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The Engine Program Market

Enrollment, Concentration, and Attrition in Business Aviation Engine Maintenance Programs

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Executive Summary

Engine maintenance programs are the largest recurring financial commitment most business aircraft owners make, and the least examined. Enrollment is routinely treated as a binary virtue — on-program good, off-program bad — rather than as what it structurally is: a long-dated, unsecured, escalating financial obligation with a term, a counterparty, and a break-even. This report presents, for the first time, a market-structure analysis of engine program enrollment across the in-operation business aviation fleet, drawn from VREF's fleet and transaction database.

Five findings:

- Enrollment is a minority position fleet-wide. Across 376 business jet and turboprop models — 42,456 aircraft in operation — 12,317 are enrolled in an engine maintenance program: 26 percent. The perception of near-universal enrollment is a financed-jet phenomenon; penetration runs 75–90 percent in financeable mid-life jet fleets and collapses toward zero in the cash market.
- Concentration follows the engine, not the airframe. In fleet after fleet, the program affiliated with the engine manufacturer holds 85–98 percent of enrolled aircraft. Of 76 fleets with 50 or more enrolled aircraft, exactly one high-volume fleet is genuinely contested between providers of comparable share.
- A single repricing decision can reprice an entire fleet. Where one provider holds 90-plus percent of a type's enrolled aircraft, one renewal adjustment changes the cost of ownership for every enrolled owner of that type simultaneously — a market-structure risk that has not previously been quantified or published.
- Enrollment erodes steadily with age — and the exit happens at the closing table. Aircraft that transacted recently are ~82 percent enrolled today; aircraft that last transacted in 1990 are 46 percent enrolled. The gradient is roughly 1–1.5 percentage points per year of age. Approximately one buyer in five drops enrollment at ownership transfer, and transfer retention visibly tracked the financing cycle through the 2020–2022 boom and the 2024–2025 recovery.
- A meaningful share of owners lapse on the doorstep of the event they funded. Of 1,058 lapsed enrollments that could be placed against the engine's maintenance cycle, 561 terminated within 2,000 hours of the next major event — 127 of them within 500 hours — surrendering years of contributions immediately before the payout those contributions existed to fund.

A sixth finding concerns what could not be measured. The maturity profile of the enrolled fleet — how the industry's accumulated overhaul obligations are distributed in time — cannot be computed from any data outside the program providers' own records, and neither can true lapse timing. The most consequential behavioral and actuarial facts about a market funded by owner contributions are visible only to the entities collecting them. This report closes with a proposal on that point.

Methodology and Data

Source. All figures derive from the VREF fleet and transaction database: registry records, transaction records, and program enrollment status as documented at the point of sale and in appraisal files, aggregated across the in-operation business jet and turboprop fleets. Helicopters, piston aircraft, and commercial airliners are excluded. Manufacturer name variants were normalized prior to aggregation. Airframe, parts, and avionics programs (e.g., parts-coverage and airframe subscription products) are excluded; this report addresses engine maintenance programs only.

Precision. Enrollment data carries a measurable error rate (misassigned program records were identified at a rate below one-tenth of one percent of the enrolled population). Figures are therefore reported in round numbers, and no figure in this report should be read to more than two significant digits.

What this report does not address. VREF has no visibility into any program provider's internal finances, reserves, or actuarial position. Nothing in this report speaks to the solvency, pricing adequacy, or claims performance of any provider. Provider families are identified in share data because market structure cannot be described without them; no finding in this report is a judgment on any provider's product.

Attrition methodology — a candid note. A true enrollment survival curve requires enrollment start and termination dates. Those dates are not recorded in any registry or public source, and are not available to VREF or, to our knowledge, to any party other than the program providers themselves. The attrition analysis in Section 3 therefore uses transaction-dated cohorts — the enrollment status today of aircraft that changed ownership in a given year — which measures net enrollment decay by vintage rather than individual lapse timing. Where lapse timing is presented (Section 3.3), it is derived from time-since-overhaul at termination for the subset of lapsed enrollments where maintenance status is documented, and is labeled accordingly. We state these limitations plainly because published analysis in this market rarely does.

1. Penetration: Enrollment Is a Financed-Fleet Phenomenon

Across 376 business jet and turboprop models in operation — 42,456 airframes — 12,317 carry active engine program enrollment: 26 percent of the fleet. Fleet-wide, the on-program aircraft is the exception, not the rule.

