AIRFINANCE JOURNAL

An ***Airfinance Journal***

special supplement

Air Investor 2021

Airbus A320neo family retains lead

Investors' appetite clearly remains in mainstream aircraft, especially in the widebody market.

Few investors venture outside the most popular types of the Boeing 787/Airbus A350 models. Of the top 10-favoured aircraft in 2020, seven were narrowbodies, two were widebodies and one aircraft was a turboprop (the ATR72-600).

Seven years ago, the favoured model was the 777-300ER and the top six included three narrowbodies (737-800/Max 8/A320neo), as well as three widebodies (777-300ER/787-9/A350-900).

The environment in 2018 and 2019 favoured current-technology narrowbody aircraft as oil prices globally remained at reasonable levels, making a viable case for these types.

The Covid-19 pandemic is set to accelerate airlines' transitions to new-technology aircraft.

Airbus current-technology narrowbody productions are almost completed. By December 2020, Airbus's backlog for the A320 family included five A319s, 18 A320s and 29 A321s. But in the first 11 months of last year, the European manufacturer had delivered only 14 current-technology narrowbodies.

On the widebody side, Airbus delivered five new A330s and nine A330neos for the first 11 months of 2020.

The second market for the A330-200 and A330-300 models was difficult before the pandemic.

"The A330 entered the Covid-19 era against a landscape of oversupply and declining values and lease rates. There is therefore little surprise that the impact of the global pandemic on international traffic has further harmed its fortunes," says one pollster.

Placements are possible but lease rates are low. Owners are trying to hold onto the type. The market for the A330-300 has been particularly bad. Mid-life aircraft have been placed at between $210,000 and $250,000 a month.

The market was more than $250,000 to $280,000 a month by mid-2019 and above $300,000 two years ago, but the

Twin-aisles

Aircraft type	Residual value	Value for money	Operational success	Remarketing potential	Overall score	Last year's score	Difference
787-9	3.83	4.05	4.29	3.64	**3.95**	**3.84**	0.11
A350-900	3.74	3.90	4.10	3.50	**3.81**	**3.97**	-0.16
767-300ER	3.18	3.53	4.00	3.29	**3.50**	**3.91**	-0.41
787-10	3.18	3.68	3.75	3.00	**3.40**	**3.53**	-0.13
A350-1000	3.04	3.48	3.62	2.91	**3.26**	**3.17**	0.09
787-8	2.91	3.21	3.45	2.76	**3.08**	**3.16**	-0.08
777-300ER	2.38	3.14	4.18	2.26	**2.99**	**3.21**	-0.22
A330-900neo	3.00	3.29	2.85	2.82	**2.99**	**3.21**	-0.22
777-9	2.88	3.07	2.70	2.67	**2.83**	**3.33**	-0.50
A330-300	2.09	3.29	3.71	2.18	**2.82**	**3.17**	-0.35
A330-200	1.73	2.65	3.55	1.67	**2.40**	**2.7**	-0.30
A330-800neo	2.33	2.47	2.14	2.15	**2.27**	**2.51**	-0.24
777-8	2.38	2.57	2.10	2.00	**2.26**	**2.71**	-0.45
777-200ER	1.65	2.45	2.90	1.55	**2.14**	**2.52**	-0.38
747-8 pax	1.64	2.32	2.15	1.43	**1.89**	**1.9**	-0.01
777-200LR	1.59	2.21	2.25	1.38	**1.86**	**2.34**	-0.48
A380	1.00	1.90	1.90	0.95	**1.44**	**1.81**	-0.37

The Boeing 787-9 model topped the widebody category

bankruptcies at XL Airways and Thomas Cook Airlines did not help.

The lease rates of the A330-200 are more into the $200,000 range depending on age, condition and configuration.

Both A330s, along with the 777-300ER model, have expensive transition costs, and the cargo conversion market, although developing at a relatively slow pace, could absorb some of the fleet.

The first 777-300ERSF is expected to enter into service in 2022. The A350-900 and 787-9 are the strongest performers in the widebody market, but as one pollster writes: "Despite the positive acclaim, these aircraft will never achieve the investment ratings of the most popular narrowbodies."

The 787-9 aircraft was the clear winner in the twin-aisle category. Its notable market popularity significantly outstrips the other options, with the A350-900 trailing behind. The Boeing aircraft took the top spot for all four criteria: residual values, value for money, operational success and remarketing potential. Covid-19 has heavily impacted some airlines such as Norwegian, which has released some 787s back to lessors. The aircraft are being placed with other operators, despite a relatively difficult long-haul market.

The 787-9, along with the A350-1000 model, was the only aircraft in the widebody market to score better than the previous year. The 767-300ER maintained a relatively strong position in the ranking because of freighter demand, according to one trader.

Narrowbodies

The A320neo family benefitted from the woes at Boeing last year and was positioned, for a second year in a row, at the top of the narrowbody rankings.

The A321neo maintained its position at the top in the narrowbody aircraft market category scoring 4.54 overall (out of five), a small increase over the previous year.

The type continues to be the most popular aircraft at present. For the first 11 months of 2020, the A321neo variants received 145 net orders, representing half of Airbus overall net orders. Another 75 net orders were for the A320neo type, while 47 orders had been placed by Spirit Airlines for the A319neo.

At the end of November, Airbus had delivered about 429 A321neos to operators and had orders for 3,446 units. In comparison, 1,120 A320neos had been delivered and orders totalled 3,925.

Investors are comfortable with the A320neo family and again this is reflected in this year's poll.

The A220-300 recorded one of the best improvements of any single-aisle aircraft

Single-aisles

Aircraft type	Residual value	Value for money	Operational success	Remarketing potential	Overall score	Last year's score	Difference
A321neo	4.64	4.35	4.43	4.75	**4.54**	**4.45**	0.09
A320neo	4.44	4.26	4.39	4.46	**4.39**	**4.36**	0.03
737-800	3.72	4.14	4.70	4.21	**4.19**	**4.14**	0.05
A321	3.80	4.04	4.35	4.00	**4.05**	**4.01**	0.04
A220-300	3.80	3.89	4.00	3.84	**3.88**	**3.76**	0.12
A320	3.36	3.96	4.52	3.67	**3.88**	**4.08**	-0.20
737 Max 8	4.00	4.05	2.81	3.88	**3.69**	**3.73**	-0.04
737-900ER	2.84	3.32	3.48	2.79	**3.11**	**2.94**	0.17
737 Max 10	3.18	3.37	2.67	2.90	**3.03**	**3.37**	-0.34
737 Max 9	3.00	3.25	2.67	2.91	**2.96**	**3.1**	-0.14
737-700	2.27	3.00	3.30	2.38	**2.74**	**2.93**	-0.19
A319	2.12	2.91	3.35	2.17	**2.64**	**2.91**	-0.27
A319 neo	2.17	2.40	2.59	2.00	**2.29**	**2.27**	0.02
737 Max 7	2.32	2.63	1.77	1.94	**2.17**	**2.37**	-0.20

The A321neo led the way in three of the four criteria in *Airfinance Journal*'s investor poll: residual values, value for money and potential remarketing.

In particular, the model scored better in three criteria than in the previous year.

If the Boeing Max family had not been impacted too much until now, especially in the residual value and value for money criteria (because the consensus is the aircraft is a good investment), its remarketing potential has dropped dramatically over the past 12 months.

This may be a cause of concern because airlines and lessors have cancelled orders, and also because some customers may not want to take delivery yet as a result of the Covid-19 crisis in the airline industry.

The Max 8 is the least impacted of the four-aircraft family. Its overall score was only a few points below its 2019 total. The Ryanair order for the high-capacity Max 8-200 model in December 2020, along with the positive news on recertification in the final quarter, has provided more confidence in the type.

