



# ICAO ENGINE EXHAUST EMISSIONS DATA SHEET

## SUBSONIC ENGINES

ENGINE IDENTIFICATION: Trent 970-84  
UNIQUE ID NUMBER: 01P18RR103  
COMBUSTOR: Phase5 Tiled  
ENGINE TYPE: TF

BYPASS RATIO: 8.5  
PRESSURE RATIO ( $\pi_{00}$ ): 38.0  
RATED THRUST ( $F_{00}$ ) (kN): 338.7

### REGULATORY DATA

CHARACTERISTIC VALUE:	HC	CO	NO <sub>x</sub>	SMOKE NUMBER
D <sub>p</sub> /F <sub>00</sub> (g/kN) or SN	0.2	18.0	52.6	8.3
AS % OF ORIGINAL LIMIT	1.1	15.3	45.4	49.1
AS % OF CAEP/2 LIMIT (NO <sub>x</sub> )			56.7	
AS % OF CAEP/4 LIMIT (NO <sub>x</sub> )			63.4	
AS % OF CAEP/6 LIMIT (NO <sub>x</sub> )			70.2	
AS % OF CAEP/8 LIMIT (NO <sub>x</sub> )			79.6	

For non-volatile particulate matter (nvPM) emissions, please refer to the ICAO Engine nvPM Emissions Data Sheet.

### 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 (DATE: - )  
- OUT OF SERVICE (DATE: - )

### MEASURED DATA

MODE	POWER SETTING (%F <sub>00</sub> )	TIME (minutes)	FUEL FLOW (kg/s)	HC	CO	NO <sub>x</sub>	SMOKE NUMBER
TAKE-OFF	100	0.7	2.605	0.02	0.32	38.29	6.1
CLIMB OUT	85	2.2	2.157	0.12	0.31	29.42	6.4
APPROACH	30	4.0	0.720	0.08	1.16	12.09	3.0
IDLE	7	26.0	0.255	0.04	13.38	5.44	0.6
LTO TOTAL FUEL (kg) or EMISSIONS (g)			965	65	5650	16826	-
NUMBER OF ENGINES				3	3	3	3
NUMBER OF TESTS				6	6	6	6
AVERAGE D <sub>p</sub> /F <sub>00</sub> (g/kN) or AVERAGE SN (MAX)				0.2	16.7	49.7	7.1
SIGMA (D <sub>p</sub> /F <sub>00</sub> in g/kN, or SN)				0.1	1.8	1.9	2.7
RANGE (D <sub>p</sub> /F <sub>00</sub> in g/kN, or SN)				0.13-0.26	15.2-18.62	47.9-51.66	5.2-9

### ACCESSORY LOADS

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

AT - POWER SETTINGS  
AT - POWER SETTINGS

### ATMOSPHERIC CONDITIONS

BAROMETER (kPa)	99.7-101.9
TEMPERATURE (K)	276.6-286.7
ABS HUMIDITY (kg/kg)	0.00243-0.01133

### FUEL

SPEC	
H/C	1.88
AROM (%)	18.2

MANUFACTURER: Rolls-Royce plc  
TEST ORGANIZATION: Rolls-Royce  
TEST LOCATION: Derby  
TEST DATES: 17/10/2003-26/04/2016

### 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. Data from Certification Report EDNS01000588914 Iss 1
2. Certification in accordance with Part III, Chapter 2, of Amendment 8 of ICAO Annex 16 Vol. II.
3. 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)