The distribution explains the perception gap. Enrollment concentrates precisely where aircraft are financed: penetration reaches 90 percent on the Falcon 50EX, 89 percent on the Gulfstream G200, 82 percent on the Falcon 900EX, 81 percent on the Learjet 45, 79 percent on the Falcon 2000, and 75 percent on the Hawker 800XP — the financeable mid-life jet fleet, where lender requirements have made enrollment a condition of the loan for two decades. Below roughly one million dollars in airframe value, where transactions go to cash, penetration collapses — in many legacy and out-of-production fleets to effectively zero.

The inference matters for how the product is understood: enrollment is substantially a credit phenomenon. A significant share of the enrolled book reflects lender requirements executed through owners, not discretionary owner demand. Section 3 shows this signature dynamically: enrollment behavior at ownership transfer tracked the financing cycle through the pandemic-era cash boom and the subsequent return of financed transactions.

2. Concentration: The Market Is Organized by Engine, Not Airframe

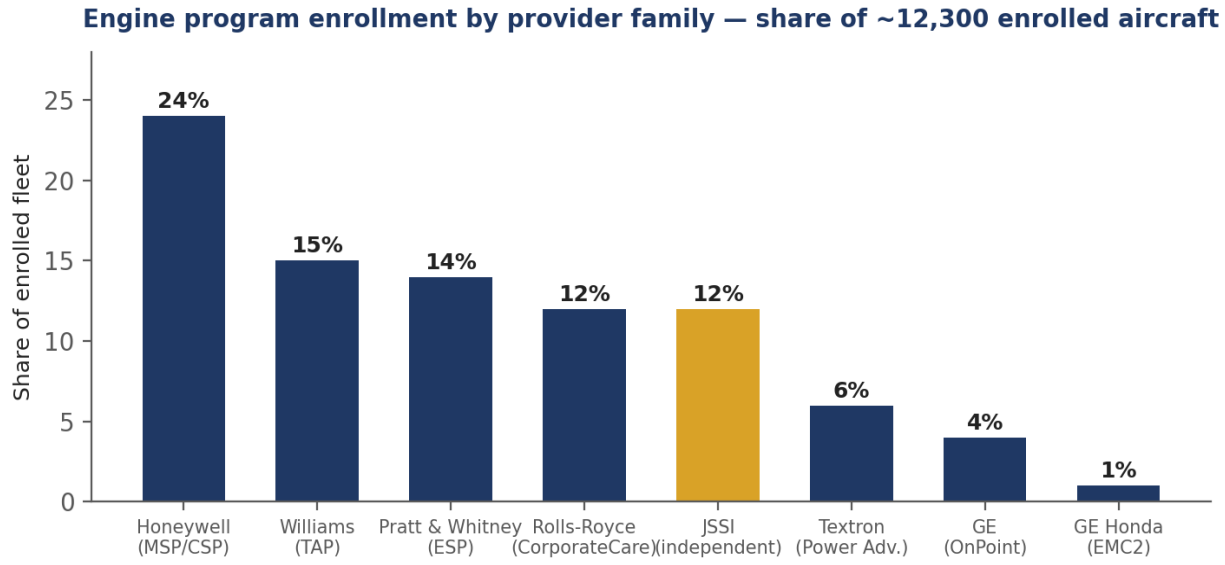

Figure 1. Provider families by share of the enrolled fleet. JSSI is the only cross-engine independent at scale.

At the market level, enrollment divides among a small set of provider families: Honeywell's MSP family holds roughly 24 percent of all enrolled aircraft, Williams International's TAP family roughly 15 percent, Pratt & Whitney's ESP family roughly 14 percent, Rolls-Royce's CorporateCare family roughly 12 percent, and JSSI — the only major engine-agnostic independent — roughly 12 percent, with Textron, GE, and GE Honda programs comprising most of the remainder.

Market-level shares, however, understate the structure that owners actually experience, because competition does not occur at the market level. It occurs — or fails to occur — fleet by fleet. Within individual fleets, the dominant provider's share of enrolled aircraft is frequently above 90 percent:

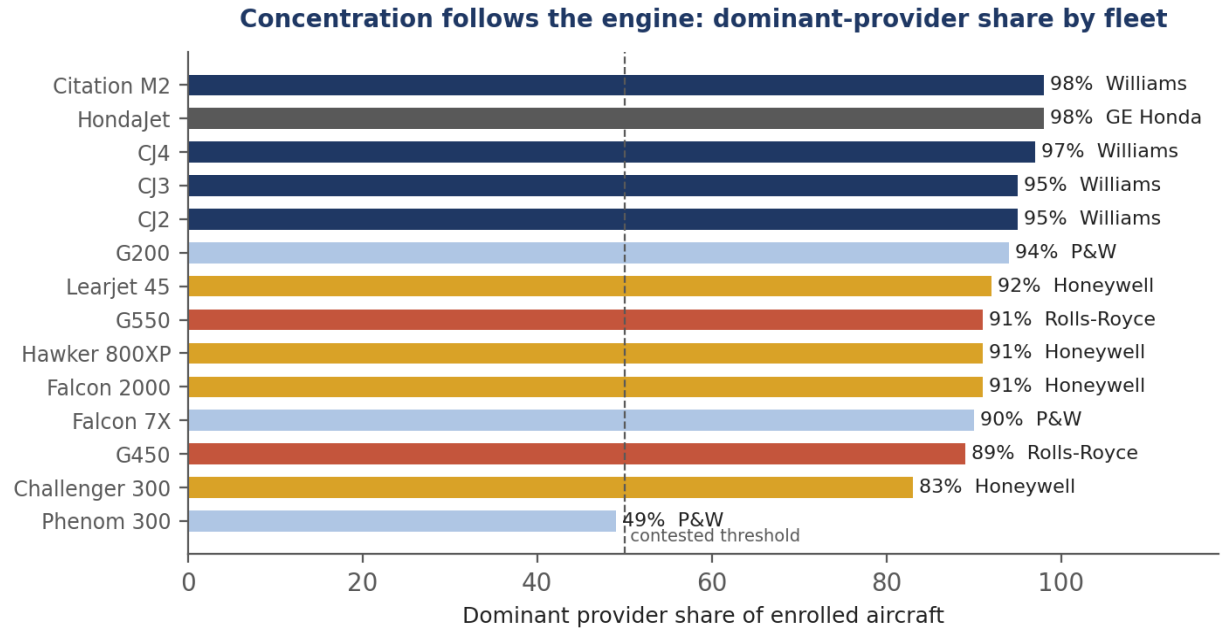

Figure 2. Dominant-provider share of enrolled aircraft, selected fleets with ≥50 enrolled aircraft.

The pattern is consistent enough to state as a rule: concentration follows the engine type certificate. Wherever a single engine type powers a fleet, the program affiliated with that engine's manufacturer dominates enrollment — Williams on the FJ44-powered CitationJets, Honeywell on the TFE731 fleets, Rolls-Royce on the large-cabin Gulfstreams and Globals, GE Honda on the HondaJet. Fleets that appear diversified (the Citation line as a whole, the King Airs, Embraer) are diversified only because they span multiple engine types; examined engine by engine, single-provider dominance reappears. The Learjet line illustrates the rule within one nameplate: its TFE731-powered fleet is a Honeywell franchise while its PW305-powered Learjet 60 fleet is a Pratt & Whitney franchise, side by side.

Of the 76 fleets with at least 50 enrolled aircraft, exactly one high-volume fleet is genuinely contested between providers of comparable share: the Embraer Phenom 300, at approximately 49 percent Pratt & Whitney and 37 percent JSSI. In every other major fleet, the practical competition is between the dominant OEM-affiliated program and JSSI as the independent alternative — with JSSI typically holding 8 to 30 percent as the second provider.

The systemic implication

Where one provider holds 90-plus percent of a fleet's enrolled aircraft, a single commercial decision — an escalation adjustment, a coverage redefinition, a transfer-fee schedule change — does not affect one owner. It reprices the effective cost of ownership for the entire type, simultaneously, through private contracts with no disclosure obligation. Business aviation devotes considerable attention to OEM parts monopolies; program concentration within most jet fleets is tighter than the parts monopoly, and has not previously been described in published analysis. Owners, lenders, and insurers holding exposure to highly concentrated types should understand that they hold this risk.

