

GIANT TEST:

Citroën Xantia Activa

Audi A4 1.8T

BMW 320i

The Activa has all the hallmarks of a winner: great looks, excellent packaging and, of course, gas-oil suspension. Not just Hydractive 2, but a wholly logical development of the arrangement that serves ordinary Xantias so well. The Activa is the world's first production car to get roll-controlled suspension - not quite 'no roll' but something very close. How does it work? Under normal conditions, the Activa's two anti-sway bars, connected to the suspension arms via a gas-filled sphere, run soft, benefiting ride comfort. On the turn, they switch to firm, effectively doubling in stiffness as the cushioning gas sphere is isolated. That's phase one of the active roll control system, or ARCS.

In phase two, which operates under sustained cornering, two hydraulic rams, one at each end and on opposite sides, act on the anti-roll bars, resisting lean. Pressure to the rams is controlled by a roll corrector (similar to that used to set the Citroën's ride height) which prevents tilt of more than half a degree. The whole operation, detection by sensors and computer-controlled correction, is blink-of-the-eye quick. Corner over, the corrector returns the rams and anti-roll bars to their normal straight-line setting.

All this wonderful hydro-pneumatic trickery, unique to Citroën, makes the metal-sprung suspensions of the Audi and BMW seem positively primitive. Of course, they're not. At the front of the Audi there's a complex arrangement of aluminium links and knuckles, designed to optimise camber, toe-in and compliance. It's not computer-controlled, but it couldn't have been designed without the aid of a computer. Ditto the multi-link rear end of the BMW, which does a wonderful job of gluing the tail to terra firma. BMW describes the 320i's 50/50 weight distribution as 'perfect', implying that its front-drive rivals are excessively nose-heavy.

To do justice to such an advanced chassis, the Citroën Xantia Activa also gets the XM's single-cam eight-valve turbocharged 2.0-litre engine, yielding, like the Audi and BMW, the 150bhp - a modest 15bhp increase on that of the Xantia 2.0i 16V twin-cam. However, torque is up from 135lb ft to a muscular 173lb ft - a healthy advantage over the 320i. Let's see if it's a telling one.

ALL THREE CARS PERFORM WITH UPLIFTING vigour. Even though the test Xantia failed to match Citroën's claims - it was nearly a second adrift from rest to 60mph - it feels the most gutsy and eager to please. Torque's the secret - velvet-swathed torque that virtually eliminates NVH disturbance. Who needs balancer shafts? The Citroën's engine may be fairly low-tech - the single-cam eight-valver is a nonentity aesthetically, buried under a porcupine quilt of plumbing and wires - but it works even better in the Xantia than it does in the heavier XM. Only at the extremes of its performance envelope is it less than impressive, but neither sub-1500rpm languor, nor breathlessness above 5500rpm, will trouble the press-on driver. It's second nature to keep the engine spinning beyond 2000rpm where there's instant access to turbo thrust. But for its muscle, you'd be hard-pressed to tell this low-pressure blower was force-fed at all.

Belted through the gears to its impressive 135mph max, the Audi - which has the best power-to-weight ratio and the least drag - is the fastest car here, though the margin of its superiority is hardly decisive. Despite breathing so freely through five valves per cylinder - three inlets and two exhausts - it is beaten on torque by the larger-engined Citroën: as the saying goes, there's no substitute for cubic inches. Like the Xantia, the 1.8T is quickly into its stride, untroubled by lag (torque peaks at a lowly 1750rpm) but more top-endy,



'The Citroën's wonderful hydro-pneumatic trickery makes the Audi and BMW seem positively primitive'



Xantia is the only one of the three with a hatchback tail (top left). Just eight valves in its transverse engine (above left) but a turbo makes the difference: it's by far the gutsiest car here. Cabin is the roomiest but the driving position is flawed.



not quite so strong in the low and mid-speed ranges. Where the French turbo starts to gasp above five-five, though, the Audi is just getting into its stride with a burgeoning boom that assails the ears more than the hushed Citroën. I liked the Xantia's nicely stacked ratios, but not its shift. That of the A4, which slots with a well-oiled precision, is much better. Sweet and refined though they are, neither four-cylinder engine is a match in timbre for the 320i's straight-six.

