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Ten brilliant ideas

IF YOU DIG DEEP ENOUGH, THE ROOTS OF MODERN MOTORING TECHNOLOGY CAN BE FOUND IN PRODUCTION CARS OF THE CLASSIC ERA: IN THE PAGES THAT FOLLOW, WE CHECK OUT TEN OF THE MOST INNOVATIVE CLASSICS



INNOVATION
SPECIAL

Even now, the Citroën DS appears out of this world, both in looks and in its spec. David Lillywhite mans mission control

Hydraulic suspension

CITROËN DS19

UNBELIEVABLE! I HAVE JUST climbed into Dan Dare's spaceship – the one he used to carry his family and their luggage between planets. Dan's wife always loved the spacious interior and the smooth ride of the self-levelling suspension, while Dan appreciated the high-speed intergalactic cruising abilities and the convenience of the clutchless gearchange and power steering.

But now this futuristic Fifties machine is in my hands, back on Planet Earth. The handbook in one of the many interior stowage pockets is written in French and the front cover proclaims it to be a Citroën DS19.

Here's a car which, with a body-colour bumper here and an airbag there, could conceivably be a Nineties concept car. In fact, it made its first show appearance as a production model at the 1955 Paris Salon. Yes, 1955.

The motoring world was astounded. The new DS, named from the French word for goddess, *déesse*, so bristled with innovations that the offerings from other manufacturers appeared positively archaic. On the first day of the show 12,000 orders were taken. Nervously flattering road tests (it was great but would it be reliable?) were soon filling magazines all over the world.

I know how those testers felt. This is my third time in a DS but there's still a flutter of nerves as I sit in the car's unfamiliar surroundings, trying to remember how to start it. Ah yes, switch on with a key then push the gear-lever – just a driver-friendly fingertip's reach from the steering wheel – to the left to turn the starter motor. ⇨

WHERE ARE THEY NOW?

Hydropneumatic suspension is now used by Citroën's XM and Xantia, as well as the MGF and Rover 100. The Xantia Activa even keeps the car level under cornering

