

Investors' Update

May 2018

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30 May, 13 April



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28 May



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The combination of the announcement of our new Business Aviation Pearl family at EBACE – the first for ten years - together with today's consensus publication, suggested it was a good time to issue a brief investor newsletter.

As well as the Pearl 15 press release, we have included some slides and a transcript from the launch which I am sure will be of interest.

The focus within the businesses has been on the restructuring programme announced in January, together with the intensive efforts to manage the in-service issues on the Trent 1000 and 900 fleet. We will update you further on each in due course.

Within the IR team, as well as helping analysts understand the implications of IFRS15, we have our heads down on preparations for the Capital Markets Event on 15 June.

Attendance is now at capacity and we will be reaching out to institutions who have requested multiple attendees to ask for a reduction in numbers.

Rest assured the event will be webcast and so we ask for your understanding as this is an extremely popular event. We look forward to seeing many of you there.

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Corporate news



Publication of consensus

31 May

Having provided guidance for 2018 under the new business structure at the FY results, and the subsequent IFRS15 teach-in, sufficient analysts (14) have updated their models for us to be able to publish a sensible consensus. We know a number of analysts are waiting for the CMD before updating their models, and there are differing treatments of ITP, L'Orange and our Commercial Marine business amongst analysts, but we believe this does not overly impact the consensus, and it will be helpful to have a company-compiled consensus available on our website (headline mean figures below). [Read more](#)

£m	2018	2019	2020
Underlying revenue	15,031	15,532	16,206
Underlying operating profit	475	786	1,129
Free cash flow	403	726	1,081



New Business Aviation family with launch of Pearl 15

29 May

At the Geneva EBACE show, Rolls-Royce announced the launch of a new engine family for business aviation, with the introduction of the Pearl. The engine has been purpose-built and will be the sole engine for Bombardier's latest business jets, the Global 5500 aircraft and the Global 6500 aircraft.

The Pearl 15 is the first of the planned state-of-the-art Pearl engine family for business aviation and the introduction of this new engine family serves to reaffirm Rolls-Royce's leading position in business aviation. The engine received certification in February and is currently undergoing flight tests at Bombardier's Flight Test Centre, supporting the planned entry into service at the end of 2019. [Read more](#)



AGM & trading statement

4 May

On 4 May Rolls-Royce held its AGM at Pride Park in Derby. On the day of the AGM, we issued a press release where CEO Warren East commented: "I am pleased to report that the year has started well and that trading is in line with our expectations." We also confirmed that we were maintaining our profit and cash expectations for 2018.

The AGM, where all resolutions were well supported, was followed by our second employee 'Meet the Board' event where 150 employees were able to put questions to the whole board, with Q&A sessions focused on strategy, technology and culture. [Read more](#)

IR news

We finished our FY results roadshows across the UK, Toronto and US in late April and have spent the past few weeks working intensively on plans for the Capital Markets event and providing further colour around IFRS 15 implications. While we are conscious that a number of analysts are waiting for the Capital Markets event before updating their figures, we believe there are sufficient updated forecasts out there to generate a sensible, albeit partial consensus.

Most sell-side analysts have booked in to visit the chalet at Farnborough Airshow in July. As the airshow will take place in the middle of our half year close period, we have been developing a different format this year, with a presentation based around our technology aspirations. Following our GDPR communication we have also reflected your preferences for this newsletter circulation list.

Business news: Civil Aerospace



Trent 1000 Package C in-service updates

13 April & 30 May

In mid-April we updated the market on the need to increase the inspection frequency on the Trent 1000 Package C compressor, a condition which was one of those highlighted earlier at the FY results. The increased inspection frequency was driven by our further understanding of the durability of the Trent 1000 Package C compressor. These inspections will be supported by service management and flight operations guidance to airlines to be issued by the airworthiness authorities. This has unfortunately led to additional disruption for customers. There are 380 Package C engines currently in-service with airlines. The new regime does not impact Trent 1000 Package B engines or Trent 1000 TEN engines. [Read more](#)

At the end of May Rolls-Royce set out how it has been responding operationally to the disruption with a range of activities to support customers experiencing disruption as a result of the requirement for increased inspections on Trent 1000 Package C engines. These activities, which include a trebling of maintenance capacity for affected engines, the introduction of a new inspection technique and the acceleration of a permanent fix for the issue, are all aimed at reducing the operational impact on customers. [Read more](#)



Jackson Square Aviation signs LessorCare agreement

9 April

Rolls-Royce has announced Jackson Square Aviation as a new customer for LessorCare, the pioneering new service tailored specifically to the needs of lessors.

Jackson Square Aviation will adopt LessorCare across its existing and future fleets of Trent-powered aircraft, drawing together a range of services under one simple, flexible and comprehensive framework. Rolls-Royce launched LessorCare in January with three key leasing operators as founder customers. [Read more](#)

Business news: Defence



MT30 gas turbine selected to power Japan's new frigate

21 May

Rolls-Royce has been selected to supply its MT30 gas turbine to power their new 30FFM class of frigates for the Japan Maritime Self Defence Force (JMSDF). The selection means Japan is the fifth nation to select the MT30 for a major naval ship building programme.

Construction of the first of the 30FFM class frigates will begin next year, with entry into service expected around 2022. [Read more](#)

Business news: Power Systems



Customer Service 4.0 at RRPS – a new service and digital strategy

17 May

Power Systems formally opened the new Customer Care Centre in Friedrichshafen, a key plank in its enhanced service strategy. Since January, MTU experts working across three locations – Singapore, Novi (Michigan) and Friedrichshafen – have been providing round the clock support and ensuring that customers get the optimum levels of availability from their MTU propulsion and energy systems. [Read more](#)

Research and Technology, Product Development



MoU signed with Hasso Plattner Institute

27 April

Rolls-Royce announced it was joining forces with the respected science organisation the Hasso Plattner Institute to further develop its digital capabilities. The focus will be on pioneering research into Artificial Intelligence (AI), Design Thinking, E-Learning and Data Security and how they can be applied to aerospace research and development, production and services.

