
How the new Pagani takes the supercar to the next level
Active suspension rises under braking to counter weight transfer
Carbon-ceramic brakes are kept at operating temperature by hot air feed
All the carbon weave flows in the same direction
Central tub is made from carbon-titanium

Words Harry Metcalfe
Pictures John Wycherley

Above left: even the desks at Pagani are carbonfibre. Above right: carbon weave options. Below: Metcalfe (left) takes a first look inside the Huayra with Horacio Pagani. Bottom: every part (this is a flywheel) is stamped with the Pagani logo

The wind of change is blowing through the supercar world, and its name is Huayra. Pagani's new supercar takes its appellation from the ancient Argentinean god of wind and, like the Zonda before it (also named after a wind), it's poised to set new benchmarks for the world's fastest and most exclusive road cars.

It's pronounced 'why-eera' (we have this on good authority from none other than Horacio Pagani himself), though the actual sound that escapes your lips might well be 'phwooar'. Because the first time you see the Huayra in the metal – or rather in the carbon, aluminium and titanium – I guarantee it'll bring out the small child in you. This is a supercar in the very best sense, dripping with advanced materials, packed with new technologies, powered by a sensationally powerful twin-turbo V12 engine, and clothed in bodywork of quite stunning proportions and exquisite detailing.

I'll let you in on a little secret. The Huayra was originally planned to appear almost two years ago, at the 2009 Geneva motor show. But when I visited the Pagani factory in December 2008, Horacio confided that he'd decided to delay the launch. With the world economy in turmoil, he said, it wasn't the right time to be unveiling a glitzy new supercar.

'Damn!' was my first reaction. I'd been close to the project for a while and we'd set a number of pages aside for the big reveal. But in fact the decision made perfect sense. For a start, it meant the car would be fully compliant with Euro 5 and LEV II (the equivalent US emissions regulation) right from launch. And since actual production wasn't due to start until 2010, customers wouldn't have to wait so long for their cars to arrive. Canny businessman, Mr Pagani.

Now wind the clock forward to December 2010 and I find myself at the Pagani factory once again, but this time there's a real buzz about the place. Apparently the Huayra test programme has been going spectacularly well, the car proving to be even quicker and even more dynamically accomplished than they'd hoped. I've only been inside the factory for minutes but Horacio is just itching to show his new baby in all its glory.

He ushers me into the inner workshop, wh a finished Huayra is hiding under a fitted co Even like this, the proportions and stance look fantastic, the shape Zonda-like but mu smoother and, from what I can tell, with no obvious spoilers to muddle the lines. Horac and test driver Davide Testi each grab a fro corner of the cover and begin to peel it bac

The jewel-like headlights appear first, the exquisite teardrop mirrors, seemingly hang in space from the slimmest stalks imaginab So far so Zonda, but with each emerging p the Huayra reveals itself to be a radically different design and very much its own thi

The overall effect is less showy than some the more recent Zondas. Subtler, classier. E single aspect of the car is quite beautifully finished, be it the forged and polished whe (different right-to-left so the spokes curve the direction of the wheels' rotation on bot sides of the car), the single titanium nut th clamps each wheel to its hub, the unique fi and rear lights or the distinctive titanium e exhaust tips poking from beneath the rear Everywhere you look there's another gorg trinket to enjoy – the leather straps, carried from the Zonda, that hold the front and re covers to the central tub. The Cinque's tit exhaust cans, just visible through the rear So much to take in…

According to Horacio, the overall shape was inspired by an aircraft's wing and its fundamental 'rightness' in terms of design That's why the nose section of the Huayra looks slightly odd at first. Instead of havin a protruding front splitter, two large scoop channel air beneath the Huayra's promine nose. At first glance, I'm not convinced th a good idea. Surely these scoops will only to lift under the front axle, while the bluff will increase drag. Horacio quickly organ


'The Huayra's stance looks fantastic, Zonda-like but much smoother and with no obvious spoilers to muddle the lines'

an air-line to be rigged up and instructs me to hold a scaled-down replica of the Huayra's front section a few millimetres above a workbench. As soon as the air blasts out, the front section is sucked downwards – not what I was expecting at all. But then, as Horacio says, air never does what you expect; it only does what it wants.

