

MERCEDES-AMG & PAGANI

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*Fangio, Affalterbach and the V12 partnership behind three generations -
the longest-running engine marriage in the modern hypercar industry*

1954/55

Fangio's Mercedes world championships - the personal bridge that opened Affalterbach to an unknown designer with no completed car and no sales record

M120→M158

One architectural lineage, three generations - 394 PS in the first Zonda to 864 PS in the Utopia, every engine developed and built by AMG for Pagani

1 CRAFTSMAN 2030/32

AMG's "one man, one engine" principle - current Pagani V12s are assembled entirely by a single Affalterbach technician

The stated homologation horizon (Europe/California, per Pagani, 2025) - a planning date, not a deadline; the decisive uncertainty lies beyond it

01 EXECUTIVE SUMMARY

The partnership between Pagani and Mercedes-AMG is one of the longest-running supplier relationships in the modern hypercar industry. It began before Pagani had produced a saleable car, survived AMG's transformation from independent engineering company into wholly owned Mercedes-Benz subsidiary, carried the change from naturally aspirated to turbocharged engines, and remains central to the Utopia more than thirty years after Horacio Pagani began developing his first production model. The common reduction - 'Pagani buys Mercedes engines' - is technically true and historically inadequate: Pagani neither orders from a parts catalogue nor designs engines that AMG merely assembles. AMG provides architecture, mechanical engineering, combustion and emissions development, durability validation, manufacturing and long-term support; Pagani defines and integrates character, installation, mass targets, cooling, intake and exhaust, response, torque delivery, gearbox interaction and sound. The correct description, established in Paper 118 and given its full history here, is a bespoke commissioned powertrain partnership: Mercedes-AMG products, developed and manufactured specifically for Pagani.

This paper tells that story with the series' usual discipline - documented fact, accepted interpretation, analytical estimate, unknown - because the partnership's mythology (Fangio's handshake, the hand-built engine, the exclusive V12) is largely true and still needs sorting from what no outsider can know: contract values, exclusivity clauses, calibration ownership, warranty splits. It runs from Horacio's founding problem and Fangio's bridge, through AMG's own corporate transformation, down the engine lineage from M120 to the 864 PS Utopia evolution, into the money nobody publishes, and out to the question that now defines the partnership's fourth decade: what happens when the stated homologation horizon - around 2030 in Europe, 2032 in California, per Pagani's own 2025 statements - finally arrives.

Key Finding

The partnership has lasted because it solves a fundamental problem elegantly: Pagani can remain an independent car manufacturer without pretending to be an independent multinational engine company. Each side contributes what the other lacks - Pagani an extraordinary showcase, demanding low-volume specifications, loyalty across three generations and zero conflict with Mercedes products; AMG powertrain engineering, emissions capability, hand assembly, durability and institutional stability no boutique could replicate. The result is something extraordinarily rare: three generations of cars with a consistent twelve-cylinder identity, backed by the resources of one of the world's largest automotive groups and expressed through an unmistakably Pagani vehicle. Dependency is the price - AMG could, in principle, change direction, and Pagani's bargaining power against Mercedes-Benz Group is limited - but for a manufacturer of dozens of cars a year, supplier independence is not automatically superior: an unreliable in-house engine would damage Pagani far more than strategic dependence on Affalterbach ever has.

The forward finding: as of July 2026 every credible indication points to continued cooperation through the Utopia generation - Pagani still describes the engine as exclusively produced and single-craftsman assembled, and company statements from 2025 put homologation coverage around 2030 in Europe and 2032 in California. Those dates are planning horizons, not deadlines: homologation guarantees neither production nor supply, and extensions are possible. The genuinely decisive uncertainty lies beyond them - and Pagani's own shelved battery-electric Utopia, abandoned because 'no one showed interest', shows which exits the customers have already closed.

02 THE PROBLEM AND THE BRIDGE

Horacio had composites, structure and conviction - Fangio supplied the credibility that drawings could not.