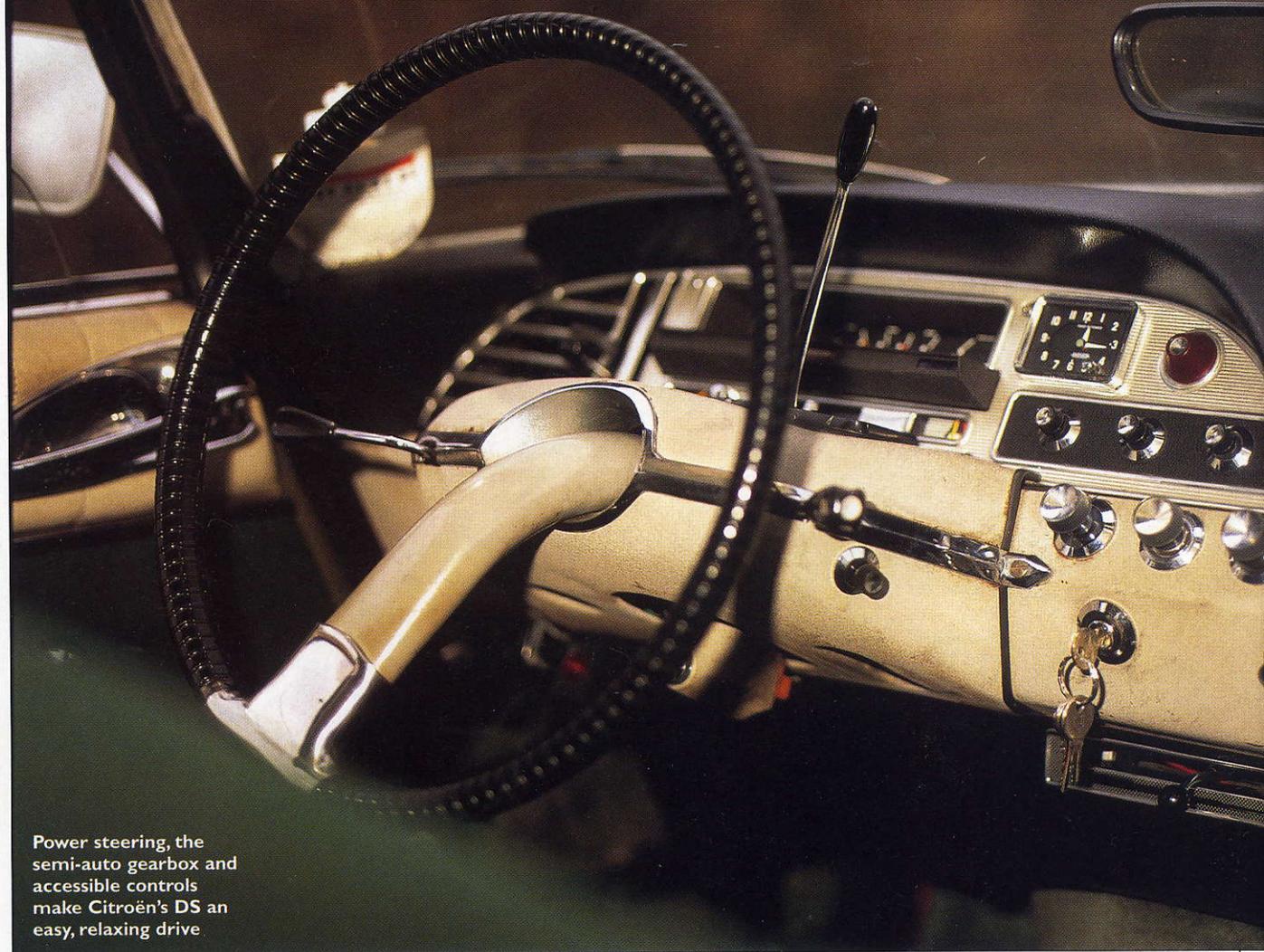


“THE NEW DS
MADE OFFERINGS
FROM OTHER
MANUFACTURERS
SEEM POSITIVELY
ARCHAIC”



Light up your driving
life with Citroën's
space-age DS, the
ultimate classic for
high-speed comfort

“AS IT FIRES, FIRST THE FRONT THEN THE REAR OF THE CITROËN FLOAT UPWARD, LIKE A FERRY IN A SWELL”



Power steering, the semi-auto gearbox and accessible controls make Citroën's DS an easy, relaxing drive

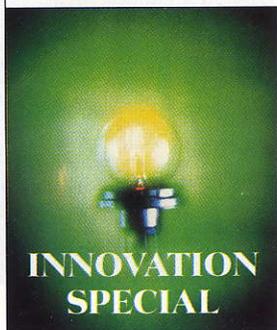
As the four-cylinder engine fires, first the front then the rear of the car float upward, reminding me for an instant of a cross-channel ferry caught in a swell. Surely a spaceship shouldn't feel like a ferry. No need to man the lifeboats though, it's just the hydraulic pump filling the gas-filled suspension spheres, which take the place of conventional springs. Hydraulic interconnections between the spheres combine with height-correcting valves front and rear to keep the car level whatever the road surface and irrespective of the load it's carrying.

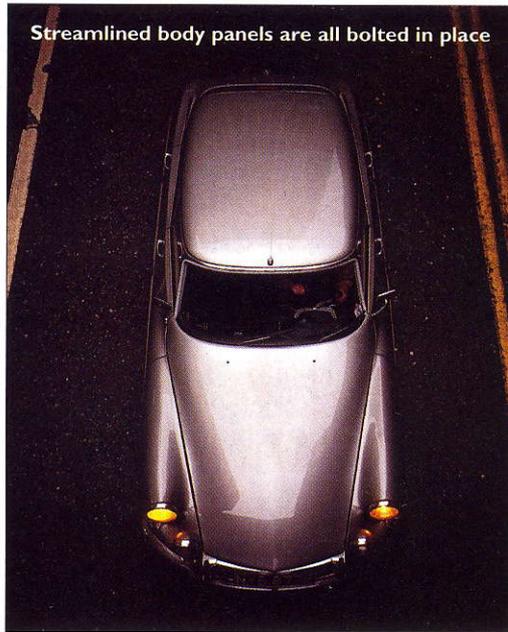
Citroën had already tried hydraulics on the 15H version of the DS19's predecessor, the Traction Avant, but a whole vehicle system had never been seen before. Tricks to astound the uninitiated abound – how about removing a wheel and driving on the remaining three,

demonstrating the safety aspect of self-levelling suspension (and centre-point steering geometry) should a tyre blow out at speed. Or changing to another of the four height settings; the lowest for fast cruising on the smoothest roads, the highest for bumpy tracks to the local vineyard (or perhaps the rocket launch pad).

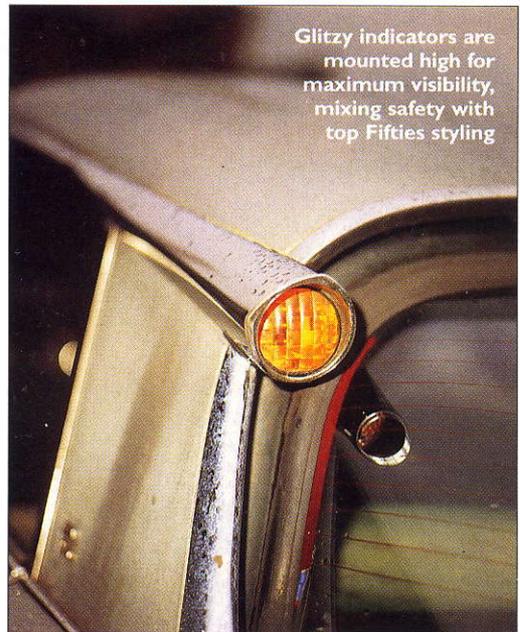
But enough tricks, it's time to move. Again hydraulics come into play, with the central system not only assisting the steering but also actuating the gearchange and the automatic clutch. All I have to do is push the gear-lever forward (no clutch pedal to press), pull the knob to my left to release the parking brake – the little parking brake pedal directly beneath the knob springs up into its 'off' position – and press the accelerator.