The lack of a conventional front air dam isn't the only surprise in the Huayra's front section, as just behind the leading edge of the nose, sitting flush with the surrounding bodywork, are two moveable flaps. These hold the key to the car's clean profile, as the Huayra sees the introduction of advanced active aerodynamics to the world of supercars. There are two similar flaps at the rear of the car and all four are controlled by a powerful ECU, which constantly monitors speed, yaw, lateral acceleration, steering angle and throttle position and then moves the flaps independently, according to whatever aero load is required.

If you've ever sat overlooking a wing on a plane then you'll have noticed that the flaps on the wing's trailing edge seem to have a life of their own, especially when you're coming in to land. Well, the flaps on the Huayra work in an identical way. When you're braking, the rear flaps will pop up to increase drag and act like an air brake. But it's when you're cornering that it all gets a little weird. Say you're going through a tightening left-hander. You might expect all the flaps to pop up to help increase overall downforce, but in fact only the inside flaps are raised as that's where the extra downforce is needed, to increase grip on the inside tyres and also to keep roll to a minimum. The way these flaps work in practice won't become entirely clear until we actually drive the car later this year, but I love the fact that they have enabled the Huayra to have such a clean and uncluttered profile along with an excellent Cd figure of 0.3, rising to a maximum Cd of 0.5 when all four flaps are deployed.

There's one more trick to the aerodynamics. Adjustable-height front suspension allows the gap between car and road to be controlled by this new ECU, so under heavy braking, for example, the suspension is raised to counter the forward weight transfer.

The rear of the Huayra is also a much cleaner design than the Zonda. The rear track is 20mm narrower, while the wheelbase has been stretched by 70mm, giving the new car a much slimmer look than its predecessor. Just

Cabin is packed with wonderful details, like the metal instrument dials (above) and 'floating' drive selector (righ
Top: steering wheel incorporates controls for lights, indicators, wipers, etc. Below: new touchscreen interface

'If you ever wondered if a mechanical object could be described as art, look no further'

THE TEST DRIVER

Davide Testi joined Pagani in 2000 at the tender age of 19 and worked with supercar chassis master Loris Bicocchi in the early days, but he had sole responsibility for the development of the Huayra, which until recently was known only by its code name, C9.

'Testing started in 2007 with "M1", which was the original C9 mule fitted with modified Zonda bodywork,' he says. 'Initially the problem was one of refinement. The AMG engine was too aggressive in its delivery because the C9 is so much lighter than an AMG Mercedes. The gearbox wasn't great either, being too clunky and unrefined.

