

# Aircraft With Low TBOs: What are the Options?

If your aircraft is fast approaching an overhaul and hasn't been enrolled on an hourly engine maintenance program, what options exist for you? Gerrard Cowan speaks to a variety of industry specialists to find out...

**D**espite their popularity, many business jets are not registered with an hourly engine maintenance program. Some are older aircraft which, after several years of faithful service, have significantly depreciated in value since they were new and are fast approaching overhaul.

What are the options available to aircraft owners if their aircraft has a low time before overhaul (TBO)? Is it simply a case of sucking up the cost, or are their alternatives to consider?

There are several reasons why an aircraft is not enrolled on an hourly engine maintenance program. One reason may be the aircraft's original owner chose not to and having purchased the aircraft on the pre-owned market, the new owner finds the costs of program buy-in to be prohibitive when viewed in the context of the aircraft's value. In such circumstances, what are an owner's options as their aircraft's engines approach their TBO limit?

## Honeywell Engine Operators

Paul David, Senior Director of Sales for Business & General Aviation at Honeywell Aerospace, says several options exist. If it makes financial sense, owners can enrol on an engine program, or they can part out the airplane, sell the aircraft, or attempt to source engines on the open market.

However, he notes "the number of available engines on the open market has diminished significantly since Covid as the demand has increased due to supply chain constraints."

Most overhaul events are very expensive, meaning there can be significant implications if the owner chooses to sell an aircraft approaching its TBO limit, David adds. Life-Limited Parts (LLPs) have cycle limits and increase the cost of an overhaul considerably when the cycle limit has been reached.

"Informed buyers will recognise that overhauls are due or that LLCs are cycling out which will decrease the value of the aircraft since that cost will still be present following their acquisition of the aircraft."

A non-program operator could install engines with time remaining to overhaul, "but at some point, the overhaul

costs will come into play again," he says.

Another option is to join an hourly program – such as Honeywell's Maintenance Service Plan (MSP), if the aircraft utilizes Honeywell powerplants. According to David, MSP does not exclude engines due to their age, though the buy-in amount could be high due to the event cost, even potentially exceeding the value of the aircraft.

"MSP works with customers to provide a buy-in quote that aligns with the event costs, and will keep the aircraft operating into the future for the contracted hourly rates following the event. In other words, when the next event comes due the engines will be covered," he says.

## Pratt & Whitney Canada: Engine Exchange

A spokesperson for Pratt & Whitney Canada says that if an owner opts to sell their aircraft within 12 months of the overhaul coming due, the market would typically deduct from the price of the aircraft 100% of the overhaul cost, or the cost to enrol on an hourly engine program, though beyond 12 months the deduction would be pro-rated to a degree.

In some cases, it may be possible to enrol on an engine maintenance program close to the overhaul, though this will naturally reduce the savings the owner can build up when compared to an enrolment five to 10 years ahead of the same event.

Nevertheless, it can still be beneficial in some cases even if there is only a smaller saving on paper, according to the spokesperson. "The benefits of a fixed costs overhaul via an engine program can still provide protection from surprises and may be worthwhile," they add.

Still, some engine programs "will not allow a customer to enrol on a Monday and overhaul on a Tuesday," they clarify. "This in effect allows someone to cut to the front of the line for MRO shop slots and lease engines ahead of customers who have been enrolled for years.

"In an age where supply chain issues have made these resources less than plentiful, engine program providers have to find a balance for both sides."

Again, though, program enrolment may not make





financial sense, exceeding the value of the aircraft in the case of an older plane. In such instances, Pratt & Whitney offers various options for older aircraft to help keep them flying, according to the spokesperson.

One such solution is flat-rate overhauls, which offer the ability to plan costs by guaranteeing a basic overhaul price as well as a capped price for parts that may be required beyond the basic overhaul cost. Another option is flat-rate exchanges and long-term leases.

"With an engine exchange, we provide the customer with a freshly overhauled engine of the same make and model in exchange for their existing core," the spokesperson explains. "With current supply chain issues, engine exchanges eliminate many of the logistics associated with an overhaul."