When Horacio Pagani left Lamborghini toward what would become the Zonda, he possessed composites, vehicle structure, body design, aerodynamics, prototyping and low-volume manufacturing - everything except an engine company. A clean-sheet twelve-cylinder road engine would have demanded hundreds of specialists, casting and machining plants, combustion and emissions laboratories, endurance rigs and capital wildly disproportionate to a volume of a handful of cars a year. He needed a partner whose engine was powerful, reliable, prestigious, emissions-compliant, serviceable, adaptable to a mid-engined installation - and characterful without being a temperamental racing unit. The Mercedes V12 was the obvious foundation; the problem was that Mercedes had no reason to talk to him. Juan Manuel Fangio - double world champion for Mercedes-Benz in 1954 and 1955, mentor to the younger Argentine through the engineering and motorsport circles of their shared homeland - was the bridge, and Pagani's own material states that the cooperation began through him. For Stuttgart and Affalterbach, Pagani represented pure risk: unknown marque, tiny volume, no dealers, uncertain financing, an unfinished car. Fangio's standing guaranteed the project's seriousness in a way no drawing could. What he did not do matters equally: there is no evidence he chose specifications, negotiated terms, financed the company or conducted development - he was mentor, advocate, introducer and guarantor. The naming history honours the relationship precisely: the early project circulated as the Fangio F1, and after Fangio's death in 1995 Pagani declined to commercialise his name, choosing Zonda - the Andean wind - and reserving the tribute for 2005's Zonda F, which Pagani described as the culmination of a friendship that had gone far beyond the original desire for a Mercedes engine (Papers 103 and 107 carry that story).

03 AFFALTERBACH IN TRANSITION

The Zonda arrived at the exact moment AMG changed owners - and the partnership grew stronger, not weaker.

The AMG that received Pagani in the 1990s was not today's Mercedes performance division. Founded independent in 1967 by Hans-Werner Aufrecht and Erhard Melcher, AMG entered a formal cooperation agreement with Daimler-Benz in 1990 - dealer-network distribution, much closer institutional ties, still legally independent - which made it the natural intermediary between the enormous Mercedes organisation and the tiny Pagani project: experienced with Mercedes engines, credible, capable of low-volume and unusual customer work. Then the ground moved: DaimlerChrysler acquired 51 per cent of AMG on 1 January 1999 - almost exactly as the Zonda C12 reached production - and full ownership followed in 2005, the year of the Zonda F. There is no public evidence of disruption: no supply break, no renegotiation crisis, no search for another engine partner. The record shows the opposite - the 7.0 and 7.3 Zondas under majority Daimler ownership, the racing V12 of the Zonda R, the Pagani-specific M158 of the Huayra, the Utopia evolution, and AMG still building Pagani V12s after retiring the architecture from most of its own range. Institutionalisation probably strengthened the programme - durability resources, emissions laboratories, production quality, global regulatory knowledge - at the cost of corporate approval processes an independent AMG never needed. Why does a group of that size bother? Not volume: the showcase (an AMG V12 in a 1,300 kg carbon car proves things an S-Class cannot), brand prestige, V12 knowledge preserved as the core range electrifies, high-margin specialist work, three decades of relationship stability, and a halo with zero market conflict - a Pagani competes with no Mercedes product.

THE PARTNERSHIP - CHRONOLOGY	
1967-1990	AMG founded independent (Aufrecht/Melcher, 1967) · formal Daimler-Benz cooperation agreement 1990 - still legally independent, no longer an outside tuner
Early-mid 1990s	Fangio opens the Mercedes/AMG door for Pagani · engine discussions run alongside Zonda development · Fangio dies 1995; "Fangio F1" name retired
1999-2005	Zonda C12 enters production with the 6.0 M120-family V12 · DaimlerChrysler takes 51% of AMG (1.1.1999) · 7.0/7.3 engines follow · AMG wholly Mercedes-owned 2005 - the Zonda F year
2007-2026	Zonda R racing V12 · Huayra M158 twin-turbo (2011) · BC/Roadster/Imola evolutions · Utopia 864 PS (2022) and Roadster (2024) · 2026: exclusive production and single-craftsman assembly still current

04 THE ZONDA ENGINES - M120 TO 760

From 394 PS of luxury-car smoothness to 760 PS of coachbuilt fury - one architecture, fifteen years of evolution.