The Hasso Plattner Institute (HPI) in Potsdam is Germany's university excellence centre for digital engineering, offering an especially practical and engineering-oriented study programme in computer science that is unique throughout Germany. [Read more](#)



MoU signed with the Alan Turing Institute

26 April

We are undertaking collaborative research and innovation in data science and analytics with the Alan Turing Institute, aiming to develop next generation Artificial Intelligence, specifically for use in industrial applications.

The two organisations will work together to co-design and deliver a programme of collaborative research in data science and AI. In particular, jointly-run research projects will explore how data science can be applied at scale; the application of AI across supply chains; data-centric engineering and predictive maintenance; and the role of data analytics and AI in science.

[Read more](#)



UltraFan engine integration collaboration with Airbus

25 April

Rolls-Royce and Airbus have signed a collaboration agreement for the integration of Rolls-Royce's UltraFan® demonstrator for flight testing. The integration solutions demonstration will be co-funded by Clean Sky 2, the EU research programme focused on developing technology to reduce emissions.

One element of the UltraFan programme is planning for ground and flight tests, and we have signed an agreement with Airbus to provide both nacelle and engine/aircraft integration architecture and technology enablers. Flights will be carried out on a Rolls-Royce flying testbed. Airbus integration solutions will play an important part in achieving the overall fuel efficiency improvement of higher bypass ratio engines such as UltraFan®, through innovative architecture and associated technologies. [Read more](#)

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www.rolls-royce.com/investors/investor-events-and-presentations

Appendix I: Consensus publication

Having had the FY17 results where we provided guidance for 2018 under the new business structure, and the subsequent IFRS15 teach-in, sufficient analysts have updated their models for us to be able to publish a representative consensus. We know a number of analysts are waiting for the CMD before updating their models, and there are differing treatments of ITP, L'Orange and our Commercial Marine business within the consensus figures, but believe this does not overly impact the average, and it is helpful to have a company-compiled consensus available on our website.

Rolls-Royce Holdings plc - Analyst consensus estimates

	2018				Count**	2019				Count**	2020				Count**
	Consensus (Mean)*	Consensus (Median)	Min	Max		Consensus (Mean)*	Consensus (Median)	Min	Max		Consensus (Mean)*	Consensus (Median)	Min	Max	
Underlying revenue (£m)															
Civil Aerospace	7,080	7,108	6,810	7,370	14	7,379	7,425	6,739	7,735	14	7,790	7,885	6,532	8,310	14
Defence	3,150	3,163	2,967	3,254	14	3,220	3,230	3,030	3,313	14	3,260	3,272	3,003	3,384	14
Power Systems	3,279	3,299	3,100	3,386	14	3,394	3,404	3,177	3,596	14	3,524	3,505	3,263	3,841	14
ITP	848	820	729	926	13	895	885	739	1,019	13	945	954	717	1,111	13
Other / Corporate	719	779	(80)	844	13	676	785	(80)	886	13	697	799	(80)	921	13
Underlying group revenue	15,031	15,041	14,440	15,503	13	15,532	15,592	14,962	16,341	13	16,206	16,221	15,367	17,219	13
Underlying operating profit (£m)															
Civil Aerospace	(206)	(220)	(255)	(127)	14	45	41	(169)	237	14	333	387	38	624	14
Defence	368	371	338	400	14	388	397	336	417	14	400	405	324	462	14
Power Systems	335	339	273	383	14	351	352	265	421	14	372	366	271	466	14
ITP	63	63	56	70	13	70	69	58	87	13	77	74	50	115	13
Other / Corporate	(91)	(92)	(120)	(41)	14	(73)	(66)	(129)	(28)	14	(64)	(60)	(129)	(9)	14
Group operating profit	475	465	321	614	13	786	783	552	994	13	1,129	1,151	691	1,452	13
Underlying finance costs	(117)	(123)	(131)	(79)	14	(116)	(118)	(128)	(100)	14	(113)	(108)	(152)	(95)	14
Group underlying PBT	357	356	195	502	13	671	657	426	891	13	1,019	1,041	584	1,352	13
Underlying EPS	12.2	12.5	1.9	24.1	14	24.6	24.9	13.4	36.3	14	38.9	40.2	21.9	53.4	14
DPS	13.0	12.3	11.7	20.0	14	14.3	13.8	11.7	22.0	14	16.1	15.8	11.7	24.2	14
Free cash flow	403	389	316	528	14	726	758	532	860	14	1,081	1,058	906	1,463	14

Compiled by analyst submissions upto 29 May 2018

The consensus estimate presented above is based on earnings projections made by a number of research analysts who cover Rolls-Royce. The data has been compiled following estimates submitted by analysts and confirmed as published based on the IFRS 15 accounting standard. The figures are a precise mean of the figures submitted and are not altered or adjusted in any way. The number of contributing analysts to each consensus figure in the table is shown under the "count" heading. The analyst consensus estimate is provided for informational purposes only and are provided solely for the convenience of our investors. Rolls-Royce does not endorse or approve the analysts' consensus estimates or any underlying estimates that may have formed part of the analysts' consensus estimates. Rolls-Royce provides no assurance with regards to the accuracy or correctness of the analysts' consensus estimates.

*Totals will not cast due to averaging & line by line analyst count

** number of contributing analysts

Min - Max range on Other / Corporate reflects certain analysts' treatment of Commercial Marine

Appendix II: Pearl 15 launch: speech & slides

At Ebace, Chris Cholerton, President of Civil Aerospace gave a speech at the launch of the Pearl family of business jets. Set out below is an extract of his speech, together with some of the key slides from the presentation.

"This is a very significant moment for all of us at Rolls-Royce. We are the world's leading engine supplier for business aviation applications and today's launch of the Pearl engine family helps ensure that for another generation. While our competitors have fought hard to win new business in this sector over the past years, we have successfully retained our market leading position. And while the market itself has, at times, resembled the weather back in the UK – a bit overcast – we believe there are sunnier skies ahead.

