

## Delivering...

The Rolls-Royce Trent 1000 is the best engine for the Boeing 787 Dreamliner, delivering the lowest fuel burn, lowest emissions and the lowest noise.

It has been certified to the full 74,000lb thrust required for the 787.



It has been demonstrated through extensive engine testing.



It has been proven through extensive flight testing.



## ...less noise

Quietest experience for passengers and communities.

A Trent 1000 powered Boeing 787, at full power take-off, is 3dB quieter than the previous generation aircraft, despite being a third heavier.

A 3dB noise reduction is equivalent to halving the noise footprint.

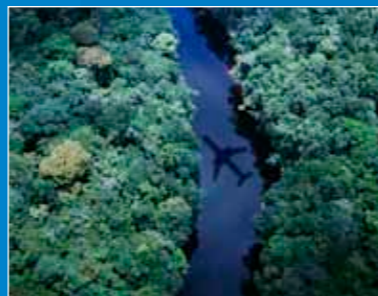


## ...benefits for everyone

Trent 1000 helps to make the Boeing 787 20 per cent more fuel efficient than the 767 it replaces.

The Trent 1000 powered Boeing 787 uses the same amount of fuel to take each passenger on a given journey as a modern car, but travels 10 times faster.

As the only engine cleared for 330 minute extended operations and with over two-thirds of all flight experience on the 787 – there are no surprises with the Trent 1000, allowing you to get away on time, every time.



## Delivering...

Cold weather testing ensures the engine can start even when its temperature is -40 degrees Celsius.

The Trent 1000 engine fan is made of hollow titanium blades and has a diameter of 112", sucking in up to 1.25 tons of air per second at take-off – this is equivalent to emptying a squash court in one second. The Trent 1000 engine fan spins at over 2,700 times a minute, with tip speeds of over 900 mph, faster than the speed of sound.

The Trent 1000 engine has around 18,000 individual components and 35,000 parts.



## ...the power for success

There are 66 high pressure turbine blades in each Trent 1000 engine and at take-off, each blade produces over 800hp (equivalent to a Formula 1 racing car), rotating at 13,500 times per minute, with tip speeds reaching 1,200 mph.

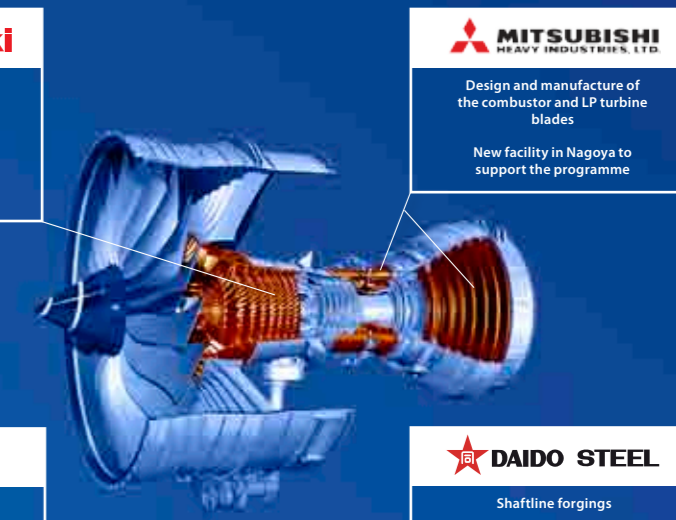
The Rolls-Royce Trent 1000 powered the first flight of the Boeing 787 on the 15th December 2009 and has since accumulated over 8,000 engine hours on 1,300 flights and powered 80% of the flight test programme to date.

Trent 1000 maintenance procedures and manuals have been developed by working with airline customers allowing the design to be adapted in order to make it easier to maintain the engine.



## Made with Japan...

There are six revenue sharing partners on the Trent 1000 programme including Japan's KHI and MHI. KHI have also been part of developing the Trent 1000 maturity by running an engine on their own test bed.



