Engines of models described herein conforming with this data sheet (which is part of Type Certificate Number E39NE) 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.

**TYPE CERTIFICATE (TC) HOLDER:** Rolls-Royce plc  
Derby, England

### I. MODELS

<table>
<thead>
<tr>
<th>TYPE</th>
<th>RB211 Trent 768-60</th>
<th>RB211 Trent 772-60</th>
<th>RB211 Trent 772B-60</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RATINGS (See NOTE 1)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum continuous</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thrust pounds at sea level static</td>
<td>60410(2)</td>
<td>63560(4)</td>
<td>63560(4)</td>
</tr>
<tr>
<td>Takeoff (5 minutes)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thrust pounds at sea level static</td>
<td>67500(1)</td>
<td>71100(3)</td>
<td>71100(5)(6)</td>
</tr>
<tr>
<td>Equivalent bare engine thrust</td>
<td>68400</td>
<td>72000</td>
<td>72000</td>
</tr>
<tr>
<td>(1) Flat rated to ISA + 15°C for all altitudes.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) ISA + 15°C up to 20,000 feet varying linearly to ISA +10°C at 25,000 feet ISA + 10°C above 25,000 feet.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3) ISA + 15°C up to 8,000 feet varying linearly to ISA + 10°C at 10,000 feet ISA + 10°C above 10,000 feet.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(4) ISA + 15°C up to 5,000 feet varying linearly to ISA + 10°C at 10,000 feet ISA + 10°C above 10,000 feet.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(5) ISA + 22°C up to 2,000 feet varying linearly to ISA + 15°C at 5,000 feet ISA + 15°C up to 8,000 feet varying linearly to ISA + 10°C at 10,000 feet ISA 10°C above 10,000 feet.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(6) The Trent 772B-60 has the same ratings as the 772-60 except between 2,000 ft and 8,000 ft altitude or when the ambient temperature is greater than ISA +15°C, where the 772B-60 produces increased thrust at takeoff ratings. The magnitude of this increase varies with altitude and ambient temperature and is limited to a maximum of 5.4%.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**LEGEND:** "- - " INDICATES "SAME AS PRECEDING MODEL"

"---" NOT APPLICABLE

**NOTE:** SIGNIFICANT CHANGES IF ANY, ARE BLACK-LINED IN THE LEFT MARGIN.
## I. MODELS

<table>
<thead>
<tr>
<th>PRINCIPAL DIMENSIONS, inches</th>
<th>RB211 Trent 768-60</th>
<th>RB211 Trent 772-60</th>
<th>RB211 Trent 772B-60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>222</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>From front fan case flange to rear of CNA</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Radius, maximum</td>
<td>54</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CENTER OF GRAVITY - complete powerplant</th>
<th>RB211 Trent 768-60</th>
<th>RB211 Trent 772-60</th>
<th>RB211 Trent 772B-60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aft from powerplant station 100</td>
<td>28.2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Below centerline</td>
<td>1.4</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Stbd. from engine centerline</td>
<td>0.1</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CENTER OF GRAVITY - basic engine</th>
<th>RB211 Trent 768-60</th>
<th>RB211 Trent 772-60</th>
<th>RB211 Trent 772B-60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aft from powerplant station 100</td>
<td>25.4</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Below centerline</td>
<td>1.6</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Stbd. from engine centerline</td>
<td>0.2</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WEIGHT</th>
<th>RB211 Trent 768-60</th>
<th>RB211 Trent 772-60</th>
<th>RB211 Trent 772B-60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Powerplant</td>
<td>14368</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Basic Engine</td>
<td>11023</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Basic engine is the dry powerplant less nacelle, intake, cowl doors, CNA and thrust reverser.

### FUELS

**APPROVED FUELS**

See relevant Engine Operating Instructions for approved fuels.

### OILS

**APPROVED OILS**

See relevant Engine Operating Instructions for approved oils.

**OIL CONSUMPTION**

1.42 U.S. pints/hour overall inflight maximum for unrestricted operation.

**OIL CAPACITY**

- Nominal total system capacity: 93.9 U.S. pints
- Nominal oil tank capacity: 49.2 U.S. pints
- Minimum useable oil (including effect of attitude): 32.5 U.S. pints

### COMPONENTS

**ELECTRONIC FULL AUTHORITY FUEL CONTROL**

- Fuel control: Lucas EEC 2000-03AB1
- Fuel pump: Argotech 721400
- Fuel metering unit: Lucas FMU 700 MK1

**IGNITION SYSTEM**

- Ignition system plugs: Champion CH34691
- Ignition system units: Simmonds 430081

**EQUIPMENT**

For identification of equipment approved for use on these engines, refer to Chapter 1 of appropriate Rolls-Royce Drawing Introduction Sheet (DIS).
CERTIFICATION BASIS

FAR 21.29 and FAR 33 effective February 1, 1965, as amended by FAR 33-1 through 33-15. Pursuant to FAR 21.29(a)(1)(ii), the Type Certificate was issued in validation of the British Civil Aviation Authority Certification Standards JAR-E change 8 plus OP E/91/1 which was found to provide a level of safety equivalent to that provided by FAR 33, Amendment 33-15.