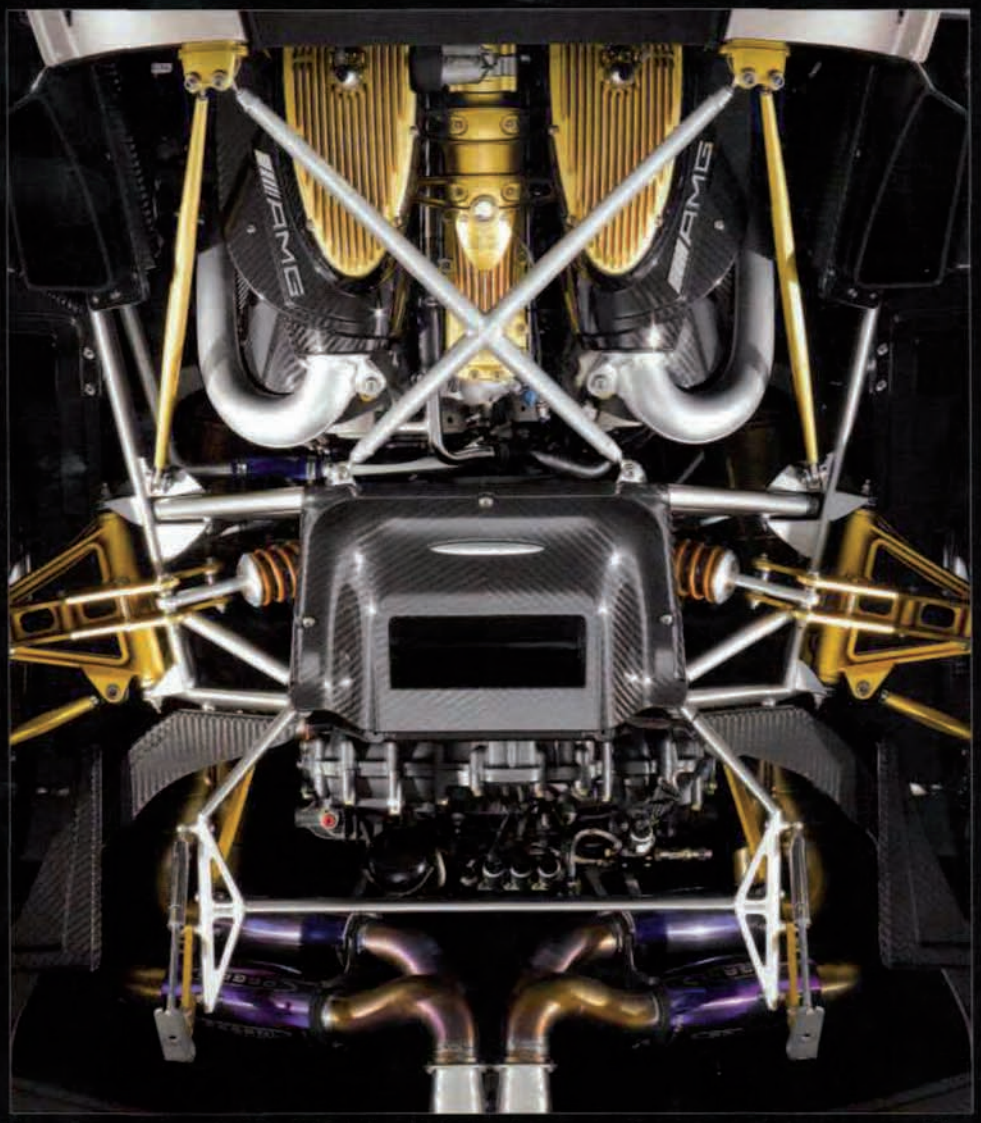
'We have now covered over one million kilometres in the C9 development cars and Mercedes have done a brilliant job on the engine, fitting smaller turbos, a revised ECU and different intercoolers, and now the engine is unbelievable! Throttle response is so much better. You don't think it's a turbo when you first drive it, but when the turbos are really working the acceleration feels extraordinary, like a Veyron. It is much, much quicker than a Zonda! The performance is incredible.

'The car is completely different to the Zonda. The chassis is much more friendly at the limits as the engine and gearbox are both lighter and shorter, as well as sitting lower in the chassis. The wheelbase is longer, too. Then the noise is very different, more induction than exhaust compared to the Zonda but still very exciting. You hear this hurricane when the turbos are working, then the wastegates when you come off the power.

'The Huayra is an amazing car and I'm very proud of it.'

Top: Horacio talks aerodynamics. Right: rear view with flaps raised. Above: every bolt used on the car is titanium. Below: Xtrac gearbox is a transverse unit, offering better weight distribution

'The air intakes are positioned so the occupants get to enjoy the aural sensations of the new twin-turbo 6-litre AMG V12'



Above: the new twin-turbo 6-litre AMG V12 and, behind it, the titanium exhaust system, which weighs under 10kg

behind the doors are the two intakes for the mid-mounted engine, designed specifically so the occupants get to enjoy the aural sensations as the new twin-turbo 6-litre AMG V12 turns air and petrol into 700 thunderous horsepower. The engine is visible from outside the car via a window just behind the passenger cell, with the gold-coloured finned air intakes to the inlet manifold dominating the view, while other details glint in the background. What you probably won't notice is that surrounding this engine window is the air intake for the gearbox cooler that sits behind the engine.