Airfinance Journal's Deal Tracker shows that lessors acquired 24 aircraft in the final quarter of 2020 under sale and leaseback transactions. In 2020, Avolon, BOC Aviation, CDB Aviation and DAE have been active in this sector.

Should the return of the Max family expand to the European and Asian skies in 2021, the aircraft type is expected to challenge the top narrowbodies in the next Air Investor's poll. In 2018, the Max 8 scored 4.21 points.

The market has not improved and remains limited for the Max 7 type, as well as the A319neo, which are now under pressure from the A220-300.

The A220-300 recorded one of the best improvements of any single-aisle aircraft, perhaps because the market is more accepting of the model.

Financing of the A220-300 has broadened over the past two years and airline request for proposals (RFP) are proving popular for the type.

A recent RFP saw 37 bids submitted, according to sources.

Air Baltic opened up the sale and leaseback market, and start-up Breeze Aviation is financing its future deliveries in the sale and leaseback market with GECAS, Einn Volant Aircraft Leasing, a joint venture between GECAS and Canadian pension fund manager Caisse de depot et placement du Quebec, and Voyager Aviation.

Lessors are placing aircraft. Recently, US lessor Air Lease signed its first operating lease commitment in Europe regarding its A220 orderbook. Deliveries are commencing mid-2022.

Interest has accelerated because the focus on domestic recovery is linked to growing interest in the A220 family, primarily the A220-300 model, says Air Lease.

In the meantime, Airbus has registered some cancellations for the A220 programme with leasing company Macquarie Airfinance taking seven aircraft out of its initial 40-aircraft order while Gulf Air cancelled a 10-aircraft order in November.

Air Canada has also cancelled 12 orders and is deferring 18 A220s due for delivery in 2021 and 2022.

The A321 remains the best performer of the Airbus current-technology product line, but there is an increasing distinction between models, with eight years of age, or 2012, models still benefitting from its success.

"Older models won't share the same success," says one pollster. However, the A321-200 has a bright future as a converted freighter.

The 737-800 retained its third position in the narrowbody ranking. The model benefitted from strong demand in 2019, albeit short- to medium-term lease requirements, as airlines needed uplift to cover the non-Max deliveries.

In 2020, demand for the type was lower, but more 737-800s headed for cargo conversion. But the consensus is that as the Max returns, the 737NG family, especially the 737-800, will experience a softening in values and lease rates.

The **numbers**

The following pages include key data for current production commercial aircraft. Aircraft that have not yet entered service are not included, because the information available has not been confirmed by in-service experience.

Technical characteristics
The maximum take-off weight (MTOW) shows the maximum option available for the type in question. There may be lower-weight versions available. The operating empty weight (OEW) is based on the manufacturers' figures. Airline weights are likely to be higher than those quoted.

Fuels and times
The figures shown for fuels and times are *Airfinance Journal*'s estimates based on a variety of sources. They are intended to reflect 60% passenger load factors, international standard atmosphere (ISA) conditions en-route, zero winds and optimum flight levels.

Indicative maintenance costs
The maintenance figures are intended as a guide to the order of magnitude of reserves associated with the various aircraft types. The figures are intended to reflect mature costs with no account taken of warranty effects and other reductions associated with new aircraft.

The C-check and heavy-check reserves are based on typical check costs and intervals. No allowance is made for cabin refurbishment. The cost quoted for component overhaul excludes inventory support.

Unless stated, the engine costs refer to the most common engine type for the aircraft model in question.

The information used to estimate the indicative maintenance reserves has been collected from a wide variety of sources. While *Airfinance Journal* has made every effort to normalize the data, direct comparisons between aircraft types may be misleading.

It should also be noted that maintenance costs of a particular type are highly dependent on the route structure, operating environment and maintenance philosophy of the airline with which the aircraft is in service. As such our estimates are difficult to reconcile with the numbers provided by manufacturers.

Seating/range
The numbers quoted for seating capacity are based on the manufacturers' selling standards. Large variations are possible, particularly for widebody aircraft. The operational ranges shown are for still-air conditions, optimum flight levels and are based on the typical seating figure and the operating empty weight quoted by the manufacturer. Ranges in airline operation are likely to be significantly less than the figures quoted.

Fleet data
The data is based on *Airfinance Journal*'s Fleet Tracker as of 15 December, 2020. The fleet information reflects the situation arising from the Covid-19 situation, in particular the high number of parked/stored aircraft. In acknowledgement of this situation, operator numbers and average age are based on the combined in-service and parked fleets.

Aircraft data index

Aircraft **data**

Airbus A220-100

SEATING/RANGE	
Max seating	133
Typical seating	100-120
Maximum range	3,500nm (6,350km)
TECHNICAL CHARACTERISTICS	
MTOW	63.1 tonnes (option 60.8)
OEW	35.2 tonnes
MZFW	52.2 tonnes
Fuel capacity	21,510 litres
Engines	PW1521G/1524G/1525G
Thrust	21,000lbs to 23,3000lbs
FUELS AND TIMES	
Block fuel 200nm	1,330kg
Block fuel 500nm	2,450kg
Block fuel 1,000nm	4,380kg
Bock time 200nm	54 minutes
Block time 500nm	94 minutes
Block time 1,000nm	160 minutes
FLEET	
Entry into service	2016
In service	46
Operators (current and planned)	10
In storage	6
On order	57
Build peak year (2019)	24
Estimated production 2021	11
Average age (years)	1.8
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$55-60 per flight hour
Higher checks reserve	$50-55 per flight hour
Engine overhaul	$95-100 per engine flight hour
Engine LLP	$125-130 per engine cycle
Landing gear refurbishment	$35-40 per cycle
Wheels brakes and tyres	$120-130 per cycle
APU	$75-80 per propeller hour
Component overhaul	$210-220 per flight hour

Maintenance reserves are estimates based on similar aircraft types pending in-service confirmation of manufacturer claims.

Airbus A220-300

SEATING/RANGE	
Max seating	160
Typical seating	120-150
Maximum range	3,400nm (6,300km)
TECHNICAL CHARACTERISTICS	
MTOW	69.9 tonnes
OEW	37.1 tonnes
MZFW	57.6 tonnes
Fuel capacity	21,510 litres
Engines	PW1521G/1524G/1525G
Thrust	21,000lbs to 23,3000lbs
FUELS AND TIMES	
Block fuel 200nm	1,370kg
Block fuel 500nm	2,510kg
Block fuel 1,000nm	4,490kg
Bock time 200nm	54 minutes
Block time 500nm	94 minutes
Block time 1,000nm	160 minutes
FLEET	
Entry into service	2016
In service	79
Operators (current and planned)	23
In storage	15
On order	441
Build peak year (2018)	30
Estimated production 2021	61
Average age (years)	1.7
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$55-60 per flight hour
Higher checks reserve	$50-55 per flight hour
Engine overhaul	$105-110 per engine flight hour
Engine LLP	$125-130 per engine cycle
Landing gear refurbishment	$35-40 per cycle
Wheels brakes and tyres	$120-130 per cycle
APU	$75-80 per propeller hour
Component overhaul	$210-220 per flight hour

Maintenance reserves are estimates based on similar aircraft types pending in-service confirmation of manufacturer claims.