<table>
<thead>
<tr>
<th>MODEL</th>
<th>APPLICATION</th>
<th>ISSUED/REVISED</th>
</tr>
</thead>
<tbody>
<tr>
<td>RB211 TREN 768-60</td>
<td>FEB 12 1992</td>
<td>NOV 1, 1994</td>
</tr>
<tr>
<td>RB211 TREN 772-60</td>
<td>FEB 12 1992</td>
<td>NOV 1, 1994</td>
</tr>
<tr>
<td>RB211 TREN 772B-60</td>
<td>MAR 2, 1998</td>
<td>OCT 9, 1998</td>
</tr>
</tbody>
</table>

The aviation authority for the United Kingdom, the UK Civil Aviation Authority (CAA), originally type certificated this engine. The FAA validated this product under U.S. Type Certificate Number E39NE. Effective September 28, 2003, the European Aviation Safety Agency (EASA) began oversight of this product on behalf of the UK.

IMPORT REQUIREMENTS

To be considered eligible for installation on U.S. registered aircraft, each new engine to be exported to the United States with UK CAA or EASA airworthiness approval shall have a Joint Aviation Authorities (JAA) or EASA Form 1, Authorized Release Certificate. The JAA or EASA Form 1 should state that the engine conforms to the type design approved under the U.S. Type Certificate E39NE, is in a condition for safe operation and has undergone a final operational check.

Additional guidance is contained in FAA Advisory Circular 21-23, "Airworthiness Certification of Civil Aircraft, Engines, Propellers, and Related Products Imported into the United States."

NOTES

Notes 1 through 19, which follow.

NOTE 1.

The engine ratings are based on static test stand operation under the following A & B conditions:

A. 
(1) Compressor inlet air at 59°F and 29.92 Hg.
(2) No aircraft accessory loads or optional air extraction.
(3) 100% air intake recovery corrected from the datum air intake system defined by drawing ATF12161 or approved alternatives.
(4) Engine exhaust system defined by Common Nozzle Assembly (CNA) FK16544 and Jet Pipe FK 16545 and Tail Plug FK 16507.
(5) Turbine gas temperature and rotor speed limitations are not exceeded.

B. Equivalent Bare Engine Thrust (LBF)
The equivalent bare thrust (lbf) is rated thrust excluding the losses of propulsion fan duct and thrust reverser and jet pipe washed by the fan stream.
NOTE 2. MAXIMUM PERMISSIBLE ENGINE ROTOR SPEEDS (%)

100% HP = 10,611 RPM
100% IP = 7,000 RPM
100% LP = 3,900 RPM

Maximum takeoff (5 minutes) (See NOTES 18, 19 and 20)
HP 100.0
IP 103.3
LP 99.0

Maximum overspeed (20 seconds)
HP 100.0
IP 103.3
LP 99.0

Maximum reverse thrust (30 seconds)
LP 80.8

NOTE 3. MAXIMUM PERMISSIBLE TEMPERATURES

TURBINE GAS TEMPERATURE (TGT) °C

Starting
Below 50% N3 (ground starting) 700 Momentary max. during start or relight
Below 50% N3 (inflight starting) 850
Above 50% N3 850
Takeoff (5 minutes) 900 May be used up to 10 minutes in the event of one engine failure.

Maximum continuous (unrestricted) 850
Overtemperature (20 seconds) 920

Fuel
Maximum temperature at outlet from HP fuel pump (°C)
Unrestricted 120
Max. during transient overshoots on reducing rpm (15 min. limit) 140

Oil
Combined scavenge temperature (°C)
Minimum for starting -40
Minimum for opening up 20
Maximum for unrestricted use 190

NOTE 4. FUEL AND OIL PRESSURE LIMITS

Fuel
MINIMUM FUEL PRESSURE
Between sea-level and 41,000 feet, not less than 5 psig plus true fuel vapor pressure, measured at inlet to engine LP fuel pump.