Our analysis shows a range of key indicators pointing in the right direction. GDP growth is set to continue, as is the growth in the number of high net worth individuals around the world. Both of which will contribute to growing demand for business jet engines. In fact, our latest forecasting shows demand for 8,500 – 9000 business jets over the next decade, and we're ready to hit the ground running - the Pearl 15 engine is already fully certified and is currently undergoing flights tests at Bombardier's Flight Test Centre in Wichita, Kansas, supporting the planned entry into service at the end of 2019.

In choosing the name Pearl we wanted to reflect some of the characteristics of this sector. Pearls are known for being robust, and long-lasting. They retain their value and they're a symbol of luxury and wealth. And, of course, it fits with Rolls-Royce's pattern of naming engines after rivers. The Pearl is a river in both the US and China, two of our key markets for this engine.

Turning to the engines themselves, the Pearl family will be based on a new core design developed as part of the Advance2 technology demonstrator programme. This programme is a critical pillar of our technology roadmap, and while we've been keeping our cards close to our chest, it has actually been in development for many years.

And the results are outstanding. We believe the new core, which features in the Pearl 15, will be the most efficient engine core available across the business aviation sector. It will enable you to fly farther, faster, cleaner and quieter.

In fact, you'll be able to travel at up to Mach 0.90, while benefitting from a 7% improvement in SFC, or specific fuel consumption, compared to the BR710. You'll have up to 9% more thrust during take-off, yet the engine will be 2 decibels quieter and has world-leading emissions performance, including best in class NOx emissions. It will also help the aircraft connect cities that others can't reach, thanks to increased range and impressive performance in challenging conditions, like hot and high operations.

Alongside the new technologies from Advance2, the Pearl 15 also builds on the foundations laid by the BR700 engine family that came before it. The BR700 family has seen exceptionally good performance in service and has been the benchmark for the industry. With more than 3600 engines in service and 23 million flying hours achieved, the engine has a dispatch reliability of 99.97%. And, if you look at the industry standard measurement of the number of unplanned engine removals per 1,000 flying hours, the latest version of that family, the BR725, has a rate of 0.00. Which speaks for itself."



2015

First engine ground run

2016

First type test

2017

Second type test

First flight

2018

Engine certification

Flight test completion

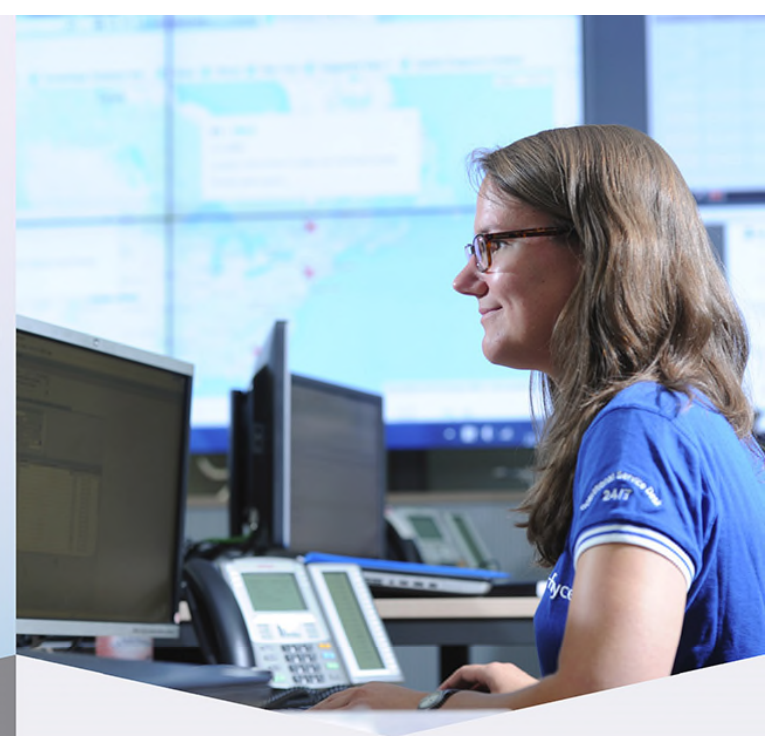
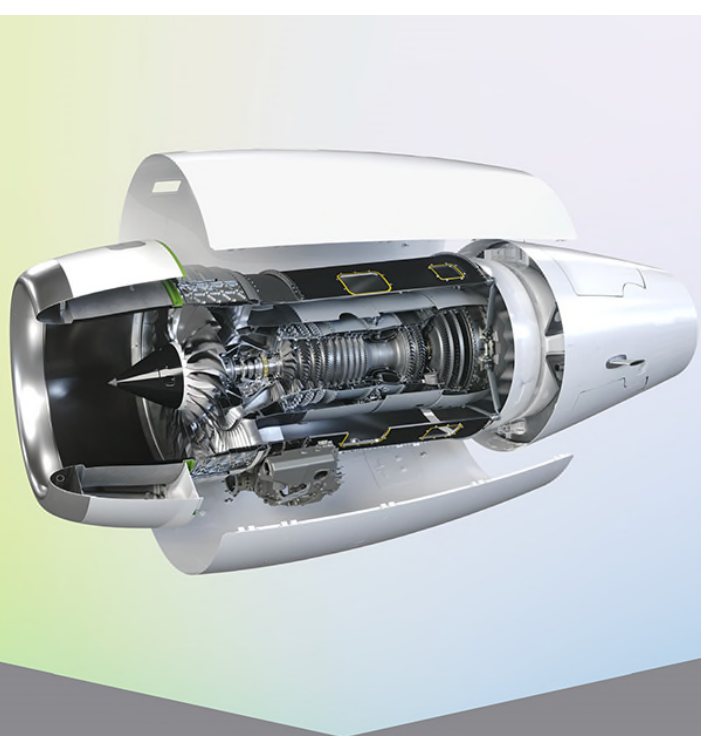
2019

