

The A300 family has been in airline service for over three decades and large numbers are still operating. A significant passenger-to-freighter conversion sector adds to the conventional MRO market. *Aircraft Commerce* has surveyed the providers of airframe, engine and associated services for the types.

A300 & A310

global technical support survey

The A300B1 prototype first flew in 1972 and 54 production A300B2s (-100s & -200s) entered airline service. The later A300B4-100 model entered service in 1975, and incorporated additional fuel capacity and higher design weights, giving it an improved payload-range capability. The further improved A300B4-200 entered service in 1978. As well as the A300B4 passenger versions, a number of A300C4 convertible aircraft and A300F4 freighters were built.

Altogether, 248 A300B2s and -B4s were built from 1975 to 1985.

The A300B4s are powered either by General Electric (GE) CF6-50C engines or by Pratt & Whitney (PW) JT9D-59A engines. The most common variant, the CF56-50C2, also powers the DC-10-30 and 747-200B (with the designation CF6-50E2).

The A310 is a shortened derivative of the A300, which served smaller markets. Although it was based on the larger A300, major changes were introduced: a

new higher aspect ratio wing of smaller span and area; new and smaller horizontal tail surfaces; fly-by-wire outboard spoilers; and, crucially, a two-crew electronic flight instrument system (EFIS) flightdeck.

Much of the A310's technology was later incorporated in the A300-600, the replacement model for the A300B4. The A310 entered service in April 1983, in its original (-200) version. The A310-300 is a longer-range development and has been in production since 1985. The A310-200 is powered by PWJT9D-7R4s or CF6-80C2s. The PW4156A was introduced for the -300 variant.

The A300-600 was introduced in 1986, and shares many of the A310's characteristics. The -600R introduced further improvements aimed largely at extending the range. The A300-600 and -600R are powered by CF6-80C2 or PW4158 engines.

The significant difference between the A300B models and the A300-600/A310 variants is that the latter were designed under the auspices of Maintenance Steering Group 3 (MSG-3). The earlier models date from the MSG-2 era, which



A large portion of A300s and A310s are configured as freighters, and this portion is set to grow. The total A300 and A310 fleet is also forecast to decline, with a commensurate reduction in the global MRO market for the types.