It is a good idea to ask about engine exchanges, the spokesperson said. "For many of our legacy programs, P&WC has offered new engine exchanges, freshly overhauled engine exchanges, as well as mid-time engine exchanges," the spokesperson reveals. "An additional benefit is that the aircraft is only down one time for engine changes."

### GE Aerospace: TBO Extension Solution

The market value of the aircraft will of course play a major factor in the decision process when it comes to pushing ahead with the overhaul or selling the aircraft, says Greg Ryan, Senior Sales Director of Business Aviation at GE Aerospace.

There has been a big impact from Covid, he notes, which has significantly pushed up the residual values of older aircraft [though market reports show values had peaked and were beginning to correct, at the time of writing].

"If you plan to keep the aircraft for many more years, the investment into the overhaul may actually be the best option, as opposed to purchasing a newer aircraft," Ryan argues. "However, older and low TBO aircraft are going to struggle to sell."

Ryan says GE Aerospace offers options on some of its engine models that could enable operators to extend the TBO. For example, he illustrates that the CF34-3A model of engine installed on the Challenger 601-3A has 3,000/6,000 hours hot section/overhaul hard time intervals, respectively.

The company has now developed a Service Bulletin (SB 72-0263) that allows the High-Pressure Compressor (HPC) and Low-Pressure Turbine (LPT) modules to go on-condition via an on-wing inspection; the 3,000-hour inspection intervals continue, but the 6,000-hour hard time overhaul is eliminated.

### Rolls-Royce: End of Life Programs

Andy Robinson, Senior Vice President for customers and services at Rolls-Royce Business Aviation, says the company offers special "end of life" programs for older engine models like the Tay 611-8, which offer attractive pricing and alternative contractual structures for operators approaching overhauls.

"In some cases 'hard time' engines can be switched to 'on-condition' for the BR710 engine models, which would push out shop visit requirements by thousands of hours, depending on the condition of scheduled borescopes.

"Such conversions are covered free of charge under the program," Robinson adds.

According to Robinson, these programs cover the engine shop visit regardless of the amount paid in, using OEM-approved parts and services. He says that attempts to cut costs by not enrolling on a program often lead to ballooning and unforeseen downstream costs, and risk of decreased value.

Rolls-Royce works to advise owner/operators on controlling costs, eliminating surprises, and maximizing value, he explains, including through its CorporateCare Enhanced program. An alternative is CorporateCare Flex, which is a new service on a limited number of engine variants, tailored for aircraft coming to end of life that need an imminent shop visit.



### Specialist Third-Party Solutions

There are a range of specialist providers of engine maintenance program, including Engine Assurance Program (EAP). Could an owner register their aircraft with such a programme if the TBO is approaching the limit?

Sean Lynch, EAP's Managing Director, echoes the Pratt & Whitney spokesperson in emphasizing that it's "very hard to get engines enrolled immediately before an overhaul is due." He attributes this to the fact that "now you have to over-assume the average expense since you have no idea where it will end up".

Nevertheless, Lynch says EAP does offer options in this scenario. For example, it will help oversee the engine through the shop at the client's cost.

"We usually end up saving the clients several hundred thousand dollars by being involved and using our negotiated fleet rates," he explains. "Then, once it comes through the shop it is fully enrolled on our program."

Tony Rossi, Director of Business Development at JSSI Advisory Services, advises it's generally a good idea to join an hourly maintenance program at any time during the aircraft lifecycle, even right before an overhaul, as it provides a partner in managing that event and future maintenance.

JSSI offers a pro-rata program as an option to the buy-in, Rossi says, meaning clients can enrol without the up-front buy-in cost, and instead event costs are shared between JSSI and the client depending on total time and cycles of the aircraft."

Additionally, there are options to optimize event outcomes and drive cost and time efficiency, even if an owner opts not to enrol in a program. This is through a Maintenance Event

Management (MEM) product through which JSSI clients "essentially can 'test drive' the experience of being on a maintenance program for a specific event," Rossi highlights.

"Through MEM, you can leverage similar global buying power, parts inventory, rental engines and technical oversight as if you were enrolled on an engine maintenance program, but on an event-by-event basis."

