DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

E-307
Revision 15
Rolls-Royce, Ltd.
Avon
522
524B
525B
526
527
531
532R-B
533R
533R-11A

April 6, 2011

NOTE 11. This type certificate is cancelled effective April 6, 2011 and is not valid for aircraft manufactured after this date. This cancellation also invalidates, and precludes issuance of, any U.S. Certificates of Airworthiness.

TYPE CERTIFICATE DATA SHEET NO. E-307-14

Engine of models described herein conforming with this data sheet (which is part of Type Certificate No. E-307) and other approved data on file with the Federal Aviation Administration meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Federal Aviation Regulations provided they are installed, operated, and maintained as prescribed by the approved manufacturer's manuals and other approved instructions.

Manufacturer:	Rolls-Royce, Ltd. Derby, England				
Model Avon	**522**	**524B**	**525B**	**526**	**527**
Type Turbojet	16 stage axial compressor	- -	- -	- -	- -
	3 stage turbine	- -	- -	- -	- -
	Turbo-annular combustion with eight flame tubes	- -	- -	- -	- -
Ratings					
Max. continuous static thrust, lb., and rpm at sea level	9125 at 7650	8765 at 7600	- -	9125 at 7650	9500 at 7750
Takeoff (5 min.) static thrust, lb., and rpm at sea level	10500 at 8050	10250 at 8050	- -	10500 at 8050	11400 at 8050
Max. reverse thrust (1 min.), rpm	—	8050	- -	—	—
Fuel Control	Lucas RTC 32/33AJ control with Lucas pump GDS 2/2B	Lucas RTC 25/26AJ control with Lucas pump GDS 1/1A	- -	Lucas RTC 32/33AJ control with Lucas pump pump GDS 2/28	Lucas RTC 102 control with Lucas GDS 6/28
Fuel	See NOTE 9	- -	- -	- -	- -
Oil	See NOTE 10	- -	- -	- -	- -

Principal Dimensions	**522**	**524B**	**525B**	**526**	**527**
Length, in. (from front of nose cone to rear of exhaust unit)	125.975	- -	- -	- -	- -
Diameter, in. (max.) (see installation dwg.	47.5 (approx.)	- -	- -	- -	- -
C.G. location, in: Rearward of front suspension C/L	21.8	21.5	- -	21.8	22.0
Weight (dry (including fuel system oil tank, igniters, bleed valves and fittings) lb.	3328	3343	3383	3328	3347
Ignition Systems	Igniters LR.103 or LR.741 and high energy boxes BTH C10/TS/3 or Rotax NB.25/2	Igniters LR.103 or LR.741 and high energy igniter boxes BTH C10/TS/3 or Champion FHE176 (Rolls-Royce P/N CR103)	- - NB.25/2	Igniters LR.103 or LR.741 and high energy boxes BTH C10/TS/3 or Rotax NB.25/2; or	Igniters LR.103 or LR.741 and high energy boxes BTH C10/TS/3 or Rotax Champion FHE176 (Rolls-Royce P/N CR103)
NOTES	1 to 10	- -	- -	- -	- -

Model	**Avon**	**531**	**532R-B**	**533R**	**533R-11A**
Type	Turbojet	17 stage axial compressor	- -	- -	- -
		3 stage turbine	- -	- -	- -
		Turbo-annular combustion with eight flame tubes	- -	- -	- -
Ratings					
Max. continuous static thrust, lb., and rpm at sea level		10820 at 7900	10710 at 7950	- -	11070 at 7900
Takeoff (5 min.) static thrust, lb., and rpm at sea level		12200 at 8050	12080 at 8050	12600 at 8150	13000 at 8150
Max. reverse thrust (1 min.), rpm		—	8150	- -	- -
Fuel Control		Lucas RTC 102 control with Lucas pump GDS 6/2B	Lucas RTC 121 control with Lucas pump GDS 102	- -	- -
Fuel		See NOTE 9	- -	- -	- -
Oil		See NOTE 10	- -	- -	- -
Principal Dimensions:					
Length, in. (from front of nose cone to rear of exhaust unit)		134.000	- -	- -	- -
Diameter, in. (max.) (See installation dwg.)		47.5 (approx.)	- -	- -	- -
C.G. location, in: Rearward of front suspension C/L		19.4	19.25	- -	- -
Weight (dry) (including fuel system oil tank, ingniters, bleed valves, and fitting), lb.		3488	3478	- -	- -

	531	532R-B	533R	533R-11A
Ignition System	Igniters LR.103 with high energy C10/TS/3 or Rotax NB.25/2 or Champion FHE176 (Rolls-Royce P/N CR103)	Igniters LR.103C with high energy boxes BTH C10/TS/3 or Rotax NB.25/2 or Champion FHE 176 (Rolls Royce P/N CR103)	- -	- -
NOTES	1 to 10	- -	- -	- -

"- -" indicates "same as previous model"
"—" indicates "not applicable"

Certification Basis CAR 10, Engine Type Certificate No. 307 issued September 17, 1958.
Date of Application for Type Certificate - March 5, 1956.