Airbus A319neo

SEATING/RANGE	
Max seating	156
Typical seating	120-150
Typical range	3,400nm (6,300km)
TECHNICAL CHARACTERISTICS	
MTOW	75.5 tonnes
OEW	43 tonnes
MZFW	60.3 tonnes
Fuel capacity	26,730 litres
Engines	LEAP-1A/PW1100G
Thrust	24,100lbs (107kN)
FUELS AND TIMES	
Block fuel 200nm	1,450kg
Block fuel 500nm	2,670kg
Block fuel 1,000nm	4,780kg
Bock time 200nm	54 minutes
Block time 500nm	94 minutes
Block time 1,000nm	160 minutes
FLEET (INCLUDING CORPORATE JET VERSIONS)	
Entry into service (nominal)	2020
In service	none
Operators (current and planned)	5
In storage	none
On order	82
Built peak year	Not applicable
Estimated production 2020	Unknown
Average age (years)	Not applicable
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$60-65 per flight hour
Higher checks reserve	$55-60 per flight hour
Engine overhaul	$100-105 per engine flight hour
Engine LLP	$125-130 per engine cycle
Landing gear refurbishment	$35-40 per cycle
Wheels brakes and tyres	$120-130 per cycle
APU	$75-80 per APU hour
Component overhaul	$210-220 per flight hour

Maintenance reserves are based on A319 current engine model pending confirmation of manufacturer's claimed reductions for new engine model.

Airbus A320

SEATING/RANGE	
Max seating	180
Typical seating	150
Typical range (with sharklets)	3,500nm (6,500km)
TECHNICAL CHARACTERISTICS	
MTOW	73.5 tonnes/78 tonnes
OEW	42 tonnes
MZFW	61 tonnes/62.5 tonnes
Fuel capacity	24,210 litres/27,200 litres
Engines	CFM56-5B/V2500
Thrust	25,000lbs (120kN)
FUELS AND TIMES	
Block fuel 200nm	1,850kg
Block fuel 500nm	3,390kg
Block fuel 1,000nm	6,080kg
Bock time 200nm	54 minutes
Block time 500nm	94 minutes
Block time 1,000nm	160 minutes
FLEET (INCLUDING CORPORATE JET VERSIONS)	
Entry into service	1988
In service	2,550
Operators (current and planned)	321
In storage	1,730
On order	45
Built peak year (2013)	352
Estimated production 2020	10
Average age (years)	11.3
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$60-65 per flight hour
Higher checks reserve	$55-60 per flight hour
Engine overhaul	$105-110 per engine flight hour
Engine LLP	$125-130 per engine cycle
Landing gear refurbishment	$35-40 per cycle
Wheels brakes and tyres	$120-130 per cycle
APU	$75-80 per APU hour
Component overhaul	$210-220 per flight hour

Airbus A320neo

SEATING/RANGE	
Max seating	194
Typical seating	150-180
Typical range	3,400nm (6,300km)
TECHNICAL CHARACTERISTICS	
MTOW	79 tonnes
OEW	44.5 tonnes
MZFW	64.3 tonnes
Fuel capacity	26,730 litres
Engines	LEAP-1A/PW1100G
Thrust	27,000lbs (120kN)
FUELS AND TIMES	
Block fuel 200nm	1,570kg
Block fuel 500nm	2,880kg
Block fuel 1,000nm	5,170kg
Bock time 200nm	54 minutes
Block time 500nm	94 minutes
Block time 1,000nm	160 minutes
FLEET	
Entry into service	2016
In service	923
Operators (current and planned)	121
In storage	194
On order	2,808
Built peak year (2019)	295
Estimated production 2021	200
Average age (years)	2.0
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$60-65 per flight hour
Higher checks reserve	$55-60 per flight hour
Engine overhaul	$105-110 per engine flight hour
Engine LLP	$120-125 per engine cycle
Landing gear refurbishment	$35-40 per cycle
Wheels brakes and tyres	$120-130 per cycle
APU	$75-80 per APU hour
Component overhaul	$210-220 per flight hour

Airbus A321-200

SEATING/RANGE	
Max seating	220
Typical seating	185
Maximum range	3,200nm (5,950km)
TECHNICAL CHARACTERISTICS	
MTOW	93.5 tonnes
OEW	48 tonnes
MZFW	73.8 tonnes
Fuel capacity	30,030 litres
Engines	CFM56-5B/V2500-A5
Thrust	27,000-33,000lbs (120-148kN)
FUELS AND TIMES	
Block fuel 200nm	2,310kg
Block fuel 500nm	4,230kg
Block fuel 1,000nm	7,590kg
Bock time 200nm	54 minutes
Block time 500nm	94 minutes
Block time 1,000nm	160 minutes
FLEET (INCLUDING -100s)	
Entry into service	1996
In service	1,001
Operators (current and planned)	119
In storage	647
On order	31
Built peak year (2013)	215
Estimated production 2020	10
Average age (years)	8.4
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$65-70 per flight hour
Higher checks reserve	$60-65 per flight hour
Engine overhaul	$120-125 per engine flight hour
Engine LLP	$125-130 per engine cycle
Landing gear refurbishment	$35-40 per cycle
Wheels brakes and tyres	$120-130 per cycle
APU	$75-80 per APU hour
Component overhaul	$210-220 per flight hour

Airbus A321neo

SEATING/RANGE	
Max seating	244
Typical seating	180-220
Maximum range	3,995nm (7,400km)
TECHNICAL CHARACTERISTICS	
MTOW	97 tonnes
OEW	50.1 tonnes
MZFW	75.6 tonnes
Fuel capacity	30,030 litres
Engines	LEAP-1A/PW1100G
Thrust	32,000lbs (143kN)
FUELS AND TIMES	
Block fuel 200nm	1,960kg
Block fuel 500nm	3,600kg
Block fuel 1,000nm	6,450kg
Bock time 200nm	54 minutes
Block time 500nm	94 minutes
Block time 1,000nm	160 minutes
FLEET	
Entry into service	2017
In service	333
Operators (current and planned)	63
In storage	98
On order	2,957
Build peak year (2019)	127
Estimated production 2021	250
Average age (years)	1.5
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$60-65 per flight hour
Higher checks reserve	$55-60 per flight hour
Engine overhaul	$120-125 per engine flight hour
Engine LLP	$125-130 per engine cycle
Landing gear refurbishment	$35-40 per cycle
Wheels brakes and tyres	$120-130 per cycle
APU	$75-80 per APU hour
Component overhaul	$210-220 per flight hour

Airbus A330-200

SEATING/RANGE	
Max seating	406
Typical seating	210-250
Maximum range	7,270nm (13,450km)
TECHNICAL CHARACTERISTICS	
MTOW	230 tonnes/242 tonnes
OEW	121 tonnes
MZFW	168 tonnes/170 tonnes
Fuel capacity	139,090 litres
Engines	PW4000/CF6-80E1/Trent 700
Thrust	68,000-72,000lbs (303-316kN)
FUELS AND TIMES	
Block fuel 1,000nm	12,720kg
Block fuel 2,000nm	23,710kg
Block fuel 4,000nm	45,680kg
Bock time 1,000nm	184 minutes
Block time 2,000nm	299 minutes
Block time 4,000nm	529 minutes
FLEET	
Entry into service	1998
In service	225
Operators (current and planned)	111
In storage	315
On order	11
Build peak year (2013)	51
Estimated production 2020	2
Average age (years)	11.4
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$105-110 per flight hour
Higher checks reserve	$95-100 per flight hour
Engine overhaul	$265-270 per engine flight hour
Engine LLP	$245-250 per engine cycle
Landing gear refurbishment	$150-155 per cycle
Wheels brakes and tyres	$375-380 per cycle
APU	$105-110 per APU hour
Component overhaul	$420-425 per flight hour