The first Zonda C12 used a 6.0-litre naturally aspirated V12 of the M120 family - the refined luxury powerplant introduced in 1991 for the W140 600 SE/SEL and SL 600: 60-degree aluminium V12, four valves per cylinder, twin cams, about 394 PS and 570 Nm in Pagani's first application. Modest by later standards, and exactly right: against a carbon monocoque, low mass and a manual gearbox, the engine's drivability, torque, smoothness and known durability let Pagani establish the chassis and the company before chasing extremes (Paper 105's argument, made in Affalterbach metal). The terminology needs the care Paper 106 introduced: M120 names the original Mercedes family; M297 the enlarged, more highly developed AMG sports-car derivatives - CLK GTR lineage - from which the 7.0 and 7.3 Zonda engines descend; publications blur the two, and a rigorous history keeps family and derivative apart. The evolution then runs: C12 S 7.0 with substantially more output; the 7.3 of the Zonda S - titanium connecting rods, 555 PS, up to 750 Nm, described by Pagani as an exclusive Mercedes-AMG V12; the F at ~602 PS and 650 PS in Clubsport form; the Cinque at ~678 PS, the Tricolore around 670, and finally ~760 PS in the late specials of Paper 117 - a fifteen-year development of an architecture rooted in the early 1990s. Assembly ran in AMG's low-volume engine environment; the exact application of the formal 'one man, one engine' plaque process to every early Zonda unit is not comprehensively documented, so the defensible statement is that Pagani's AMG engines are specialist hand-assembled units, with current engines explicitly built by a single craftsman. And Pagani's own share was never trivial: mounts, induction, airbox, exhaust, cooling, shielding, gearbox interface and calibration were Modena's - the Zonda's legendary voice was made by naturally aspirated combustion and Pagani's intake resonance, header lengths and short central exhaust together, not by the block alone. One exception proves the partnership's range: the Zonda R's 6.0-litre racing V12 - ~750 PS, 710 Nm, structurally mounted, closer to CLK GTR practice than to any road Zonda - showed AMG could supply circuit powertrains as well as grand-touring torque (Paper 110).

05 THE TURBO TRANSITION - M158

Not an S 65 in a carbon dress, not a clean sheet - a Pagani-specific programme on AMG's twin-turbo knowledge.

The C9 project that became the Huayra faced a regulatory wall no 7.3 could climb: global emissions, consumption, catalyst light-off, torque expectations. The answer was the M158 - a new 6.0-litre twin-turbo V12 developed by AMG for Pagani, retaining V12 architecture, hand-built character and refinement while adding boost, vastly more low-speed torque and a long development path. Its position must be stated precisely, because both simplifications mislead: it belongs to the lineage of Mercedes' modern twin-turbo V12s (S-Class, SL, CL, Maybach, the 65-series) and differs in application, turbocharging, intake and exhaust, calibration, cooling, lubrication, packaging, weight targets and transmission interaction - developed specifically, built exclusively. Neither 'an S 65 engine in a Huayra' nor 'a wholly unrelated clean-sheet design': a Pagani-specific AMG V12 programme on established architecture. The early Huayra's turbo-response criticism - boost delay and a less direct voice against the Zonda's linearity - drove the partnership into its modern form: continuous joint revision of turbo control, wastegates, throttle maps, intake volume, exhaust and transmission coordination, through BC, Roadster BC, Imola and Utopia. The relationship evolved from supplying complete engines toward increasingly detailed collaborative calibration - the fact on which Papers 111-116's custody doctrine ('update state is the specification') ultimately rests.

M158 EVOLUTION - THE PAGANI LINE	
Huayra Coupé (2011)	~730 PS / 1,000 Nm - the torque revolution, calibrated as one system with the single-clutch Xtrac (Paper 111)
BC / Roadster / R.BC	764 PS / 1,000 Nm (BC, Roadster) → 800 PS / 1,050 Nm with six-outlet exhaust (Roadster BC) - output, weight and calibration sharpened together (Papers 112-113)
Imola / Imola R.	827 PS / 1,100 Nm → ~850 PS - described by Pagani as crafted to its specification by Mercedes-AMG (Paper 115)
Utopia (2022-)	864 PS @ 6,000 / 1,100 Nm @ 2,800-5,900 - full homologation without special exemptions, California included; manual-gearbox integration; single-craftsman assembly (Paper 116)

06 THE UTOPIA ACHIEVEMENT - AND WHO CALIBRATES WHAT

A 1,100 Nm turbo V12 behind three pedals, certified in California - apparent simplicity built on invisible control.