Import Requirements Each individually imported engine must be accompanied by a Rolls-Royce, Ltd./CAA approved "Inspection and Test Certificate" signed by a person authorized by the CAA and containing the following statement: "The engine covered by this certificate conforms to Type Certificate E-307 and is in condition for safe operation and has been subjected by the manufacturer to a final operational check."

NOTE 1. Maximum permissible temperatures:

	522, 526	524B, 525B	527	531
Turbine gas temperatures:				
Takeoff	1157°F (625)	- -	1247°F (675°C)	1220°F (670°C)
Maximum continuous	1067°F (575°C)	1058°F (570°C)	1076°F (580°C)	1103°F (595°C)
Maximum transient starts	1292°F (700°C)	- -	- -	- -
Maximum reverse	—	1157°F (625°C)	—	—
Oil inlet temperature:	-40°F to + 103°F (-40°C to +95°C)	- -	- -	- -
Maximum 15 min.	212°F (100°C)	- -	- -	- -
Maximum fuel temperature	149°F (65°C)	- -	- -	- -

	532R-B	533R	533R-11A
Turbine gas temperatures:			
Takeoff	1238°F (670°C)	1283°F (695°C	1292°F (700°C)
Maximum continuous	1103°F (595°C)	- -	- -
Maximum transient starts	1292°F (700°C)	- -	- -
Maximum reverse	—	—	—
Oil inlet temperature:	-40°F to +203°F (-40°C to +95°C)	- -	- -
Maximum 15 min.	212°F (100°C)	- -	- -
Maximum fuel temperature	149°F (65°C)	- -	- -

(Actual operating exhaust gas temperatures will vary to meet environmental operating conditions in accordance with the manufacturer's approved instructions.)

NOTE 2. Fuel and oil pressure limits:

Fuel supply at engine inlet: In accordance with HK 23372 iss. 5.

Oil pressure: All models - 30 to 45 p.s.i.g. with 20 p.s.i.g. minimum in flight.

NOTE 3. The ratings are based on standard conditions with no air bleed or accessory power drive, 60°F and 29.92" Hg. pw/po = .01 and with turbine outlet gas temperature within limits. Engine to be fitted as follows:

	522, 526	**524B, 525B**	**527**	**531**	**532R-B**	**533R**	**533R-11A**
Intake Flare	J 58900	- -	- -	J 86958	J58900	J 86958	- -
Jet Pipe	J 68956	- -	- -	- -	- -	- -	- -
Final Nozzle	J 68973-L	J 69873-G	J 84355	J 84355-A	- -	J 84355-B	J 84355-C
Equiv. Diams. (in.)	21.15	21.285	20.65/21.15	21.165/21.68	- -	21.08/21.68	20.93/21.535

The thrusts quoted for the 532R-B, 533R, and 533R-11A are for the engine and thrust reverser combination.

NOTE 4. The following accessory drive provisions are incorporated:

Drive	Type	Rotation (1)	Speed Ratio to Turbine	(2) Cont. Torque (lb.-in.)	(3) Inst. Torque (lb.-in.)	Weak Link, Eng. or Access.	Maximum Overhang (in.-lb.)
a) **Avon 524B, 535B**							
Elec. Starter	Rotax C6811	C	6	264	816	ACC	56 x 6 = 336
Alternator (4)	BTH LA.3016	C	1.3099	138.5 Max 369.0 Idling	2388	ENG	Not overhung (80 x 8 = 640)
Governor Pump	Plessey GP .078C	C	.58	33	330	ACC	3.5 x 1.5 = 5.25
Fuel Pump	Lucas GDS.1/1A	CC	.454	476	(5)	ENG	43.5 x 5.5 = 240
Hyd. Pump	Lockheed MK.9 TF	CC	.4935	144	384	ENG	8 x 2.4 = 19.2
Hyd. Pump (6)	MK.8 TF	CC	.4935	288	768	ENG	16 x 3.5 = 56
Synch Alt.	Rotol S.N.A.11	CC	.681	3.7 Max	389	ENG	4.8 x 2.25 = 11
Tachometer	Smiths RN.106.KP	CC	.5013	0.25	450	ENG	2.8 x 2 = 5.6
b) **Avon 522, 526, 527, 531, 532R-B, 533R, 533R-11A**							
Gearbox Drive	Rotol GD.9/85	C	.6 966	655 Max 909 Idling	3852	ENG	
Elec. Starter	Rotax C.6811	C	6	264	816	ACC	56 x 6 = 336
Alternator (4)	Auxilee	C	1.3099	159 Max. 308 Idling	1289	ENG	Not overhung (46 x 7.5 = 345)
Governor Pump	Plessey GP .073C	C	.58	33	330	ACC	3.5 x 1.5 = 5.25
Fuel Pump	Lucas GDS.2/2B	CC	.454	476	310	ENG	38.25 x 5.5 = 205
	GDS-102 GDS 6/2B	CC	.454	476	310	ENG	42.25 x 5.5 = 233
Synch Alt.	Rotol S.N.A.11	C	.6729	1.5	220	ENG	4.8 x 2.25 = 11
Tachometer	Laegar 545/681	C	.5018	0.25	450	ENG	2.75 x 2 = 5.5

(1) "C" - Clockwise, "CC" - Counterclockwise: facing drive.
(2) Continuos torque values are based on takeoff power at sea level.
(3) Max. Instantaneous torque of weak link without permanent set.
(4) Supported by independent mounting.
(5) 2550 (when MK. 9 = hyd. pump shear neck fails).
2000 (when MK. 8 = hyd. pump shear neck fails).
(6) Alternatives. Two each per aircraft.

NOTE 5. The maximum air blend for aircraft services at maximum continuous r.p.m. is 6% of the no-bleed engine mass flow for 524B and 525B; 9% of the no-bleed mass flow for 522, 526, and 527; 10% of the no-bleed mass flow for 531, 532R-B, 533R, and 533R-11A.

NOTE 6. This engine meets FAA requirements for icing protection, for adequate turbine disk integrity, for rotor blade containment, and does not require external armoring.

NOTE 7. Maximum overspeed limits for 20 seconds are: 8300 r.p.m. for 522, 524B, and 525B; 8350 r.p.m. for 526 and 531; 8400 r.p.m. for 527 and 533R-11A; and 8450 r.p.m. for 532R-B and 533R. If these limits are exceeded, the engine shall be overhauled.

NOTE 8. The maximum permissible engine speed for takeoff when operating above sea level or with high ambient air temperature is 8100 r.p.m. for the 526 and 8150 r.p.m. for the 532R-B. For the 533R and 533R-11A, the maximum r.p.m. is 8150 under all conditions. For all other models, the maximum r.p.m. is 8050.

NOTE 9. The following fuels and additives are eligible for these engines: (Fuels shall conform to the specifications as listed or to subsequent revisions thereof.)

Aviation Kerosene Specifications
- British D Eng. R.D. 2453, 2494, 2498
- Canadian 3-GP-23C Type I
- American MIL-J-5624E Type JP-5
  - A.S.T.M. D.1655-59T Type A or Type A-1
  - United Airlines UA-1
- I.A.T.A. Kerosene Type Fuel

Aviation Wide-Cut Specifications
- British D Eng. R.D. 2486, 2454
- Canadian 3-GP-22C Type II
- American MIL-J-5624F Grade JP-4
  - A.S.T.M. D.1655-59T Type B
- I.A.T.A. Wide-cut fuel

ASTM emergency fuel Specification ES2-74 is alternative specification for use on an exception basis where local fuel supplies so dictate.

"TOLAD 245" corrosion inhibitor additive up to a concentration not exceeding 12 pounds per 35,000 imperial gallons.

NOTE 10. The following oils are eligible for these engines: (11.5 U.S. pints integral oil tank)

Esso/Exxon Turbo Oil 2380
Aeroshell Turbine Oil 390
Aeroshell Turbine Oil 750
Texaco TSATO 15
Castrol 98 Turbine Oil
Castrol 3C Oil
Castrol 325 Oil
Turbonycoil 13B
Mobil Jet Oil II
Chevron Jet Engine Oil 5
Caltex RPM Jet Engine Oil 5

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