Airbus A330-200 Freighter

SEATING/RANGE	
Max Payload	65 tonnes
Maximum range	4,000nm (7,400km)
TECHNICAL CHARACTERISTICS	
MTOW	233 tonnes
OEW	115 tonnes
MZFW	178 tonnes
Fuel capacity	97,530 litres
Engines	RR Trent 700/PW4000
Thrust	68,000-72,000lbs (302-320kN)
FUELS AND TIMES	
Block fuel 1,000nm	12,720kg
Block fuel 2,000nm	23,710kg
Block fuel 4,000nm	45,680kg
Bock time 1,000nm	184 minutes
Block time 2,000nm	299 minutes
Block time 4,000nm	529 minutes
FLEET	
Entry into service	2010
In service	37
Operators (current and planned)	11
In storage	0
On order	3
Build peak year (2012)	8
Estimated production 2021	2
Average age (years)	4.7
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$105-110 per flight hour
Higher checks reserve	$95-100 per flight hour
Engine overhaul	$265-270 per engine flight hour
Engine LLP	$245-250 per engine cycle
Landing gear refurbishment	$150-155 per cycle
Wheels brakes and tyres	$375-380 per cycle
APU	$105-110 per APU hour
Component overhaul	$420-425 per flight hour

Airbus A330-300

SEATING/RANGE	
Max seating	440
Typical seating	250-290
Maximum range	6,340nm (11,750km)
TECHNICAL CHARACTERISTICS	
MTOW	230 tonnes/242 tonnes
OEW	121 tonnes
MZFW	173 tonnes/175 tonnes
Fuel capacity	97,530 litres
Engines	PW4000/CF6-80E1/Trent 700
Thrust	68,000-72,000lbs (303-316kN)
FUELS AND TIMES	
Block fuel 1,000nm	13,120kg
Block fuel 2,000nm	24,460kg
Block fuel 4,000nm	47,120kg
Bock time 1,000nm	184 minutes
Block time 2,000nm	299 minutes
Block time 4,000nm	529 minutes
FLEET	
Entry into service	1993
In service	359
Operators (current and planned)	82
In storage	364
On order	12
Build peak year (2014)	74
Estimated production 2021	5
Average age (years)	9.9
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$105-110 per flight hour
Higher checks reserve	$95-100 per flight hour
Engine overhaul	$265-270 per engine flight hour
Engine LLP	$245-250 per engine cycle
Landing gear refurbishment	$150-155 per cycle
Wheels brakes and tyres	$375-380 per cycle
APU	$105-110 per APU hour
Component overhaul	$420-425 per flight hour

Airbus A330-800neo

SEATING/RANGE	
Max seating	406
Typical seating	220-260
Typical range	8,150nm (15,090km)
TECHNICAL CHARACTERISTICS	
MTOW	251 tonnes
OEW	110 tonnes
MZFW	176 tonnes
Fuel capacity	139,090 litres
Engines	Trent 7000
Thrust	68,000lbs (303kN)
FUELS AND TIMES	
Block fuel 1,000nm	10,940kg
Block fuel 2,000nm	20,390kg
Block fuel 4,000nm	39,290kg
Bock time 1,000nm	184 minutes
Block time 2,000nm	299 minutes
Block time 4,000nm	529 minutes
FLEET	
Entry into service (planned)	2020
In service	2
Operators (current and planned)	3
In storage	none
On order	12
Built peak year	Not applicable
Estimated production 2021	1
Average age	Not applicable
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$105-110 per flight hour
Higher checks reserve	$95-100/flight hour
Engine overhaul	$265-270/engine flight hour
Engine LLP	$245-250/engine cycle
Landing gear refurbishment	$150-155/cycle
Wheels, brakes and tyres	$375-380/cycle
APU	$105-110/APU hour
Component overhaul	$420-425/flight hour

Maintenance reserves are based on A330-300 model pending confirmation of manufacturer's claimed reductions for new engine model.

Airbus A330-900neo

SEATING/RANGE	
Max seating	440
Typical seating	260-300
Maximum range	7,200nm (13,330km)
TECHNICAL CHARACTERISTICS	
MTOW	251 tonnes
OEW	115 tonnes
MZFW	181 tonnes
Fuel capacity	139,090 litres
Engines	Trent 7000
Thrust	68,000lbs (303kN)
FUELS AND TIMES	
Block fuel 1,000nm	11,280 kg
Block fuel 2,000nm	21,040 kg
Block fuel 4,000nm	40,520 kg
Bock time 1,000nm	184 minutes
Block time 2,000nm	299 minutes
Block time 4,000nm	529 minutes
FLEET	
Entry into service	2018
In service	31
Operators (current and planned)	25
In storage	21
On order	271
Build peak year (2019)	32
Estimated production 2021	15
Average age (years)	1.5
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$105-110 per flight hour
Higher checks reserve	$95-100 per flight hour
Engine overhaul	$265-270 per engine flight hour
Engine LLP	$245-250 per engine cycle
Landing gear refurbishment	$150-155 per cycle
Wheels brakes and tyres	$375-380 per cycle
APU	$105-110 per APU hour
Component overhaul	$420-425 per flight hour

Maintenance reserves are based on A330-300 model pending confirmation of manufacturer's claimed reductions for new engine model.

Airbus A350-900

SEATING/RANGE	
Max seating	440
Typical seating	300-350
Maximum range	8,100nm (15,000km)
TECHNICAL CHARACTERISTICS	
MTOW	280 tonnes
OEW	116 tonnes
MZFW	195 tonnes
Fuel capacity	141,000 litres
Engines	Trent XWB
Thrust	84,000lbs (374kN)
FUELS AND TIMES	
Block fuel 1,000nm	11,810kg
Block fuel 2,000nm	22,010kg
Block fuel 4,000nm	42,410kg
Bock time 1,000nm	179 minutes
Block time 2,000nm	291 minutes
Block time 4,000nm	512 minutes
FLEET	
Entry into service	2014
In service	242
Operators (current and planned)	54
In storage	109
On order	422
Build peak year (2019)	80
Estimated production 2021	45
Average age (years)	2.7
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$105-110 per flight hour
Higher checks reserve	$95-100 per flight hour
Engine overhaul	$295-300 per engine flight hour
Engine LLP	$270-275 per engine cycle
Landing gear refurbishment	$150-155 per cycle
Wheels brakes and tyres	$375-380 per cycle
APU	$105-110 per APU hour
Component overhaul	$420-425 per flight hour

Airbus A350-1000

SEATING/RANGE	
Max seating	440
Typical seating	350-410
Maximum range	8,700nm (16,100km)
TECHNICAL CHARACTERISTICS	
MTOW	316 tonnes
OEW	129 tonnes
MZFW	223 tonnes
Fuel capacity	159,000 litres
Engines	Trent XWB
Thrust	97,000lbs (432kN)
FUELS AND TIMES	
Block fuel 1,000nm	13,860kg
Block fuel 2,000nm	25,840kg
Block fuel 4,000nm	49,770kg
Bock time 1,000nm	179 minutes
Block time 2,000nm	291 minutes
Block time 4,000nm	512 minutes
FLEET	
Entry into service	2018
In service	39
Operators (current and planned)	15
In storage	13
On order	118
Build peak year (2019)	23
Estimated production 2021	25
Average age (years)	Less than 1
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$105-110 per flight hour
Higher checks reserve	$95-100 per flight hour
Engine overhaul	$315-320 per engine flight hour
Engine LLP	$290-295 per engine cycle
Landing gear refurbishment	$150-155 per cycle
Wheels brakes and tyres	$375-380 per cycle
APU	$105-110 per APU hour
Component overhaul	$420-425 per flight hour

Maintenance reserves are based on A350-900 model pending confirmation of manufacturer's claimed reductions for new engine model.