3. Attrition: How Enrollment Actually Erodes

3.1 The decay gradient

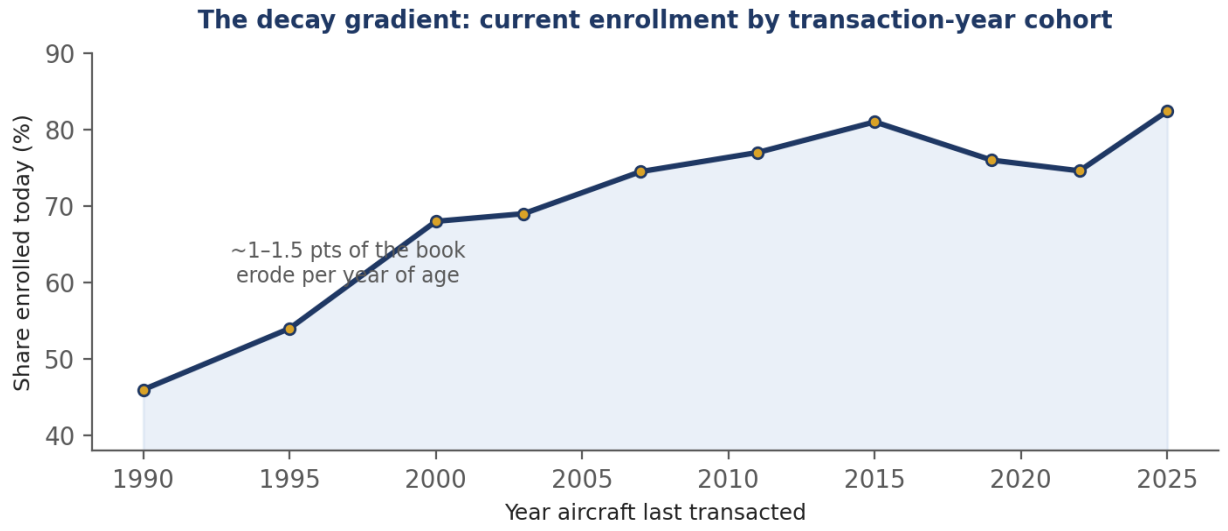

Figure 3. Share of transaction-year cohorts enrolled today. Methodology per Section "Methodology and Data."

Aircraft that transacted within the last two years are approximately 82 percent enrolled today. Aircraft that last transacted in 2015: 81 percent. In 2003: 69 percent. In the mid-1990s: mid-50s. In 1990: 46 percent.

The gradient is strikingly steady — roughly 1 to 1.5 percentage points of the book eroding per year of age, compounding across decades, with no visible cliff. By roughly age 25, half the book is gone. Programs do not lose fleets in a day; they lose them tail by tail, as individual owners reach the same arithmetic a year or two apart.

3.2 The closing table is the exit

Ownership transfer is the one event the transaction record timestamps precisely, and it is where the enrollment decision is actually made. When an enrolled aircraft changes hands, roughly eight buyers in ten retain the program; approximately one in five lapses at closing. Transfer retention runs 74 to 84 percent depending on vintage and year — highest on newer, financed aircraft, lowest on older cash transactions — because lenders require enrollment on the aircraft they finance and no one requires it on the aircraft they don't.

The financing signature is visible dynamically. Through 2020–2022 — the cash-heavy transaction boom — transfer retention dipped and closing-table lapses rose toward one in four. In 2024–2025, as rates rose and financed transactions returned, retention recovered to 82–84 percent, the highest levels in the dataset. Enrollment behavior tracked the credit cycle in both directions, in real time.

