07

FERRARI SF90 STRADALE

More car than the market wanted — the 1,000-PS flagship, and the −37% verdict low-mileage cars delivered inside three years

−37%
Three-year value loss on low-mileage cars, public records — the sharpest depreciation in this library

1,000 PS
System output of the plug-in hybrid flagship — the most powerful series Ferrari at launch

780 PS
The 4.0-litre twin-turbo V8 alone — before three electric motors are added

2019–
In production — a technical landmark whose market never matched its engineering

JUNE 2026 PUBLIC SOURCES ONLY NOT INVESTMENT ADVICE

AN IMP INTERMEDIAPARTNERS VENTURE EST. 1976

01 EXECUTIVE SUMMARY

The Most Capable Ferrari Almost Nobody Wants to Pay For

The Ferrari SF90 Stradale is, on every objective axis Maranello publishes, the most accomplished series-production road car the company had ever built when it launched. A 4.0-litre twin-turbo V8 and three electric motors combine for 986 hp (1,000 PS); all-wheel drive through an F1-derived torque-vectoring front axle; 0–100 km/h in 2.5 seconds; a 340 km/h top speed; and the first 8-speed dual-clutch gearbox and the first series plug-in hybrid architecture Ferrari ever shipped. It was the technological flagship of the regular range, named for the 90th anniversary of Scuderia Ferrari. Nothing about the engineering is in dispute.

The market verdict is another matter. A low-mileage 2022 Stradale recently changed hands for roughly $485,000 against an as-optioned delivered price of about $763,000 — a $278,000 loss across three years and 1,600 miles, or about $174 per mile driven. A near-new car with 185 miles sold for roughly $140,000 below its window sticker. At Barrett-Jackson Palm Beach in 2025, a 2022 Stradale sold at auction for $495,000. In the United Kingdom, the cheapest Stradale coupes are now listed at £279,000 to £300,000 — in some cases below what a clean 458 Speciale commands, and within reach of well-specified F8 stock. The owner's intuition that good early cars will settle well under €300,000 is not a forecast. At the entry of the UK coupe market, it is already happening.

A note on the figures. The depreciation evidence in this paper is based on representative market listings and selected transaction examples — including public auction results — not full aggregated market averages. The individual losses are illustrative of the pattern, not a statistical mean. Prices and market data are as of May 2026 and revise monthly.

Two questions sit beneath that curve, and they are not the questions the 296 paper had to answer. The first is the **'bigger 296' problem**: the SF90 is routinely dismissed as a heavier, pricier version of the car most reviewers preferred to drive — a charge that is chronologically backwards (the SF90 came first) and commercially devastating all the same. The second is **reliability and recall**: unlike the 296, whose engineering robustness quietly underwrote its residuals, the SF90 carries its own fire-risk 'do-not-drive' recall and a set of owner-reported (non-systematic) hybrid-system issues. The battery question — Ferrari's Power Hybrid programme — applies identically to both cars and is treated here only where the SF90 differs.

This paper takes the SF90 seriously as a driving machine and unsentimentally as an asset. It examines, in order: why the car exists and why it came before the 296; the 'bigger 296' charge head-on; the technical specification and the four variants; owner and tester feedback on what it is actually like to drive and live with; the depreciation record and the sub-€300k trajectory; the four mechanisms driving the decline; reliability and the recall record; the Power Hybrid battery programme as it bears on the SF90; the XX variants and the LaFerrari logic of capped production; the 849 Testarossa succession effect; and three scenarios for where the SF90 sits a decade out.

> ***"The SF90 is not a bad car the market has misjudged. It is a brilliant car the market has decided it can buy more cheaply, in a lighter wrapper, wearing the same badge."***

02 WHY THE SF90 EXISTS

The Flagship, the Anniversary, and the First Plug-In

The SF90 Stradale was unveiled in May 2019 and entered customer hands through 2020. The designation is not a model code in the usual Ferrari sense: **SF** denotes Scuderia Ferrari and **90** marks the ninetieth anniversary of the racing team's 1929 foundation. The car was conceived as the technological apex of the series-production range — the model that would sit below the limited-run hypercars but above everything else, and would carry Ferrari's first volume application of the plug-in hybrid architecture the company was already obliged to develop for the road.

The regulatory backdrop is the same one set out at length in the 296 paper and not relitigated here: Regulation (EU) 2019/631, the fleet-average CO_2 ceiling, and the small-volume derogation that keeps Ferrari compliant for now but expires at the 2035 horizon. What matters for the SF90 specifically is the sequencing. Ferrari chose to introduce hybridisation at the *top* of the range first, in 2019, where the price ceiling could absorb the cost and complexity of three motors and a high-voltage system, and only afterwards distil the architecture downward into the cheaper, lighter, rear-drive 296 in 2021. The SF90 is therefore the senior car. The 296 is the derivative.

THE SEQUENCING THAT THE MARKET FORGOT

The SF90 Stradale reached the market roughly two years **before** the 296 GTB. It was the first Ferrari series plug-in hybrid, the first with an 8-speed dual-clutch transmission, and the first to deploy an electrically driven front axle for all-wheel drive and torque vectoring.

Every 'innovation' the 296 is praised for — e-torque fill, silent e-Drive running, F1-derived hybrid integration — was proven on the SF90 first. The 296 refined the recipe and removed weight and cost. It did not invent it. This single fact reframes the entire 'bigger 296' debate, and Section 03 takes it apart.

Ferrari's stated ambition for the SF90 was that it would be the dynamic benchmark of the range — the car against which the front-engined V12 GT (now the 12Cilindri) no longer had to measure itself. On the numbers it delivered. As a driver's car, as Section 05 records, the verdict was more divided, and that division is the seed of the residual-value story.

THE ROADMAP CONTEXT: FIRST OF MANY, NOT AN OUTLIER

The SF90 is easy to misread as a one-off experiment. It is not. At its 2025 Capital Markets Day Ferrari set a product mix for 2030 of roughly **40% internal-combustion, 40% hybrid and 20% fully electric**, with an average of four new models a year between 2026 and 2030 and its first EV — the Elettrica — premiering in 2026. Combustion is explicitly retained, not abandoned, reinforced by the EU's December 2025 softening of the 2035 ICE ban.

