



# ICAO ENGINE EXHAUST EMISSIONS DATA SHEET

## SUBSONIC ENGINES

ENGINE IDENTIFICATION: Trent XWB-97  
UNIQUE ID NUMBER: 01P21RR125  
COMBUSTOR: Phase5 Tiled (improved)  
ENGINE TYPE: TF  
BYPASS RATIO: 8.1  
PRESSURE RATIO ( $\pi_{00}$ ): 48.4  
RATED THRUST ( $F_{00}$ ) (kN): 436.7

### REGULATORY DATA

CHARACTERISTIC VALUE:	HC	CO	NO <sub>x</sub>	SMOKE NUMBER
D <sub>p</sub> /F <sub>00</sub> (g/kN) or SN	0.0	9.9	81.3	10.2
AS % OF ORIGINAL LIMIT	0.1	8.4	59.5	64.8
AS % OF CAEP/2 LIMIT (NO <sub>x</sub> )			74.3	
AS % OF CAEP/4 LIMIT (NO <sub>x</sub> )			78.3	
AS % OF CAEP/6 LIMIT (NO <sub>x</sub> )			84.9	
AS % OF CAEP/8 LIMIT (NO <sub>x</sub> )			93.6	

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	TIME	FUEL FLOW	EMISSIONS INDICES (g/kg)			SMOKE NUMBER
	SETTING (%F <sub>oo</sub> )	(minutes)	(kg/s)	HC	CO	NO <sub>x</sub>	
TAKE-OFF	100	0.7	3.498	0.00	0.36	66.05	9.3
CLIMB OUT	85	2.2	2.798	0.00	0.40	48.51	6.9
APPROACH	30	4.0	0.918	0.00	0.82	14.86	6.5
IDLE	7	26.0	0.301	0.01	7.75	5.64	1.3
LTO TOTAL FUEL (kg) or EMISSIONS (g)			1206	5	4016	33540	-
NUMBER OF ENGINES				3	3	3	3
NUMBER OF TESTS				5	5	5	5
AVERAGE D <sub>p</sub> /F <sub>oo</sub> (g/kN) or AVERAGE SN (MAX)				0.0	9.2	76.8	9.3
SIGMA (D <sub>p</sub> /F <sub>oo</sub> in g/kN, or SN)				0.0	1.5	0.9	0.2
RANGE (D <sub>p</sub> /F <sub>oo</sub> in g/kN, or SN)				0-0.03	7.44-10.28	75.77-77.36	9.1-9.5

### ACCESSORY LOADS

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

### ATMOSPHERIC CONDITIONS

BAROMETER (kPa)	98.5-102
TEMPERATURE (K)	282.3-294.1
ABS HUMIDITY (kg/kg)	0.00304-0.00757

### FUEL

SPEC	
H/C	1.95
AROM (%)	15.2

MANUFACTURER: Rolls-Royce plc  
TEST ORGANIZATION: Rolls-Royce  
TEST LOCATION: Derby  
TEST DATES: 10/04/2020-29/04/2020

### 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. Improved Smoke Combustor
2. Data from Certification Report EDNS01000886402
3. Certification in accordance with Part III, Chapter 2, of Amendment 9 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)