Dynamically, though, the BMW is beaten by its turbo challengers. Try slugging it out at low revs in a high gear, and the 320i languishes, short on wallop. There's no real bite to the acceleration until the tacho needle swings beyond 3000rpm. Mind you, the snappy gearwork required for brisk motoring is hardly a chore, given the precise and meaty action of the lever. As the unblown six gets into its stride with a creamy wail that never fails to please, so pick-up sharpens and the BMW flies. The more you drive the 320i, the greater the appeal of its classy powertrain.



Here's the proof: Activa (above) stays flat in a bend even with your foot flat to the floor, while A4 (left) shows what normally happens with normal cars. The Citroën's roadholding is staggering, the Audi's merely good.



Much of our test was conducted in speed-restricting fog, which will have had a bearing on the excellent consumption figures recorded by the Audi (35.9mpg) and BMW (31.6mpg). Both returns are in line with official averages that suggest the Xantia (27.8mpg) is significantly less frugal than its German rivals.

THE CORNERING SHOTS SHOULD SAY IT all, pictures being more telling than words. Yet words are needed to emphasise the decisive margin of the Citroën Activa's grip and handling advantage. Steering is not super-sensitive so much as pin-sharp precise and unerringly accurate. There's enough weighting in it - more to the point, enough variation in weighting - to induce useful and reassuring tactility, so you can clearly detect the onset of mild, stabilising understeer. Show it a bend and the Xantia simply changes direction, defying the centrifugal forces that cause other cars with supple suspension to tilt on their springs. Roundabouts are zapped as though they had been stretched straight, zigzags negotiated without untidy - and unsettling - lurch.

Roadholding benefits, too. Because the suspension geometry is not upset by body roll, the tyres remain upright for optimum purchase. Through our test corner (see pictures) the Xantia looked and felt dramatically more stable and secure than the Audi, which leaned, lurched, scrabbled and squealed - as a normal front-drive touring car does when pressed to its limit and beyond on compromised suspension. Travelling even faster, the Citroën whipped through the same bend with an even-kneeled fusslessness that was almost breathtaking.

At first, this no-roll, high-grip behaviour

seems quite extraordinary, even uncanny. The novelty of it all, however, is soon replaced by something akin to complacency. After a day's driving, it's easy to convince yourself that the Activa is behaving quite normally, that abnormality lies with everything else. The impression is heightened by a ride that is so composed, so unruffled, it's easy to overlook it, to take it for granted. Although surface bumps can coarsely penetrate the Citroën's defences, foundation irregularities are effectively absorbed.

I have two reservations about the Citroën's roll-controlled suspension. One is that it might encourage excessive bravura, so easily and arrogantly does the Activa despatch corners. The other is that the very considerable benefits of ARCS would be lost on anyone who does not drive with attack and singing tyres. Passengers may well feel the advantages - I certainly felt them riding with a police driver in a telling slalom demonstration on the Activa's press launch - but that's a comfort bonus, not a dynamic one.

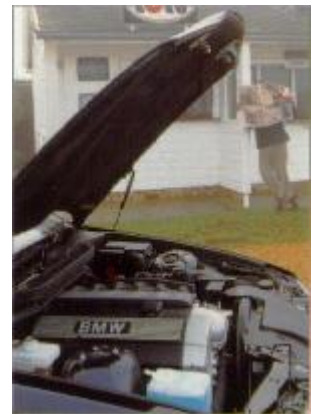
AFTER DRIVING THE CITROËN, WHICH is as impeccably poised as it is secure, the Audi felt, well, under-damped if not exactly loose and lurchy. You couldn't call the 1.8T untidy, and certainly not inept, but to credit it with the same iron-fisted control as the Xantia would be to flatter it falsely. Trouble is, the extraordinary capabilities of the Citroën expose as shortcomings the heaving rock and roll suffered by most cars without anti-lean suspension. Accept this, and the Audi rides pretty well, absorbing the rough stuff efficiently if not silently: tyre thump and road roar are constant companions - when were they not in a German saloon bred for super-smooth highways?

'Despite the heave and roll, the BMW feels nicely balanced, but it simply cannot match the Activa's composure'

BMW fits its driver the best (above left), and outsmarts Citroën for fit and finish. It's a less versatile load-carrier, though, because the rear seat doesn't fold.



Six cylinders, 24 valves, variable valve timing, rwd, a seductively silky snarl - of such things is the ultimate driving machine made. Until the physics-defying Citroën came along, that is.