ENGINEERING MANAGEMENT & TECHNICAL SUPPORT

Maintenance Provider	Outsourced engineering service	Design organisation approval	Mtce records manage	Documents & manuals manage	Mtce programme manage	Reliability stats	ADs, SBs, & EOs manage	Check plan & job card manage
AAR Corp	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Abu Dhabi Aircraft Technologies (ADAT)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Aeroframe Services	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Aveos	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
EADS-EFW		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Egyptair M&E 2)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
GE Engine Services 1)	GE	GE	GE	GE	GE	GE	GE	GE
Goodrich	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Iberia	A310	A310	A310	A310	A310	A310	A310	A310
JorAMCo	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Kuwait Airways Corporation 2)		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lufthansa Technik	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MNG Technic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pratt & Whitney 1)	PW	PW	PW	PW	PW	PW	PW	PW
Sabena Technics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SIA Engineering Company 2)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SR Technics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ST Aerospace	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TAP M&E	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TIMCO Aviation Services	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Thai International Airways	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Turkish Airlines Technic 2)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Maintenance Provider	Aircraft config & IPC	Total tech support	Engine trend monitor	Flight data monitor	Aircraft accept & return	Continuing airworthiness approval	Approvals held
AAR Corp	Yes	Yes			Yes	Yes	FAA, EASA + various
Abu Dhabi Aircraft Technologies (ADAT)	Yes	Yes	Yes	Yes	Yes	Yes	GCAA, FAA, EASA
Aeroframe Services	Yes	Yes	Yes	Yes	Yes	Yes	FAA, EASA
Aveos	Yes	Yes	Yes	Yes	Yes	Yes	Transport Canada, FAA, EASA + 2
EADS-EFW	Yes	Yes			Yes		EASA
Egyptair M&E 2)	Yes	Yes	Yes	Yes	Yes	Yes	EASA
GE Engine Services 1)	GE	GE	GE	GE	GE	GE	FAA, EASA, +30/40
Goodrich	Yes	Yes	Yes	Yes	Yes	Yes	FAA, EASA + 16
Iberia	A310	A310	A310	A310	A310	A310	FAA, EASA + various
JorAMCo	Yes	Yes	Yes	Yes	Yes	Yes	FAA, EASA
Kuwait Airways Corporation 2)	Yes	Yes	Yes	Yes	Yes	Yes	DGCA, EASA
Lufthansa Technik	Yes	Yes	Yes	Yes	Yes	Yes	FAA/EASA + 39 countries
MNG Technic		Yes			Yes		FAA/EASA + 2
Pratt & Whitney 1)	PW	PW	PW			PW	FAA, EASA + various
Sabena Technics	Yes	Yes	Yes	Yes	Yes	Yes	FAA, EASA + various
SIA Engineering Company 2)	Yes	Yes	Yes	Yes	Yes	Yes	CAAS, FAA, EASA + 23
SR Technics	Yes	Yes	Yes	Yes	Yes	Yes	FAA, EASA + various
ST Aerospace	Yes	Yes	Yes	Yes	Yes	Yes	FAA, EASA + 5
TAP M&E	Yes	Yes	Yes	Yes	Yes	Yes	ANAC, FAA, EASA + 5
TIMCO Aviation Services	Yes	Yes	Yes	Yes	Yes	Yes	FAA, EASA + 3
Thai International Airways	Yes	Yes	Yes	Yes	Yes	Yes	Thai DOA, FAA, EASA + various
Turkish Airlines Technic 2)	Yes	Yes	Yes	Yes	Yes	Yes	FAA/EASA + 18

1) Engines only
2) Based on Aircraft Commerce research
PW: applicable to Pratt & Whitney engines only
GE: applicable to General Electric engines only
All providers cater for A300 & A310, unless otherwise stated.

means that their maintenance programmes are more onerous.

Significant numbers of factory-built freighter versions of the A300-600 and both variants of the A310 have been produced. The A310 and A300 officially ceased production in July 2007.

A300/A310 fleets

According to the ACAS database, there are currently 472 Airbus

A300/A310s in active service, and a further 122 in storage. The proportion of the fleet in storage is high, particularly for the A300B and A310-200 models. Only the A310-300 has less than 10% of its fleet in storage. The average age of the overall fleet is 19 years and there are 91 operators. The full breakdown by model is summarised (*see second table, page 50*).

The geographic split of the current fleet shows a higher concentration of

aircraft in the Middle East and Asia than for the types featured in previous *Aircraft Commerce* maintenance, repair and overhaul (MRO) surveys. This is reflected in the distribution of third-party maintenance providers. A quarter of the remaining A300B fleet is in the Middle East. Europe still has a significant fleet of A300Bs, but many of the remaining aircraft are not currently active and few are likely return to service. Most A300B2s and -B4s operate as freighters.

LINE AND LIGHT MAINTENANCE SUPPORT

Maintenance Provider	Maint ops ctrl	Off-site & off-line AOG	Line checks	A checks	Eng LRU & QEC change	Engine changes	Ldg gear changes	APU changes	Thrust rev changes	Despatch relia stats	Approvals held
AAR Corp		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		FAA, EASA + various
Abu Dhabi Aircraft (ADAT) Technologies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	GCAA, FAA, EASA + various
Aeroframe Services	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	FAA, EASA
Aveos	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Transport Canada, FAA, EASA + 7
EADS-EFW	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		FAA, EASA + 4
Egyptair M&E 2)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	EASA
Evergreen Maintenance 2) Center			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	FAA, EASA, CAAC
GE Engine Services 1)	GE	GE	GE	GE	GE	GE			GE	GE	FAA, EASA +30/40
Goodrich									Yes		FAA, EASA + various
HAECO 2)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		CAD, FAA, EASA + 25
Iberia	A310	A310	A310	A310	A310	A310	A310	A310	A310	A310	FAA, EASA + 16
JorAMCo	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	FAA, EASA
Kuwait Airways Corporation 2)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	DGCA, EASA
Lufthansa Technik	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	FAA, EASA + 39 countries
MNG Technic			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	FAA, EASA + 2
Monarch Aircraft Engineering											
Pratt & Whitney 1)					Yes	Yes					FAA, EASA + various
Sabena Technics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	FAA, EASA + various
SIA Engineering Company	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	CAAS, FAA, EASA + 23
SR Technics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	FAA/EASA + various
ST Aerospace	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	FAA, EASA + 7
TAP M&E	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	ANAC, FAA, EASA + 5
TIMCO Aviation Services	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		FAA, EASA
Thai International Airways	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Thai DOA, FAA, EASA + various
Turkish Airlines Technic 2)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	FAA, EASA + 18