From directly behind the car you can see how much taller the rear haunches are compared with the Zonda's, and how uncluttered your view to them is thanks to the absence of a fixed spoiler. The rear grille (there to help vent the engine compartment) is in the same Pagani-signature oval shape as on the Zonda R, while the rear venturi looks simpler than before but apparently delivers even greater downforce.

Go to take a peak inside the Huayra's cabin and initially you don't realise that the door is a gullwing design; when closed, it looks just like the conventionally opening door on a Zonda. Only when you pull on the catch do you twig that it doesn't pivot outwards but wants to rise vertically instead. As it does, it reveals probably the most spectacular interior you'll ever see.

It's hard to know where to start, as everything in here is new. The cockpit is bigger (70mm longer and 50mm wider to be exact) and although the seats look familiar, they are in fact an all-new design offering greater lateral support. But it's what sits between them that defines what this car is all about…

The owner's manual probably calls it the 'gear selector', but if you ever wondered if a mechanical object could be described as art, look no further. Suspended in mid-air, the lever pivots around a single rose-joint that is gripped between two horseshoe brackets mounted on the end of the central tunnel. Push or pull the lever and you can see it operating the chromed rods protruding from the tunnel below. Sadly, you'll only use this lever to select Drive, Reverse or Park – the Huayra comes exclusively with a seven-speed automated manual gearbox with paddles for manual shifting – but it's a thing of utter beauty nonetheless.

Just like the Ferrari 458, the Huayra gathers lots of minor controls on the steering wheel, including lights, wipers, indicators, even Pagani's version of the manettino switch, which alters both the electronic stability control and gearbox settings, allowing the driver to choose between Normal, Sport and Race modes (in Race the car will record lateral acceleration and lap times, as well as speed). One surprise is that the

THE SALES MANAGER

Alberto Giovanelli is the link between the customers and the factory. He is currently in the process of setting up new Pagani dealers around the globe, ready for the launch of the Huayra this spring.

Since he joined Pagani in 2005 the epicentre of sales has shifted east, away from Europe and towards the Middle East and Singapore, despite huge taxes in these regions. 'In Singapore a new owner has to pay 136 per cent tax on the price of the car,' Alberto explains. 'In China it's 100 per cent, Brazil 136 per cent and in Thailand it's 200 per cent! This doesn't apply to track cars, though, and that's why the Zonda R has been very good for us. Another important factor is that the Zonda has always been available in right-hand drive, unlike the Veyron, Enzo and Carrera GT. In certain regions you can only drive a right-hand-drive car on the road.'

Alberto expects that production of the Zonda will end this year. 'We have orders for a few more Zondas which have still to be built,' he says. 'Horacio will want to keep the very last Zonda and we are also looking to do something very special. Owners always want more power and we think 750bhp will be possible!'

So how many Huayra orders has Alberto received? 'We have refused to take deposits on the car until we announce the price but I have so many letters of serious intent. Buyers are desperate to send us a deposit but this isn't the Pagani way. I expect I will have at least 50 deposits sent to me when we announce the price during a private event for clients we will hold just before Geneva.'

THE HEAD OF CARBON

Roberto Malmusi has been in charge of the carbonfibre workshop at Pagani since 1996 and is the only man entrusted by Horacio to do the carbonfibre work on cars that will have unpainted, bare-carbon bodies.

Horacio insists that the carbon weave on every car is perfectly aligned when the various components come together. So where the rear clamshell meets a door or a sill, for example, you'll see the weave is at precisely the same angle, like you might find in a Savile Row suit.