Airbus A380

SEATING/RANGE	
Max seating	853
Typical seating	544 (four-class)
Maximum range	8,700nm (15,200km)
TECHNICAL CHARACTERISTICS	
MTOW	575 tonnes
OEW	277 tonnes
MZFW	369 tonnes
Fuel capacity	320,000 litres
Engines	GP7200/Trent 900
Thrust	70,000lbs (311kN)
FUELS AND TIMES	
Block fuel 1,000nm	26,590kg
Block fuel 2,000nm	50,580kg
Block fuel 4,000nm	104,290kg
Bock time 1,000nm	146 minutes
Block time 2,000nm	265 minutes
Block time 4,000nm	501 minutes
FLEET	
Entry into service	2007
In service	61
Operators (current and planned)	16
In storage	178
On order	8
Build peak year (2012)	30
Estimated production 2021	8
Average age (years)	6.4
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$160-165 per flight hour
Higher checks reserve	$145-150 per flight hour
Engine overhaul	$195-200 per engine flight hour
Engine LLP	$200-205 per engine cycle
Landing gear refurbishment	$200-205 per cycle
Wheels brakes and tyres	$565-570 per cycle
APU	$155-160 per APU hour
Component overhaul	$575-580 per flight hour

ATR42-600

SEATING/RANGE	
Max seating	50
Typical seating	48
Maximum range	720nm (1,330km)
TECHNICAL CHARACTERISTICS	
MTOW	18.6 tonnes
OEW	11.7 tonnes
MZFW	17 tonnes
Fuel capacity	5,700 litres
Engines	PW127M
Thrust	2,160 shp
FUELS AND TIMES	
Block fuel 100nm	340kg
Block fuel 200nm	560kg
Block fuel 500nm	1,210kg
Bock time 100nm	33 minutes
Block time 200nm	55 minutes
Block time 500nm	122 minutes
FLEET	
Entry into service	2012
In service	41
Operators (current and planned)	23
In storage	12
On order	17
Build peak year (2019)	10
Estimated production 2020	5
Average age (years)	4.5
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$35-40 per flight hour
Higher checks reserve	$25-30 per flight hour
Engine overhaul	$100-105 per engine flight hour
Engine LLP	$30-35 per engine cycle
Landing gear refurbishment	$20-25 per cycle
Wheels brakes and tyres	$35-40 per cycle
APU	$15-20 per propeller hour
Component overhaul	$115-120 per flight hour

ATR72-600

SEATING/RANGE	
Max seating	78
Typical seating	72
Maximum range	825nm (1,526km)
TECHNICAL CHARACTERISTICS	
MTOW	23 tonnes
OEW	14 tonnes
MZFW	21 tonnes
Fuel capacity	6,370 litres
Engines	PW127M
Thrust	2,475 shp
FUELS AND TIMES	
Block fuel 100nm	370kg
Block fuel 200nm	610kg
Block fuel 500nm	1,310kg
Bock time 100nm	36 minutes
Block time 200nm	58 minutes
Block time 500nm	125 minutes
FLEET	
Entry into service	2011
In service	323
Operators (current and planned)	100
In storage	224
On order	160
Build peak year (2015)	79
Estimated production 2021	30
Average age (years)	5.0
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$35-40 per flight hour
Higher checks reserve	$25-30 per flight hour
Engine overhaul	$100-105 per engine flight hour
Engine LLP	$30-35 per engine cycle
Landing gear refurbishment	$20-25 per cycle
Wheels brakes and tyres	$35-40 per cycle
APU	$15-20 per propeller hour
Component overhaul	$125-130 per flight hour

Boeing 737-800

SEATING/RANGE	
Max seating	189
Typical seating	162
Maximum range (with winglets)	3,115nm (5,767km)
TECHNICAL CHARACTERISTICS	
MTOW	79 tonnes
OEW	41.1 tonnes
MZFW	61.7 tonnes
Fuel capacity	26,020 litres/40,580 litres
Engines	CFM56-7B
Thrust	27,300lbs (121kN)
FUELS AND TIMES	
Block fuel 200nm	2,000kg
Block fuel 500nm	3,530kg
Block fuel 1,000nm	6,190kg
Bock time 200nm	54 minutes
Block time 500nm	94 minutes
Block time 1,000nm	160 minutes
FLEET	
Entry into service	1998
In service	3,580
Operators (current and planned)	240
In storage	1,299
On order	33
Build peak year (2016)	408
Estimated production 2021	10
Average age (years)	8.7
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$65-70 per flight hour
Higher checks reserve	$50-55 per flight hour
Engine overhaul	$120-125 per engine flight hour
Engine LLP	$125-130 per engine cycle
Landing gear refurbishment	$45-50 per cycle
Wheels brakes and tyres	$70-75 per cycle
APU	$80-85 per APU hour
Component overhaul	$210-220 per flight hour

Boeing 737 Max 8

SEATING/RANGE	
Max seating	200
Typical seating	162-172
Maximum range	3,515nm (6,510km)
TECHNICAL CHARACTERISTICS	
MTOW	82.2 tonnes
OEW	45.1 tonnes
MZFW	65.9 tonnes
Fuel capacity	25,810 litres
Engines	LEAP-1B
Thrust	26,780lbs (119kN)
FUELS AND TIMES	
Block fuel 200nm	1,720kg
Block fuel 500nm	3,040kg
Block fuel 1,000nm	5,320kg
Bock time 200nm	54 minutes
Block time 500nm	94 minutes
Block time 1,000nm	160 minutes
FLEET	
Entry into service	2017
In service	28
Operators (current and planned)	94
In storage	327
On order	3,097
Build peak year (2018)	194
Estimated production 2021	Under review
Average age (years)	1.5
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$65-70 per flight hour
Higher checks reserve	$50-55 per flight hour
Engine overhaul	$120-125 per engine flight hour
Engine LLP	$125-130 per engine cycle
Landing gear refurbishment	$45-50 per cycle
Wheels brakes and tyres	$70-75 per cycle
APU	$80-85 per APU hour
Component overhaul	$210-220 per flight hour

Maintenance reserves are estimates based on 737-800 model pending in-service feedback and confirmation of claimed savings.

Boeing 737 Max 9

SEATING/RANGE	
Max seating	220
Typical seating	178-193
Maximum range	3,215nm (5,960km)
TECHNICAL CHARACTERISTICS	
MTOW	88.3 tonnes
OEW	45.1 tonnes
MZFW	71 tonnes
Fuel capacity	25,810 litres
Engines	LEAP-1B
Thrust	27,300 (121kN)
FUELS AND TIMES	
Block fuel 200nm	1,790kg
Block fuel 500nm	3,150kg
Block fuel 1,000nm	5,520kg
Bock time 200nm	54 minutes
Block time 500nm	94 minutes
Block time 1,000nm	160 minutes
FLEET	
Entry into service	2018
In service	1
Operators (current and planned)	15
In storage	27
On order	298
Build peak year (2018)	20
Estimated production 2021	Under review
Average age (years)	1.2
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$70-75 per flight hour
Higher checks reserve	$50-55 per flight hour
Engine overhaul	$20-125 per engine flight hour
Engine LLP	$125-130 per engine cycle
Landing gear refurbishment	$45-50 per cycle
Wheels brakes and tyres	$70-75 per cycle
APU	$80-85 per APU hour
Component overhaul	$210-220 per flight hour

Maintenance reserves are estimates based on 737-900 model pending in-service feedback and confirmation of claimed savings.