Rossi offers a range of advice to owners facing an impending overhaul. They need to perform early research, he emphasizes, review and understand quotes, select a reputable facility and plan ahead. It is vital to avoid assumptions about the overhaul process, he warns.

"The landscape has changed significantly, with the impact of the Covid-19 pandemic leading to parts shortages and shop capacity issues. Simple aircraft engine overhauls have become more complex, and costs have increased."

### TBO Extension for JT15D Engines

Gary Sherrill is Sales Manager at TBO Extension LLC, a Sky Aviation Holdings company. The TBO Extension concept is designed to assist aircraft owners in managing and extending the lifespan of their aircraft engines, he explains, "thereby offering a viable option for those facing a low TBO".

Specifically designed for JT15D engines, "The possibility of extending or even postponing the TBO largely depends on local regulations and the manufacturer's recommendations," Sherrill explains.

Sherill highlights several potential options to cut costs, including purchasing engines, though (as others have within this article) he also points to the decreased availability of

“ Every engine is not created equal in terms of cost... ”



↓ Photo courtesy of JSSI

engines for legacy aircraft. And another approach could be to purchase an aircraft that's being parted out, he suggests, enabling the owner to potentially access parts at lower costs.

"It is crucial to conduct a thorough analysis of all relevant figures, including the costs associated with different maintenance options, the potential value of the aircraft in its current state, and the potential value after various maintenance procedures or overhauls," Sherrill summarizes.

### Low TBO: Can You Finance an Overhaul?

Adam Meredith, President of AOPA Aviation Finance, reveals that his company regularly receives requests to help provide financing of aircraft engine overhauls.

"In particular," he adds, "with the recent market activity and low inventory available over the last couple of years, many folks have found it more economical to overhaul their engine(s) and/or purchase an aircraft needing an overhaul."

However, most lenders will require most non-turboprop aircraft to be enrolled on an engine maintenance program, he says. "That said, there are often ways to structure a loan that the right lenders will allow [to provide] options for owners to avoid having to put the airplane on an engine maintenance program.

"Lower advance rates and escrow accounts, setup with the lender, are two of the most common," he offers.

James Becker, Accredited Senior Appraiser at Elliott Aviation, says that if an engine is within 300 hours of a TBO limit and the owner plans on selling, they "might as well fly it out" first. This is because the market perception of engines based on time remaining is not linear, with a perception that the first 300 hours and the last 300 hours are the cheapest in terms of their impact on the aircraft's value.

"If you have freshly overhauled engines and you fly it up to 300 hours, the market still views that as freshly overhauled and will pretty much pay the overall price for it," he explains. "Conversely, if you have 300 hours remaining, the market will want to pay for it as totally run out, so you may as well use up those hours and sell it totally run out."

### All Engines are Not Created Equal in Terms of Cost

In today's environment, with the supply chain issues and other hurdles faced in private aviation, it is essential to plan ahead by several years if you are not enrolled on an engine maintenance program, summarizes Stacy Hollis, an Engine Service Sales Specialist at Duncan Aviation.

"Make sure you have enough money saved up to pay for that engine overhaul, make sure you have complied with logbook research to identify the major cost drivers that will be needed at the overhaul, and that you start looking at any Life-Limited Components that will need to be replaced," he concludes.

"Do a lot of homework and hone in on what those specific engines will need at the event, because every engine is not created equal in terms of cost." ■



#### More information from:

**AOPA Aircraft Finance:** <https://finance.aopa.org/>

**Duncan Aviation:** [www.duncanaviation.aero](http://www.duncanaviation.aero)

**Engine Assurance Program:** [www.eap.aero](http://www.eap.aero)

**Elliott Aviation:** [www.elliottaviation.com](http://www.elliottaviation.com)

**GE Aviation:** [www.geaerospace.com](http://www.geaerospace.com)

**Honeywell Aerospace:** <https://aerospace.honeywell.com/>

**JSSI:** [www.jetsupport.com](http://www.jetsupport.com)

**Pratt & Whitney Canada:** [www.prattwhitney.com](http://www.prattwhitney.com)

**Rolls-Royce:** [www.rolls-royce.com](http://www.rolls-royce.com)

**TBO Extension:** <https://skyaviationholdings.com/tbo-extension/>



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