I ask Roberto what is the trickiest part of the Huayra to make. 'The underside of the rear clamshell,' he replies. 'It takes me three days to lay out the carbonfibre and it's incredibly tricky to get it all to match up perfectly. I love doing it, though, as customers really notice the workmanship that goes into every Pagani.'

gearchange paddles are now mounted on the wheel itself, rather than on the column (as in the Cinque), after the development team decided they were easier to use in this position.

More evidence of the fanatical attention to detail that has gone into this car are the Huayra's instruments, the facias for which are not the normal printed plastic affairs but are hand-made for Pagani by a Swiss watch-face maker in metal, with the numerals and markings cut from the metal face itself. They take days to create and instead of costing the industry standard of around 4 euros, they come in at over 2500 euros a set!

The central console sports an LCD screen, which displays navigation, ventilation, audio and phone functions. Below this is a row of manual controls for the ventilation, and below those the slot where the new 'key' that Pagani has designed for the Huayra needs to be inserted. Shaped like the car itself and made from aluminium, not only is it a key, it also doubles as a music storage device, so every time it's plugged into the car, all of your music stored within it becomes available. And no, there isn't a starter button in sight.

As you might expect, the finish inside the Huayra is amazing, especially when you consider that the car complies with all known safety regulations, including those in the US. That's why the steering wheel now has an airbag and the passenger seat comes equipped with a load sensor, so the two-stage passenger-side airbag can be deployed at the correct level. There are even Isofix child-seat mounting points on the passenger seat – that's because it's a legal requirement in certain countries. Even so, I can't see many Huayras being used for the school run…

Delve under the carbon bodywork and you'll discover even more engineering cleverness going on. For example, rather than venting the hot air that leaves the front-mounted radiator over the bodywork, Pagani has flowed the majority of it into the front wheelarches. The thinking here is that it will keep the carbon-ceramic brake discs above ambient temperat and therefore the pad material doesn't have to be compromised for cold-disc performanc as the discs are hardly ever stone-cold. There are also pipes that take air from the back of t air-to-water intercoolers on either side of the front section and direct it straight onto the d According to Horacio, this allows the discs t be kept at around 50 degrees C, which is the perfect temperature for the ceramics not to have any unwanted cold-braking performan characteristics.

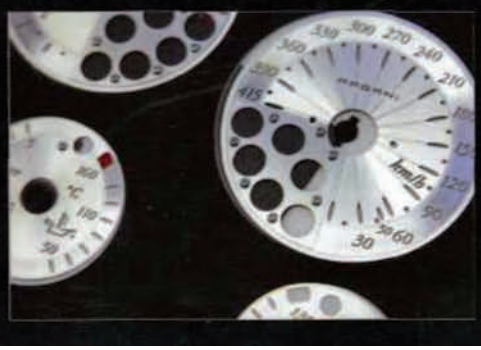
The suspension front and rear is a double-wishbone arrangement, with near-horizontal dampers, and again it all looks utterly beauti Taken almost directly from the Zonda R, the components have been machined individual from solid pieces of aircraft-grade aluminiu before being anodised in their final golden fi The suspension is attached to incredibly str

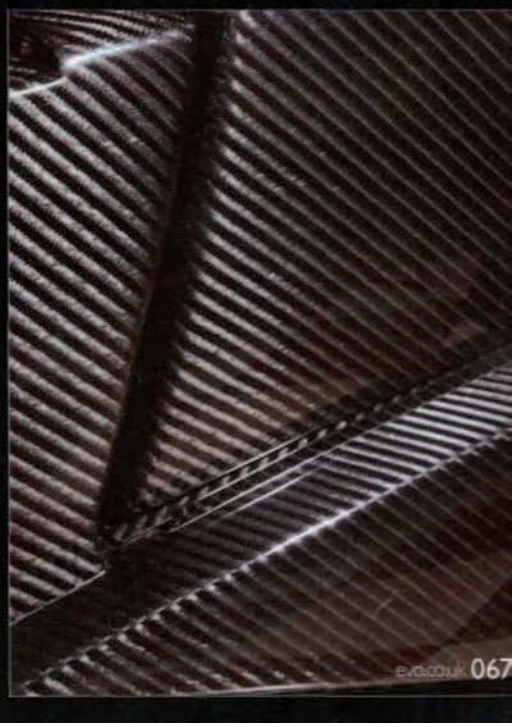
'The Huayra feels like it should be sold on Bond Street rather than from a car showroom'