Aircraft certification

Entry into service



Key project milestones



**First member of the new
engine family for the next
generation of business jets**

Enabling the aircraft to
fly farther, faster, cleaner
and quieter

**Combining exceptional
design with innovative
technologies**

Featuring the most
efficient engine core in
business aviation

**Enhanced by our
pioneering CorporateCare**

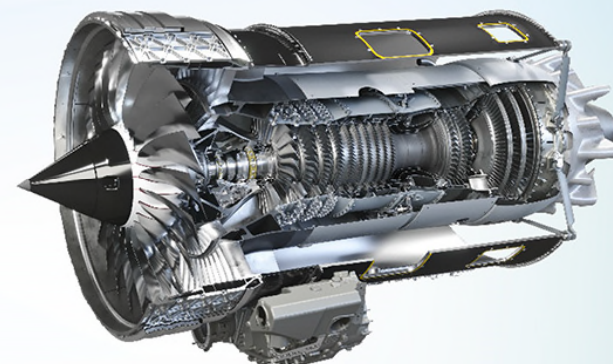
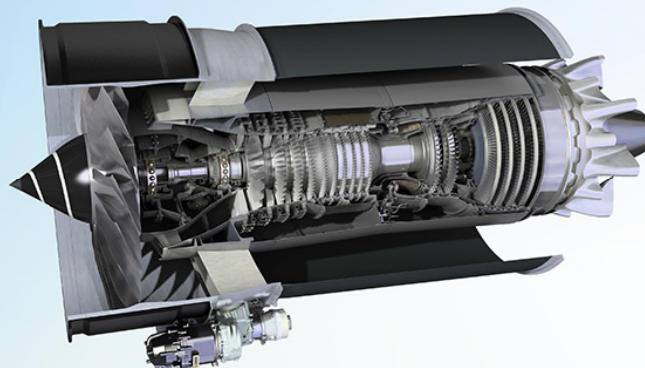
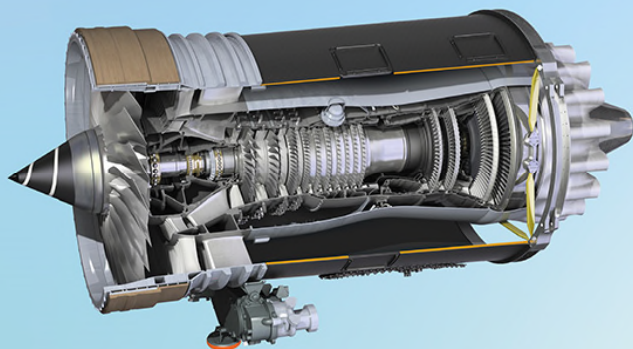
Giving you complete
peace of mind wherever
you are in the world, 24/7



BR700 family

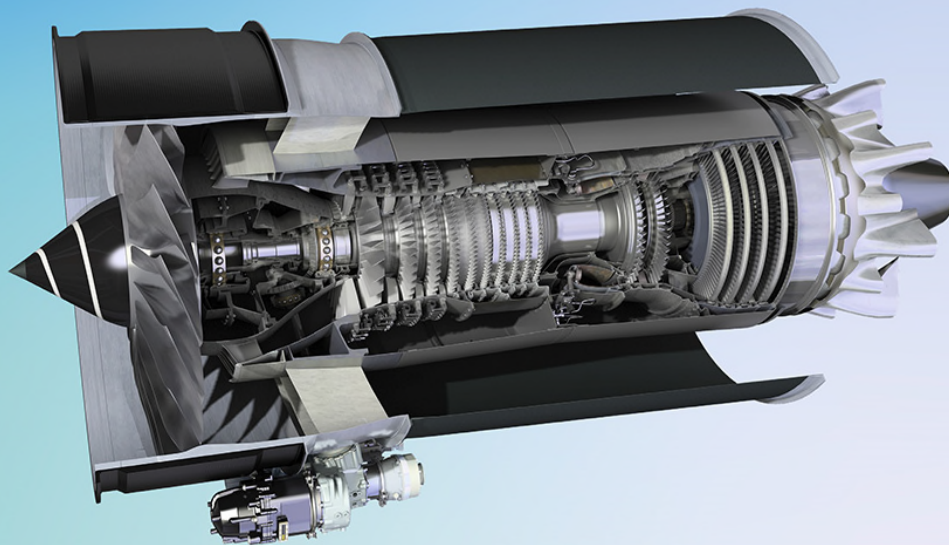
Advance2 demo programmes

Pearl family



Product roadmap

Combining exceptional design
with innovative technologies



The Advance2 technology portfolio

Maturing architectures and technologies for a new 2-shaft engine family

Based on proven BR700 family heritage with improved fan and core technology
Improved SFC

