

MODEL FILE 07 · HYBRID V8 FLAGSHIP

FERRARI SF90

F154 V8 PHEV · FROM 2019 · STRADALE · SPIDER · XX

THE FAMILY IN BRIEF

VARIANTS

SF90 Stradale (coupé) and SF90 Spider (RHT), each available with the Assetto Fiorano package: an option code, not a model. SF90 XX Stradale (799 units) and XX Spider (599 units, both factory-confirmed): road-legal Special Series cars positioned between classic Special Series and the track-only XX programme; for provenance and market data they are Special Series, not XX-programme track cars.

HYBRID DRIVETRAIN

3,990 cc F154 twin-turbo V8, dry sump, 780 cv and 800 Nm, plus three electric motors: two independent front motors and one between V8 and gearbox, 162 kW / 220 cv electric, 7.9 kWh HV battery, 1,000 cv system output, plug-in E4WD, 8-speed F1 DCT, eSSC with e-Diff3, SCM-E, brake-by-wire, about 25 km electric range. In pure eDrive the car drives through the front axle only, and the DCT has no mechanical reverse gear: reverse comes solely from the front motors.

WHY IT MATTERS

On the 296 the hybrid is a layer over a classic rear-drive car; on the SF90 electrification is the fundamental function. Without a healthy HV system the car can lose E4WD, torque vectoring, eDrive and even reverse. The PPI hierarchy inverts accordingly: structural and HV integrity first, campaigns and full diagnostics next, cylinders last.

INSPECTION ZONES · ELECTRIFICATION AS CORE FUNCTION

HV BATTERY & CHARGING

State of health, cell-voltage spread, temperature spread, isolation resistance, stored overtemperature, undervoltage and reduced-power events, replacement history, coverage status. Standing history matters: a 1,500 km collector car is not automatically better than one with 15,000 km. Include a real charge test of 10 to 20 minutes: port, locking, power and SOC rising, no aborts. A PPI without a working charge test is not complete.

TWO BATTERIES

Separate the 12 V battery (body electronics, ECUs, wake-up) from the HV battery (three motors, eDrive, reverse): a car can hold a charged HV battery and still appear electronically dead. Field pattern, not a confirmed common defect: dead or unresponsive cars, wake-and-sleep problems, reinitialisation after voltage loss. Check the 12 V system before activation; with multiple communication faults, stabilise supply voltage first, then scan again.

REVERSE BY WIRE

Because no mechanical reverse exists, the reverse test carries unusual diagnostic weight. Cold, then again warm: select R, expect immediate activation, both front motors working plausibly, no E4WD or hybrid warning, no delay, judder or unusual noises. Reverse unavailable together with hybrid or eAxe faults means far more than on any conventional DCT Ferrari.

FRONT EAXLE / E4WD

The defining difference to the 296: two independent front motors with their own cooling. Check both motors, inverter and front-axle cooling, wheel-speed plausibility, torque-vectoring and E4WD faults, coolant leaks, isolation. Road test: a tight curve under moderate torque with no vibration, clicking, pulsing or asymmetry, then stronger acceleration where safe.

DRIVE MODES

All four eManettino modes, not just the symbols. eDrive: engine stays off where conditions allow, clean electric drive, reverse works. Hybrid: clean start-stop and transitions. Performance: engine available, power management plausible. Qualify: full system output, no reduced-power warnings.

V8 / TURBOS

No robust basis supports a systemic engine failure. Force a true combustion cold start and judge misfires, smoke, valve-train and turbo noise, leaks, smells, boost plausibility, lambda and knock data where accessible. Because of RC86, the turbo oil supply is a named focus: pipes, connections, heat shields, oil traces, cleaning traces, oil smell after heat soak.

DCT

An 8-speed wet dual clutch, newly developed for this car, with dry-sump gearbox lubrication and no mechanical reverse. Ferrari Technical Information 2612 includes the SF90 in its DCT oil-leak repair procedures: an OEM-recognised inspection category, not a claim that gearboxes commonly leak. Cold and warm shift protocol; underbody check for oil, seals, fresh cleaning; diagnosis of pressure faults, adaptations, temperature and replacement history.