1) engines only

2) based on Aircraft Commerce research, not survey response

PW: applicable to Pratt & Whitney engines only

GE: applicable to General Electric engines only

All providers cater for A300 & A310, unless otherwise stated.

A300/A310 CURRENT FLEET

Aircraft model	In service	Stored	Average age	Number of operators
A300B	67	25	28	27
A300-600	240	56	24	33
A310-200	38	27	25	8
A310-300	127	14	19	42
Total	472	122		

Aircraft model	Africa	Asia	Europe	Latin America	Middle East	North America	Aircraft in pax role
A300B	4	5	44	4	23	12	22%
A300-600	11	72	19	5	26	163	43%
A310-200	3	1	8	0	7	46	28%
A310-300	1	37	38	1	25	39	60%

Large fleets are flown by DHL, TNT and MNG Cargo at low rates of utilisation.

North America has the highest concentration of A300-600s and A310-300s, due largely to the sizeable freighter fleets of UPS and Fedex, and American's A300-600 fleet. American now plans to phase out these aircraft.

The freighter market is highly

significant for the A300/A310, with only the A300-600 having a majority of aircraft in the passenger role.

The market is characterised by operators with small fleets, with only a few operators having more than 10 aircraft. Apart from the two major US freight carriers, only Iran Air and Japan Air have more than 20 aircraft.

A300/A310 MRO market

The combined A300/A310 MRO market remains an important contributor to the commercial aircraft MRO industry's revenues. It is significantly smaller than, for example, the 757/767 market (see 757/767 global technical support, Aircraft October/November 2009, page 67).

According to OAG/AeroStrategy's commercial aircraft MRO forecast, the combined total spend for the A300/A310 in 2009 was close to \$1.5 billion (about a quarter of the 757/767 maintenance market).

The A300 fleet accounts for over 60% of the spend, in line with the size of fleet. The split between MRO sectors is typical, with engines accounting for the largest part of the spend (30%). Modifications account for only 5%, but this excludes passenger-to-freighter conversions.

The annual market of \$1.5 billion is forecast to decline further in line with fleet retirements. Most of the aircraft operating in 10 years' time will be freighters, and large numbers of passenger-configured aircraft will have

