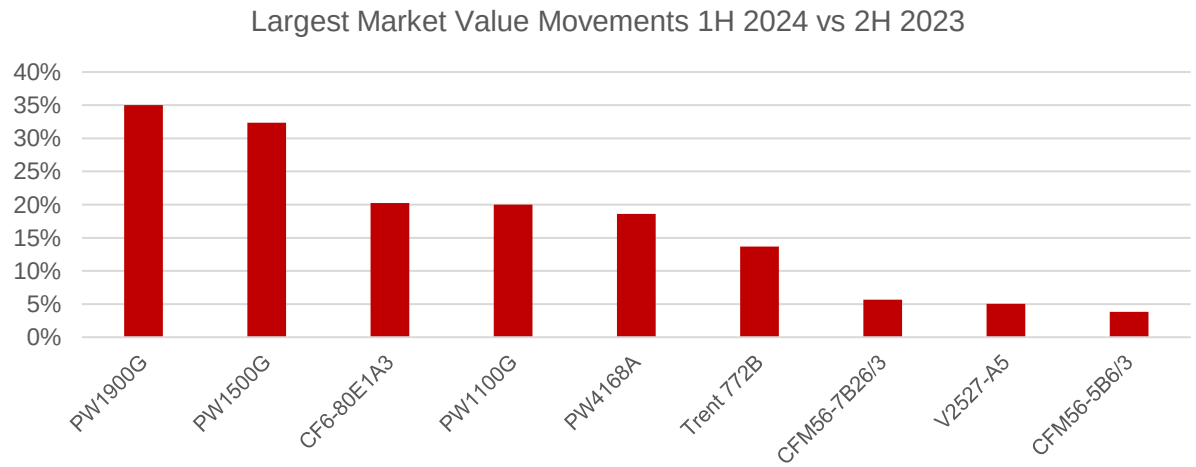
REDBOOK Subscriber Update – Engines – 1H 2024

Last week mba Appraisal Team published its 1H 2024 values update for engines. The primary focus of the 1H 2024 update is Market Value movements beginning to catch up with Lease Rate movements seen in previous updates. Many engines saw the beginning of Market Values stability and growth where over the last few years, values may have experienced more volatility. This is a trend mba expects to continue into the first half of the year as traffic demand grows and operators seek green time in the market to support the flying fleet and provide additional lift, coupled with aircraft groundings and extended turnaround times at engine MROs. Additionally, anticipated double digit maintenance cost escalation for a second year may drive demand for spares as operators seek to push expensive shop visits to the right. Overall, mba has a neutral to optimistic outlook for the engine market entering 2024. Below are mba's key takeaways:

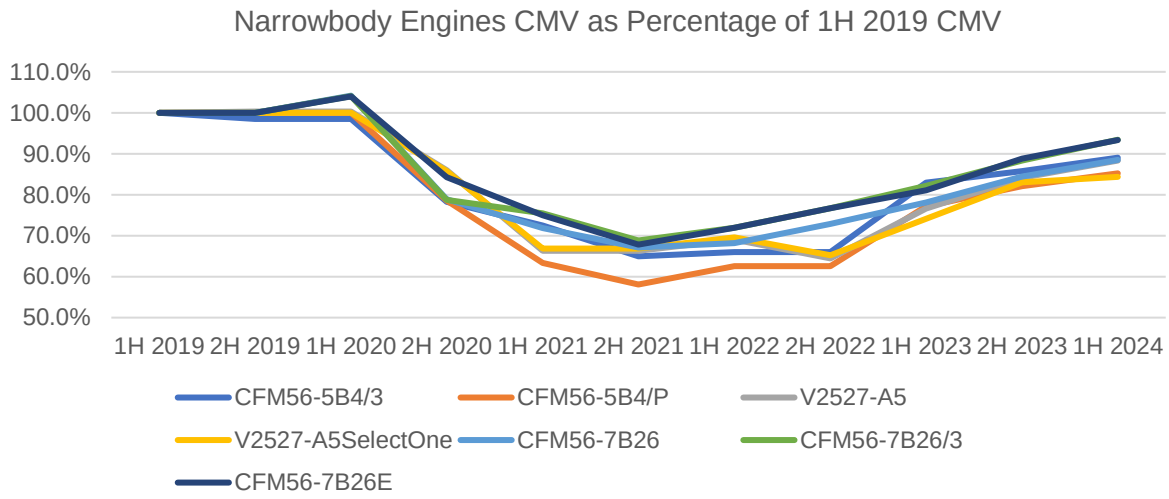
- New technology narrowbody engines had positive Base Value adjustments as well as strong Market Value increases as impacts from Airworthiness Directives ("ADs") and other technical issues hit the market, coupled with limited availability of serviceable spare engines across the board.
- Current generation narrowbody engines are on strong recovery trajectories as Market Adjustment Factors ("MAF") reach 100.0% or higher for the first time since 2019, partially fueled by technical issues with new technology engines driving demand for current technology aircraft.
- Current generation widebody engines saw their first positive Market Value movements since before the pandemic as trade activity increases while new technology widebody engines saw marginal Market Value increases.
- Freighter engines, both narrowbody and widebody, continue to have strong markets with limited availability, though Market Values have begun to flatten, with little to no movement from mba's last values update.
- Current technology regional jet engines continue to be a soft market, with values remaining stable or softening further, while new technology regional jet engines saw an increase in both Base and Market Values.
- Turboprop engines are experiencing a split market recovery as engines on the ATR family have significantly stronger market dynamics than those on the DHC family, with MAFs that reflect the differential in market strength.