There's a steer-by-wire detachment about the non-Sport 1.8T which has neither the rubber nor the suspension control seriously to mix it with the Xantia as a cornering machine, sound - even entertaining - though it is by normal yardsticks. The brakes are strong but far too light. Anything more than a delicate caress around town is a head-snapper. No, neither the steering nor the brakes do the 1.8T any favours on the fun-car front. The fully powered, pressure-sensitive anchors of the Xantia are not to everyone's liking, either. Don't even think about fancy heel-and-toe footwork.

Good though it is, the doughty BMW is eclipsed by the Citroën for much the same reason as the Audi. Attitude. The 320i simply cannot match the Activa's composure and all-

square stance, even when cornered gently, never mind hard. Not that it's short on grip: optional 225/50 rubber (£1410 on the base 320i, £685 on the SE) endowed the well-loaded test car with plenty of that. Steering that's uncorrupted by tractive forces - and much better wighted than that of the Audi - is one of the BMW's strenghts. Its multi-link rear suspension is another. Even when provoked, the 320i resists breakaway with impressive tenacity. Despite the heave and roll - mild by normal standards, excessive by the Activa's - the BMW feels nicely balanced, fluent, precise. The way it flows along twisty roads never fails to impress. Its low-profile gumballs do nothing for ride comfort, but they don't ruin it either. There's discernibly more heave and agitation than in the Citroën



Smoothly sculpted A4 feels too squashy in non-Sport guise, and the brakes are drastically over-servoed. Their over-sensitivity nearly spoils the car.

Five valves in each cylinder, and a turbo just outside them: the A4's engine (far left) is sweet, torquey, frugal too. Boot gains its vastness at the expense of rear legroom. Things are better in front (opp) with a well-designed dash and decent seats.

but nothing more than intrusive tyre roar to provoke serious criticism. firm, progressive brakes recover some points lost to the Citroën in handling and poise.

ALL THREE CARS HAVE STYLISH looks, though the elegant Xantia is still let down by its anonymous face; both German cars have stronger identities to back their higher status. What they don't have is the five-door Citroën's folding rear seats, split 60/40, or generous rear kneeroom. Space has been sacrificed in the back of the A4, it seems, for a huge boot that's unnecessarily long.

Roomy though it is, the Citroën is flawed ergonomically by a catalogue of irritations that give fresh hope to the German opposition. Iam not alone in finding a comfortable driving position impossible to arrange in the Xantia. The pedals need to be shifted to the right (to create some room for your off-clutch foot), the steering wheel give telescopic adjustment (as in the Audi), and the seat movement expanded (to include cushion tilt). Other gripes, glossed over in the past, include low-set, white-on-grey instruments (those of the Audi and BMW, raised in pods, are closer to your sight-line) and rather distant switchgear, spreadeagled over a busy dash. A cheer, though, for audio remote controls on the steering wheel.

Step into either German car after the Citroën and you step up a class. The Xantia is not badly finished, but it lacks the in-depth quality of the Audi and BMW. Neither is overtly opulent - though the BMW comes close with £1220-worth of optional leather. Both excel in cabin decor and dash design. The Audi's sweeps around you, encompassing the doors; that of the BMW is angled in, all the better to reach and view.

Seat support is no better in the two German cars than in the Xantia - all three could do

'The Audi has neither the rubber nor the suspension control to mix it with the Xantia as a cornering machine'



with more shoulder location. But crucial seat adjustment most certainly is, even allowing for the Audi's unsatisfactory combined tilt/height facility, and the BMW's fixed-position steering wheel. The Audi's wheel adjusts for height as well as reach. Persevere with the BMW's clumsy and confusing seat-side adjusters, and you can arrange a driving position that's close to perfection. Only in the Citroën do the back pillars create nasty rear-threequarter blindspots.

All three cars are quite cruisers, free from excessive wind noise - though coarse surfaces excite excessive road roar in the Audi. All have excellent heating/ventilation systems, too. Options available for the Xantia Activa include powered seats (which might improve the driving position), air-con and leather.