Read against that roadmap, the SF90 is the **leading edge of a deliberate, decade-long electrification programme** — the first series plug-in hybrid in what will become a hybrid-heavy range. That cuts two ways for residuals: it normalises the architecture (a hybrid Ferrari is no longer strange), but it also guarantees the SF90 will be surrounded by newer, better-resolved hybrids — starting with the 849 Testarossa — that make the first attempt look dated.

03 THE ‘BIGGER 296’ QUESTION

Confronting the Charge Head-On

The most common dismissal of the SF90 in 2026 is that it is 'just a bigger, more expensive 296.' The charge is worth confronting precisely because it is half true and half nonsense, and the half that is true is the half that moves prices.

Start with the nonsense. **Chronologically the claim is inverted.** The SF90 (2019) predates the 296 (2021). If anything the 296 is 'a smaller, cheaper SF90' — the same PHEV concept, two fewer cylinders, one motor instead of three, rear-drive instead of all-wheel drive, around €160,000–190,000 less at list. Calling the senior car a derivative of the junior one is a perception artefact, not a fact. It happens because most enthusiasts met the 296 first as the 'attainable' hybrid Ferrari, anchored on it, and now read the SF90 backwards through it.

Now the half that is true. The two cars sit close enough on the road that the SF90's premium is hard to feel. Independent rolling-race testing makes the point brutally: from a standstill the SF90's all-wheel-drive traction and 150-plus extra horsepower win comfortably; but in a 50 mph rolling start, where traction stops mattering, the 100 kg-lighter 296 wins. Weight is the great leveller, and the SF90 carries 270 kg of hybrid hardware to the 296's 99 kg. Worse for the SF90, the 296 launched to road-test reviews that were, if anything, *warmer* than the SF90's — praising exactly the lightness, steering feel and rear-drive adjustability that the heavier, four-wheel-drive SF90 trades away for traction and outright pace.

> ***"The SF90 is the senior car wearing the price of a flagship. The 296 is the junior car delivering most of the sensation for two-thirds of the money. The market is not confused. It is doing arithmetic."***

The dimensional gap is real but modest: the SF90 is 139 mm longer, 50 mm longer in the wheelbase, and rides a fraction wider and taller than the 296. It is not a large car. But it *feels* the senior, more complex, more remote machine — and when a buyer can have a lighter, sharper, rear-drive Ferrari that reviewers prefer for two-thirds of the outlay, 'bigger 296' becomes shorthand for 'why pay the difference?' That is the question the SF90's used price is answering. Ferrari itself validated the diagnosis: the 849 Testarossa successor (Section 11) was explicitly styled and positioned to *separate* the top hybrid from the 296, an admission that the two had drifted too close.

WHERE THE SF90 ACTUALLY BEATS THE 296

This is not a one-way verdict. The SF90 is materially faster everywhere traction is the constraint: standing-start acceleration, wet-road deployment, and any surface where the 296 spins its rear tyres. The front axle's torque vectoring makes the car preternaturally stable and easy to drive very fast with low skill exposure.

It also has the V8 — the architecture a meaningful share of Ferrari buyers still consider the minimum legitimate mid-engine Ferrari powerplant, and the engine note the 296's V6 cannot fully replicate despite the hot-tube acoustic system. For the buyer who prioritises all-weather pace, outright output and eight cylinders, the SF90 is the better car. The market simply does not price those attributes at the €160,000+ premium the SF90 was sold at.

The performance hierarchy, on Ferrari's own track. Fiorano lap times place the three hybrids in a clear order — and show how little the SF90's 167-extra-horsepower buys over the 296 once weight is in play, and how decisively the 849 moves the game on.

	296 GTB	SF90 Stradale	849 Testarossa
Combined power	819 hp	986 hp	1,036 hp
Drive	RWD	AWD	AWD
Dry weight	1,470 kg	1,570 kg	1,570 kg
Power-to-weight	1.79 kg/hp	1.59 kg/hp	1.52 kg/hp
Fiorano lap	1:21.0	1:19.0	1:17.5
0–100 km/h	2.9 s	2.5 s	2.3 s

Fiorano times are Ferrari figures (SF90 with Assetto Fiorano). For reference, the limited SF90 XX Stradale holds the road-car Fiorano record at 1:17.309. The SF90 is two seconds a lap faster than the 296 — real, but a narrower gap than its power and price imply; the 849 is a further 1.5 seconds clear.

04 WHAT THE SF90 IS, TECHNICALLY

Architecture, Output, Variants

The SF90's combustion engine is the F154-family 90-degree, twin-turbo, 3,990 cc V8 — a developed version of the architecture Ferrari had run since the California T — producing 780 PS (769 hp) on its own. To that, the SF90 adds **three** electric motors: two independent units on the front axle, each driving a front wheel for all-wheel drive and torque vectoring, and a third (the MGU-K-derived rear motor) mounted between the engine and the gearbox. The three motors contribute up to 220 PS (217 hp). Combined system output is 1,000 PS (986 hp). Drive runs through Ferrari's first 8-speed dual-clutch transmission — which, notably, has no mechanical reverse gear: reverse is handled by the front electric motors.

The high-voltage battery is a 7.9 kWh lithium-ion pack giving roughly 25 km (16 miles) of WLTP electric-only range. Charging is via a Type 2 AC connector. The deployable aerodynamics are unusual: rather than a conventional rising rear wing, the SF90 uses a patented **Shut-Off Gurney** at the rear that closes for low drag at speed and opens to raise downforce under braking and cornering. The structure is aluminium-intensive with carbon-fibre reinforcement; dry

weight is 1,570 kg, rising materially in real-world, fully-fuelled trim.