Source: mba REDBOOK 1H 2024

Narrowbody Engines

- For the first time since 2019, the MAF for current technology narrowbody engines, including the CFM56-7B, CFM56-5B, and V2500-A5, is at or above 100% of Base Values. The CFM56-7B leads the market with an average Market Value increase of approximately 5.4%. The markets for all of these types are heating up with limited availability of quality green time in the market and strengthening demand due to passenger traffic growth and current ADs impacting GTF engines, forcing operators to rely more heavily on current generation aircraft for needed lift.
- New technology narrowbody engines, including the LEAP-1A, LEAP-1B, PW1100G, and PW1500G, have all experienced positive value movements this half. Most significantly, mba increased the Base and Market Values for the GTF engines to better reflect the current market and future value prospects for these types. PW1100G Market Values increased 20.0% from 2H 2023, and PW1500G Market Values increased approximately 32.4% from 2H 2023. This change was driven by market trade and lease data points as well as sustained OEM list price and maintenance cost escalation for the types.



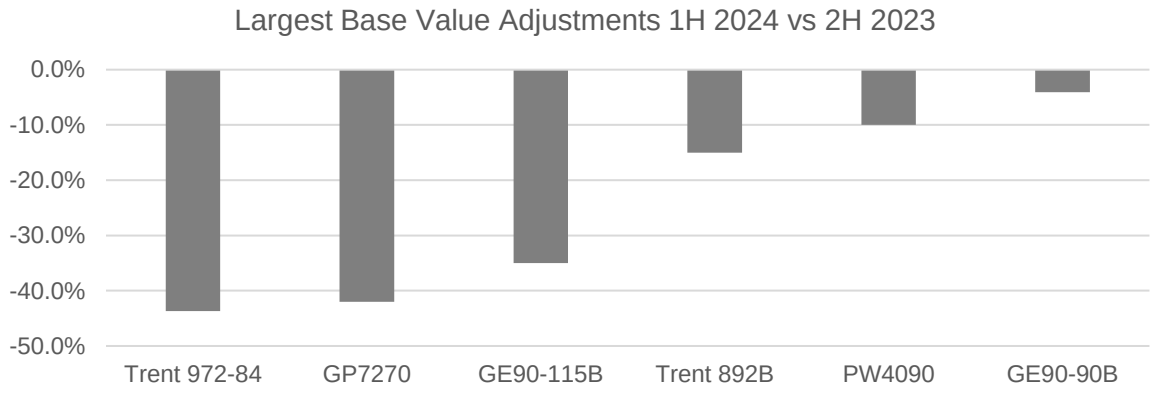
Source: mba REDBOOK 1H 2024

- Multiple recent ADs issued by the FAA related to the powder metal manufacturing issue on the PW1100G engines have begun to impact the fleet, grounding several aircraft, and increasing demand for serviceable PW1100G spare engines. As a follow-on effect, demand for current technology engines, including the V2500-A5 and the CFM56-5B, is strengthening as operators keep current generation aircraft in service to support capacity demand. While the ADs impact a significant portion of the fleet, mba does not expect any long-term value impacts to the PW1100G to come from this issue.
- Market Lease Rates ("MLRs") for narrowbody engines, both current technology and new technology, remained stable in this value update. mba made significant MLR changes in previous updates that remain consistent as we enter the new year. Market Value movements, which have lagged MLR movements, are beginning to catch up to previous MLR increases seen in previous quarters.

- While the engine OEMs have not yet released maintenance cost escalation for 2024, mba expects to see similar double digit cost escalation that the industry experienced in 2023. This continues to drive increases in Full Life values as well as a strong engine part out market and increasing core values for engines. Looking forward, mba is keeping a close eye on the MRO market, particularly as the GTF maintenance and inspection demand increases and MROs must balance current technology and new technology shop visit needs.