3.3 Where owners were standing when they stopped paying

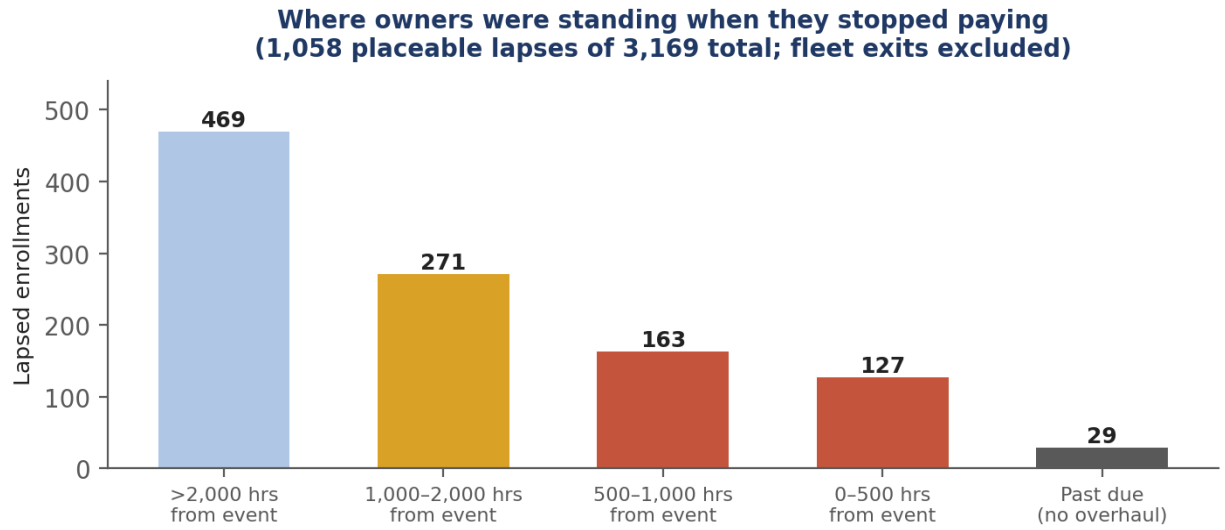

Figure 4. Time to next major engine event at enrollment termination, for the 1,058 placeable lapses.

Of 3,169 terminated enrollments in the database (fleet exits excluded), 1,058 can be placed against the engine's maintenance cycle using documented time-since-overhaul. Of those: 469 terminated with more than 2,000 hours of runway to the next major event — the defensible exits, including owners lapsing after a completed overhaul. But 561 terminated within 2,000 hours of the event they had been funding; 290 within 1,000 hours; 127 within 500 hours — the final year or two of flying before the payout.

Owners do not voluntarily surrender years of contributions on the doorstep of the event those contributions fund. Lapses at that position are best read as forced moves: an aircraft sale in which the buyer would not absorb the transfer economics of a near-event engine; a renewal repricing at the worst possible moment; or shortfall arithmetic surfacing late. Whatever the mechanism in any individual case,

the population-level fact stands: a substantial share of owners exit these programs at precisely the point of maximum accumulated contribution and minimum realized benefit.

4. The Transparency Gap

Two of the most consequential facts about this market could not be computed — by VREF or, we believe, by any party outside the program providers:

- The maturity profile of the enrolled fleet. Distributing enrolled engines by time to next major event — the basic actuarial picture of the industry's accumulated overhaul obligations — requires time-since-overhaul data that exists only in logbooks and program files. In VREF's attempt, 88 percent of enrolled aircraft could not be placed. Each provider can produce this chart for its own book to the day; no one outside can draw, audit, or check it.
- True lapse timing. Enrollment start and termination dates are recorded nowhere public. The single most honest measure of whether the product's economics work for the owners funding it — when, in the life of an enrollment, owners stop paying — is visible only to the providers.

The structural observation deserves to be stated plainly. Engine programs are funded by long-dated, unsecured owner contributions against future obligations. In most markets where the public bears that structure — insurance, pensions, banking — disclosure of the obligation profile is mandatory. In this market, thousands of unsecured creditors fund obligations whose maturity schedule and behavioral history are invisible to every one of them. This is not an allegation against any provider; it is a description of an information architecture.

A proposal. VREF invites the program providers to publish their lapse curves and book maturity profiles — anonymized, aggregated, and audited under safeguards of their choosing. If the product performs as marketed, that data is the strongest advertisement the industry could produce. Until it is published, owners are entitled to weigh the silence.

5. Implications

For owners

Enrollment is a financing decision with a term, a counterparty, and a break-even — not a virtue. The analysis owners apply to every other line item applies here: remaining contributions to the event (at escalated rates) versus the market premium for enrollment plus the realistic self-funded exposure. Owners of aircraft aging toward the cash market should note the decay gradient: the market premium for enrollment erodes as the buyer pool shifts from financed to cash, and Section 3.3 documents where that arithmetic ends for those who defer it.

For buyers

Approximately one in five buyers makes the lapse decision at closing. It should be made deliberately: verified account status in diligence (arrears, disputed hours, and pending escalations transfer with the contract), and — where purchasing unenrolled with intent to enroll — a written buy-in quote obtained before closing, priced into the transaction.

For lenders and insurers

Enrollment requirements have made lenders the largest single driver of program penetration; portfolios holding concentrated types carry correlated repricing exposure through a counterparty that reports to no one. Residual assumptions that treat enrollment as permanent should be tested against the decay gradient: on a 15-year hold, the base rate says roughly one in five enrolled airframes in a vintage cohort will not stay enrolled.

For appraisers

Enrolled-versus-unenrolled premiums are point-in-cycle and fleet-specific, and the premium conflates two components that age differently: transferred maintenance value and access to financed buyers. VREF will address the premium itself — its magnitude, rationality, and decay — in a companion report.

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