THE FOUR eMANETTINO MODES

The SF90 exposes four hybrid modes. **eDrive** runs on the front electric motors alone, V8 off, front-wheel drive only — silent, around 25 km of range. **Hybrid** is the default on start-up and manages V8 and motors for efficiency. **Performance** keeps the V8 always on and uses the battery to top up, prioritising readiness over economy. **Qualify** unlocks the full 1,000 PS, prioritising the battery for performance over range.

A real-world caveat reviewers stress: the full 1,000 PS is only sustainable for a couple of laps before the battery depletes, after which output falls and the car reverts to rear-drive while still carrying the hybrid system's weight. On the road this is a non-issue — regeneration keeps the pack topped up. On track it is a meaningful asterisk on the headline figure.

Specification against its own family. The comparison that matters most to a buyer is not the McLaren rival but the 296 in the next showroom bay.

	SF90 Stradale	296 GTB	F8 Tributo
Engine	4.0L twin-turbo V8 + 3 e-motors	3.0L twin-turbo V6 + 1 e-motor	3.9L twin-turbo V8
Drive	All-wheel drive	Rear-wheel drive	Rear-wheel drive
Power (combined)	986 hp (1,000 PS)	819 hp	720 hp
0–100 km/h	2.5 s	2.9 s	2.9 s
Top speed	340 km/h	330 km/h	340 km/h
Dry weight	1,570 kg	1,470 kg	1,330 kg
Hybrid mass added	~270 kg	~99 kg	n/a
Transmission	8-speed DCT	8-speed DCT	7-speed DCT
Battery / EV range	7.9 kWh / ~25 km	7.45 kWh / ~25 km	n/a
Launch MSRP (EU, base)	~€430,000	~€269,000	~€225,000

MSRP figures are launch base prices, EU mainland, before options. Real delivered prices with carbon, Assetto Fiorano specification and personalisation routinely ran 30–55% above base — the root of much of the depreciation shock in Section 06. Spider variants add roughly 90 kg and a price premium.

The variants. Four cars share the platform. The **SF90 Stradale** is the closed coupe. The **SF90 Spider** (2020) adds a retractable hardtop that operates in 14 seconds. The **SF90 XX Stradale** and **SF90 XX Spider** (2023) are the track-focused, heavily aerodynamically reworked, limited-production halo versions — capped at roughly 799 and 599 units respectively, road-legal, and the first 'XX' cars Ferrari ever sold for road use. As Section 10 argues, the capped XX cars behave like a completely different asset class from the uncapped Stradale and Spider.

05 THE DRIVING CASE

What the Car Is Brilliant At, and Where It Splits Opinion

Two things are true at once, and the tension between them is the whole story. The SF90 is **mind-blowingly fast and astonishingly easy to drive fast.** Reviewers and owners converge on this: the all-wheel-drive traction makes the performance accessible in a way a 986 hp rear-drive car could never be, the steering is quick and accurate, the brakes are unflappable, and for all the technology the driver rarely feels overruled by intervention. As a point-to-point weapon and an all-weather, genuinely usable supercar — silent out of a residential street at dawn, compliant in traffic, surprisingly efficient in Hybrid mode — it is hard to fault.

The recurring criticism is equally consistent, and it is not about pace. It is about **engagement.** Multiple testers describe the SF90 as feeling 'a little remote and digital,' and Ferrari's own successor reviewers were blunter still: on its merits the SF90 'wasn't entirely satisfying' and 'wasn't engaging enough as a driver's car to satisfy the benchmark role Ferrari wanted to give it.' The mass, the all-wheel-drive security and the sheer layered complexity insulate the driver from the road in a way the lighter, rear-drive 296 does not. The SF90 flatters; the 296 involves. For a marque sold on involvement, that distinction is expensive.

> ***"The SF90 makes a fast driver feel safe and a safe driver feel fast. What it rarely does is make either of them feel the road. That is the gap the 296 walks through."***

WHAT OWNERS ACTUALLY DO WITH THEM

As reported in industry and media analyses of Ferrari ownership telemetry, SF90 and 296 owners **rarely plug in** and **almost never use pure-electric mode.** Most are said to run in Performance mode, keeping the V8 on and using the motors purely as a torque overlay, relying on regeneration rather than the wall socket; the cars are typically charged only when stored for extended periods.

The implication is pointed. For the median owner, the plug-in hybrid system's daily benefit is largely unused — it is carried mass and carried complexity in service of a regulatory and performance brief, not a usage pattern. That is a defensible engineering choice. It is also exactly the kind of value the used market discounts when it cannot feel the payoff.

None of this makes the SF90 a poor car. It makes it a car whose greatest strengths — traction, outright pace, all-weather usability, eight cylinders — are precisely the ones the secondary market undervalues, while its one relative weakness, tactile engagement, is precisely what enthusiasts pay a premium for elsewhere in the range.