Corporate applications with take-off thrust from 10-20k lbf

Scalable, adaptable core and LP system

Utilising complete integrated propulsion system capability

LP system technology

Titanium blisked fan

Light-weight containment system

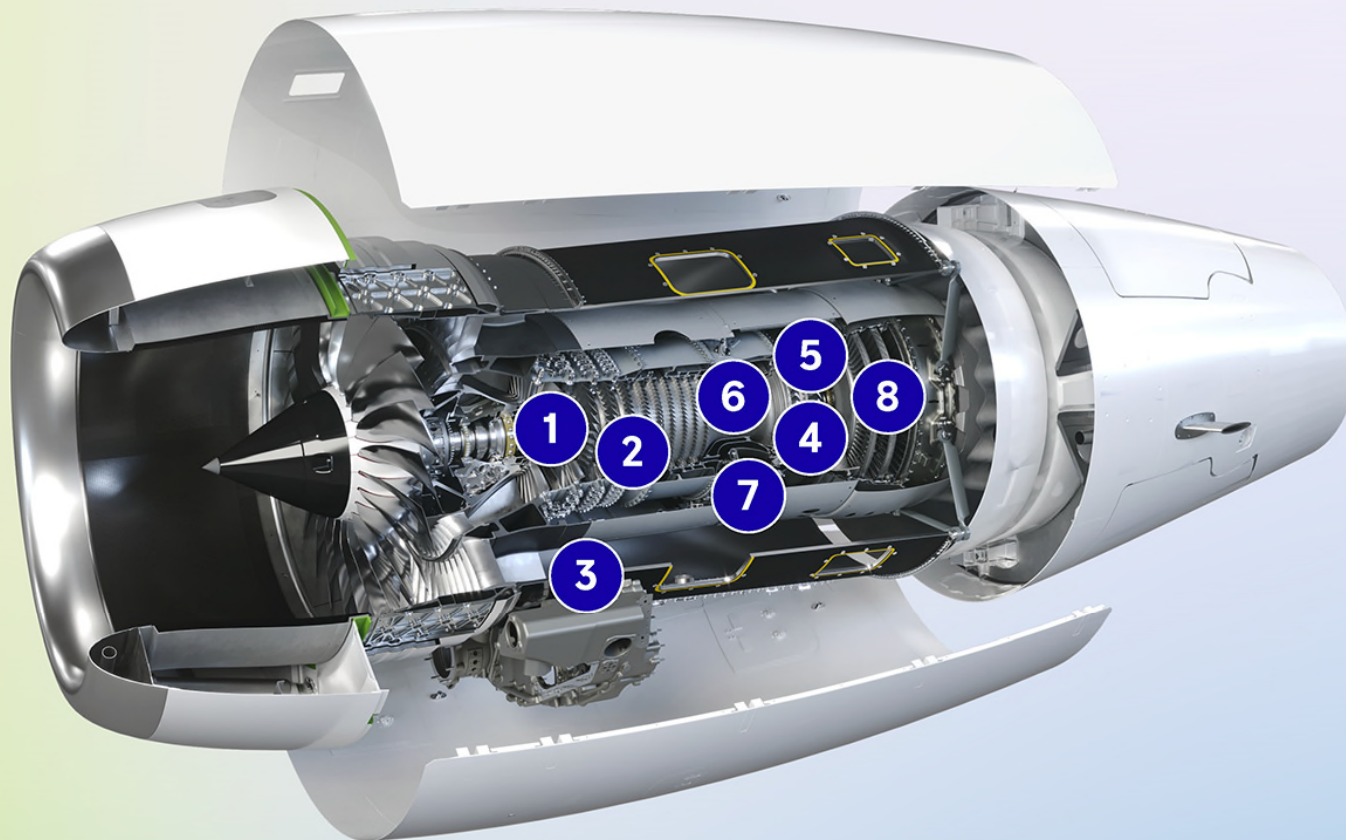
High-efficiency, low noise LP turbine

Core technology

10 stage blisk HP compressor

2 stage HP turbine

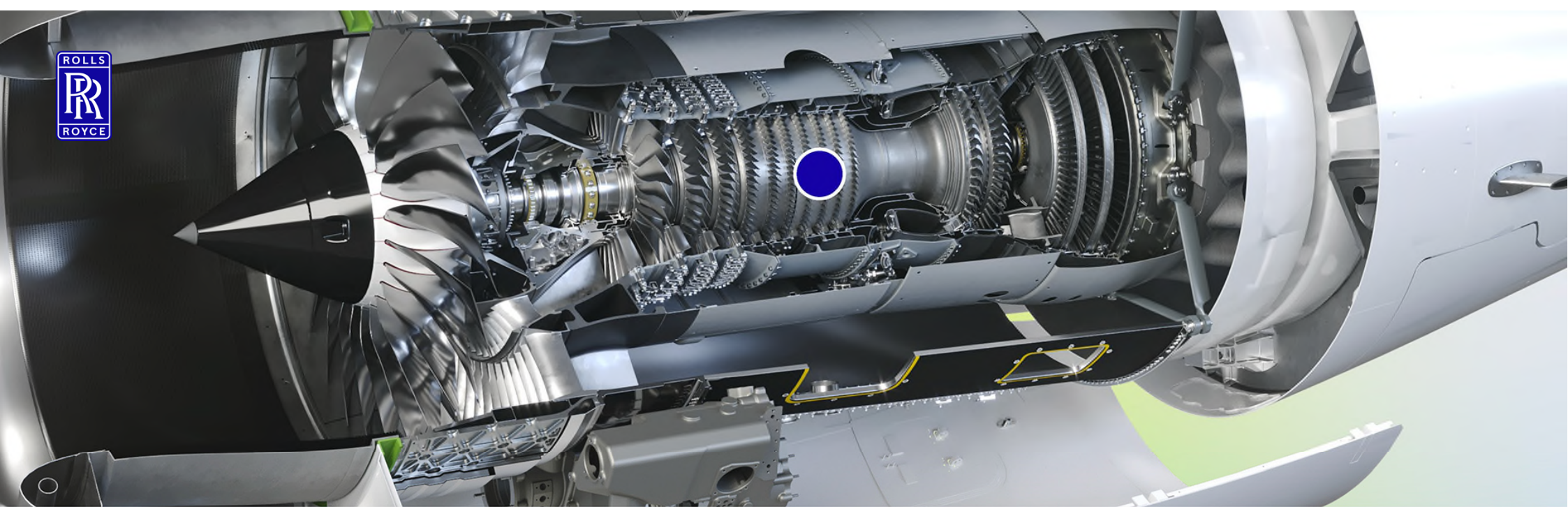
Future-proofed for noise and emission requirements



Combining exceptional design with innovative new technologies

- 1 Advance2 core architecture
- 2 New HP compressor
- 3 Advanced EHM
- 4 Advanced cooling

- 5 2-stage shroudless HP turbine
- 6 Ultra-low emissions combustor
- 7 High temperature materials
- 8 High efficiency low noise LP turbine