The front rises and the rear dips in another cross-





Streamlined body panels are all bolted in place



Glitzy indicators are mounted high for maximum visibility, mixing safety with top Fifties styling

channel ferry manoeuvre as the car accelerates, then it self-levels and, yes, we're ready for second gear. Off the accelerator, pull the lever towards the steering wheel and it's engaged. Not as smooth as it could have been (shades of Sealink again) but I know the changes will get better as I learn to compensate for the tiny delay that it takes for the automatic clutch to engage.

The changes to third and fourth are much easier and now this Citroën is really moving. The faster it goes the more remarkable the suspension's ability to glide over every imperfection seems, and yet a tug on the steering wheel results in instant, responsive turn-in. Even the engine, the least advanced element of the DS, smooths out at speed but it's obviously on the lower limit of power and torque for such a big car. The later DS21 (2175cc) and DS23 (2347cc) were more muscular than the 1911cc and 1985cc DS19 models.

Now its time to try the brakes. There's no conventional brake pedal, just a tiny rubber sphere on the floor, which I know from previous experience will weed out a DS virgin with a single application of a heavy right foot. No, this small black pimple in the floor must be caressed rather than pressed because it has only around a single centimetre of travel – the obvious system really because as soon as your reactions tell you to stop, your foot is operating the brakes rather than taking up the pedal's travel.

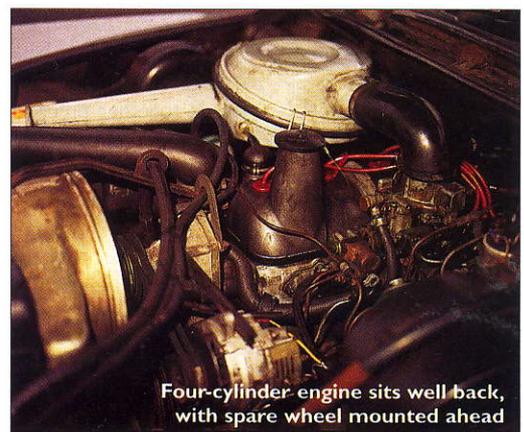
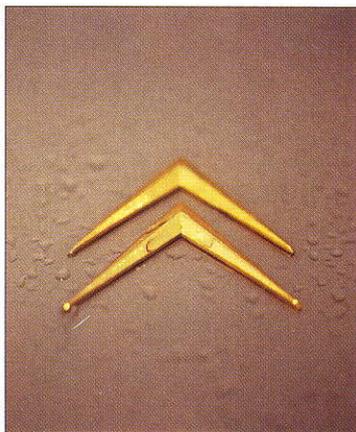
When you do 'caress' the pedal, it operates two valves in the high-pressure hydraulic system; one for the front brakes and one for the rears, so that effort is distributed proportionately between the two independent circuits depending on load. This system, which had never previously been used on a mass-production car, means the wheels are less likely to lock during emergency stops.

It's only once the more daunting aspects of the DS have been learnt – how to operate the parking brake, how to change gear, how to stop without cranium hitting

windscreen – that its other design features find room to sneak into the consciousness. The excellent all-round vision for example; achieved by the use of unusually thin screen and door pillars plus frameless door windows, only possible because the DS is constructed of a central structural frame upon which those aerodynamic outer panels, including the glassfibre roof, are hung.

Then there are the driving lamps that swivel as the steering wheel is turned (only on the power-steering-equipped cowled-headlamp models; later than the DS19 featured here). And the heating and ventilation that works as well as a modern car's: compare that with the contemporary Jaguar Mk2's pitiful system. While we're at it, check out the one-spoke steering wheel and curved, high-tech dashboard, which demonstrated ergonomics and crash protection to a world that was more used to scattered switches and hard metal edges.

After a while you realise that the DS is a car that appears to have been designed without reference to anything that has gone before, turning previous standards on their heads and influencing the design of every car since. Of course there were some who rejected the complicated hydraulics, but for them Citroën introduced more down-to-earth versions: for the Dan Dares amongst us, only a fully equipped DS will do. ●



Four-cylinder engine sits well back, with spare wheel mounted ahead