Oil
Minimum acceptance for flight
Ground idle to 70% HP rpm 35 psig
Above 95% HP rpm 60 psig
Minimum to complete flight
Ground idle and 70% HP rpm 24 psig
Above 95% HP rpm 50 psig
NOTE 5. MAXIMUM PERMISSIBLE COMPRESSOR AIR BLEEDS

Air delivery for aircraft services, excluding powerplant anti-icing. The air is automatically scheduled from the engine IP stage 8 and HP stage 6 compressor bleed ports via two valves in the aircraft ducting which select the appropriate supply in response to signals sensing HP compressor delivery pressure (P30), IP compressor delivery pressure (P25) and altitude together with a synthesized HP compressor delivery temperature (T30Syn).

With valve controller ABG SEMCA DRG 6764A010000 the switchover from the HP to the IP compressor delivery port occurs at engine power settings where the following conditions are met:
(a) T30Syn is greater than 450°C ± 2.5°C and P30 is greater than 75 psi ± 2.5 ambient pressure or
(b) Altitude is greater than 26,000 ft ± 250 and P30 is greater than 85 psi ± 2.5 ambient pressure or
(c) P25 is greater than 40 psi ± 4.0 ambient pressure.

Maximum HP6 bleed, (% of gas generator compressor flow); This bleed decreases linearly between the values listed below for the low idle and switchover points.

1. Normal operation:
   i. Low Idle 11.6
   ii. At switchover point (1.26 EPR) 5.2

2. Abnormal (one engine inoperative):
   i. Low Idle 12.7
   ii. At switchover point (1.26 EPR) 5.8

Maximum IP8 bleed (5 of gas generator compressor flow); This bleed (IP8) decreases linearly between the values listed below for the switchover and maximum continuous points.

1. Normal operation:
   i. At switchover point 4.5
   ii. Max. continuous 3.1
   iii. Above max. continuous 2.4

2. Abnormal (one engine inoperative):
   i. At switchover point 5.3
   ii. Max. continuous 4.0
   iii. Above max. continuous 2.9

Maximum LP bleed (% of fan flow)

1. Normal & Abnormal (one engine inoperative):
   i. From low idle to max. continuous 1.23
   ii. Above max. continuous 0.96

Maximum HP8 bleed for powerplant anti-icing (% of HPC inlet flow); This bleed decreases linearly between the values listed below for the 1450K TET and max. continuous points.

1. Normal & Abnormal (one engine inoperative):
   i. From low idle to 1450K TET 0.75
   ii. Max. continuous 0.69
   iii. Above max. continuous 0.44
NOTE 6. SHAFT POWER EXTRACTION LIMITATIONS

Accessory drive provisions (continuous power as listed may be extracted under all engine operating conditions)

<table>
<thead>
<tr>
<th>MODELS</th>
<th>DRIVE</th>
<th>ROTATION (AS VIEWED)</th>
<th>SPEED RATIO TO HP ROTOR SPEED</th>
<th>TORQUE (lb - in)</th>
<th>MAXIMUM INSTANTANEOUS OVERHANG (IN - LB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL MODELS</td>
<td>STARTER</td>
<td>CW</td>
<td>1.00057</td>
<td>SEE BELOW</td>
<td>2956</td>
</tr>
<tr>
<td></td>
<td>IDG</td>
<td>CW</td>
<td>0.855</td>
<td>SEE BELOW</td>
<td>2956</td>
</tr>
<tr>
<td></td>
<td>HYDRAULIC PUMPS</td>
<td>CW</td>
<td>0.4002</td>
<td>1500</td>
<td>1730</td>
</tr>
<tr>
<td></td>
<td>Front pump</td>
<td>CW</td>
<td>0.3919</td>
<td>1500</td>
<td>1730</td>
</tr>
<tr>
<td></td>
<td>Rear pump</td>
<td>CW</td>
<td>1.00057</td>
<td>SEE BELOW</td>
<td>2956</td>
</tr>
</tbody>
</table>

CW = CLOCKWISE  
CCW = COUNTERCLOCKWISE

Max starter torque varies with air temperature as follows:

<table>
<thead>
<tr>
<th>Air temperature (°C)</th>
<th>Max torque (lb - in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>7440</td>
</tr>
<tr>
<td>-20</td>
<td>8640</td>
</tr>
<tr>
<td>-40</td>
<td>10800</td>
</tr>
</tbody>
</table>

NOTE 7. Power settings, power check, and control of the engine output is to be based on Rolls-Royce (RR) engine charts included in RR Operating Instructions referring to engine pressure ratio (EPR). Pressure probes are included in the engine for this purpose.

NOTE 8. Life limited parts are identified in the Engine Manual.