SPECIFICATIONS			
Model name	Audi A4 1.8T	BMW 320i	Citroën Xantia Activa
Price	£20,389	£20,195	£18,480
POWERTRAIN			
Engine	1781cc 20V dohc four	1991cc 24V dohc six	1998cc 8V sohc four
Bore/stroke (mm)	81/86	66/80	86/86
Compression (to one)	9.5	11.0	8.0
Power (DIN/rpm)	150bhp/5700	150bhp/5900	150bhp/5300
Torque (DIN/rpm)	155lb ft/1750	140lb ft/4200	173lb ft/2500
Specific output	84bhp per litre	75bhp per litre	75bhp per litre
Power-to-weight ratio	123bhp per tonne	109bhp per tonne	108bhp per tonne
Transmission	five-speed manual, fwd	five-speed manual, rwd	five-speed manual, fwd
CHASSIS			
Front suspension	Four links, coils, anti-roll bar	Struts, coil springs, anti-roll bar	Hydractive with active roll control
Rear suspension	Trailing arms, torsion beam, anti-roll bar	Multi-link, coils, anti-roll bar	Hydractive with active roll control
Steering	Rack and pinion, power-assisted	Rack and pinion, power-assisted	Rack and pinion, power-assisted
Turns, lock to lock	2.7	3.2	3.0
Brakes, front/rear	Vent disc/disc, ABS	Vent disc/disc, ABS	Vent disc/disc, ABS
Tyres	195/65 R15	205/60 R15	205/55 R15
DIMENSIONS			
Length/width/height(mm)	4479/1733/1415	4433/1700/1395	4444/1755/1387
Wheelbase	2617	2700	2740
Fuel-tank capacity (gal/ltr)	13.6/62	14.3/65	14.3/65
Kerb weight (kg)	1235	1395	1410
CABIN DIMENSIONS (mm)			
Front headroom (max)	940	990	920
Front legroom (max)	1060	1070	1080
Rear headroom	910	890	890
Rear legroom (min)	560	620	700
Rear shoulder room	1320	1360	1370
Boot capacity (litres)	440	300	480
STANDARD EQUIPMENT			
Airbag driver/passenger	Yes/extra	Yes/extra	Yes/extra
Air-conditioning	Extra	Extra	Extra
Alarm/immobiliser	Yes/yes	No/Yes	Yes/yes
ABS	Yes	Yes	Yes
Alloy wheels	Extra	Extra	Yes
Automatic transmission	No	Extra	No
Power-assisted steering	Yes	Yes	Yes
Seatbelt pre-tensioners	Yes	Yes	Yes
Central locking	Yes	Yes, deadlocks	Remote, deadlocks
Folding rear seat/split	Extra	No/No	Yes/yes
Electric windows/mirrors	Yes/yes	Yes/yes	Yes/yes, heated
Radio/cassette	Yes/Yes	Extra, to choice	Yes/Yes
Steering reach/rake	Yes/yes	No/yes	No/Yes
Seat height/tilt	Extra	Yes/No	Yes/No
Sunroof	Yes, electric	Extra	Yes, electric

THERE IS MUCH TO ADMIRE about the attractive Audi A4 1.8T, not least its comfort, build quality, performance and economy. It's a civilised and desirable car found wanting only in tactile sensations. With meatier steering and firmer brakes, it might have dethroned its greatest adversary. As it is, the BMW pips the Audi at the post. The 320i is a joy to drive. It is also beaten into second place.

Though marred by an indifferent gearchange, over sensitive brakes and a flawed driving position, the Citroën sets new standards in cornering stability, grip and ride comfort. It had the German opposition floundering in its wake, especially at a price that undercuts the Audi by £1910 and the fully-loaded test BMW by £6763.

Citroën's Xantia has always nudged greatness. With its new turbo engine and truly wonderful suspension, greatness it has now achieved.

PERFORMANCE

ACCELERATION (sec)	0-30	0-60	0-100
Audi	3.0	8.2	23.2
BMW	3.0	9.0	25.7
Citroën	3.1	9.5	27.6

IN 3rd/4th/5th (sec)	30-50	50-70
Audi	5.3/6.7/7.1	5.7/7.5/9.5
BMW	5.8/9.0/12.5	5.7/9.0/12.5
Citroën	4.2/6.6/9.6	5.1/6.2/8.3

SPEEDS IN GEARS					
(mph)	First	Second	Third	Fourth	Fifth
Audi	36	60	98	123	135
BMW	31	53	81	110	133
Citroën	32	56	82	111	129

FUEL CONSUMPTION					
(mpg)	Test	Urban	56mph	75mph	Official average
Audi	35.9	28.8	48.7	37.2	35.9
BMW	31.6	25.0	43.5	35.8	32.3
Citroën	27.8	22.6	40.9	33.6	29.9

CITROEN XANTIA ANTI-ROLL SYSTEM

I IMAGINE A WORLD where the sun always shines, yet the soil never dries out; where the sick are provided for; yet no-one pays tax. OK, try this. Imagine a car that rides like a limousine, yet corners like a Mini Cooper.

