

The Comprehensive Technical Evolution of the Peugeot 607 (2000–2009): An Engineering and Ownership Perspective

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The Peugeot 607, produced between 2000 and 2009, represents a significant era in French automotive engineering, marking the pinnacle of PSA Group's executive sedan ambitions. Launched as the successor to the aging 605, the 607 was designed to compete directly with German stalwarts such as the BMW 5 Series and the Mercedes-Benz E-Class. This article provides an exhaustive technical analysis of the 607's architecture, powertrain innovations—including the pioneering use of diesel particulate filters—and its sophisticated electronic suspension systems.

The Architectural Foundation: Chassis and Aerodynamics

The Peugeot 607 was built upon a heavily modified version of the 605 platform, known internally within PSA as the **Z platform**. To maintain a competitive edge in the executive segment, Peugeot engineers focused on structural rigidity and vibration isolation. The body utilized high-elasticity steel in critical load-bearing areas, ensuring a high level of torsional stiffness which was essential for both safety and the operation of the vehicle's complex suspension geometry.

Aerodynamically, the 607 was a masterclass in subtlety. Despite its imposing length of nearly 4.9 meters, it achieved a drag coefficient (Cd) of approximately **0.29**. This was accomplished through a smooth underbody design, tapered pillars, and integrated airflow management around the wheel arches. Such efficiency not only reduced wind noise—a prerequisite for the E-segment—but also optimized high-speed stability and fuel consumption across the engine range.

The AMVAR System: Variable Damping Logic

One of the most technically advanced features of the Peugeot 607, particularly on V6 models, was the **AMVAR (Amortissement Variable)** system. Unlike static damping setups, AMVAR utilized an electronic control unit (ECU) to monitor vehicle dynamics in real-time. The system processed inputs from sensors measuring vertical acceleration, steering angle, longitudinal acceleration (braking/acceleration), and wheel speed.

- **Sensors:** Four vertical displacement sensors (one at each wheel) and three accelerometers.
- **Logic:** The ECU adjusted the damping rates of the shock absorbers independently every 2.5 milliseconds.
- **Modes:** The system offered nine different damping settings, ranging from 'Comfort' to 'Sport,' effectively balancing the traditional French 'supple' ride with the firm control required for high-speed motorway cruising.

Powertrain Analysis: From EW12 to the AJ-V6

The 607's engine lineup showcased the evolution of internal combustion during the first decade of the 21st century. It transitioned from traditional naturally aspirated petrol engines to highly sophisticated, twin-turbocharged diesel units developed in collaboration with Ford.

Petrol Engines: Reliability and Smoothness

At launch, the 2.2-liter 16V (EW12J4) served as the entry-level petrol option. This engine featured **Variable Valve**

Timing (VVT) and twin balance shafts to mimic the smoothness of a six-cylinder. However, the 3.0-liter V6 (ES9) was the flagship. By 2004, the ES9J4S was upgraded to the ES9/A, producing 211 PS (208 hp). This engine utilized a 60-degree V-angle and featured multi-point electronic injection, providing a linear power delivery characteristic of executive cruisers.

Diesel Innovation: The FAP Milestone

The Peugeot 607 holds a historical position as the first mass-production car to be equipped with a **Diesel Particulate Filter (FAP - Filtre à Particules)**. Launched on the 2.2 HDi (DW12) engine in 2000, this system revolutionized diesel emissions by trapping 99% of soot particles. The system utilized a cerium-based additive (Eolys) to lower the combustion temperature of the soot, allowing for regeneration cycles even during lower-speed driving.

Engine Variant	Displacement	Configuration	Power (hp)	Torque (Nm)	Introduction Year
2.2i 16V	2230cc	Inline-4 Petrol	160	217	2000
3.0 V6 24V	2946cc	V6 Petrol	211	285	2000 (Updated 2004)
2.0 HDi	1997cc	Inline-4 Diesel	110 / 136	250 / 320	2001
2.2 HDi	2179cc	Inline-4 Diesel	133 / 170	314 / 370	2000 (Bi-Turbo 2006)
2.7 V6 HDi	2720cc	V6 Bi-Turbo Diesel	204	440	2004

Transmission Systems and Torque Management

The 607's transmission options evolved significantly to handle the increasing torque of the HDi engines. Initial automatic models utilized the **ZF 4HP20** four-speed gearbox, which, while robust, lacked the ratio spread for optimal fuel economy. Following the 2004 facelift, Peugeot introduced the **Aisin AM6 (TF-80SC)** six-speed automatic transmission.

The Aisin AM6 was a technical marvel for its time, utilizing a Lepelletier gear mechanism which allowed for six speeds within the footprint of a traditional four-speed unit. This transmission featured 'Auto-Adaptive' software that analyzed the driver's behavior and road conditions (gradients, curves) to select the most appropriate shift map. It also incorporated a slip-controlled lock-up clutch on all gears to reduce energy losses and heat buildup.

Electrical Architecture and Multiplexing

The Peugeot 607 was among the first PSA vehicles to utilize a fully **multiplexed electrical system** based on the **CAN (Controller Area Network)** and **VAN (Vehicle Area Network)** protocols. Multiplexing allowed for the reduction of physical wiring by transmitting multiple signals over a single pair of wires.