Widebody Engines

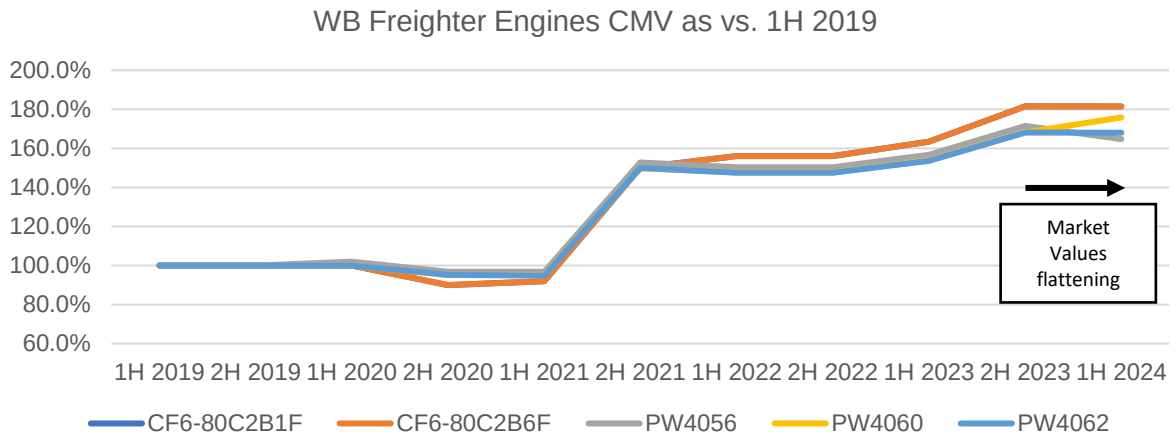
- Current technology widebody engines, including the Trent 700, CF6-80E, and PW4000-100" all experienced Market Value increases as trade activity and demand picked up in the second half of 2023. Market Values for the CF6-80E increased approximately 20.3% from 2H 2023, and MAFs for each type are above 70% for the first time since 2H 2020.
- While engines powering the A330 started to show value recovery, engines powering larger widebodies, including the 777 and A380, took Base Value hits due to the continued significant softness in their respective markets and poor likelihood of future Market Value recovery. The GP7270 and Trent 900 powering the A380 took the largest Base Value cuts at over 40.0% from 2023 Base Values. On the 777-300ER, the GE90-115B Base Value decreased 35.0% from 2023, with a current MAF of 77.0%, up from 50.0% in 2H 2023.



Source: mba REDBOOK 1H 2024

- New generation widebody engines continue to show moderate recovery into 2024. GEnx-1B Market Values increased approximately 3.2% from 2H 2024 with the MAF returning to 100.0%. Trent 1000 TEN Market Values increased approximately 2.2% from 2H 2024 with a MAF of 101.0%. Trent XWB and Trent 7000 Market Values remained stable, increasing approximately 1.1% from 2H 2023. mba expects this trend to continue as international widebody travel demand recovers.
- Market Lease Rates for current technology widebody engines increased significantly, upwards of 40.0%, along with strengthening Market Values, as demand for these types increased over the last few quarters and availability of quality spare engines becomes more limited. Market Lease Rates for new technology widebody engines have remained stable, increasing 1.0-2.0%, primarily in line with Market Value movements.
- Market Values for widebody freighter engines have flattened for the first time since 2021 as the freight market has begun to cool over the last year. Engine demand remains strong for the types, though Market Values have not continued to increase at the rate seen over the last few years. As

the freight market continues to slow, engines may become more readily available, and Market Values could become more volatile. However, mba expects Market Value flattening to continue into the first half of 2024, given no major market changes.



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Regional Jet & Turboprop Engines

- Current generation regional jet engines, including the CF34-8C, CF34-8E, and CF34-10E remain a relatively soft market overall with slow to stagnant Market Value recovery as demand for regional jet capacity softens.
- The CF34-10E had a negative Base Value adjustment of approximately 14.1%, with a Market Value decline of approximately 9.1% in this recent update. Despite a Base Value impairment, the MAF for the CF34-10E increased to 90.0% to reflect mba's views on the probability of Market Value recovery for the type. The CF34-8C and CF34-8E experienced no Base or Market Value adjustments with normal depreciation as the market for these types remains stable.
- The PW1900G on the E2 family had positive Base Value and Market Value adjustments this values update. Market Values increased 35.0% from 2H 2023, primarily due to limited availability and sustained increases in OEM list prices and maintenance costs over the last few years. Market Lease Rates for the type remain steady and well above Base.
- The PW127M powering recent variants of the ATR42/72 family is experiencing strong Market Values as ATR aircraft have proven more popular during post-pandemic recovery. The MAF for the PW127M is currently at 146%. The PW150A powering the DHC 8-400, however, is seeing slower Market Value recovery as a significant portion of the fleet remains parked or available. The MAF for the PW150A is approximately 75.0%, with the Market Value remaining stable from 2H 2023.

If you have any questions or would like to discuss any of mba's commentary above, please contact Sloane Churchill schurchill@mba.aero and David Archer darcher@mba.aero. mba's full appraisal team can also be reached at appraisals@mba.aero.