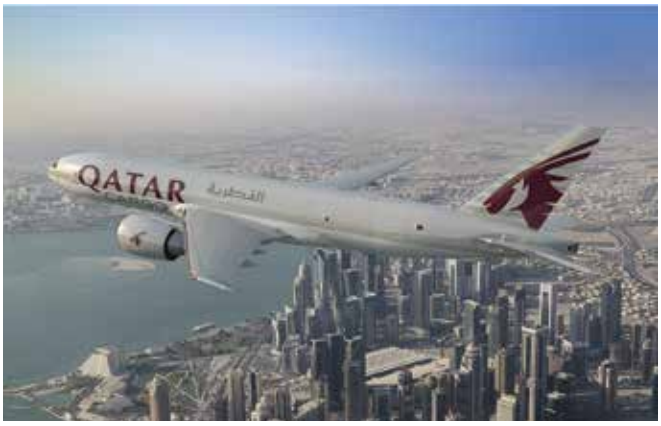
Boeing 747-8F

SEATING/RANGE	
Max Payload	137.7 tonnes
Maximum range	4,120nm (7,630km)
TECHNICAL CHARACTERISTICS	
MTOW	447.7 tonnes
OEW	197 tonnes
MZFW	329.8 tonnes
Fuel capacity	226,180 litres
Engines	GEnx-2B
Thrust	66,500 (296kN)
FUELS AND TIMES	
Block fuel 1,000nm	20,730kg
Block fuel 2,000nm	38,760kg
Block fuel 4,000nm	79,910kg
Bock time 1,000nm	146 minutes
Block time 2,000nm	265 minutes
Block time 4,000nm	501 minutes
FLEET	
Entry into service	2010
In service	92
Operators (current and planned)	14
In storage	2
On order	12
Build peak year (2013)	20
Estimated production 2021	5
Average age (years)	6.3
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$155-160 per flight hour
Higher checks reserve	$115-120 per flight hour
Engine overhaul	$170-175 per engine flight hour
Engine LLP	$260-265 per engine cycle
Landing gear refurbishment	$160-165 per cycle
Wheels brakes and tyres	$750-755 per cycle
APU	$105-110 per APU hour
Component overhaul	$505-510 per flight hour

Boeing 767F

SEATING/RANGE	
Max Payload	52 tonnes
Maximum range	3,250nm (6,020km)
TECHNICAL CHARACTERISTICS	
MTOW	187 tonnes
OEW	81 tonnes
MZFW	133 tonnes
Fuel capacity	91,380 litres
Engines	GE CF6-80C
Thrust	63,300lbs (276kN)
FUELS AND TIMES	
Block fuel 1,000Nm	10,560kg
Block fuel 2,000nm	19,760kg
Block fuel 4,000 Nm	37,910kg
Bock time 1,000Nm	184 minutes
Block time 2,000Nm	301 minutes
Block time 4,000Nm	536 minutes
FLEET	
Entry into service	1995
In Service	185
Operators (current and planed)	17
In Storage	1
On order	48
Built peak year (2019)	18
Estimated production 2021	6
Average age	8.6 years
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$100-105 per flight hour
Higher checks reserve	$75-80 per flight hour
Engine overhaul	$165-170 per engine flight hour
Engine LLP	$255-260 per engine cycle
Landing gear refurbishment	$65-70 per cycle
Wheels brakes and tyres	$70-75 per cycle
APU	$105-110 per APU hour
Component overhaul	$250-260 per flight hour

Boeing 777F



SEATING/RANGE	
Max Payload	102 tonnes
Maximum range	4,970 nm (9,200km)
TECHNICAL CHARACTERISTICS	
MTOW	348 tonnes
OEW	144 tonnes
MZFW	248 tonnes
Fuel capacity	181,280 litres
Engines	GE 90-110/115
Thrust	110,000lbs (489 kN)
FUELS AND TIMES	
Block fuel 1,000Nm	14,140 kg
Block fuel 2,000nm	26,350 kg
Block fuel 4,000 Nm	50,780 kg
Bock time 1,000Nm	152 minutes
Block time 2,000Nm	277 minutes
Block time 4,000Nm	525 minutes
FLEET	
Entry into service	2009
In Service	196
Operators (current and planed)	25
In Storage	none
On order	38
Built peak year	25
Estimated production 2021	12
Average age	6.1 years
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$125-130 per flight hour
Higher checks reserve	$90-95 per flight hour
Engine overhaul	$290-295 per engine flight hour
Engine LLP	$450-455 per engine cycle
Landing gear refurbishment	$160-165 per cycle
Wheels brakes and tyres	$480-485 per cycle
APU	$105-110 per APU hour
Component overhaul	$400-410 per flight hour

Boeing 777-300ER

SEATING/RANGE	
Max seating	550
Typical seating	365 (three-class)
Maximum range	7,370nm (13,650km)
TECHNICAL CHARACTERISTICS	
MTOW	351.5 tonnes
OEW	168 tonnes
MZFW	238 tonnes
Fuel capacity	181,280 litres
Engines	GE90-115BL
Thrust	115,300lbs (504kN)
FUELS AND TIMES	
Block fuel 1,000nm	15,610kg
Block fuel 2,000nm	29,840kg
Block fuel 4,000nm	60,900kg
Bock time 1,000nm	152 minutes
Block time 2,000nm	277 minutes
Block time 4,000nm	525 minutes
FLEET	
Entry into service	2003
In service	604
Operators (current and planned)	52
In storage	215
On order	16
Build peak year (2016)	89
Estimated production 2021	12
Average age (years)	8.1
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$125-130 per flight hour
Higher checks reserve	$90-95 per flight hour
Engine overhaul	$295-300 per engine flight hour
Engine LLP	$450-455 per engine cycle
Landing gear refurbishment	$160-165 per cycle
Wheels brakes and tyres	$480-485 per cycle
APU	$105-110 per APU hour
Component overhaul	$410-415 per flight hour

Boeing 787-8

SEATING/RANGE	
Max seating	359
Typical seating	248
Maximum range	7,300nm to (13,530km)
TECHNICAL CHARACTERISTICS	
MTOW	227.9 tonnes
OEW	120 tonnes
MZFW	172 tonnes
Fuel capacity	126,920 litres
Engines	GEnx/Trent 1000
Thrust	64,000lbs (280kN)
FUELS AND TIMES	
Block fuel 1,000nm	10,170kg
Block fuel 2,000nm	18,970kg
Block fuel 4,000nm	36,540kg
Bock time 1,000nm	178 minutes
Block time 2,000nm	265 minutes
Block time 4,000nm	510 minutes
FLEET	
Entry into service	2011
In service	229
Operators (current and planned)	52
In storage	146
On order	50
Build peak year (2014)	104
Estimated production 2021	12
Average age (years)	6.1
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$110-115 per flight hour
Higher checks reserve	$80-85 per flight hour
Engine overhaul	$300-310 per engine flight hour
Engine LLP	$305-310 per engine cycle
Landing gear refurbishment	$75-80 per cycle
Wheels brakes and tyres	$100-105 per cycle
APU	$105-110 per APU hour
Component overhaul	$315-320 per flight hour

Boeing 787-9

SEATING/RANGE	
Max seating	408
Typical seating	296 (two-class)
Maximum range	7,530nm (13,950km)
TECHNICAL CHARACTERISTICS	
MTOW	252.7 tonnes
OEW	120 tonnes
MZFW	181 tonnes
Fuel capacity	138,700 litres
Engines	GEnx1B/Trent 1000
Thrust	71,000lbs (320kN)
FUELS AND TIMES	
Block fuel 1,000nm	10,480kg
Block fuel 2,000nm	19,500kg
Block fuel 4,000nm	37,630kg
Bock time 1,000nm	178 minutes
Block time 2,000nm	265 minutes
Block time 4,000nm	510 minutes
FLEET	
Entry into service	2014
In service	395
Operators (current and planned)	69
In storage	162
On order	323
Build peak year (2018)	120
Estimated production 2020	36
Average age (years)	3.1
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$110-115 per flight hour
Higher checks reserve	$85-90 per flight hour
Engine overhaul	$310-315 per engine flight hour
Engine LLP	$320-325 per engine cycle
Landing gear refurbishment	$75-80 per cycle
Wheels brakes and tyres	$100-105 per cycle
APU	$125-130 per APU hour
Component overhaul	$320-325 per flight hour