The Utopia asked AMG for a combination nothing in the group's catalogue required: more output than any Huayra, contemporary emissions compliance including California, no hybrid assistance, compactness and low mass - and compatibility with a true manual gearbox, which exposes torque behaviour more nakedly than any electronically managed dual clutch. The engine cannot simply deliver 1,100 Nm on demand; its calibration weighs engine speed, gear, throttle rate, wheel speed, clutch engagement, traction, differential state, temperature and emissions - the car's mechanical simplicity depends on extensive electronic control, which is Paper 119's 'analogue interface on a digital core' seen from inside the engine bay. Whether the Utopia unit shares its block casting or head machining with the first Huayra is not public; it is correctly described as an evolved M158, neither a new engine nor a software tune. The calibration division is likewise private but reconstructable: AMG almost certainly owns combustion, ignition, injection, knock, turbo protection, emissions, cold start, diagnostics and durability; Pagani the throttle character, drive modes, traction and differential strategy, gearbox torque management, pedal relationship, cooling air, exhaust character and final feel; jointly - torque by gear, clutch protection, over-temperature strategy, altitude, certification, complete-vehicle testing. Who legally owns which calibration files has never been disclosed, and this series does not guess.

07 EXCLUSIVITY, SERVICE AND THE CONTRACT

Application exclusivity is documented in effect - everything contractual is private, and stated as such.

Is the M158 exclusive? In application, evidently: Pagani describes the engine as developed for and produced exclusively for its hypercar, and no other production car is publicly known to use it. But the contract is private, so certainty ends there: it cannot be stated that AMG is legally barred from developing related engines for others - the normal supplier position is exclusivity over a defined specification, calibration, designation and application, with the underlying V12 knowledge remaining Affalterbach's intellectual property. Could AMG sell the Pagani engine elsewhere? In principle a separate programme is always possible; an identical M158 for another boutique would breach either the letter or the trust of the arrangement, and no evidence suggests any intention - the Pagani V12 is a dedicated customer programme, not a crate engine. Could AMG terminate? Almost certainly, subject to contract - minimum quantities, development payments, spares obligations, warranty splits and termination conditions are all private - and that residual exposure is Pagani's deepest strategic dependency, mitigated by thirty years of mutual performance. The practical corollaries matter to every owner in this series: a Mercedes dealer cannot treat a Huayra as an S 65 with different bodywork - the installation is Pagani-specific in intake, exhaust, cooling, electronics, mounts and diagnostics, so service runs through Pagani's network with AMG behind it for components, analysis and factory rebuilding;

and warranty on a failure crossing the engine-vehicle boundary (detonation, overheating, turbo damage, lubrication) is investigated jointly, with the customer facing Pagani, not Affalterbach.

08 THE MONEY - ORDERS OF MAGNITUDE

No invoice has ever been published - the analytical frame, and why the programme is priceless to one side and immaterial to the other.

No verified contract value exists: neither company publishes unit prices, development charges, supply revenue, royalties or duration, and Pagani's purchases are immaterial inside Mercedes-Benz Group's consolidated accounts. What analysis can responsibly offer is orders of magnitude, never invoices. A directly manufactured engine of this specification plausibly represents a high-five- to low-six-figure euro component; the fully burdened programme cost per customer car - engineering, validation, emissions development, tooling, prototypes, calibration, individual assembly, certification support, warranty reserve, decades of parts obligations, spread over very low volume - plausibly several hundred thousand euros; and the complete Utopia-generation powertrain programme (99 Coupés, 130 Roadsters, derivatives, prototypes, spares, a decade of support) plausibly exceeds €50 million in total economic activity. Illustratively - forty engines a year at €250,000 fully burdened would be €10 million annually: meaningful for a specialist programme, invisible in Stuttgart's accounts, which is why the programme's strategic and reputational value exceeds its accounting significance. Who pays development - direct fees, loaded unit prices, volume commitments, or blends - is unknown; it would be commercially surprising if AMG funded everything without recovery, and equally plausible that thirty years of loyalty buys terms no newcomer would see. For Pagani the engine is the most important purchased system in the car and still far from the whole price: a €3-5 million Pagani is not a cheap chassis around an expensive Mercedes engine - the value lies in carbon, coachbuilding, individuality and scarcity. And the long tail is part of the deal: spare engines, short engines, heads, turbochargers, sensors and emissions components for cars meant to survive decades - with certified electronics and emissions hardware, not machined metal, the probable future obsolescence problem.

