



ICAO ENGINE EXHAUST EMISSIONS DATA BANK

SUBSONIC ENGINES

ENGINE IDENTIFICATION: Trent 1000-D2 BYPASS RATIO: 9.2
UNIQUE ID NUMBER: 12RR063 PRESSURE RATIO (π_{oo}): 44.1
ENGINE TYPE: TF RATED OUTPUT (F_{oo}) (kN): 334.7

REGULATORY DATA

CHARACTERISTIC VALUE:	HC	CO	NOx	SMOKE NUMBER
D_p/F_{oo} (g/kN) or SN	0.0	10.0	65.1	6.5
AS % OF ORIGINAL LIMIT	0.2 %	8.5 %	50.8 %	38.2 %
AS % OF CAEP/2 LIMIT (NOx)			63.5 %	
AS % OF CAEP/4 LIMIT (NOx)			68.4 %	
AS % OF CAEP/6 LIMIT (NOx)			74.7 %	
AS % OF CAEP/8 LIMIT (NOx)			83.1 %	

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)
x OUT OF PRODUCTION (DATE: -)
- OUT OF SERVICE

MEASURED DATA

MODE	POWER SETTING (% F_{oo})	TIME minutes	FUEL FLOW kg/s	EMISSIONS INDICES (g/kg)			SMOKE NUMBER
				HC	CO	NOx	
TAKE-OFF	100	0.7	2.503	0	0.5	52.65	3.3
CLIMB OUT	85	2.2	2.053	0	0.48	39.86	3.8
APPROACH	30	4.0	0.666	0	0.67	13.67	3.9
IDLE	7	26.0	0.247	0.03	7.37	5.74	0.5
LTO TOTAL FUEL (kg) or EMISSIONS (g)			922	12	3131	20735	-
NUMBER OF ENGINES				4	4	4	4
NUMBER OF TESTS				8	8	8	8
AVERAGE D_p/F_{oo} (g/kN) or AVERAGE SN (MAX)				0.03	9.36	61.96	5.98
SIGMA (D_p/F_{oo} in g/kN, or SN)				0.04	2.52	0.83	2.26
RANGE (D_p/F_{oo} in g/kN, or SN)				0 - 0.08	6.32 - 12.14	61.13 - 62.91	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 C1 engines
- DNS183412
- 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)