
TEST DATES: 24/09/2009-03/08/2012

NO<sub>x</sub> REGULATION PARAGRAPH

	2.3.2 c) (CAEP/4)
	2.3.2 d) (CAEP/6)
x	2.3.2 e) (CAEP/8)

## REMARKS

1. Representative of Package B engines
2. DNS170301
3. Certification in accordance with Part III, Chapter 2, of Amendment 7 of ICAO Annex 16 Vol. II.
4. NO<sub>x</sub> levels in accordance with Part III, Chapter 2, 2.3.2 e) (CAEP/8)

Compliance with Fuel Venting requirements:

x ('x' if complies, 'PR' if pre-regulation, '-' if information is not available)