chrome-vanadium front and rear subframes, which in turn are bolted directly to the new carbon-titanium central tub. Pagani is rightly very proud of the inherent strength offered by this tub, which enables the Huayra to pass all of the current and impending crash tests around the world with flying colours.

The engine remains at the heart of a Pagani, though, and this new one certainly delivers. The twin-turbocharged, 5980cc AMG V12 is bespoke (it has its own Mercedes part number, M158) and produces over 700bhp at 5000rpm and 811lb ft at 3500rpm, yet it will be rated at below 310g/km of CO_2 on the combined cycle, a remarkable result for a 700bhp supercar (for comparison, the 562bhp V8-engined Ferrari 458 Italia comes in at 307g/km).

Combine this amount of horsepower with the new seven-speed Xtrac gearbox (bespoke to Pagani and said to be super-smooth-shifting) and the performance promises to be astonishing. At the time of my visit the final figuring had yet





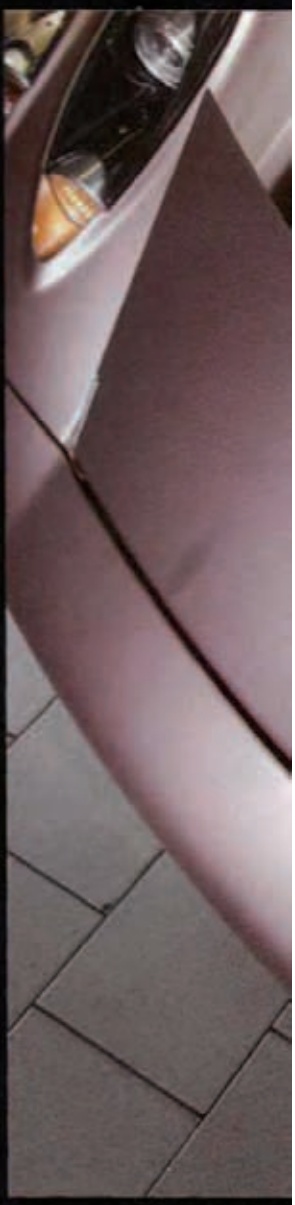
Top: weight distribution is 44:56 front:rear; Pirelli tyres are unique to Huayra. Above: aluminium 'key' also stores your music files. Below: Swiss-made dials before fitting. Right: carbon weave aligns across components

to happen, but in initial tests the car has proved so fast in a straight line (235mph+) that there's talk of having to limit the top speed to avoid the need for the kind of incredibly expensive, bespoke tyres that Veyron owners have to put up with. Speaking of the Veyron, acceleration is expected to be a match for the 1000bhp hypercar thanks to the Huayra tipping the scales at around 1390kg with fluids – that's over 550kg lighter than the mighty Bugatti.