09 HWA, THE SIX PATHS - AND THE ELECTRIC CAR

The Huayra R proves Pagani can commission elsewhere; the market has already voted on the alternatives.

The Huayra R and R Evo run a naturally aspirated V12 developed with HWA - founded by AMG's own Aufrecht after the Daimler integration, so the two partners are cousins, not strangers (Paper 114). The track programme proves Pagani can commission a bespoke engine outside the AMG road programme - and simultaneously why that path does not transfer: the V12-R exists because track-only use deletes emissions certification, cold start, urban noise, OBD, warranty cycles and road drivability; homologating it would rebuild it. AMG for the road, HWA for the circuit - partners chosen by regulatory environment. Beyond the Utopia, six paths are thinkable: further M158 evolution (least disruptive, most Pagani); a new AMG V12 (possible, extremely expensive); hybridisation (investigated - including V8-hybrid concepts - and rejected for Utopia on weight, complexity and character); synthetic-fuel-compatible combustion (dependent on fuel availability and lifecycle rules); a Pagani-commissioned specialist engine in the HWA mould (proven possible, economically hard for road use); and full electrification - where the customers have already voted: Pagani developed a battery-electric Utopia alongside the combustion car and shelved it because, in the company's words, no one showed interest. Could Pagani build its own road engine? Theoretically; practically it would buy marketing purity at the price of reliability risk, certification risk, decades of support obligations and capital that its composites, structures and integration - the actual identity - would have to fund. The stated horizon frames it all: per Pagani's 2025 statements, the V12 is homologated to around 2030 in Europe and 2032 in California, with extensions hoped for - dates from interviews, not certificates, and planning horizons rather than deadlines: homologation guarantees neither production nor supply, and production could end earlier or run later. The decisive uncertainty of the whole partnership lives on the far side of those dates.

10 SYNTHESIS - THE MARRIAGE THAT MADE THE MARQUE

Three generations, one identity - and the file of what is known, believed and unknowable.

The final interpretation: Horacio Pagani arrived from Lamborghini with a vehicle concept, composite expertise and conviction - not an engine. Fangio supplied the bridge; AMG, independent but already allied to Mercedes, supplied exactly the missing capability; and Daimler's acquisition transformed the supplier from independent specialist into part of a global group without breaking the thread - M120 in the first Zonda, M297 derivatives in the later ones, racing V12 in the R, M158 in the Huayra, the 864 PS evolution in the Utopia. The engine is neither borrowed from a Mercedes road car nor wholly Pagani-designed: it is a supplier-developed, customer-specific programme whose complete character emerges only after Pagani integrates intake, exhaust, cooling, transmission, electronics, structure and calibration - which is why the cars have never sounded or responded like anything from Stuttgart.

As of July 2026 the partnership appears secure through the Utopia period; beyond 2030-2032, if regulation permits the V12, Pagani will likely keep it for as long as AMG will build it - and if not, the choices are a new AMG engine, hybridisation, an HWA-assisted programme, synthetic fuel, or the electrification its customers have so far refused. What the thirty years have already delivered is the rarest asset in the industry: a boutique manufacturer with a generation-spanning twelve-cylinder identity it never had to build alone.