06 THE DEPRECIATION RECORD

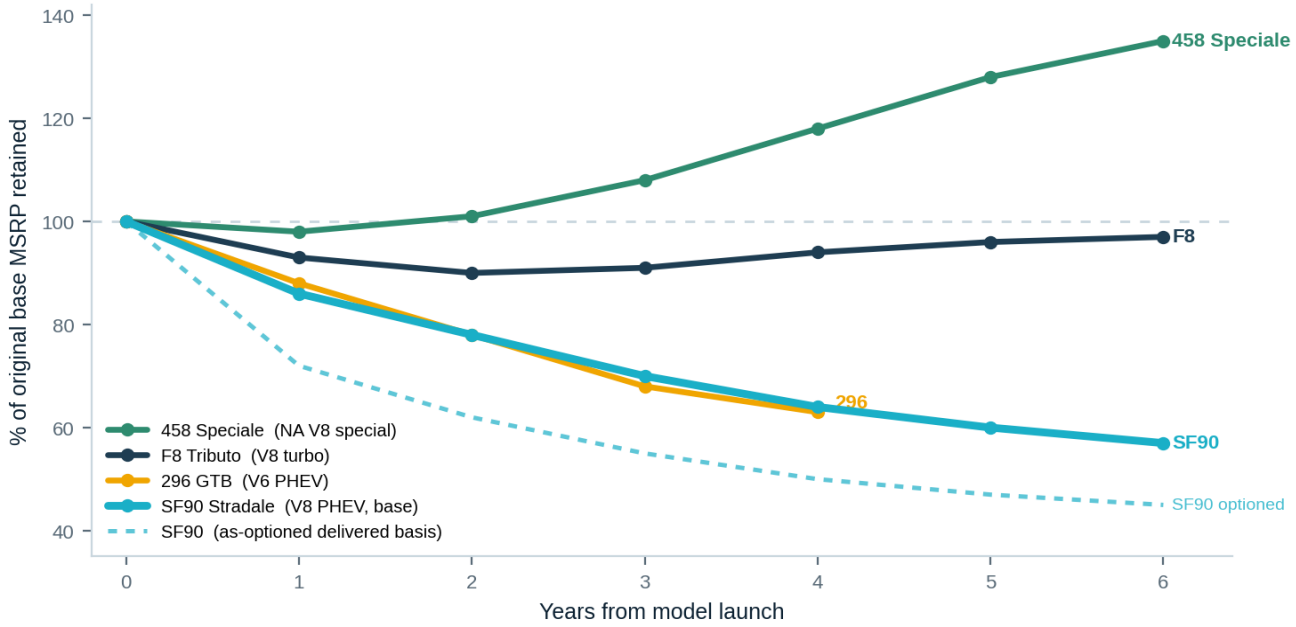
What the Market Is Pricing — and the Sub-€300k Line

The headline anecdotes are well documented and consistent. A 2022 Stradale optioned to a delivered $763,000 sold for $485,000 at three years and 1,600 miles — a $278,000 loss. A 185-mile example sold roughly $140,000 under sticker. A 2022 Stradale crossed the block at Barrett-Jackson Palm Beach in 2025 at $495,000. These are not distress sales; they are the normal clearing prices for over-optioned cars meeting a market that will not pay for options at resale. They are illustrative of the pattern rather than a statistical average (see the note in Section 01).

The structural picture is what matters. In the UK, entry Stradale coupes have now crossed beneath the £300,000 line: 2021–22 cars with 4,000–9,000 miles are listed at roughly £279,000–£300,000 as of spring 2026, against an original UK list near £376,000. Convertible Spiders and Assetto Fiorano cars sit higher — broadly £340,000–£400,000 — and the capped XX variants are a separate market entirely (Section 10). In euro terms the entry coupes are now around €330,000 and falling. **The owner's call that good early cars settle well under €300,000 is the visible trajectory, not a contrarian bet** — it is a question of months, not years, for the cheapest, highest-mileage coupes.

Model / variant	Year	Approx. trade (2026)	Direction (12-mo)
SF90 Stradale (entry coupe)	2021–22	£279k–£300k	down, hard
SF90 Stradale (clean / AF)	2021–23	£320k–£400k	down
SF90 Spider	2021–24	£340k–£440k	down
SF90 XX Stradale (capped)	2023–25	at / above MSRP	firm – up
296 GTB	2022–23	£200k–£260k	down -19%
F8 Tributo (V8, non-hybrid)	2019–22	£280k–£320k	stable
458 Speciale (NA V8)	2013–15	£330k–£480k	up +5–12%

Sources: Ferrari Approved and independent UK classifieds (AutoTrader, PistonHeads, CarGurus, Dick Lovett, Redline) March–May 2026; autoevolution and Carscoops single-car loss reporting; Barrett-Jackson Palm Beach 2025 auction result; classic.com US averages; iSeeCars resale data. US entry Stradale coupes track ~$400k–$410k. Figures are indicative and revise monthly.



Indicative value retention, % of original base MSRP, by years from launch. Trajectories are directional, built from representative listings and selected transactions, not aggregated market averages. The naturally-aspirated 458 Speciale appreciates; the V8-turbo F8 holds; the two plug-in hybrids (296, SF90) decline in near-lockstep, and the SF90 falls furthest once option inflation is stripped out (dashed). The chart is the whole thesis in one frame.

The damning comparison is internal, exactly as it was for the 296 — but harsher. The non-hybrid V8 F8 Tributo, the SF90's showroom contemporary, has held broadly firm. The naturally-aspirated 458 Speciale has *appreciated*. A buyer in 2026 can therefore acquire an early SF90 Stradale — the 1,000 PS technological flagship of its generation — for less than a decade-old, 605 hp special-series V8 with no hybrid system at all. The market is not pricing capability. It is pricing authenticity, simplicity and the cost of the unknown.

THE MARKET BACKDROP MATTERS

The SF90's decline is steeper than the wider trend, but it is not happening in a vacuum. The post-pandemic collector-car boom (2020–2022, near-zero interest rates) has been unwinding for three years. Hagerty's collector-car market rating fell to a 15-year low in early 2026; broad indices were down roughly 10% in 2025 alone, with US values off about 23% from peak and UK values off more. Higher rates, tighter liquidity and softer discretionary demand compress the whole modern-supercar segment.

Two implications follow. First, part of the SF90's headline drop is cyclical and shared, not SF90-specific — a point of fairness the car is owed. Second, the downturn is bifurcated: marquee and genuinely scarce cars (Enzo, F50, special-series NA models) are still setting records while uncapped modern hybrids soften. The SF90 sits squarely on the wrong side of that split.

07 WHY THE SF90 IS DEPRECIATING

Four Mechanisms, None About How It Drives

Four forces operate in parallel. As with the 296, none of them is a verdict on the car's dynamics.

First, the option-inflation unwind and the supply weight behind it. SF90s were ordered with extraordinary option loads — $200,000–$250,000 over base was common, much of it carbon and personalisation that carries almost no resale value. A delivered price built on options collapses to a market price built on the car; most of the eye-watering 'loss' headlines are options evaporating, not the underlying car halving. Underneath that sits a structural point the enthusiast conversation underplays: **the SF90 was a regular-series flagship, not an allocation-gated special.** Unlike the 488 Pista, 812 Competizione or 296 Speciale — cars Ferrari deliberately rations to vetted clients — the

SF90 Stradale and Spider were built at series volume against demand that proved softer than the order books implied. Higher-than-expected supply diluted perceived exclusivity and accelerated downward price discovery the moment speculator allocations began exiting together. The SF90 behaves, in the used market, like a high-volume Ferrari, because that is what it is. Estimates from registration data put global SF90 production at roughly **5,000–6,000 units** across Stradale and Spider — an order of magnitude above the deliberately rationed cars it is mentally lumped with: the 812 Competizione (999 built), the F12tdf (799), or the allocation-gated 488 Pista. Volume at that scale cannot carry a scarcity premium, and the market has priced it accordingly.