COOLING

Ferrari's own pre-delivery checklist separates engine coolant, HV-battery coolant and inverter/front-eAxe coolant: OEM confirmation of how to structure the inspection. Every reservoir, dried residue, radiator packs, pumps, debris, bent fins, fan operation; then a full warm cycle, heat soak and restart.

BRAKES BY WIRE

CCM (398 × 223 × 38 mm front, 360 × 233 × 32 mm rear) with brake-by-wire and regeneration: judge function, not just wear. Pedal consistency, the regeneration-to-friction transition, straight braking, ABS and wheel-speed faults. Part history is valuable: TI 2770 introduced pre-bedded discs and pads in 2021 (discs 776901/776900, pad kits 70005267/68). Never judge CCM on thickness alone; a conspicuous regen transition is HIGH pending diagnosis.

ACTIVE AERO

The patented shut-off Gurney at the tail moves between low-drag and high-downforce configurations. Mechanism, actuators, alignment, faults, foreign objects, repair traces, panel fit, function via diagnosis where possible. An SF90 PPI without the active-aero check is incomplete.

UNDERBODY / HV & EAXLE

CRITICAL zone, and wider than on the 296: HV-battery enclosure, the front eAxle area, composite trays, aero tunnels, jacking points, diffuser, ducts, deformation, replaced panels. Rule: an impact in the HV-battery zone stops PPI clearance pending a Ferrari HV-qualified inspection. Accident assessment weighs heavier in general: a “small front-end damage” can involve the electric front axle, not just bodywork and radiators.

VARIANT-SPECIFIC · SPIDER

RETRACTABLE HARDTOP

About 14 seconds. Two full cycles cold, one or two more warm after the road test: locks, decklid, rear glass, seals, sensors, alignment, water marks, wind noise, stored roof faults. No sufficient evidence of a systemic roof defect: a high-cost PPI component, not a known common failure.

VARIANT-SPECIFIC · ASSETTO FIORANO

PACKAGE AUDIT

Substantially more than trim: GT-racing-derived Multimatic dampers, titanium springs, full titanium exhaust, carbon door panels and underbody parts, high-downforce carbon rear spoiler (up to 390 kg at 250 km/h), specific Cup 2 tyres; about 30 kg saved on the Stradale, 21 kg on the Spider. Verify each item against the build sheet; the dampers do not adjust like the standard SCM-E set-up. AF parts replaced by standard parts after an accident justify a real market-value adjustment.

VARIANT-SPECIFIC · XX STRADALE / XX SPIDER

XX SUBSTANCE

1,030 cv system (797 cv V8, 233 cv electric), 7.9 kWh, E4WD, and the first fixed large rear wing on a road-legal Ferrari since the F50: up to 530 kg downforce at 250 km/h. Rear CCM grows to 390 × 263 × 32 mm; tyres stay 255/35 and 315/30 ZR20. Extra Boost adds time-limited electric deployment (later carried to the 296 Speciale): verify availability, software and the absence of related faults; do not provoke maxima on public roads.

XX ASSESSMENT

Track use is practically part of the car's purpose: score condition and documentation, never treat use itself as a defect. Damaged OEM aero is an originality and collector-value problem, not merely a repair cost. The population is small, young and low-mileage: no XX failure pattern is claimed, and none should be. The PPI is predominantly provenance and originality: allocation, build sheet, factory livery, original aero, wheels, interior, Ferrari-only service history.

RECALLS · VIN CHECK MANDATORY

TURBO OIL PIPES

NHTSA 23V698 / Ferrari RC86, campaign C24000086: certain MY2022–24 Stradale and Spider, 614 cars in the US filing, production window November 2022 to September 2023. The turbo oil-delivery pipes could carry a notch and insufficient wall thickness: crack, oil on hot components, fire risk; initially a stop-sale and do-not-drive. Remedy: both pipes replaced, kit P/N 70007937. The action ran worldwide (Transport Canada and Japan document it). Completion evidence is CRITICAL.