THE PARTNERSHIP FILE - FACTS, INTERPRETATION, UNKNOWNNS

Documented	Fangio initiated the contact · AMG-Daimler cooperation 1990, 51% 1999, wholly owned 2005 · Zonda: 6.0 M120 V12, then 7.0/7.3 AMG developments · Huayra: Pagani-specific M158 · Utopia: 864 PS/1,100 Nm, single-craftsman assembly, exclusive production · partnership active 2026
Accepted interpretation	Fangio's prestige was decisive · the Daimler acquisition strengthened the programme · specification exclusivity and joint calibration · Pagani funds meaningful development via fees or pricing · strategically, not financially, important to AMG
Analytical estimate	Engine as component: high five to low six figures · fully burdened per car: several hundred thousand euros · Utopia-generation programme: plausibly >€50M total activity - orders of magnitude, never invoices
Unknown	Contract values, prices, minimum volumes, duration, exclusivity terms, calibration ownership, warranty allocation, spare-engine counts, AMG margin - and whether a fourth-generation agreement already exists

BOTTOM LINE

The Pagani-AMG relationship is the quiet foundation beneath everything this series has priced: a bespoke commissioned powertrain partnership, opened by Fangio's credibility, carried across AMG's absorption into Mercedes, and evolved from the 394 PS M120 of the first Zonda to the 864 PS single-craftsman M158 of the Utopia. Neither crate engine nor in-house pretence, it lets Pagani be an independent car manufacturer without becoming an engine company - at the price of a dependency thirty years of mutual performance has made bearable. Secure through the Utopia era, stated-homologated to ~2030/2032, and genuinely uncertain only beyond: the next engine decision will define the fourth generation of the marque.

ONE-SENTENCE VERDICT

Fangio opened the door, Affalterbach built the heart, Modena gave it a voice - and thirty years on, the AMG partnership remains the most elegant solution in the hypercar industry to the problem of being small: three generations of V12 identity, rented from nobody, built by a friend.

SOURCES

Factory material, corporate history and public record: Fangio - Mercedes world champion 1954/1955; Pagani's own material states the AMG cooperation began through him; mentor/advocate role, no evidence of technical or financial involvement; 'Fangio F1' project name retired after his death 1995, Zonda F (2005) as tribute (Papers 103, 107). AMG: founded 1967 (Aufrecht/Melcher); Daimler-Benz cooperation agreement 1990; DaimlerChrysler 51% from 1.1.1999 (contemporary annual report); wholly owned 2005 (Mercedes-Benz corporate history); no public evidence of supply disruption across the transitions. Engines: Zonda C12 - 6.0 M120-family NA V12, ~394 PS/570 Nm (Pagani historical material); M120 vs M297 terminology distinguished (CLK GTR lineage); 7.0 C12 S; 7.3 with titanium rods, 555 PS/750 Nm; Zonda F 602/650 PS; Cinque ~678 PS; Tricolore ~670 PS; 760-series ~760 PS (Papers 105-110, 117). Zonda R: 6.0 AMG racing V12, ~750 PS/710 Nm, structural mounting (Paper 110). M158: 6.0 twin-turbo developed for Pagani; Huayra ~730 PS/1,000 Nm; BC 764 PS; Roadster BC 800 PS/1,050 Nm; Imola 827 PS, Imola Roadster ~850 PS; Utopia 864 PS @ 6,000/1,100 Nm @ 2,800-5,900, full homologation incl. California without special exemptions, single-AMG-craftsman assembly, exclusive production per Pagani (Papers 111-116). 'One man, one engine' principle: current engines explicitly so built; uniform application to earliest Zonda units not comprehensively documented. Exclusivity, contract terms, calibration ownership, warranty allocation, prices, development charges, spare-engine counts: private/unknown - analytical orders of magnitude only (engine high-5/low-6 figures; burdened several hundred thousand euros per car; Utopia programme plausibly >€50M). Homologation horizon: ~2030 Europe / 2032 California per Pagani press-relations statements (Sebastian Berridi, July 2025 reporting) - interview-sourced planning dates, not certification documents. Shelved battery-electric Utopia: developed alongside the combustion car, abandoned - 'no one showed interest' (2025 reporting); V8-hybrid concepts investigated and rejected for Utopia. HWA: founded by Aufrecht post-integration; V12-R for Huayra R/R Evo (Paper 114). Companion papers: 103, 105-118. Thematic paper - no Model File or Checklist. Nothing here is investment advice.