

Airfinance Journal Aircraft Profile: Boeing 787-10

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There are hopes, not least at its manufacturer, that the Boeing 787-10, along with other members of the widebody family, might be emerging from a difficult recent history and that an upturn in orders and deliveries is a sign that the largest version of the Dreamliner might start to repay some of the company's investment.

The restarting of deliveries is clearly positive news, but production and regulatory issues encountered by Boeing mean that some of the new aircraft being handed over to customers are more than two years old, following a 15-month delivery hiatus. The stoppage ended in August 2022, although a further shorter pause was imposed by the FAA in February until mid-March this year. A further hiccup occurred in June when the company announced it would need to inspect the aircraft in its inventory after discovering a production issue with the horizontal stabiliser.

Family ties

The 787-10 is the latest version of the Boeing widebody, having been launched in June 2013 and entering service in 2018. The aircraft is the largest variant in the family and is a further stretch of the -9 model, which followed the original 787-8. Although the stretch increased the aircraft's passenger capacity by more than 10%, there was no increase in the certified maximum take-off weight (MTOW) or fuel capacity. The consequent decrease in range has been cited as a disadvantage, particularly versus the aircraft's nearest competitor - the A350-900. Increased weight versions of the 787-9 and 787-10 have been muted by Boeing, with the largest variant benefiting from a greater improvement. However, no timescale has been provided for the availability of the upgrades.

Seating/range

Maximum seating	440
Typical seating	336
Typical range (winglets)	6,345nm (11,570km)

Technical characteristics

MTOW	254 tonnes
OEW	135 tonnes
MZFW	193 tonnes
Fuel capacity	126,370 litres
Engines	GEnx-1B/Trent 1000
Thrust per engine	76,000lbf/120kN

Fuels and times

Block fuel 1,000 nautical miles (nm)	11,310kg
Block fuel 2,000nm	21,080kg
Block fuel 4,000nm	40,620kg
Block time 1,000nm	146 minutes
Block time 2,000nm	265 minutes
Block time 4,000nm	501 minutes

Fleet data

Entry into service	2018
In service	81
On order	108
Operators (current and planned)	15
In storage	1
Built peak year (2019)	29
Average age	2.9 years

Source: *Airfinance Journal Fleet Tracker*, 15 May 2023 (excludes Paris airshow announcements)

Indicative maintenance reserves

C-check reserve	\$120-\$130 per flight hour
Higher checks reserve	\$90-\$100/flight hour
Engine overhaul	\$320-\$330 per engine flight hour
Engine LLP	\$335-\$340 per engine cycle
Landing gear refurbishment	\$80-\$90 per cycle
Wheels, brakes and tyres	\$110-\$120 per cycle
APU	\$130-\$140 per APU hour
Component overhaul	\$340-\$350 per flight hour

Source: *Air Investor* 2023

Competitive operating costs

Marketing material claims that the 787-10 has 10% better fuel and emissions than the the competition and that this increases to 25% when compared with the aircraft it will replace. As ever with such material, the exact comparison on which these claims are based is unclear, but the new technology of the aircraft certainly provides substantial efficiencies. Previous analysis by Airfinance Journal has indicated that the 787-10 has about an 8% advantage over the A350-900 in terms of cash operating cost per seat. This result remains broadly the same at current fuel prices (\$2.70 per US gallon).

Customer base

The 787-10 is building a customer base that includes several major airlines. In addition to airline customers, leasing customers have placed major orders, with Air Lease having the largest orderbook with 20 aircraft.

Airline	Orders to date
Etihad Airways	30
United Airlines	22
Singapore Airlines	22
All Nippon Airlines	14
Eva Air	11
Korean Air	10
KLM Royal Dutch Airlines	9
Air New Zealand	7
China Airlines	6
Saudia	5

Source: *Collateral Verifications*, July 2023

At this year's Paris air show Boeing announced China Airlines as a new 787-10 customer as the airline converted six 787-9 orders to the larger

model.

Recent market activity

As various regulatory issues were resolved, Boeing was able to announce 787-10 orders and a number of airlines have indicated that they are considering converting orders for 787-9s to the larger member of the family. The recent agreement with Saudi Arabian carriers, for example, will include both 787-9 and 787-10 models according to the manufacturer.

As the 787-10 gets back into service, financing activity is beginning to return. International law firm Watson Farley & Williams announced in mid-June that it had advised Investec Aviation Finance on its acquisition of a Boeing 787-10 from Aergo Capital. The aircraft is under a long-term lease to Singapore Airlines. Investec underwrote the acquisition which was supported by debt and equity co-investment from longstanding institutional business partners.

Production rates

Recent orders are a boost to Boeing's backlog at a time when the company is reportedly aiming to increase production of the 787 family to 10 units a month by 2026. It is not clear what proportion of this ambitious target will be the largest variant. There appears to some progress towards the target, but there is some distance to go. Latest reports say the company has increased production from three to four aircraft per month and is trying to raise the number to five by the end of the year.

There are plans to add a second production line to the company's facilities in Charleston, South Carolina. How the production will be split between the family variants is not yet clear.

Appraiser's View

Collateral Verifications (CV) Gueric Dechavanne, vice-president, commercial aviation services

Since 2018, technical issues with the Rolls-Royce Trent 1000 engine have resulted in some Boeing 787s being grounded. As these issues have been resolved, and demand for widebody capacity has returned, 787s have been put back in service. Additionally, because of quality issues in the manufacturing of aircraft, Boeing had also put production on hold. Despite some difficulties, solutions have been put in place allowing deliveries to restart. As traffic continues to recover worldwide, Collateral Verifications (CV) fully expect these aircraft to continue delivering and for the fleet to grow over the next decade.

The current trends for the aircraft had shown stability in its market value and lease rates, which can be seen around \$900,000 to \$1.2 million per month, depending on age, for operating leases. Due to its efficiency, the 787 will over the long term replace many ageing aircraft such as older A340s, some A330s, and early Boeing 767s and 777s. Because the manufacturer reduced monthly production rates for the 787 from 14 to 10 in 2021 and down to seven in 2022, there is a limited number of aircraft available for placement in the market. This in turn should help to maintain some stability in the current and future residual values of the aircraft.

Build year	2018	2019	2020	2021	2022	New
Current market value (\$m)	110.4	116.2	121.9	128.6	137.3	167.3
Lease rate (\$'000s/month)	900	950	1,000	1,050	1,100	1,200

Source: Collateral Verifications, July 2023

With almost 200 orders since its launch, the 787-10 has already shown signs of success and CV believes it will continue to do so as the fleet expands and proves itself as the next generation of widebody aircraft for the industry. Based on the capabilities of the -10 variant, we expect it will be somewhat of a niche aircraft as it is designed for long-haul routes. This aircraft offers improved seat mile economics and greater cabin flexibility to better meet passenger demand, which we feel is more compelling to certain operators. With the A350-1000 having also entered service, the 787-10 will face strong competition from an aircraft that offers attractive performance and operating economics. The 777-9, once it enters service, may also be viewed as a competitor to the 787-10. Both Airbus and Boeing claim that their aircraft offer better economics over the other, but CV feels that there will be sufficient demand for both the A350-1000 and the 797-10 to succeed.

Overall, CV feels the 787 family of aircraft will perform well for many years to come and will continue to be one of the top aircraft choices by operators and investors.

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