BASE MAINTENANCE SUPPORT

Maintenance Provider	C checks	D& heavy checks	Interior refurb	Strip & paint	Types of back shop	Location/No base check bays	No of mechanics	No of shifts	Weekend shifts	Annual capacity base checks	Approvals held
AAR Corp	Yes	Yes	Yes	Yes	Extensive	2	1,000+	3	Yes	Depends on demand	FAA, EASA + various
Abu Dhabi Aircraft Technologies (ADAT)	Yes	Yes	Yes	Yes	Wide range of composites	3	350	2/3	Yes	20	GCAA, FAA, EASA + various
Aeroframe Services	Yes	Yes	Yes	Yes	Comprehensive, supports all base activity	14	250	2	2	6	FAA, EASA
Aveos	Yes	Yes	Yes	Partial	Composite, sheet metal, machine shop	6	400-600	3	Yes	2 lines	Transport Canada, FAA, EASA + 2
EADS-EFW	Yes	Yes	Yes	Partial paint	Extensive	8	300	3	Yes	8	FAA, EASA+ 4
Egyptair M&E 2)	A300	A300	A300	A300	Extensive	Cairo					EASA
Evergreen Maintenance Center	Yes	Yes	Yes	Yes	Extensive	Marana, AZ					FAA, EASA, CAAC
Iberia	A310	A310	A310	A310	Various	12	1,050	3	3	800,000MH	FAA, EASA + 16
JorAMCo	Yes	Yes	Yes	Yes	Comprehensive	5	35		Yes	55-60	FAA, EASA
Kuwait Airways Corp	Yes	Yes	Yes		Includes avionics, electrical, NDT	Safat	900				DGCA, EASA
Lufthansa Technik	Yes	Yes	Yes	Yes	Full			3	Yes		FAA, EASA + 39
MNG Technic	Yes	Yes	Yes	Yes	Extensive	6	80	1	1	60	FAA, EASA + 2
Sabena	Yes	Yes	Yes	Yes	Hydraulics, avionics, pneumatics, sheet metal		1,200	3	Possible	700	FAA, EASA + various
SIA Engineering Company	Yes	Yes	Yes	Yes	Extensive	Singapore					CAAS, FAA, EASA + 23
SR Technics	Yes	Yes	Yes	Yes	Extensive	6	610	3	3	Varies	FAA, EASA + various
ST Aerospace	Yes	Yes	Yes	Yes	Extensive	Various, 25	3,000	1	Yes	Varies	FAA, EASA + 7
TAP M&E	Yes	Yes	Yes	Yes	Extensive	LIS, RIO, 8	900	3	Yes	65	ANAC/EASA, FAA + 5
Thai International Airways	Yes	Yes	Yes	Yes	Interior, sheet metal	3	330	3	Yes	30	Thai DOA, FAA, EASA + various
TIMCO Aviation Services	Yes	Yes	Yes	Yes	Full capability	6	400	3	Yes	120	FAA, EASA + 3
Turkish Airlines Technic 2)	Yes	A310	Yes	Yes	Extensive	Istanbul	1,920	3	Yes	100	FAA, EASA + 18

2) Based on Aircraft Commerce research

ENGINE MAINTENANCE

Maintenance Provider	Engine maint mgt	Scheduled on-wing engine maint.	Unscheduled on-wing maint.	Engine shop visits	Parts repair schemes	Total Care Packages	Level of test cell capabilities	Aviation Authority Approvals
AAR Corp	PW, GE		PW, GE		PW, GE	Joint with MTU		FAA, EASA + various
Abu Dhabi Aircraft Technologies (ADAT)	Yes	Yes	Yes	GE	Extensive	Yes	10,000lbs	GCAA, FAA, EASA + various
Aeroframe Services		Yes	Yes		Yes			FAA, EASA
Aveos		Yes	Yes					Transport Canada, FAA, EASA + 7
EADS-EFW		Yes	Yes					EASA, FAA + 4
Egyptair M&E 2)		Yes	Yes					EASA
Evergreen Maintenance Centre 2)		Yes	Yes					FAA, EASA, CAAC
GE Engine Services	GE	GE	GE	GE Celma & GE Caldeonian	GE	GE	Full	FAA, EASA, + 30/40
Goodrich					PW			FAA, EASA, CAAC, TCAA + various
JorAMCo		Yes	Yes	Module Changes				FAA, EASA
Kuwait Airways Corp 2)	GE	Yes	Yes					DGCA, EASA
Lufthansa Technik	PW, GE	PW, GE	PW, GE	PW, GE	PW, GE	PW, GE	100,000lbs	FAA, EASA, + 39
Pratt & Whitney	PW	PW	PW	PW	PW	PW	Full (PW)	FAA, EASA+ various
Sabena Technics	Yes	Yes	Yes	Managed	Managed			FAA, EASA+ various
SIA Engineering Company	GE	Yes	Yes	GE	GE	GE	Full (PW)	CAAS, FAA, EASA, + 23
SR Technics	PW	PW	PW	PW	PW	PW	Full	FAA, EASA + various
TAP M&E		Yes	Yes					ANAC, FAA, EASA, + 5
Thai Airways International	PW, GE	PW, GE	PW, GE	GE	GE		Full	Thai DOA, FAA, EASA, + various
TIMCO Aviation Services		PW, GE	PW, GE					FAA, EASA
Turkish Airlines Technic 2)	GE	PW, GE	PW, GE	GE	GE	GE	Full	FAA, EASA + 18

