



TRENT 900 FACT FILE

Market position:

Trent 900

Selected by five out of eight operators who have so far made engine decisions

Singapore Airlines (10 firm + 15 options)
Qantas (12 firm)
Virgin Atlantic (6 firm + 6 options)
Lufthansa (15 firm + 10 options)
Malaysia Airlines (6 firm)

Total: 80 aircraft (320 installed engines)

Market share: 50% (firm and option)

Trent 900 development and technical background:

Leading engine development programme on the A380 and launch engine for the aircraft (entry into service with Singapore Airlines, Spring 2006)

First run, on schedule, March 2003

Engine certification, on schedule, October 2004

Successfully completed 60-hour flight test programme on A340-300 flying test bed, August 2004, on schedule

Will power maiden flight of A380, Spring 2005

Cleared for 80,000lb thrust at certification, allowing margin for growth. Thrust required at entry into service is 70,000lb

Lightest, cleanest and quietest engine on A380. Lowest emissions of any large turbofan engine, measured per pound of thrust

New technology features include “swept” titanium fan blades (lower noise, improved aerodynamics) and counter-rotating HP system (“straightens” air flow, improves efficiency)

Its 116 inch diameter fan makes the Trent 900 physically the largest engine ever built by Rolls-Royce

Trent 900 risk and revenue sharing partners:

Industria de Turbo Propulsores (ITP), Hamilton Sundstrand, Avio, Marubeni, Volvo Aero, Goodrich and Honeywell.

Samsung Techwin, Kawasaki Heavy Industries (KHI) and Ishikawajima-Harima Heavy Industries (IHI) are programme associates.

Trent 900 specifications:

Thrust 70,000 – 76,500lb (Certificated to 80,000lb)

Overall pressure ratio 37:1 – 39:1

Bypass ratio 8.7:1 – 8.5:1

Inlet mass flow 2,655 - 2,745lb/sec

Fan diameter 116 inches

Length 179 inches

Weight 14,190lb

Stages:

- Fan
- 8-stage intermediate pressure compressor (IPC)
- 6-stage high pressure compressor (HPC)
- Annular combustor
- Single-stage high pressure turbine (HPT)
- Single-stage intermediate pressure turbine (IPT)
- 5-stage low pressure turbine (LPT)

Family background:

Trent 900 incorporates the successful and unique three-shaft design established by the RB211 series and continued by earlier Trent variants

Fourth version of the Trent series to enter service – all market leaders

Trent 700 (39%) Trent 800 (43%) Trent 500 (100%)

Firm and option orders placed for over 1,900 Trents by nearly 50 customers

Trent 900 will draw on the experience of 20 million total Trent flying hours by service entry

And, not a lot of people know that....

At take-off, the A380's four Trent 900s will deliver thrust equivalent to the power of more than 3,500 family cars

The engine's hollow, titanium fan blades are almost 10 feet across and suck in over 1.25 tons of air every second. By the time the air leaves the nozzle at the back of the engine it has been accelerated to a speed of nearly 1,000 miles per hour (1,600 kph)

Temperatures in the engine core are half those on the surface of the sun

Air passing through the engine is squeezed to more than 700lb per square inch – over 50 times normal pressure at sea level

The blades in the engine's high pressure system rotate at 12,500 rpm, with tip speeds reaching 1,200 miles per hour (2,000 kph)

At take-off, each of the 70 high pressure turbine blades in a Trent 900 produces over 800hp....more power than a Formula One racing car

The 116 inch fan operates at nearly 3,000rpm with tip speeds 1.5 times the speed of sound

A Trent 900 has around 20,000 individual components