Boeing 787-10

SEATING/RANGE	
Max seating	440
Typical seating	336
Maximum range	6,345nm (11,750km)
TECHNICAL CHARACTERISTICS	
MTOW	254 tonnes
OEW	135 tonnes
MZFW	192.7 tonnes
Fuel capacity	126,370 litres
Engines	GEnx-1B/Trent 1000
Thrust	76,000 (340kN)
FUELS AND TIMES	
Block fuel 1,000nm	11,310kg
Block fuel 2,000nm	21,080kg
Block fuel 4,000nm	40,620kg
Bock time 1,000nm	146 minutes
Block time 2,000nm	265 minutes
Block time 4,000nm	501 minutes
FLEET	
Entry into service	2018
In service	50
Operators (current and planned)	14
In storage	11
On order	144
Build peak year (2019)	29
Estimated production 2022	24
Average age (years)	1.6
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$120-125 per flight hour
Higher checks reserve	$90-95per flight hour
Engine overhaul	$315-320 per engine flight hour
Engine LLP	$320-325 per engine cycle
Landing gear refurbishment	$75-80 per cycle
Wheels brakes and tyres	$105-110 per cycle
APU	$125-130 per APU hour
Component overhaul	$330-335 per flight hour

Bombardier CRJ900

SEATING/RANGE	
Max seating	90
Typical seating	88
Maximum range	1,550nm (2,871km)
TECHNICAL CHARACTERISTICS	
MTOW	38.3 tonnes
OEW	21.8 tonnes
MZFW	32.1 tonnes
Fuel capacity	10,990 litres
Engines	CF34-8C5
Thrust	14,510lbs (64.5kN)
FUELS AND TIMES	
Block fuel 200nm	1,240kg
Block fuel 500nm	2,100kg
Block time 200nm	45 minutes
Bock time 500nm	88 minutes
FLEET	
Entry into service	2003
In service	290
Operators (current and planned)	35
In storage	195
On order	18
Build peak year (2008)	59
Estimated production 2020	10
Average age (years)	9.6
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$50-55 per flight hour
Higher checks reserve	$35-40 per flight hour
Engine overhaul	$75-80 per engine flight hour
Engine LLP	$105-110 per engine cycle
Landing gear refurbishment	$30-35 per cycle
Wheels brakes and tyres	$50-55 per cycle
APU	$60-65 per APU hour
Component overhaul	$160-165 per flight hour

De Havilland of Canada Dash 8 400

SEATING/RANGE	
Max seating	90
Typical seating	74
Maximum range	1,100nm (2,040km)
TECHNICAL CHARACTERISTICS	
MTOW	30.5 tonnes
OEW	17.8 tonnes
MZFW	29 tonnes
Fuel capacity	6,700 litres
Engines	PW150A
Thrust	5,070shp
FUELS AND TIMES (LR cruise)	
Block fuel 100nm	480kg
Block fuel 200nm	740kg
Block fuel 500nm	1,550kg
Bock time 100nm	44 minutes
Block time 200nm	65 minutes
Block time 500nm	126 minutes
FLEET	
Entry into service	1999
In service	328
Operators (current and planned)	75
In storage	236
On order	31
Build peak year (2010)	54
Estimated production 2021	12
Average age (years)	10.1
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$45-50 per flight hour
Higher checks reserve	$34-35 per flight hour
Engine overhaul	$150-155 per engine flight hour
Engine LLP	$45-50 per engine cycle
Landing gear refurbishment	$35-40 per cycle
Wheels brakes and tyres	$45-50 per cycle
APU	$55-60 per APU hour
Propeller	$15-20 per flight hour
Component overhaul	$145-150 per propeller hour

Embraer E190

SEATING/RANGE	
Max seating	114
Typical seating	98
Maximum range	2,400 Nm (4,450km)
TECHNICAL CHARACTERISTICS	
MTOW	47.8 tonnes
OEW	27.7 tonnes
MZFW	40.8
Estimated fuel capacity	16,210 litres
Engines	GE CF34-10E
Thrust	18,500 lbs
FUELS AND TIMES	
Block fuel 200nm	1,340 kg
Block fuel 500nm	2,710 kg
Block time 200nm	51 minutes
Bock time 500nm	89 minutes
FLEET	
Entry into service	2005
In service	331
Operators (current and planned)	87
In storage	229
On order	3
Build peak year (2008)	78
Estimated production 2021	3
Average age (years)	Not applicable
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$45-50 per flight hour
Higher checks reserve	$35-40 per flight hour
Engine overhaul	No data per engine flight hour
Engine LLP	No data per engine cycle
Landing gear refurbishment	$35-40 per cycle
Wheels brakes and tyres	$55-60 per cycle
APU	$70-75 per APU hour
Component overhaul	$180-185 per flight hour

Embraer E175

SEATING/RANGE	
Max seating	88
Typical seating	78
Maximum range	2,200nm (4,070km)
TECHNICAL CHARACTERISTICS	
MTOW	40.4 tonnes
OEW	22 tonnes
MZFW	32 tonnes
Fuel capacity	11,630 litres
Engines	CF34-8E
Thrust	13,800lbs (60kN)
FUELS AND TIMES	
Block fuel 200nm	1,180kg
Block fuel 500nm	2,390kg
Block time 200nm	51 minutes
Bock time 500nm	89 minutes
FLEET	
Entry into service	2005
In service	540
Operators (current and planned)	30
In storage	109
On order	178
Build peak year (2016)	88
Estimated production 2021	30
Average age (years)	6.2
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$45-50 per flight hour
Higher checks reserve	$35-40 per flight hour
Engine overhaul	$75-80 per engine flight hour
Engine LLP	$105-110 per engine cycle
Landing gear refurbishment	$30-35 per cycle
Wheels brakes and tyres	$50-55 per cycle
APU	$55-60 per APU hour
Component overhaul	$150-160 per flight hour

Embraer E190-E2

SEATING/RANGE	
Max seating	114
Typical seating	106
Maximum range	2,850nm (5,280km)
TECHNICAL CHARACTERISTICS	
MTOW	56.4 tonnes
OEW	33 tonnes
MZFW	46.7 tonnes
Fuel capacity	17,110 litres
Engines	PW1919
Thrust	19,000lbs (85kN)
FUELS AND TIMES	
Block fuel 200nm	1,140kg
Block fuel 500nm	2,300kg
Block time 200nm	51 minutes
Bock time 500nm	89 minutes
FLEET	
Entry into service	2018
In service	14
Operators (current and planned)	7
In storage	5
On order	16
Build peak year (2019)	7
Estimated production 2021	6
Average age (years)	1.5
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$45-50 per flight hour
Higher checks reserve	$35-40 per flight hour
Engine overhaul	No data
Engine LLP	No data
Landing gear refurbishment	$35-40 per cycle
Wheels brakes and tyres	$55-60 per cycle
APU	$70-75 per APU hour
Component overhaul	$18-185 per flight hour

Maintenance reserves are estimates based on E190 model pending in-service feedback and confirmation of claimed savings.