Key Advantages of Multiplexing in the 607:

1. **Weight Reduction:** By streamlining the loom, Peugeot saved approximately 15kg in wiring alone.
2. **Integrated Safety:** The ESP (Electronic Stability Program) could communicate directly with the Engine Management System (EMS) and the Transmission Control Unit (TCU) to reduce torque instantly when wheel slip was detected.
3. **Advanced Diagnostics:** The BSI (Built-in Systems Interface) acted as the 'brain,' allowing technicians to diagnose faults across dozens of ECUs via a single OBD-II port.

Phase II Facelift (2004): Technical Refinements

In late 2004, the 607 underwent a significant 'Phase II' refresh. Beyond the aesthetic changes—such as the enlarged front air intake and chrome detailing—the technical upgrades were profound. The front overhang was increased slightly to improve pedestrian safety and accommodate the larger cooling requirements of the new 2.7-liter V6 HDi engine.

The 2.7 V6 HDi, developed in the Ford-PSA joint venture, featured a **Compacted Graphite Iron (CGI)** cylinder

block. CGI offers higher strength and stiffness than traditional aluminum or grey cast iron, allowing for a lighter, more compact engine that can withstand the high combustion pressures of twin-turbocharging (up to 1.3 bar of boost). This engine also utilized piezo-electric injectors, capable of up to five injection phases per cycle, significantly reducing combustion noise (diesel clatter).

Practical Implementation: Maintenance and Technical Lifecycle

For owners and technicians, the Peugeot 607 presents specific maintenance requirements dictated by its advanced components. Reliability in the second-hand market is heavily dependent on the adherence to technical service bulletins.

Technical Maintenance Checklist:

- FAP Additive (Eolys): The reservoir typically requires refilling every 80,000 to 120,000 km. Failure to do so leads to forced 'Limp Home Mode.'
- AMVAR Struts: The electronic shock absorbers are significantly more expensive than standard units. Seals should be inspected for leaks every 40,000 km.
- Timing Belt (V6 Engines): The 3.0 Petrol and 2.7 Diesel are 'interference' engines. Belt replacement is critical at 10-year or 150,000 km intervals (whichever comes first).
- Dual-Battery System: Many 607 models utilize a twin-battery setup—one for cranking and one for auxiliary electronics (located in the boot). A voltage drop in the auxiliary battery often causes 'ghost' faults in the multiplex system.

Comparative Evaluation: Peugeot 607 vs. Contemporary Rivals

To understand the 607's market position, it is necessary to evaluate its technical specs against its primary competitors during the 2005-2007 era.

Feature	Peugeot 607 2.7 V6 HDi	BMW 525d (E60)	Mercedes E280 CDI (W211)
Engine Type	V6 Twin-Turbo	Inline-6 Single-Turbo	V6 Single-Turbo
Horsepower	204 hp	177 hp	190 hp
Torque	440 Nm	400 Nm	440 Nm
Suspension	Electronic Variable (AMVAR)	Multi-link (Standard)	Air Suspension (Optional)
Acoustics	Laminated Side Glass	Standard Glass	Standard Glass

The comparison reveals that Peugeot focused heavily on **NVH (Noise, Vibration, and Harshness)**. The 607 often came standard with double-laminated side windows, a feature usually reserved for the 'S-Class' tier of luxury vehicles, providing class-leading interior silence.

Troubleshooting Common Failure Modes

Despite its engineering excellence, the 607's complexity introduced specific failure modes that require technical expertise to resolve.

1. Multiplexing (BSI) Faults

Symptoms often include erratic wiper behavior, central locking failure, or dashboard 'Christmas tree' lights. The root cause is frequently moisture ingress into the BSI unit located behind the glovebox or a failing auxiliary battery.

Solution: Ensure all drainage channels near the windshield are clear and verify auxiliary battery health (12.6V minimum).

2. 2.2 HDi 'Anti-Pollution' Warnings

This is often triggered by a faulty Swirl Flap Actuator (also known as the 'diaphragm'). When the rubber diaphragm splits, it creates a vacuum leak, preventing the swirl flaps from optimizing airflow. **Solution:** Replace the vacuum actuator—a relatively inexpensive part that prevents costly turbo over-spooling issues.

3. AMVAR System 'Hard' Ride

If the AMVAR system loses communication with any sensor, it defaults to the stiffest setting for safety. **Solution:** Use a Peugeot-specific diagnostic tool (Diagbox) to calibrate the steering angle sensor and check for continuity in the accelerometer wiring looms.

The Engineering Legacy of the 607

The Peugeot 607 was a vehicle of 'firsts.' It pioneered emissions technology that is now mandatory across the globe and demonstrated that French manufacturers could achieve the refinement levels of high-end German brands. While its complex electronics require a diligent maintenance approach, the mechanical components—particularly the V6 engines—have proven remarkably durable, with many units exceeding 300,000 km with original internals.

The transition from the 607 to the 508 in 2010 marked the end of the traditional large French executive sedan, making the 607 the last of its kind. Its blend of high-technology AMVAR suspension, pioneering FAP filtration, and

the smooth Aisin-sourced transmissions ensures its place as a significant milestone in 21st-century automotive development. For the enthusiast or the technical historian, the 607 remains a fascinating study in how a manufacturer balances comfort-oriented heritage with the aggressive technological demands of the executive market.

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