PASSENGER SEAT

NHTSA 23V136 / Ferrari RC84, campaign C24000084: 13 US cars, certain MY2021–23 Stradale and MY2022 Spider with the M-size racing passenger seat, replaced by the XL seat because a deploying airbag could strike a fitted child seat. CRITICAL where applicable, and explicitly not a general seat problem: verify seat configuration against build sheet, campaign record, airbag faults, undamaged electronics.

INTERNATIONAL CAMPAIGNS · REGULATORY REGION

BEYOND NHTSA

A US-only check misses documented SF90 actions. Japan 2022: an engine-ECU temperature-threshold software campaign (with ion-control and gearbox-control updates) after possible engine-restart problems. Japan 2023: 12 imported Stradale with insufficient welding of an HV-battery cell electrode: rising resistance, reduced motor output, in the worst case no onward drive; government-confirmed, limited production population, not a common battery failure. Ferrari Campaign 466 updated air-conditioning-node software on early Stradale VINs 249268–265105 with a prescribed full scan-out. Market-specific campaigns do not transfer automatically to every VIN: check the individual car with Ferrari, especially imports.

SERVICE · WARRANTY · COST DISCIPLINE

GENUINE MAINTENANCE

20,000 km or once a year depending on the item; the first seven years covered by Genuine Maintenance on new cars. No invented sub-intervals: document services, fluids including HV and inverter/eAxle coolant, plugs, DCT work, hybrid inspections, software, recalls and campaigns. An HV-qualified Ferrari service chain outweighs any stamp booklet.

HYBRID COVERAGE

Carry as market intelligence: factory and power warranty status, hybrid and extended coverage, HV-battery replacement entitlement, transferability, last official inspection. An SF90 with lapsing or absent HV coverage has a fundamentally different forward risk profile.

COST DISCIPLINE

Deliberately no single euro figures: risk classes instead. Moderate: annual service, tyres. Substantial: CCM pads, AF components, RHT repairs. Major: CCM rotors, DCT, front eAxe, inverter. Highest: HV-battery repair or replacement, and any accident involving the HV enclosure. Circulating battery prices are frequently mixed with LaFerrari figures: exactly the kind of number this revision keeps out.

BUYING NOTES · THE TWO CHECKS THAT MATTER

1 · THE HIERARCHY

Structural and HV integrity, then campaigns, then a full Ferrari-level scan before AND after the road test with heat soak, then HV battery and front eAxe, cooling, DCT and reverse, engine, brakes, suspension and aero, and only then cosmetics and options.

2 · CONFIDENCE DISCIPLINE

OEM or government confirmed: RC86, RC84, the Japanese 2022 software and 2023 HV-cell campaigns, Campaign 466, TI 2612, TI 2770. Field patterns to monitor: 12 V and undervoltage events, dead-car and wake-sleep symptoms, hybrid and E4WD warnings, charging complaints. Not established, not to be claimed as common: systemic failures of HV battery, e-motors, inverter, V8, turbos, DCT, roof, active aero, or anything XX-specific.

MARKET POSITION · TWO MARKETS, TWO READINGS

STATUS

European and US bands to be set from the transaction dataset in this verification round. Two structural expectations: remaining HV coverage will stratify the used market at least as strongly as mileage, and the XX pair trades on provenance and originality more than on condition line items.

1,000 cv

System output Stradale/Spider: 780 cv V8 plus 220 cv electric; XX 1,030 cv

7.9 kWh

HV battery behind E4WD, eDrive and reverse: its health is the file's first question

RC86

Turbo oil-pipe campaign 23V698: completion evidence CRITICAL

Sources: NHTSA campaigns 23V698 and 23V136 (verified September 2026); Ferrari published specifications and press material for SF90 Stradale, Spider, Assetto Fiorano and SF90 XX; Ferrari PDI checklist structure, TI 2612, TI 2770, Campaign 466, and part numbers per campaign filings as sourced; Japanese MLIT campaign records and Transport Canada documentation as sourced. Field-pattern items are observations, not OEM defects; market bands follow the verification round.