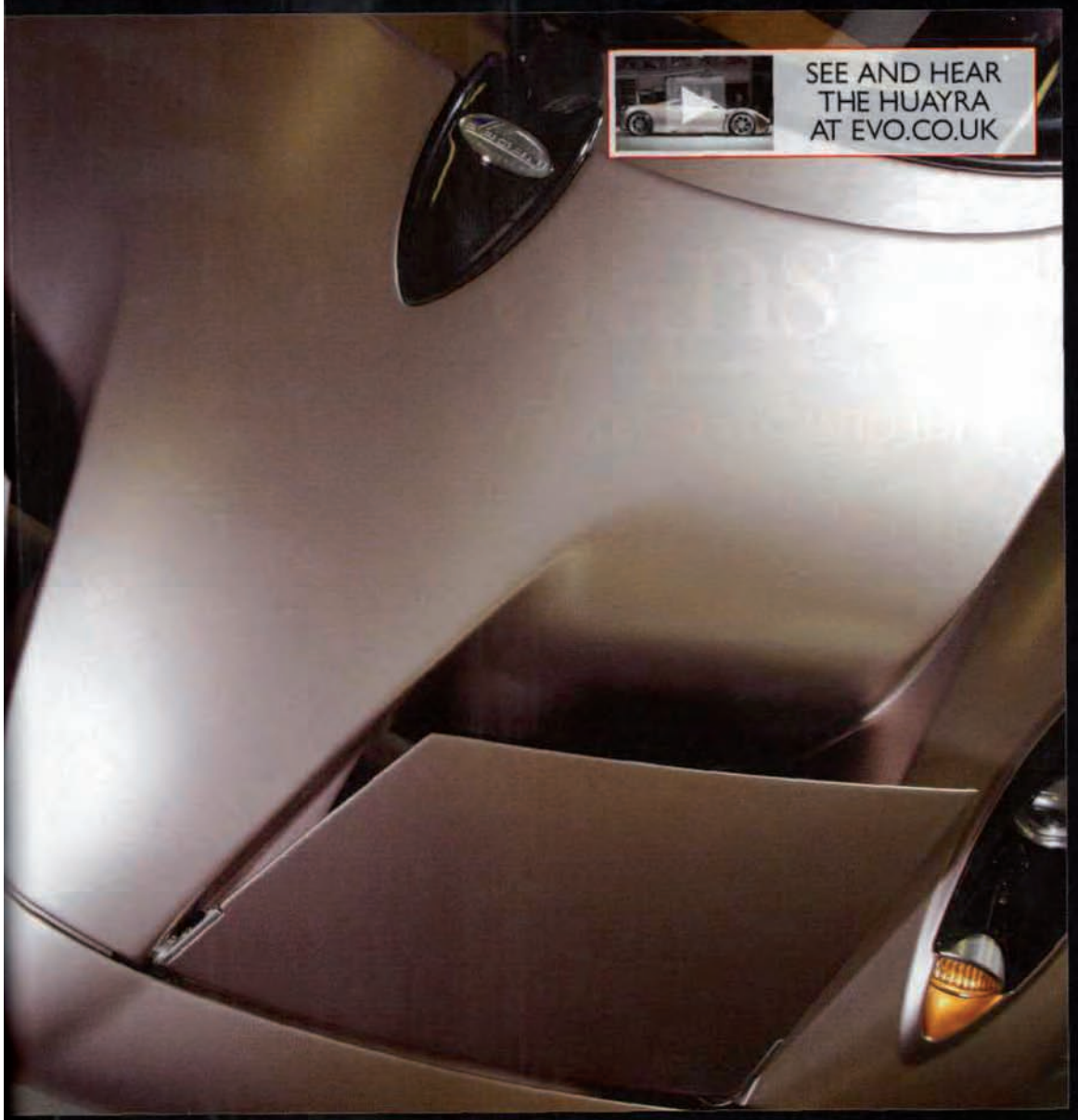
Horacio explains that to get the kerb weight this low took real determination from the outset, with every single component scrutinised before being used. That's why every fastener on the car is made of titanium and etched with a Pagani logo and a unique number that relates to an individual stress-test.