Second, 296 cannibalisation and the hybrid discount. The single largest drag, and the subject of Section 03. The 296 delivers most of the sensation, less weight, sharper engagement and the same badge for two-thirds of the money, and reviewers prefer driving it. Every 296 sold is an argument against an SF90's premium. Note the broader pattern beneath it: both plug-in hybrids (296 and SF90) are depreciating faster than Ferrari's non-hybrid V8s (F8, 488), which points to a **structural hybrid-discount effect** the market is applying to the architecture itself, over and above any single-model dynamic.

Third, complexity and the cost of the unknown. Three motors, an electric front axle, an 8-speed DCT and a 7.9 kWh pack present more to go wrong and more that is expensive to fix out of warranty than a conventional V8. The reliability and recall record (Section 08) gives that anxiety a factual anchor the F8 simply does not have.

Fourth, the 849 Testarossa. The named successor (Section 11) arrived in late 2025 as an uprated 'SF90 Evo' — same architecture, +50 hp, sharper, faster around Fiorano. A current model that is transparently better, on the identical hardware, caps what anyone will pay for the superseded car. Discontinuation removes the showroom anchor that supports a current model's used values.

WHY THE SF90 LACKS A FLOOR THE 296 MIGHT FIND

The 296 paper argued the 296's depreciation might find support from its engineering robustness, the 296 Speciale halo, and eventual recognition as the last hybrid-V6 Berlinetta. The SF90's floor is structurally weaker on each count.

It is uncapped series production with no exclusivity premium; its robustness story is compromised by a fire-risk recall; and its halo variant (the XX) is a *separate, capped car* that supports its own price, not the base Stradale's. The base SF90's residual rests almost entirely on the Power Hybrid battery programme and on eventual recognition as 'the first series PHEV Ferrari' — a historical 'first' that may or may not be priced.

THE COLLECTOR-PSYCHOLOGY CURVE

There is an emotional mechanism beneath the financial ones, and for a Ferrari it may be the most important. Collectors price **mechanical simplicity and long-term serviceability**: naturally aspirated engines, fewer moving parts, modest electronics, a car a competent independent can keep alive for decades. Hagerty's 2026 Bull Market list made the preference explicit, favouring cars with manuals and 'limited electronic interference.' That is the exact axis on which the 458 Speciale rises and the SF90 falls.

The SF90 breaks Ferrari's emotional formula. Its triple-motor all-wheel-drive architecture, high-voltage battery and deep software stack make it the most engineering-first road Ferrari of its era — brilliant, but on the wrong side of the collector-preference curve for authenticity, tactility and maintainability. The market is not only doing arithmetic on price; it is expressing a taste, and the SF90 is not to that taste. This is not a flaw in the car. It is a mismatch between what the car optimises for and what the marque's buyers emotionally reward.

The cyclical caveat, restated. A meaningful slice of the SF90's headline decline is the wider collector-market correction described in Section 06, not an SF90-specific verdict. Strip the cycle out and the car is still depreciating faster than its V8 stablemates — but the gap is narrower than the raw numbers suggest, and a buyer should weight that fairness into any purchase thesis.

08 RELIABILITY AND THE RECALL RECORD

Where the SF90 Diverges From the 296 Story

The 296 paper's quiet thesis was that engineering robustness underwrote the car's residuals while the headline depreciation said otherwise. The SF90 cannot make that claim as cleanly, because its record includes a serious safety recall and a documented thread of hybrid-system faults.

The turbocharger oil-pipe recall (NHTSA 23V-698 / Ferrari RC 86). In October 2023, Ferrari and the NHTSA issued a **'do-not-drive' order** on 2022–2024 SF90 Stradale and Spider cars built between 7 November 2022 and 19 September 2023. A turbocharger oil-delivery pipe, supplied with a notch and reduced wall thickness, could leak oil onto hot engine components and create a fire risk. The recall covered 614 US vehicles; the defect was estimated to affect **100% of the affected production batch** (not 100% of all SF90s), and a stop-sale halted deliveries. Crucially, the issue was found during a pre-production review of a new model rather than through field failures, and the recall was issued as a **precautionary measure following that internal validation finding**: Ferrari reported no fires, leaks or injuries before the remedy. Cars built after 20 September 2023 had conforming pipes. A separate, tiny March 2023 recall (13 cars) concerned airbag-to-child-seat interaction on a specific seat option.

> ***"The 296's depreciation was the price of being first into a category. The SF90's depreciation is the price of being first — plus a fire-risk recall the 296 never had."***

OWNER-REPORTED HYBRID ISSUES (NON-SYSTEMATIC)

Owner forums and fault trackers record a recurring — but anecdotal and non-systematic — set of hybrid-electric reports on the SF90: high-voltage battery warning messages (including an early-build car at ~1,600 miles unable to start or shut down), battery-management software errors, touchscreen latency, and adaptive-suspension calibration faults. A documented annoyance: if the car is left unplugged long enough to deplete the pack, certain functions — including the charging port and fuel filler — can lock out, requiring dealer intervention.

These are owner-reported accounts, not aggregated reliability data or a confirmed design flaw, and modern Ferraris are meaningfully more reliable than their predecessors. But they are real, they are electronic and battery-related, and they feed directly into the 'complexity premium' the used market subtracts. A used buyer cross-shopping an F8 reads this thread and adjusts the bid.