2) Based on Aircraft Commerce research

PW: Applicable Pratt & Whitney engine models

GE: Applicable General Electric engine models

A300/A310 MRO MARKET 2009 - \$ MILLIONS

Maintenance sector	A300	A310	Total
Airframe heavy maintenance	196	140	336
Engine repair & overhaul	267	171	438
Component repair & overhaul	185	99	284
Line maintenance	237	123	360
Modifications (including freighter conversion)	46	26	72
Total	\$931 million	\$559 million	\$1,490 million

Source: OAG/AeroStrategy's commercial aircraft MRO forecast

FORECAST OF A300/A310 MRO MARKET VALUE - \$ MILLION

Year	2009	2013	2018	CAGR
A300	930	818	671	-4%
A310	558	442	250	-9%
Total	1,488	1,260	922	-5%

Source: OAG/AeroStrategy's commercial aircraft MRO forecast

SPARE ENGINE SUPPORT

Maintenance Provider	AOG Services	Short-term leases	Medium /long-term leases	Engine pooling	Approvals
AAR Corp	PW, GE	PW, GE	PW, GE	PW, GE	FAA, EASA + various
GE Engine Services	GE	GE	GE	GE	FAA, EASA + 30/40
Lufthansa Technik	PW, GE	PW, GE	PW, GE	PW, GE	FAA, EASA + 39 countries
Pratt & Whitney	PW	PW	PW	PW	FAA, EASA + various
SR Technics	PW	PW	PW	PW	FAA, EASA + various
Turkish Airlines Technic 2)	GE	GE	GE	GE	FAA, EASA + 18

2) Based on Aircraft Commerce research
 PW Applicable Pratt & Whitney engine models
 GE Applicable General Electric engine models

retired. The OAG/AeroStrategy forecast is that the combined fleet size will shrink by 10% over the next 10 years and that by 2018 it will be 70% of its current size.

Moreover, most of the freighters will be operated at low rates of utilisation, further shrinking the MRO market.

The total market value is forecast to contract to \$922 million by 2018. The decline in fleet size is reflected in Aerostrategy's forecasts on MRO spend. This indicates negative compound annual growth rates (CAGR) for all models. The

A310 market will be particularly hard hit according to the forecast.

The predicted decline is borne out by the views of many of the providers. Some indicate that they will be exiting the market, and many suggest that they will not be investing further in the sector.

John Marshall, Director AA-MRO Services, confirmed that, as American Airlines is phasing out its A300-600s, it would no longer be offering third-party services for the type. A spokesperson for Emirates Engineering confirmed a similar

picture for the Dubai-based carrier.

However, some providers see a decent outlook, at least for the medium term. Leonard Kazmerski, vice president of marketing and business development at TIMCO Aviation Services, is relatively optimistic. He concedes that the ageing of the fleet will make a shrinking of the corresponding MRO market inevitable. "Even so, based on the high volume of A300/A310 work, we continue to deliver," he says. "With the efficiencies we have built into our fleet-specific practices, we believe the segment will still constitute an important portion of the total volume of work at TIMCO in the future. With most of the aircraft now a reliable type in cargo fleets, it is likely that many will still go through at least one more heavy maintenance visit before a fall in volume becomes significant."

Conversion market

Passenger-to-freighter conversions have been an attractive proposition for the A300/A310 models, not least because the type's fuselage cross-section is well-suited to container operations.

