



# ICAO ENGINE EXHAUST EMISSIONS DATA SHEET

## SUBSONIC ENGINES

ENGINE IDENTIFICATION: PW4x52  
UNIQUE ID NUMBER: 1PW054  
COMBUSTOR: Phase 3  
ENGINE TYPE: TF

BYPASS RATIO: 5.0  
PRESSURE RATIO ( $\pi_{co}$ ): 26.3  
RATED THRUST ( $F_{oo}$ ) (kN): 231.3

### REGULATORY DATA

CHARACTERISTIC VALUE:	HC	CO	NO <sub>x</sub>	SMOKE NUMBER
D <sub>p</sub> /F <sub>oo</sub> (g/kN) or SN	12.8	59.2	52.4	9.4
AS % OF ORIGINAL LIMIT	65.2	50.1	56.6	50.0
AS % OF CAEP/2 LIMIT (NO <sub>x</sub> )			70.7	
AS % OF CAEP/4 LIMIT (NO <sub>x</sub> )			85.7	
AS % OF CAEP/6 LIMIT (NO <sub>x</sub> )			97.4	
AS % OF CAEP/8 LIMIT (NO <sub>x</sub> )			116.6	

### 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 (DATE: - )

### MEASURED DATA

MODE	POWER SETTING (%F <sub>oo</sub> )	TIME (minutes)	FUEL FLOW (kg/s)	HC	CO	NO <sub>x</sub>	SMOKE NUMBER
TAKE-OFF	100	0.7	2.127	0.08	0.52	27.02	7.3
CLIMB OUT	85	2.2	1.757	0.10	0.60	22.54	4.9
APPROACH	30	4.0	0.600	0.17	2.15	11.41	0.5
IDLE	7	26.0	0.198	6.02	34.54	3.77	0.0
LTO TOTAL FUEL (kg) or EMISSIONS (g)			774	1914	11164	10449	-
NUMBER OF ENGINES				1	1	1	1
NUMBER OF TESTS				3	3	3	3
AVERAGE D <sub>p</sub> /F <sub>oo</sub> (g/kN) or AVERAGE SN (MAX)				8.3	48.2	45.2	7.3
SIGMA (D <sub>p</sub> /F <sub>oo</sub> in g/kN, or SN)							
RANGE (D <sub>p</sub> /F <sub>oo</sub> in g/kN, or SN)							

### ACCESSORY LOADS

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

AT - POWER SETTINGS  
AT - POWER SETTINGS

### ATMOSPHERIC CONDITIONS

BAROMETER (kPa)	102
TEMPERATURE (K)	270
ABS HUMIDITY (kg/kg)	0.0015

### FUEL

SPEC	Jet A
H/C	1.91
AROM (%)	21

MANUFACTURER: Pratt & Whitney  
TEST ORGANIZATION: Pratt & Whitney  
TEST LOCATION: Middletown, CT  
TEST DATES: 15/01/1993-19/01/1993

### NO<sub>x</sub> REGULATION PARAGRAPH

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

### REMARKS

1. Data from X693-20 with Phase 3 reduced pressure loss combustor

Compliance with Fuel Venting requirements:

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