Two ownership ergonomics complete the picture and recur in owner reports: ingress and egress are tighter than older mid-engine V8 Ferraris (the battery packaging lowers and narrows the seating aperture), an issue more acute in the Spider. These are livability notes, not defects — but they subtract from the 'usable supercar' case the SF90 otherwise makes well.

Running-cost perception reinforces the complexity discount. Beyond the battery, owners commonly report higher insurance premiums (a function of the high replacement value and the cost of the hybrid and electronic systems), heavier annual service quotes than a conventional V8, and more expensive brake and tyre replacement — carbon-ceramic discs and staggered Cup-2-class tyres on a 1,570 kg, 986 hp all-wheel-drive car wear and cost accordingly. None of this is unique to the SF90 among hypercars, but the perception that it is dearer to keep than a 'simple' V8 feeds straight back into the residual: a used buyer prices not just the purchase but the decade of ownership behind it.

09 THE BATTERY QUESTION

Power Hybrid, as It Applies to the SF90

The battery economics are covered in full in the 296 paper and apply identically here — Ferrari's **Warranty Extension Hybrid** and **Power Hybrid** programmes explicitly cover the SF90 Stradale, SF90 Spider, SF90 XX Stradale and SF90 XX Spider alongside the 296 GTB and GTS. Both are transferable. This section records only what is SF90-specific.

Years	Programme	HVB replacement	Approx. cost
0–5	Factory hybrid warranty	Covered	Included in MSRP

Years	Programme	HVB replacement	Approx. cost
5–8	Warranty Extension Hybrid	Year-8 swap	~€7,000/yr · ~€21,000
8–16	Power Hybrid	Year-16 swap	~€7,000/yr · ~€56,000
to year 16	Both programmes	Two swaps	Approx. €77,000

Annual figures per Reuters / Automotive News / WardsAuto reporting; Ferrari publishes no list price. US extended powertrain coverage has been quoted near $14,500 per two-year block plus inspection.

The SF90's 7.9 kWh pack is larger than the 296's 7.45 kWh unit and architected for higher production volume than the bespoke, sealed LaFerrari pack. Trade and service-network estimates put a raw out-of-warranty high-voltage battery replacement for the SF90 in the region of £16,000 — an order of magnitude below the €180,000–€195,000 Ferrari has quoted for a LaFerrari pack. That is the reassuring number. The unresolved one is the same as the 296's: whether an independent cell-level repair ecosystem (the EV Clinic Zagreb LaFerrari case being the proof of concept) matures for these packs before the cars exit the Power Hybrid window at year sixteen. As of mid-2026 that ecosystem remains nascent: a handful of specialists (EV Clinic in Zagreb the most-cited) have demonstrated cell-level diagnosis and repair on sealed Ferrari hybrid packs as a proof of concept, but no mature, SF90-specific independent repair network yet exists. The reassuring raw-replacement number and the unresolved long-horizon serviceability question therefore sit side by side.

WHY THE PROGRAMME READS THE SAME WAY FOR THE SF90

A manufacturer confident in a car's residuals does not pre-commit to replacing its battery at years eight and sixteen. The Power Hybrid programme is residual-value insurance, written by Ferrari and sold to the owner. For the SF90 it does double duty — because the SF90's depreciation is steeper and its complexity anxiety higher than the 296's, the programme is arguably *more* load-bearing for an SF90 buyer than a 296 one. Continuous coverage is close to mandatory for anyone intending to hold the car past the factory window.

10 THE XX VARIANTS AND THE LAFERRARI LOGIC

Why Capped Cars Behave Differently

The clearest evidence for what ails the base SF90 is what happens to the cars that share its mechanicals but not its production model. The **SF90 XX Stradale** and **XX Spider** — capped at roughly 799 and 599 units — are often reported at or above their original MSRP, with low-mileage examples cited at a 25–40% premium, though the figure varies materially with allocation, mileage and region. Same V8, same hybrid system, same battery questions. The principal difference is scarcity — reinforced by a halo credential the base car lacks: the SF90 XX Stradale holds the Fiorano lap record for a road-homologated car at 1:17.309, a documented 'fastest road Ferrari' claim that auction buyers reward and that the uncapped Stradale can never carry.

> ***"Limited production plus mythology outruns battery economics. The LaFerrari proved it; the SF90 XX confirms it; the base SF90 Stradale is the control group that proves the rule by lacking the cap."***

This is the LaFerrari lesson the 296 paper drew, applied within a single model line. The LaFerrari (499 coupes, 210 Apertas) has appreciated from roughly €1.2–1.4m to €3.0–3.6m despite battery-replacement quotes near €190,000 — because rarity and storytelling overwhelm running-cost anxiety. The SF90 XX inherits a diluted version of that dynamic. The base Stradale and Spider inherit none of it: uncapped, series production, no exclusivity premium, no founder-edition halo. Their residual is determined by the same forces that shape the F8 and 488 — supply, drivability, perceived authenticity and out-of-warranty cost — with the hybrid system adding uncertainty to the last of those without improving the first three.

11 THE 849 TESTAROSSA EFFECT AND TEN-YEAR OUTLOOK

Three Scenarios, Honestly Specified

In September 2025 Ferrari **officially unveiled** the SF90's successor: the **849 Testarossa** (public reveal 9 September 2025; first customer deliveries from 2026). This is a confirmed production model, not a rumour — it has since been road-tested by the international press. Mechanically it is an evolution rather than a clean sheet: the same 4.0L twin-turbo V8 and three-motor AWD layout, uprated by roughly 50 hp (V8 to ~819 hp; ~1,036 hp combined), with the largest turbos ever fitted to a road Ferrari, revised aero and a bolder, deliberately more aggressive identity. It laps Fiorano about 1.5 seconds faster than the SF90 and is priced from roughly €460,000 (UK £407,617; US ~$560,685). Crucially, Ferrari designed it to look and feel clearly distinct from the 296 — a tacit admission of the 'bigger 296' problem this paper has described.