New HP compressor

Reduced weight to
enable greater efficiency

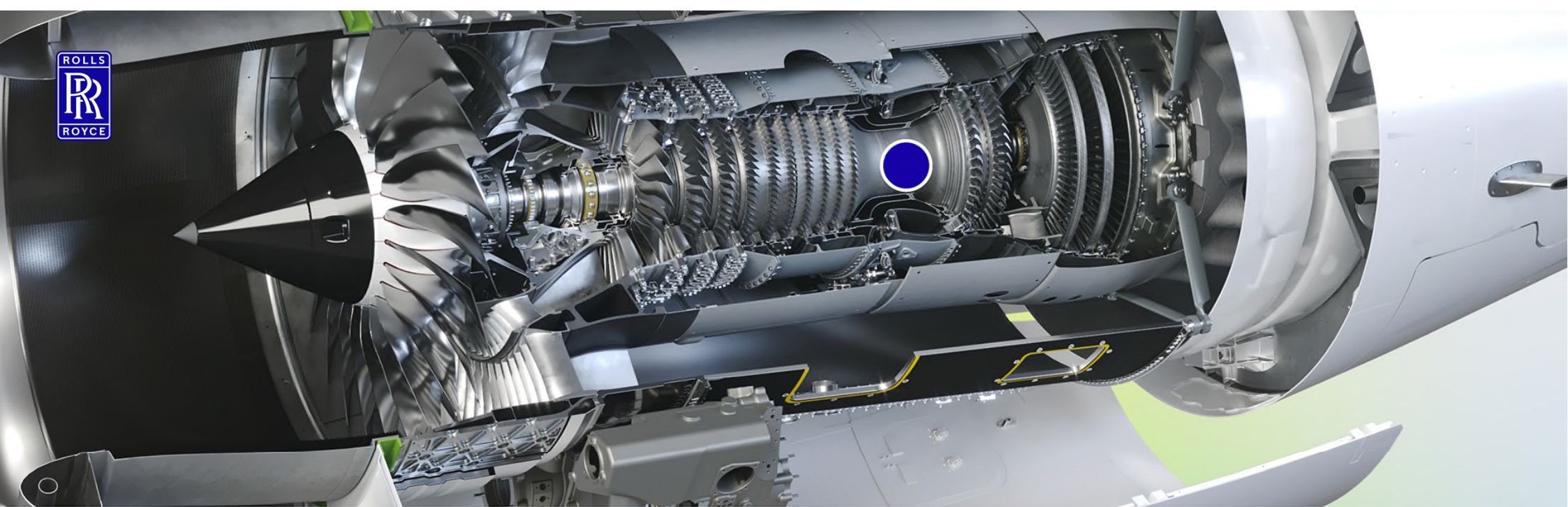
Enhanced aerodynamics deliver 50% higher PR (24:1)

Third generation 3D aerodynamics

Enables advanced high temperature and pressure cycle

Light-weight design

Titanium blisks



New ultra-low emissions combustor

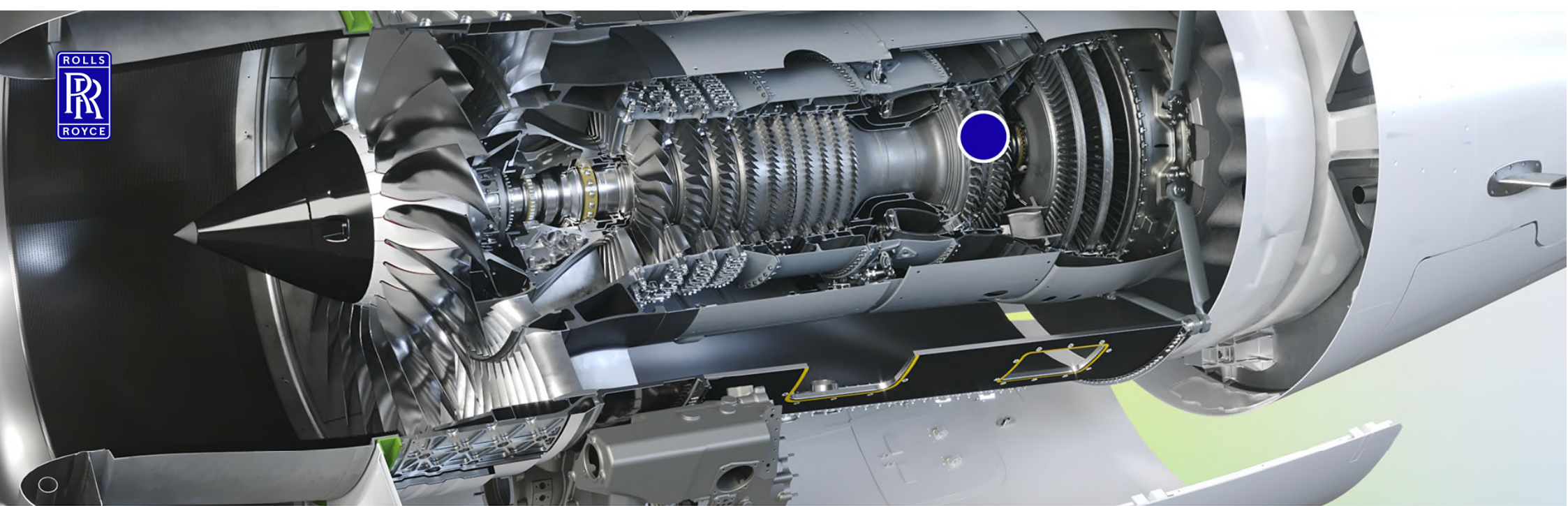
To minimise emissions
such as noise and NOx