NOTE 9. This engine approval includes bare engine plus thrust reverser, engine mounting feet and links, core engine cowlings, and engine accessories, coolers, filters, harness, and instrumentation transmitters as defined in the appropriate RR DIS. Hydraulic pumps and IDG are aircraft supply.

NOTE 10. RB211 series manuals under CAA requirements accepted as equivalent to FAR 33.4 and FAR 33.5 requirements are:

<table>
<thead>
<tr>
<th>MODEL RB211-</th>
<th>OPERATING INSTRUCTIONS</th>
<th>MAINTENANCE MANUAL</th>
<th>INSTALLATION MANUAL</th>
<th>ENGINE MANUAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRENT 768-60</td>
<td>F-TRENT-A330</td>
<td>M-TRENT-A330</td>
<td>EL 2837</td>
<td>E-TRENT-IRR</td>
</tr>
<tr>
<td>TRENT 772-60</td>
<td>F-TRENT-A330</td>
<td>M-TRENT-A330</td>
<td>EL 2837</td>
<td>E-TRENT-IRR</td>
</tr>
<tr>
<td>TRENT 772B-60</td>
<td>F-TRENT-A330</td>
<td>M-TRENT-A330</td>
<td>EL 2837</td>
<td>E-TRENT-IRR</td>
</tr>
</tbody>
</table>

Each of the documents listed below must state that it is approved by the European Aviation Safety Agency (EASA) or, for approvals made before September 28, 2003 by the United Kingdom Civil Aviation Authority. Any such documents including those approved under a delegated authority, are accepted by the FAA and are considered FAA approved.

- Service bulletins,
- Structural repair manuals,
- Vendor manuals,
- Aircraft flight manuals, and
- Overhaul and maintenance manuals.
- Technical Variances

These approvals pertain to the type design only.
NOTE 11. These engines meet the smoke and gaseous emission requirements of Part 34.

NOTE 12. The engine is fitted with a Digital Electronic Engine Fuel Control system in which the software meets the "critical" standard of RTCA DO-178A/ED12A.

NOTE 13. In icing conditions, the engine may be operated satisfactorily at LP rotor speeds (N1) down to low idle. Minimum corresponding N1 at low idle for these engines is 21.4 percent.

NOTE 14. These engines are fitted with an independent IP and LP spool overspeed governor. Dispatch with this item unserviceable is not permitted.

NOTE 15. These engines satisfy the certification base as defined in this Data Sheet when operating with the FADEC in reversionary control mode.

NOTE 16. VARIANTS

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RB211 Trent 768-60</td>
<td>Basic model.</td>
</tr>
<tr>
<td>RB211 Trent 772-60</td>
<td>Same as basic model except for increased thrust rating.</td>
</tr>
<tr>
<td>RB211 Trent 772B-60</td>
<td>Same as 772-60 model except for increased takeoff thrust ratings at altitude between 2,000 feet and 8,000 feet.</td>
</tr>
</tbody>
</table>

NOTE 17. The RB211 Trent 700 series engines have been approved to operate with certain faults present in the control system, based on satisfaction of FAR 33 requirements and appropriate FAR 25 control system reliability requirements.

The following criteria exist as dispatch and maintenance requirements for the engine control system.

<table>
<thead>
<tr>
<th>Fault Class 1 Level A:</th>
<th>No dispatch allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fault Class 1 Level B:</td>
<td>Dispatchable; maximum operating interval for Fault Class 1 level B fault(s) is 150 operating hours</td>
</tr>
<tr>
<td>Fault Class 2:</td>
<td>Dispatchable; maximum operating interval for Fault Class 2 fault(s) is 500 operating hours</td>
</tr>
</tbody>
</table>

Fault levels Class 1 and 2 constitute Rolls-Royce nomenclature. The airframe manufacturers may use different nomenclature in adapting these fault categories to the aircraft maintenance and display systems; however, the maximum operating intervals are restricted as shown above.

NOTE 18. The take-off rating and its associated operating limitations may be used for up to 10 minutes in the event of engine out contingency, but their use is otherwise limited to no more than 5 minutes.

NOTE 19. Post modification 73-C780, the maximum Take-off speeds for the LP and HP shafts are increased to 99.5% and 100.7% respectively. The speed signals transmitted to the aircraft, however, are trimmed in order to maintain the same cockpit indicated Maximum Take-off speeds as the pre-modification standard, i.e., 99.0% and 100.0%.

NOTE 20. Post modification 73-E502 for the data entry plug for the selection of increased HP redline speed, the maximum take-off speed for the HP shaft is increased to 101.7%. However the speed signal transmitted to the aircraft is trimmed to maintain the same cockpit indication as the pre mod standard i.e. 100.0%.

---END---