For SF90 residuals the successor cuts both ways. Near term it is a ceiling: a transparently better car on the same hardware caps the superseded model's price and removes its showroom anchor. Longer term it may help — by re-establishing a clear hierarchy and confirming the V8-PHEV flagship as a continuing, valued line, it could eventually rehabilitate the SF90 as the cheaper, first-generation entry into that lineage. Three scenarios follow. The probabilities and indicative price targets reflect the author's assessment, not market consensus; targets are for clean, post-recall, history-complete entry Stradale coupes in euro, on a roughly five-year view.

SCENARIO A · STABILISATION (probability: moderate-high · target €250k–€290k)

Option-inflation washes fully out of pricing; the entry coupe finds a floor around €250,000–€290,000 (roughly 35–45% of original base MSRP; clean / AF cars and Spiders higher) and holds. Power Hybrid year-8 swaps execute cleanly and de-risk the battery question. The 849 establishes a clear hierarchy that stops the SF90 bleeding into 296 territory. The SF90 settles as a high-capability, well-supported used flagship — drivable, ownable, not collected. The single best value-per-horsepower in the modern range.

SCENARIO B · THE 612 OUTCOME (probability: highest · target €200k–€240k)

The V8-but-complex perception persists; the 296 keeps cannibalising; the SF90 becomes the modern 612 Scaglietti — a competent, fundamentally well-engineered Ferrari the market never collects because its successor is sharper and its lighter sibling is more loved. Values grind to a long, flat floor near €200,000–€240,000 for entry coupes (around 35% of base MSRP). Power Hybrid keeps the worst battery outcomes off the market but generates no upward pressure. Drivable and ownable; not investable.

SCENARIO C · ORPHAN GENERATION (probability: lower, non-zero · target €150k–€190k)

The 2035 ICE/PHEV reassessment erodes confidence in the whole combustion-hybrid generation; independent repair capability for the bespoke pack and electric front axle fails to mature; by year twelve-plus, parts continuity becomes a genuine concern for cars outside the Power Hybrid window. The uncapped SF90 — too common to be saved by rarity, too electronically complex to be cheap to keep — finds a floor near €150,000–€190,000 (25–30% of MSRP). The XX variants are insulated; the base cars are not.

The asymmetric upside. One factor sits outside all three scenarios and could lift the SF90 above them: the 'historical-first' premium. The SF90 is the *first series plug-in hybrid Ferrari* ever built. If, a decade out, that 'first' acquires the significance the market eventually granted other transitional Ferraris, a clean, low-mileage, fully-warranted Stradale could re-rate as a documented milestone rather than a used flagship. It is the least probable path — 'first of a high-volume type' rarely commands what 'rarest of a type' does — but for a preservation-minded buyer it is the free option embedded in the car.

The three scenarios at a glance (entry Stradale coupe, indicative, ~5-year view):

Scenario	Trigger	5-yr target	Probability
A · Stabilisation	Option-inflation clears; year-8 battery swaps execute cleanly; 849 restores hierarchy	€250k–€290k	Moderate-high

Scenario	Trigger	5-yr target	Probability
B · The 612 outcome	V8-but-complex stigma persists; 296 keeps cannibalising; competent but uncollected	€200k–€240k	Highest
C · Orphan generation	Repair ecosystem fails to mature; parts continuity doubts post-warranty	€150k–€190k	Lower, non-zero
Upside · Historical-first	'First series PHEV Ferrari' becomes a priced milestone for clean, warranted cars	Above the above	Least likely

Probabilities and targets reflect the author's assessment, not market consensus. Clean / AF cars, Spiders and capped XX variants sit above these entry-coupe figures.

THE RATIONAL BUYER POSITION

At sub-€300k–€330k for an early coupe, the market is pricing the SF90 between Scenarios B and C and weighting B. A buyer who maintains Power Hybrid coverage continuously, drives the car rather than stores it, and is honest that they are buying the most capable, least loved flagship Ferrari of its era is buying an enormous capability-per-euro delta. A buyer whose thesis is appreciation should be in the capped SF90 XX, the 458 Speciale, or nothing in this family at all.

12 CLOSING

Where the SF90 Sits in the Ferrari Story

The SF90 Stradale is the car that proved Ferrari could build a 1,000 PS series plug-in hybrid and make it usable, fast and credible — and then watched its own cheaper, lighter, rear-drive distillation win the affection and undercut the price. Its tragedy is not that it is flawed. It is that it is the senior, more expensive, more complex expression of a formula the market decided it preferred in miniature.

The 'bigger 296' charge is chronologically false and commercially true, and both halves matter. The reliability record — a fire-risk 'do-not-drive' recall plus owner-reported (non-systematic) hybrid issues — denies the SF90 the quiet robustness argument that cushioned the 296. The uncapped production denies it the scarcity floor the SF90 XX and the LaFerrari enjoy. And the 849 Testarossa, an uprated evolution on the same hardware, caps it from above while admitting, in its very styling brief, the problem this paper has set out.

> ***"The SF90 is the most capable Ferrari its generation could buy and the one its generation least wanted to pay for. For the driver who is honest about why, that gap is the opportunity."***

WHO SHOULD BUY AN SF90 — AND WHAT TO CHECK

Right buyer: a driver, not a flipper, who wants maximum all-weather capability per euro, values eight cylinders and AWD traction over last-degree tactility, will keep the car several years, and treats any future appreciation as a free option rather than the thesis. **Wrong buyer:** anyone whose frame is appreciation — they belong in a capped SF90 XX, a 458 Speciale, or nothing in this family.

Checklist before buying: (1) confirm the turbo-pipe recall (RC 86) is closed, or buy a car built after 19 September 2023; (2) demand a complete Ferrari main-dealer service history and a high-voltage battery / hybrid-system health check; (3) verify Warranty Extension Hybrid / Power Hybrid status and that coverage is transferable and continuous; (4) do not pay a resale premium for options — value the car, not the carbon; (5) prefer a lightly-optioned, lower-mileage Stradale coupe for value, or a documented XX for preservation; (6) factor the cyclical market backdrop into the offer, but expect entry coupes to keep drifting toward, and through, €300,000.