The Xantia Activa is a truly extraordinary experience. Savour its wonderfully supple suspension, and however much you prepare yourself, you're going to be amazed at the first corner. The steering reponse is sharp as

glass; the tyres grip as if the road itself is rubber-surfaced. And when, finally, the tyres do begin to slide, they do it benignly.

Oh, yes, and the car doesn't roll on its suspension. Not a degree. There's a soupçon of lean, but that's down to the compression of the outside tyres. Strangely, though as the driver, you're too busy being amazed by the Activa's responses to notice that absence of roll, which is the mother-lode of this staggering agility and cornering prowess.

When you turn the steering wheel, the car actually turns - the effort isn't wasted in bringing on the body-roll. Faster steering response stems also from the tyres. The Activa's Michelin footwear has a special construction that's relieved of the need to tolerate roll.

Passengers love the Activa, too. Suddenly, they aren't sitting sideways on a see-saw.

Only Citroën could have brought us this leap forward. Mechanically speaking, the

Activa system is a comparatively straightforward batch of components to add to the Xantia VSX's Hydractive II suspension - an insignificant 17kg weight penalty. The system is able to deliver its benefits because of the car it's strapped to: a Hydractive Citroën is the only car that can alter its damper and spring rates depending on whether it's cornering or cruising. Throw in the self-levelling properties and you've got a suspension more or less without compromise.

HOW IT WORKS

The Xantia's Springing medium is gas, constrained in steel spheres, one per wheel. Suspension movement is transferred to the gas via oil, which is incompressible, the oil volume in the system can be augmented or reduced by the hydraulic system: adding oil enables the car to pump itself up to counteract a heavy load. At either end of the car, there's an extra sphere. In a straight line, the oil from each suspension arm at that end of the car is also linked via pipes to the extra sphere. Because of this link, when a wheel hits a bump, the opposite wheel is momentarily pumped up slightly, which damps side-to-side rocking.

But when the Xantia's cornering, braking or accelerating, the computer

determines that the car could use a sportier chassis. Valves close and the third sphere is isolated from the system at each end of the car. This reduces the gas volume to be compressed by each wheel - just the one sphere now - so the car becomes more firmly sprung. Also, because the oil flows into all the spheres through small holes to provide the damping action, when the third sphere isn't in use the damping rate rises, too. This much is standard Hydractive Citroën.

The Activa's key is in its anti-roll bars. For both ends of the car, the bar is joined at one end to the suspension arm by the usual fixed link, but at the other to the arm by a small hydraulic ram. Each ram is plumbed via separate valves both to the main hydraulic

pressure accumulator and to yet another sphere. In the relaxed straight-line position, the ram is in effect 'sprung' by the sphere, so that it has little effect on the car's downy=soft ride. But when the computer senses a corner, that link is closed off, giving the ram a fixed length, and the anti-roll bar acts just the same as it would in any ordinary car: it diminishes roll, but doesn't actually prevent it.

That's just the start, though. Roll is measured by a hydraulic linkage, and in a corner, once the Activa begins to lean - by an imperceptible 0.5deg - the rams are actually extended (or compressed, depending on whether you're in a right- or left-hander) by the high-pressure oil. *Et voila*, the bars actively lever the car upright again.

THE SHORTLIST

The variable valve control of the top MGF's engine provides a type of control (infinitesimal adjustment of the inlet valve opening period) that's unavailable elsewhere. But it doesn't really give the quantum leap represented by the Activa, and Prof Randle said 'Victorian sewing machine designers would have made a better job.'

The transponder ignition key, brought to you first by VAUXHALL and FORD, caught on with JAGUAR, FIAT, BMW and others, and looks like slowing up car thieves. Airbags and belt pre-tensioners mean faster impacts are now survivable, but the victims often suffer foot injuries. The VAUXHALL VECTRA has a safety pedal box that moves away from the feet in a crash.

HOW THEY VOTED	CAR	CITROEN XANTIA ACTIVA
	JIM RANDLE	CITROEN XANTIA ACTIVA
	LJK SETRIGHT	CITROEN XANTIA ACTIVA