Embraer E195-E2

SEATING/RANGE	
Max seating	146
Typical seating	132
Typical range	2,600nm (4,800km)
TECHNICAL CHARACTERISTICS	
MTOW	61.5 tonnes
OEW	35.7 tonnes
MZFW	51.8 tonnes
Estimated fuel capacity	17,110 litres
Engines	Pratt & Whitney PW1919
Thrust	19,000lbs (85kN)
FUELS AND TIMES	
Block fuel 200nm	1,260kg
Block fuel 500nm	2,440kg
Bock time 200nm	51 minutes
Block time 500nm	89 minutes
FLEET	
Entry into service	2019
In service	11
Operators (current and planned)	11
In storage	2
On order	130
Built peak year	Not applicable
Estimated production 2019	20
Average age (years)	Less than 1
INDICATIVE MAINTENANCE RESERVES	
C-check reserve	$45-50 per flight hour
Higher checks reserve	$35-40/flight hour
Engine overhaul	No data
Engine LLP	No data
Landing gear refurbishment	$35-40/cycle
Wheels, brakes and tyres	$55-60/cycle
APU	$70-75/APU hour
Component overhaul	$180-185/flight hour

Maintenance reserves are estimates based on E195 model pending in-service feedback and confirmation of claimed savings.

Sukhoi SSJ100

SEATING/RANGE	
Max seating	108
Typical seating	98
Maximum range (basic version)	1,645nm (3,048km)
Maximum range (LR version)	2,470nm (4,578km)
TECHNICAL CHARACTERISTICS	
MTOW (basic version)	45.8 tonnes
MTOW (LR version)	48.5 tonnes
OEW (basic version)	24.3 tonnes
OEW (LR version)	25.1 tonnes
MZFW (basic version)	36.6 tonnes
MZFW (LR version)	37.4 tonnes
Fuel capacity	13,135 litres
Engines	PowerJet SaM146-1S17/8
Thrust	17,800lbs with automatic power reserve
FUELS AND TIMES	
Block fuel 200nm	1,150kg
Block fuel 500nm	2,340kg
Block time 200nm	46 minutes
Bock time 500nm	83 minutes
FLEET	
Entry into service	2011
In service	106
Operators (current and planned)	31
In storage	62
On order	130
Build peak year (2018)	28
Estimated production 2020	12
Average age (years)	4.7
INDICATIVE MAINTENANCE RESERVES	
Insufficient data available	

New aircraft market values ($ million)

Model	Avitas view	CV view	IBA view	ICF view	MBA view	Oriel view	Average
Airbus							
A220-100	30.4	31.5	32.9	33.6	33.6	33.4	**32.6**
A220-300	35.3	35.8	36.4	37.1	38.0	38.2	**36.8**
A319neo	37.3	-	37.0	36.8	35.6	-	**36.7**
A320	42.6	42.0	39.9	41.7	42.2	40.5	**41.5**
A320neo	48.6	50.0	48.9	49.4	48.1	50.1	**49.2**
A321	47.9	47.5	46.4	50.4	50.4	48.3	**48.5**
A321neo	53.9	56.0	56.2	54.9	55.0	50.9	**54.5**
A330-200	78.6	70.0	70.5	78.0	64.7	-	**72.4**
A330-200 Freighter	82.7	98.5	70.6	91.2	77.2	-	**84.0**
A330-300	87.6	75.0	78.8	87.5	73.9	-	**80.6**
A330-800	89.5	-	98.4	95.6	96.0	81.4	**92.2**
A330 900 (neo)	100.0	105.4	109.5	101.9	109.6	97.4	**104.0**
A350-900	147.7	147.2	147.6	148.8	144.4	139	**145.8**
A350-1000	160.0	161.2	162.3	161.7	167.3	142	**159.1**
A380	195.2	147.4	177.6	194.7	132.4	-	**169.5**
ATR							
ATR42-600	15.7	-	15.3	15.7	15.6	15.3	**15.5**
ATR72-600	18.9	-	21.0	20.4	20.0	16.5	**19.3**
Boeing							
737-800	-	42.6	41.8	42.7	46.4	-	**43.4**
737 Max 8	46.5	47.1	46.7	47.8	48.1	45.4	**46.9**
737 Max 9	48.5	49.0	46.9	52.3	49.0	48.5	**49.0**
747-8F	180.2	187.7	164.6	182.6	190.6	182	**181.3**
767F	80.8	86.7	66.2	78.1	80.9	80.0	**78.8**
777-300ER	147.6	135.7	135.1	147.4	152.5	132.0	**141.7**
777F	166.1	170.4	143.4	156.9	168.6	149	**159.1**
787-8	114.5	112.4	112.2	117.9	119.5	108	**114.1**
787-9	138.1	140.0	139.8	141.2	141.8	138	**139.8**
787-10	150.0	147.0	143.5	152.1	152.6	147.0	**148.7**
Mitsubishi							
CRJ900	25.4	21.3	21.9	26.0	27.4	-	**24.4**
DeHaviland							
DHC8-400	20.0	-	21.2	20.3	19.9	16.8	**19.7**
Embraer							
E175	27.1	21.5	24.7	28.3	30.0	23.4	**25.8**
E190	31.0	-	-	-	21.9	-	**26.5**
E190-E2	32.4	29.0	30.2	32.4	31.9	30.6	**31.1**
E195-E2	34.3	31.7	34.3	36.5	34.5	32.3	**33.9**
Sukhoi							
SSJ100	24.0	-	20.4	22.5	-	-	**22.3**

New aircraft lease rates ($'000s per month)

Model	Avitas view	CV view	IBA view	ICF view	MBA view	Oriel view	Range
Airbus							
A220-100	220-230	230	209	223-247	237	230	**209-247**
A220-300	245-255	260	230	247-273	267	270	**230-273**
A319neo	265-275	-	239	262 -290	241	-	**239-290**
A320	300-310	280	238	277-306	286	275	**238-310**
A320neo	310-320	320	285	314-347	325	315	**285-347**
A321	330-340	310	260	335-370	341	280	**260-370**
A321neo	335-345	350	361	365-404	372	360	**335-404**
A330-200	570-600	450	570	548-606	394	-	**394-606**
A330-200 Freighter	685-715	750	632	624-689	535	-	**535-750**
A330-300	600-630	460	621	623-689	451	500	**451-689**
A330-800	650-680	-	683	636-703	585	660	**585-703**
A330 900 (neo)	685-715	725	762	726-803	668	740	**668-803**
A350-900	935-965	950	951	990-1,094	880	895	**880-1,094**
A350-1000	1,075-1,105	1,100	1,122	1,121-1,239	1,020	975	**975-1,239**
A380	1,405-1,435	1,200	1,345	1,295-1,431	807	-	**807-1,435**
ATR							
ATR42-600	125-135	-	136	104-115	117	130	**104-136**
ATR72-600	105-115	-	152	135-150	150	150	**105-152**
Boeing							
737-800	-	280	244	284-314	314	-	**244-314**
737 Max 8	270-280	320	262	282-311	325	295	**262-325**
737 Max 9	290-300	330	272	308-340	332	315	**272-340**
747-8F	1,455-1,485	1,275	1,330	1,214-1,342	1,306	1,425	**1,214-1,485**
767F	490-520	660	509	519-574	561	635	**490-660**
777-300ER	980-1,010	950	955	980-1,083	929	855	**855-1,083**
777F	1,085-1,115	1,200	1,152	1,043-1,153	1,207	1,085	**1,043-1,207**
787-8	760-790	725	723	784-867	729	705	**705-867**
787-9	885-915	900	863	939-1,038	864	810	**810-1,038**
787-10	915-945	950	924	1,011-1,118	930	910	**910-1,118**
Mitsubishi							
Mitsubishi CRJ900	165-175	165	171	173-191	205	-	**165-205**
DeHaviland							
DHC8-400	115-125	-	145	135-149	149	150	**115-150**
Embraer							
E175	200-210	215	178	188-208	225	180	**178-225**
E190	215-225	-	-	-	200	-	**200-215**
E190-E2	240-250	230	200	216-238	222	210	**200-250**
E195-E2	255-265	250	227	243-269	240	220	**220-269**
Sukhoi							
SSJ100	35-45	-	176	149-165	-	-	**35-176**

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