EADS' subsidiary Elbe Flugzeugwerke (EADS-EFW) is now the sole provider of conversions for the A300/A310. The Dresden-based company is clearly well placed to offer conversions because of its close links to Airbus, another EADS subsidiary, and the programme has had some success. However, with the air-freight market particularly depressed, the current throughput of conversions is well down on historic levels. This leaves the company with capacity for MRO work.

Wolfgang Schmid, vice president sales and marketing at EADS-EFW, confirmed that, while the company had historically not actively pursued third-party maintenance contracts, it was now offering base maintenance to clients, including Lufthansa, and Airbus itself.

Schmid emphasises that EFW is not confined to maintaining freighter aircraft, and offers extensive capabilities (see survey tables) for passenger aircraft. He adds that the current economic climate offers an excellent opportunity to carry out conversions, with aircraft available and values relatively depressed. Schmid believes in general that suitable aircraft for conversion will become more scarce in the short to medium term, and that A300s and A310s will become more difficult to obtain.

John Trevett, Senior Istat Appraiser at Mach Two, says the main A300/A310 candidate for conversion is the -600 and particularly the -600R. He suggests that it would cost \$10-\$15 million for later-build models. He doubts, however, that the values for any of the A300 types will harden significantly. With the retirement of the largest A300-600 fleet by

American, values are likely to soften.

Survey results

This global survey summarises the major aftermarket and technical support providers for all models of the Airbus A300 and A310 and the associated engines. It lists the world's major providers of technical support and is grouped into the following areas:

- 1) Engineering management & technical support (*see table, page 49*).
- 2) Line & light maintenance support (*see table, page 50*).
- 3) Base maintenance support (*see first table, page 52*).
- 4) Engine maintenance (*see second table, page 52*).
- 5) Spare engine support provisioning (*see third table, this page*).
- 6) Rotables & logistics (*see first table, page 55*).
- 7) Heavy component maintenance (*see second table, page 55*).

The data are based primarily on survey responses but some additional research has been undertaken. As in *Aircraft Commerce's* previous MRO surveys, many of the technical support providers are listed in most, if not all, of the seven sections. This means that they provide most of the services that a third-party customer would require. The tables show the range of services and the level of support these facilities offer. A large majority of respondents indicated a capability for both aircraft, reflecting perhaps the commonality of the types.

Engineering management

The trend towards outsourcing of maintenance functions by airlines, identified in our previous surveys, is borne out for the A300 and A310 market. The high proportion of operators with small fleets accentuates this trend.

Line & light maintenance

As for most aircraft types, line and light maintenance is one of the least likely functions to be completely outsourced, with many airlines choosing to look after all, or at least most of, their own requirements, and trying to leverage this requirement by offering third-party services on their networks. The survey does not cover all such providers unless they offer other services for the aircraft.

Base maintenance

Despite the withdrawal of some suppliers, the A300/A310 family remains well served by providers of heavy

maintenance. The range of the early A300 models means that ferrying for heavy maintenance is unlikely to be economic. Although the later A300 and A310 models have greater range, most providers indicated that relatively little business comes from outside their region.

Engine market

The original equipment manufacturers (OEMs) have a significant presence in the engine overhaul market.

GE's Celma and Caledonian facilities perform CF6-80C2 MRO work for all relevant aircraft models including the

A300 and A310 applications. The OEM provides on-wing support via its network of facilities. However, unlike for the 757/767, GE does not offer on-wing support for competitor types.

PW offers overhaul services at its Cheshire facility and via Eagle Services Asia (ESA) in Singapore. It offers capability for the CF6-80C2 through designated service partner agreements.

