



ICAO ENGINE EXHAUST EMISSIONS DATA SHEET

SUBSONIC ENGINES

ENGINE IDENTIFICATION: Trent 1000-M3 BYPASS RATIO: 8.9
UNIQUE ID NUMBER: 01P19RR114 PRESSURE RATIO (π_{co}): 48.7
COMBUSTOR: Phase5 Tiled
ENGINE TYPE: TF RATED THRUST (F_{eo}) (kN): 358.1

REGULATORY DATA ** DATA SUPERSEDED ** SEE FOLLOWING UID FOR REVISED DATA: 02P23RR134

CHARACTERISTIC VALUE:	HC	CO	NO _x	SMOKE NUMBER
D _p /F _{eo} (g/kN) or SN	0.0	8.3	74.1	16.4
AS % OF ORIGINAL LIMIT	0.0	7.1	53.9	98.2
AS % OF CAEP/2 LIMIT (NO _x)			67.4	
AS % OF CAEP/4 LIMIT (NO _x)			71.0	
AS % OF CAEP/6 LIMIT (NO _x)			76.9	
AS % OF CAEP/8 LIMIT (NO _x)			84.6	

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 _{eo})	TIME (minutes)	FUEL FLOW (kg/s)	EMISSIONS INDICES (g/kg)			SMOKE NUMBER
				HC	CO	NO _x	
TAKE-OFF	100	0.7	2.721	0.00	0.43	59.30	7.6
CLIMB OUT	85	2.2	2.222	0.00	0.44	44.55	10.2
APPROACH	30	4.0	0.712	0.00	0.59	14.72	9.4
IDLE	7	26.0	0.260	0.00	6.13	6.61	1.8
LTO TOTAL FUEL (kg) or EMISSIONS (g)			983	0	2760	25036	-
NUMBER OF ENGINES				3	3	3	6
NUMBER OF TESTS				7	7	7	8
AVERAGE D _p /F _{eo} (g/kN) or AVERAGE SN (MAX)				0.0	7.7	69.9	15.3
SIGMA (D _p /F _{eo} in g/kN, or SN)				0.0	1.4	1.3	1.7
RANGE (D _p /F _{eo} in g/kN, or SN)				0.0	6.25-8.96	68.47-70.73	12.1-16.8

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)	275-304.6
ABS HUMIDITY (kg/kg)	0.00308-0.01935

FUEL

SPEC	
H/C	1.91
AROM (%)	17.2

MANUFACTURER: Rolls-Royce plc
TEST ORGANIZATION: Rolls-Royce
TEST LOCATION: Derby
TEST DATES: 07/02/2011-30/11/2017

NO_x 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 EDNS01000615769
2. Certification in accordance with Part III, Chapter 2, of Amendment 8 of ICAO Annex 16 Vol. II.
3. NO_x 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)