Other partners on the programme are ITP, Hamilton Sundstrand, Carlton Forgings, and Parker.

## ...powering the world's airlines

The Trent 1000 is part of the successful Rolls-Royce Trent family of engines which power over half of the latest generation wide-bodied aircraft. The family has accumulated over 50 million hours in service and covered 24,000 million miles – equivalent to 120 trips to the sun and back.

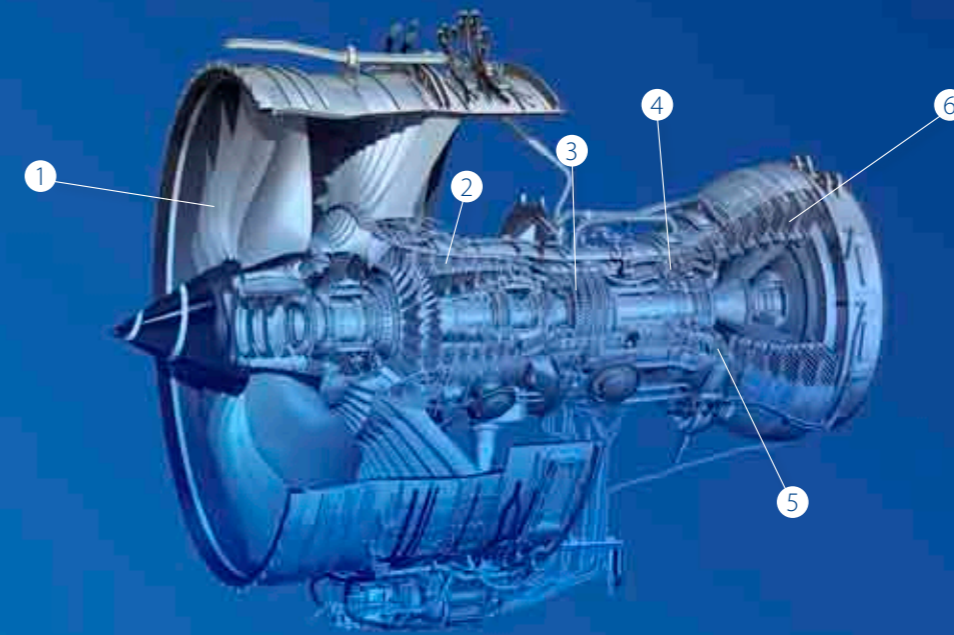
A Rolls-Royce powered aircraft takes off or lands every 2.5 seconds.

*Thank you and congratulations to ANA, Boeing, and all our partners and stakeholders for their support of the Boeing 787 Dreamliner and the Rolls-Royce Trent 1000.*



Rolls-Royce - Proud to power the Boeing 787 Dreamliner

air astana	AIR CHINA 中國國際航空公司
AirEuropa	AIR NEW ZEALAND
Air Niugini	arkia ארקיע
ANA	Avianca
AVIATION CAPITAL GROUP	BRITISH AIRWAYS
CIT	DELTA
ILFC INTERNATIONAL LEASE FINANCE CORPORATION	LAN
LOT	norwegian.com
ROYAL BRUNEI	Unannounced
virgin atlantic	VIP customer



### Trent 1000 Technical Data

**Configuration:** Three-shaft turbofan

**Thrust:** 53,000lbf to 74,000lbf

**Bypass Ratio:** 10:1

**Overall Pressure Ratio:** 50:1

**Fan:** 20 blades, 112" diameter ①

**Intermediate Pressure Compressor:** 8 stages ②

**High Pressure Compressor:** 6 stages ③

**Noise:** QC1 departure/ QC 0.5 arrival

**High Pressure Turbine:** Single stage ④

**Intermediate Pressure Turbine:** Single stage ⑤

**Low Pressure Turbine:** 6 stages ⑥

## Trent 1000

Into service with ANA



Proud to power the Boeing 787 Dreamliner