Rotables & logistics

A number of providers in our survey offer rotatable component provisioning, inventory and logistics management, and

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ROTABLES AND LOGISTICS

Maintenance Provider	Rotable inventory initial provisioning estimates	Rotable inventory leasing	Rotable inventory pooling	Consumables inventory	Repair & Document mgt	AOG Support	24 hour support	Fixed cost per FH full rotatable support contracts	Aviation Authority Approvals
AAR Corp	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	FAA, EASA + various
Abu Dhabi Aircraft Technologies (ADAT)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	GCAA, FAA, EASA, + various
Aeroframe Services	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	FAA, EASA
EADS-EFW				Yes	Yes	Yes	Yes		FAA, EASA + 4
Egyptair M&E 2)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	EASA
GE Engine Services 1)	GE	GE	GE	GE	GE	GE	GE	GE	FAA, EASA, +30/40
Goodrich	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	FAA, EASA, CAAC, + various
Iberia		A310	A310	A310	A310	A310	A310	A310	FAA, EASA + 16
JorAMCo	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	FAA, EASA
Kuwait Airways Corp 2)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	DGCA, EASA
Lufthansa Technik				Yes	Yes	Yes	Yes	Yes	FAA, EASA, + 39
Pratt & Whitney 1)	PW	PW	PW	PW	PW	PW	PW	PW	FAA, EASA + various
Sabena Technics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	FAA, EASA + various
SIA Engineering Company	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	CAAS, FAA, EASA, + 23
SR Technics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	FAA, EASA + various
ST Aerospace	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	FAA, EASA + 4
TAP M&E		Yes	Yes	Yes	Yes	Yes	Yes	Yes	ANAC, FAA, EASA, + 5
Thai Airways International	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Thai DOA, FAA, EASA + various
Turkish Airlines Technic 2)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	FAA, EASA + 18

1) engines only

2) Based on Aircraft Commerce research

All providers cater for A300 & A310, unless otherwise stated.

HEAVY COMPONENT MAINTENANCE

Maintenance Provider	Wheels, inspection & repair	Tyre remoulding	APU test & shop visit	Thrust reverser shop visit	Landing gear overhaul	Landing gear exchanges	Aviation Authority Approvals held
AAR Corp	Yes				Yes	Yes	FAA, EASA + various
Abu Dhabi Aircraft Technologies (ADAT)	Yes	Yes	Yes	Partial for GE		Yes	GCAA, FAA, EASA + various
Aeroframe Services		Yes	Yes	Yes	Yes	Yes	FAA, EASA
Aveos	Yes		Yes		Yes	Yes	TC, FAA, EASA + 7
Egyptair M&E 2)	Yes	Yes					EASA
Evergreen Air Center	Yes						FAA, EASA, CAAC
Goodrich	Yes	Yes		Yes	Yes		FAA, EASA, CAAC + various
Iberia	Yes	Yes	Yes	Yes		Yes	FAA, EASA + 16
JorAMCo			No	No	No		FAA, EASA
Kuwait Airways Corp 2)	Yes	Yes	Test only				DGCA, EASA
Lufthansa Technik	Yes	Yes	Yes	Yes	Yes	Yes	FAA, EASA + 39
Messier Services	Yes				Yes	Yes	FAA, EASA + various
SIA Engineering Company	Yes	Yes			Via joint venture	Via joint venture	CAAS, FAA, EASA + 23
SR Technics	Yes		Yes	Yes	Yes	Yes	FAA, EASA + various
Sabena Technics	Yes	Yes	Yes	Yes	Yes	Yes	FAA, EASA + various
TAP M&E	Yes	Yes					ANAC, FAA, EASA + 5
Thai International Airways	Yes	Yes	Yes				Thai DOA, FAA, EASA + various
Turkish Airlines Technic 2)	Yes	Yes	Yes	Yes	Yes	Yes	FAA, EASA + 18

2) Based on Aircraft Commerce research

PW: applicable to Pratt & Whitney engines only

GE: applicable to General Electric engines only

All providers cater for A300 & A310, unless otherwise stated.

repair and overhaul services.

Heavy components

Heavy components include: wheels, tyres & brakes; landing gears; thrust reversers; and auxiliary power units

(APUs). It is rare for airlines to maintain such equipment in-house. Landing gear, thrust reversers and APUs are generally handled by specialist companies although some of the larger MRO integrators also offer capability. The OEMs tend to dominate the overhaul market for their

respective products. Another feature of this market, particularly landing gear, is the need for an exchange service. [AC](#)

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