For the buyer in 2026: the SF90 represents the largest capability-per-euro figure in the modern Ferrari range, available precisely because the things it does best are the things the secondary market values least. It was, and remains, **more car than the market wanted** — more power, more drive, more complexity, more money than its own

lighter sibling, sold into a taste that rewards the opposite. Run the warranty, drive the car, and accept that you are buying engineering, not authenticity or appreciation, and the SF90 is a remarkable amount of supercar for the money. Frame it as an investment, or expect it to feel like a 296, and it will disappoint on both counts. And there is a wildcard the rational case does not require but quietly carries: this is the *first series plug-in hybrid Ferrari ever built*, and if that 'first' is ever priced as the milestone it is, the clean, warranted, low-mileage car bought today at the bottom of its curve is the one that captures it. The owner's instinct — that the criticism is unfair only up to a point, and that good cars are headed well under €300,000 — is, on the evidence assembled here, correct on both halves.

APPENDIX · THE VALUE MATRIX

Where the SF90 sits today against its live rivals and stablemates on price-per-horsepower and usability. The basis is mixed by necessity: the SF90 and 296 are priced at indicative *used* values (the whole point of this paper), while the 849, 750S and Revuelto are *new* MSRP. Read it for the capability-per-euro shape, not to the last euro.

Car	Powertrain	Drive	Power	Indicative price	€ / hp	Usability
296 GTB *(used)*	V6 PHEV	RWD	819 hp	~€240k	~€293	High; e-Drive, daily-friendly
SF90 Stradale *(used)*	V8 PHEV	AWD	986 hp	~€330k	~€335	High; AWD all-weather, silent EV
McLaren 750S *(new)*	V8, no hybrid	RWD	740 hp	~€300k	~€405	High; light, simple, no plug
849 Testarossa *(new)*	V8 PHEV	AWD	1,036 hp	~€460k	~€444	High; SF90 usability, sharper
Lamborghini Revuelto *(new)*	V12 PHEV	AWD	1,015 hp	~€520k	~€512	Lower; bigger, more theatrical

Prices indicative, May 2026; conversions at 1 EUR = 1.17 USD = 0.85 £. The read is blunt: among 1,000-horsepower all-wheel-drive cars, the used SF90 is comfortably the cheapest per horsepower — undercutting its own successor (849) and the Revuelto by a wide margin — while delivering the same daily usability. Only the lighter, lower-output, non-hybrid 296 and 750S beat it on headline €/hp, and neither offers the SF90's output or all-weather traction. The matrix is the buyer's case in one table: maximum capability per euro, bought precisely because the market discounts what the SF90 is best at.

SOURCES

• Ferrari S.p.A. / Ferrari Approved Pre-Owned — SF90 Stradale & Spider technical specifications and used listings (UK/EU, 2026).
• NHTSA — Recall 23V-698 (Ferrari RC 86), turbocharger oil-delivery pipe, 2022–2024 SF90 Stradale/Spider, 'do-not-drive', 614 vehicles, 100% estimated defect; Recall 23V-136 (airbag/child seat).
• autoevolution; Carscoops — single-owner SF90 depreciation case studies (2025): ~$278k and ~$140k losses.
• machineswithsouls.com — SF90 value decline and 849 Testarossa effect (Sept 2025).
• Autocar; Top Gear; evo; Robb Report; Motor1; CarExpert — 849 Testarossa official reveal (9 September 2025), first drives, confirmed specifications and pricing, and SF90-successor positioning (Sept 2025–Feb 2026).
• CarBuzz; Autoblog; Haute Living; SSO Report; DragTimes/InsideEVs — SF90 Stradale/Spider driving impressions and EV-mode/daily-use reports.
• autoevolution — SF90 vs 296 GTB drag and rolling-race comparison (weight vs power/traction).
• drivemebarcelona.com; PCAuto; TrueCar — SF90 vs 296 dimensional, mass and power-to-weight comparison.
• AOL/Autoweek via Ferrari ownership-telemetry reporting — 296/SF90 owners rarely plug in or use EV mode.
• automotivefaults.com; FerrariChat ('SF90/849' forum) — owner-reported hybrid, HVB, software and ingress/egress issues.
• The Autopian; Reuters/Automotive News/WardsAuto — Power Hybrid and Warranty Extension Hybrid programme structure and pricing (July 2024).
• AutoTrader UK, PistonHeads, CarGurus, Dick Lovett, Redline Specialist Cars, theparking-cars — UK SF90 classified pricing (Mar–May 2026).
• classic.com; iSeeCars; KBB — US SF90 market averages and resale data (2026).
• Barrett-Jackson — Palm Beach 2025 auction result (2022 SF90 Stradale at $495,000).
• Ferrari S.p.A. — SF90 XX Stradale Fiorano road-car lap record (1:17.309, November 2023); official Fiorano lap times (SF90 1:19.0, 296 GTB 1:21.0); 849 Testarossa 1:17.5.
• Ferrari N.V. — 2025 Capital Markets Day: 2030 product mix (40% ICE / 40% hybrid / 20% EV), Elettrica first EV (premiere 2026); four new models per year 2026–2030.
• TrueCar; KBB; Carwow — McLaren 750S and Lamborghini Revuelto power and pricing for the value matrix.
• Hagerty; The Classic Valuer; Jalopnik; Motorious — collector-car market correction, 2026 market rating at a 15-year low, and 2026 Bull Market preference for mechanical simplicity / limited electronic interference.
• Reference: Marque Intelligence — Supercar Model 06, 'The Ferrari 296' (April 2026) — for the shared Power Hybrid, battery-economics and regulatory analysis.

Prices and market data are as of May 2026; depreciation figures are indicative, drawn from representative listings and selected transactions (including public auction results), not aggregated market averages, and are subject to monthly revision. Currency conversions are approximate.
Author: Uwe Riemeyer · Series: Marque Intelligence — Supercar Model 07 · This paper is independent analysis. It is not affiliated with Ferrari S.p.A., Ferrari N.V., or any dealer organisation. The author owns and drives a Ferrari 488; dynamic preferences are disclosed accordingly. Not investment

advice.