It's also why the Huayra was never going to be equipped with a fashionable dual-clutch transmission, as Pagani thought them too heavy to be worthy of consideration, as well as being uninvolving to use. Horacio explains that the slight acceleration advantage you might get with a DCT would be nullified by the extra weight, adding that the Huayra's single-clutch system has a maximum rating of 811lb ft while weighing 54kg less than the dual-clutch transmission in the Ferrari 458, which is only rated up to 442lb ft. Altogether, the engine/gearbox drivetrain in the Huayra weighs in at 395kg, some 25kg lighter than the Zonda's drivetrain, while the centre of mass is 40mm lower thanks to dry sump lubrication.

So much to take in… I reckon that what we're seeing with the Huayra, along with Aston's One-77, is the birth of a new genre of supercar, one that brings much more to the table than just the exceptional performance that is almost a given



Above: new seats offer better support than Zonda's. Below: mirrors look delicate, but carbon construction makes them strong. Right: front flaps in raised position. Below right: wheels have a single central nut



SEE AND HEAR THE HUAYRA AT EVO.CO.UK

THE ALUMINIUM EXPERT

Maurizio Meschiari is Pagani's go-to man at Modena-based machining firm Aspa SRL. Aspa specialises in making very high quality aluminium components, mainly for use in aircraft and hydraulic motors. It began working with Pagani in 2005 and now 35 per cent of its work is for the supercar maker.

Maurizio explains that Aspa will be fabricating over 800 individual parts for the Huayra. These will include all the suspension components (Aspa already makes the suspension for the Cinque and Zonda R), the dash, badging and hinges, and the intakes for the engine. Basically, every single exquisitely finished aluminium component on the Huayra is made by Aspa.

'It feels like we're seeing the birth of a new genre of supercar, one that offers much more than just exceptional performance'

SPECIFICATION

Engine V12, 5980cc, twin-turbo
Location Mid, longitudinal
CO2 <310g/km
Power 700bhp+ @ 5000rpm
Torque 811lb ft @ 3500rpm
Transmission Seven-speed automated manual gearbox, rear-wheel drive, limited-slip differential, ESP
Front suspension Double wishbones, coil springs, active dampers, anti-roll bar
Rear suspension Double wishbones, coil springs, active dampers, anti-roll bar
Brakes Vented and cross-drilled carbon-ceramic discs, ABS
Wheels 19in front, 20in rear
Tyres 255/35 ZR19 front, 335/30 ZR20 rear, Pirelli P Zero
Weight (kerb) 1350kg (dry)
Power-to-weight 512bhp/ton
0-60mph c3.2sec (est)
Top speed 235mph+ (claimed)
Basic price c£1,000,000 (est)
On sale Spring 2011

today. Unique features; bespoke components; fastidious detailing…

Of course, all this beautiful engineering doesn't come cheap. The final price of the Huayra has yet to be finalised, but there's talk of it being over 800,000 euros plus local taxes – call it a million pounds in the UK, give or take. Then consider that some even more expensive variants are likely to follow (Horacio is already talking openly about a Roadster version in a couple of years' time). Supercars were always expensive, but since the Veyron arrived a £1million-plus price tag is not so unusual.

Is the Huayra going to be worth it? For people like us, that will come down to how it drives. My only reservation lies with the engine, and then only because the naturally aspirated 7.3-litre V12 in the Zonda, howling its way up to its 7000rpm limit, is one of the great wonders of the automotive world. Will the Huayra's turbocharged unit have the same charisma? With maximum power at 5000rpm and a red line at six, I'm not sure, but then I bet there's plenty of tuning potential and perhaps even an 'S' version waiting in the wings. We'll just have to wait and see.

Already I sense that there's more to enjoy here than with the Veyron. The Huayra has more soul somehow. Each component is machined by hand with absolute precision; it's as if Pagani was originally a watch manufacturer that turned its hand to supercars. The Huayra feels like it should be sold on Bond Street rather than from a car showroom. Yes, the price may be stratospherically high, but so is the quality of the construction. Horacio Pagani has a favourite saying from the great Leonardo da Vinci: 'la perfezione è fatta di dettagli'. Roughly translated, it means 'perfection is made by details'. That's the Huayra all over.