Greener technology to reduce emissions

Enhanced noise dampening technology

Impingement effusion cooling technology

Rigorous testing successfully completed



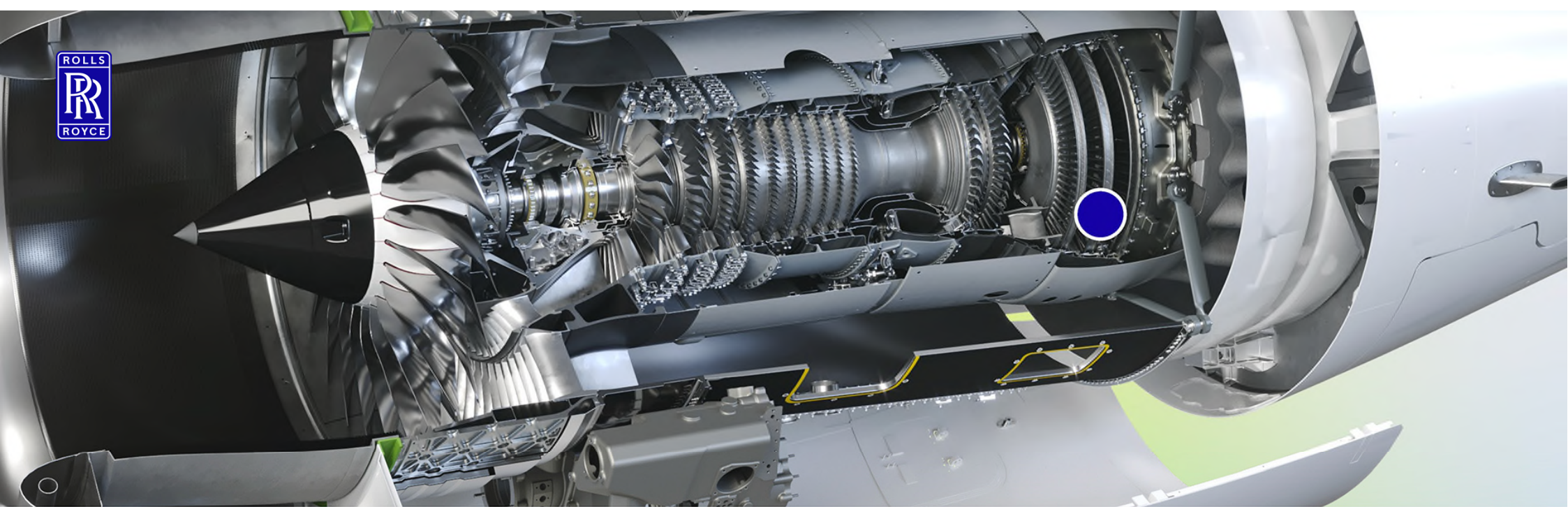
New HP turbine

Enables a higher
temperature and faster core

Enhanced aerodynamics and blade cooling

2-stage shroudless blade design

Fully modulated case-cooling system to reduce fuel consumption



Enhanced 3-stage LP turbine

Enables higher fan power
for increased thrust

LP turbine features 3 stages of shrouded blades

Optimised casing to accommodate smaller core size

Enhanced stage 1 liner segments for higher pressures and temperatures

Lowers fuel burn with excellent performance retention



	BR710 (A2-20)	Pearl 15	Improvement
Maximum thrust (lbf)	14,750	15,125*	3% higher at sea level**
Specific Fuel Consumption	Datum	7% better	7% better
Noise (Cumulative)	Stage 4 – 12 (EPNdb)	Stage 4 – 14 (EPNdb)	2 EPNdb quieter
NOx emissions (% margin to CAEP VI limits)	15%	35%	20% more margin
Smoke emissions (% margin to CAEP VI limits)	32%	80%	48% more margin

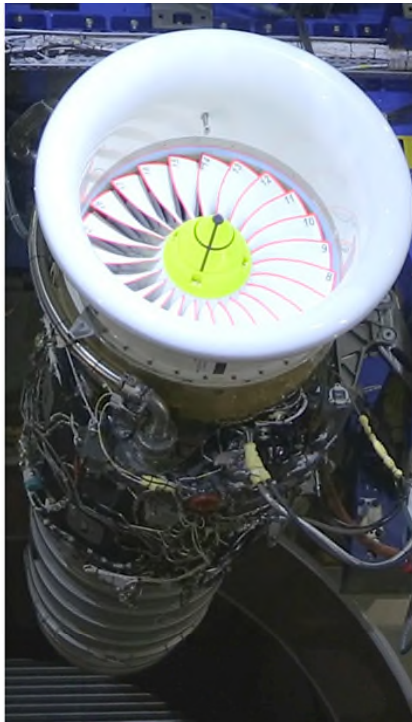
Performance comparison

* At ISA+15; certified to 15,249

** Up to 9% higher during climb



A comprehensive test programme



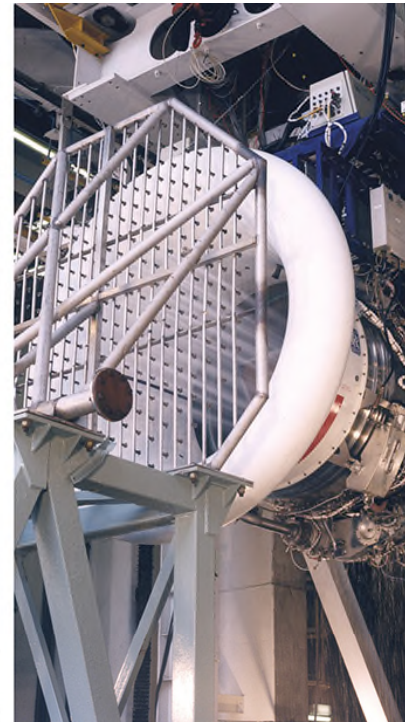
Lightning strike testing

Electrical pulses of up to 1,000A



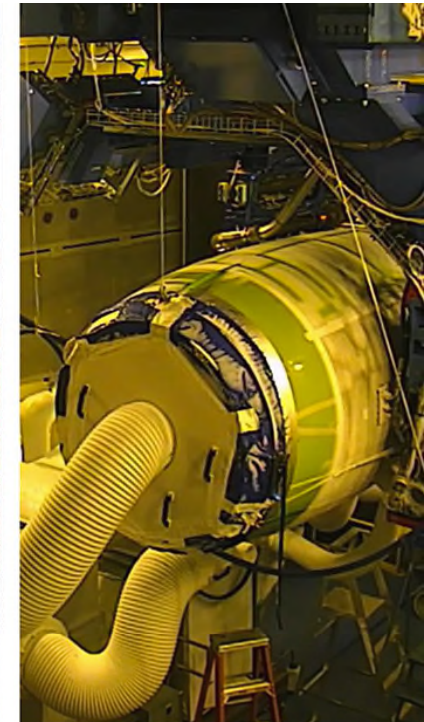
Ice testing

20 μm droplets at -30°C



Water ingestion testing

>27,000 litres/hour of water



Cold start testing

At temperatures as low as -40°C

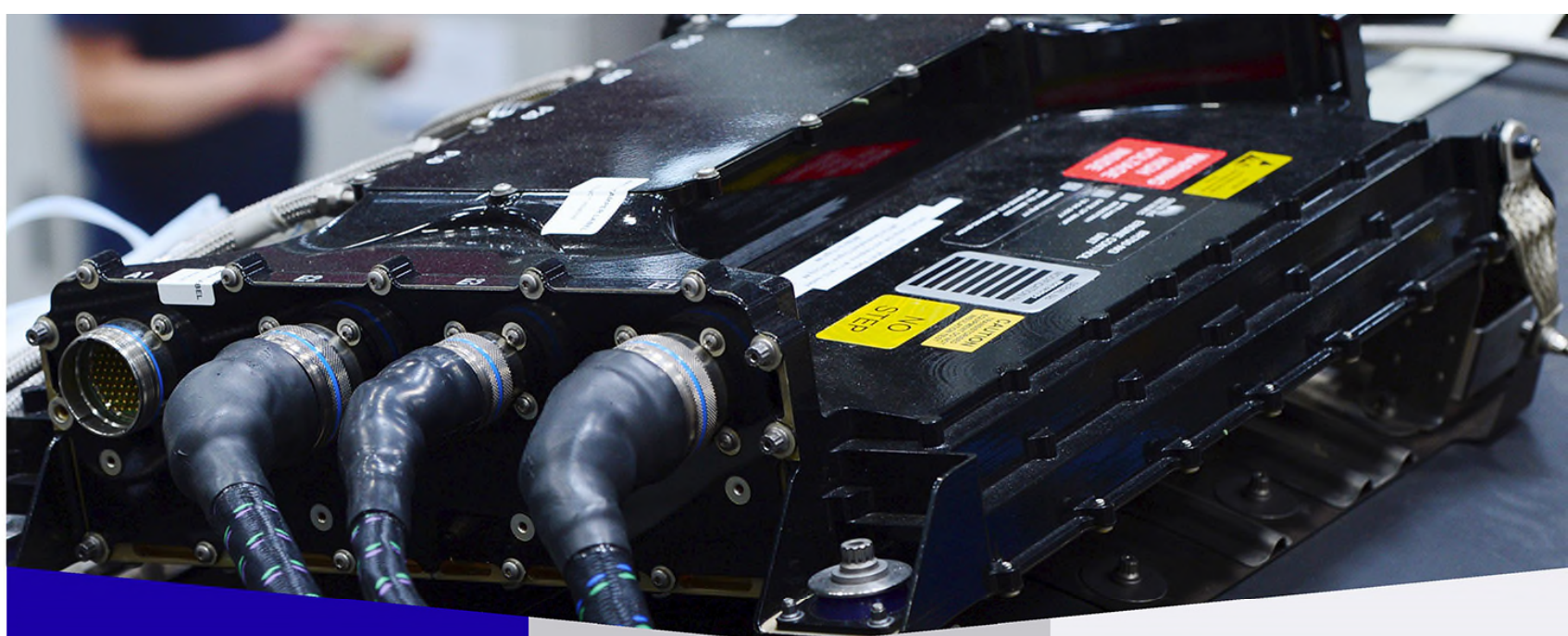


World-leading Engine Health Management (EHM)

Aims to increase engine
availability

A step change in health
monitoring

Equipment prognostic
capability



On-wing engine intelligence

State-of-the-art
engine health
monitoring system

Advanced engine diagnostics and alerts

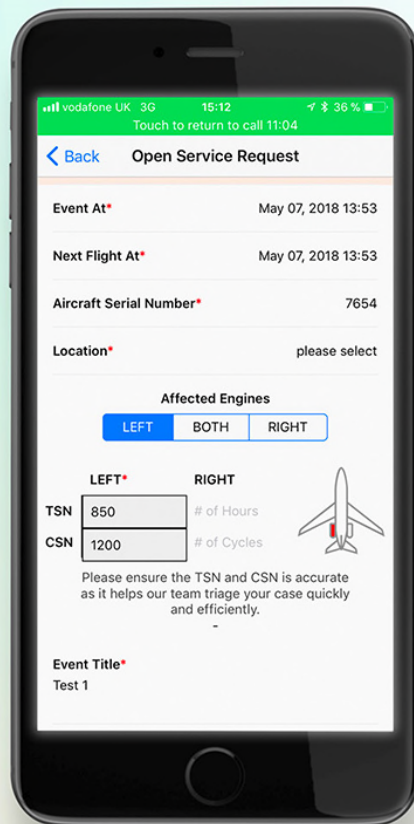
Driven by Big Data
and cloud computing
analytics

Highly flexible system

Easy remote
reconfiguration of
engine-monitoring
features from the ground



Making practical use of digital capability



Business Aviation Availability App



ASC tool

Business Aviation Availability App

“AOG Alert” function

Providing real-time service information

Enabling swift and smart decision making

Maximising availability by minimising disruption

Reducing service restoration time

Enhancing the customer experience



Engine fully certified

