

EVERY DETROIT ENGINEER concerned creatively with the design of an automobile should be ordered by his management to spend at least 2000 miles behind the wheel of a Citroen DS-21 with hydraulic shift.



Even after that, he might not agree with the way Citroen does it, but he *would* realize that there are alternates to such engineering norms as coil or leaf-spring suspension, a separate source of power for each driving assist, two or more spokes in the steering wheel, welded fenders, and even the conventional brake pedal with four or more inches of time-consuming travel.

No car in the world presents anything approaching the collection of engineering innovations — for better and sometimes, for worse — that can be found in the DS-21 or its cheaper and older sister, the DS-19. Styling-wise, everyone, including Detroit, is entitled to his own opinion. At 191 inches overall, it fits well within the classic definition of a compact but inside, it is roomy enough to serve unaltered as leggy Charles De Gaulle's official limousine. Citroen designers wasted no curves fitting the exterior around the interior, coming up with a shape that is certainly functional and provedly aerodynamic, but whether or not it is pleasing is a matter for individual pairs of eyeballs to decide.

As we found out when turning the car over to reluctant parking attendants, few persons can safely drive off in the DS-21 without a thorough briefing and check ride. For example, hooking the starter to an empty position in the shift quadrant is as logical as Studebaker's first use of the clutch

pedal for starting, but in neither case were directions printed on the instrument panel. And the floor button that actuates the powerful braking system has about as much discernible movement with increasing foot pressure as the platform of a bathroom scale. It takes at least 100 miles, preferably in easy-moving city traffic, before you achieve a thorough rapport with this brake, and some persons with an incurable right-foot brake habit may find it impossible.

The Citroen ride, derived from its self-leveling hydro-pneumatic suspension system, can only be compared to that of an airliner hitting isolated pockets of gentle to moderate turbulence. You go up or down when you hit the actual bump, but by then the leveling system is in action so there is no feeling of sudden return to normal and thus, no shock. In extreme dips we could bottom the car at the front end, but the rear never did and there was no rebound whatever.

In a ride so soft that it can only be described as floating, almost total stability while cornering is the more amazing. Again, the leveling system takes over with a little torsion bar that tells a valve to shoot some boost into the off-side airroils.

The only give stems from the radial-ply Michelin XA tires, which tend to roll over under stress. These specific tires are mandatory, according to the owner's manual, and if you rotate the wheels from one side of the car to the other you have to take the tire completely off and replace them so that the "old" outside becomes the "new" inside. If they are wrong-side-to, they won't perform. As is usual with the Michelin, the relatively narrow treads took a little edge away

CITROËN DS-21 ROAD TEST

The car that could teach Detroit



TWO LOWER SCOOPS DIRECT AIR TO INBOARD FRONT DISCS. THE MAIN SCOOP ABOVE DIRECTS AIR THROUGH A CHUTE TO THE RADIATOR.



Control in driver's compartment increases road clearance by nearly six inches to facilitate fording streams and crossing rough terrain. When a tire is changed, the car is first raised and then let down on a stand inserted under the desired side.

from the car's superlative brakes, but they corner like a worm on sandpaper.

The 109-hp hemi 4 won't quite chirp the front tires when accelerating, but it will move the DS-21 from 0 to 60 mph in 12.8 seconds with two persons added to its 2860-pound curb weight. On the highway, you get that usual fwd feel of being pulled around corners. It seems like the rear end should let go first, but instead the front will start to shove out. The power steering is not overly boosted by U.S. standards, and it sets up a sort of chuckle in the wheel during full-cram parking.

One time after we had shut the car off and got out, we heard a strange noise and looked back to see the steering wheel shivering away for a moment without any mechanical reason that could be explained by us or the Citroen people. Another strange phenomenon is the way, after you leave the car, that it rises up and then expires back down on its haunches with an audible sigh, as though thankful that the day's work is done.

Some controls represent the finest thinking in their execution and placement, and others not. For example, the emer-

gency brake is the only true such one on any current car. Upon application, it may be locked in a PARK position, but just below and to the left of this is a slot that permits application like any foot brake. You won't screech to a stop, but there is enough pressure from it mechanically applied to the front discs to remove any real fear of total hydraulic failure of the regular system. If you ever have to use the auxiliary system, remember that it does not, like the main brake, disengage the hydraulic clutch when you come to a stop, so sometime during the procedure you must shift into neutral.

An example of a not-so-good control is the location of the accelerator pedal. There is plenty of space on the floor to move both it and the brake over, but instead, it is tucked up against the deep-pile carpet that covers the hump that in turn covers the rear of the engine. Your shoe rubbing against this carpet precludes sensitive throttle control, which again in turn, is a must to operate the hydraulic shift at low speeds with any degree of smoothness.

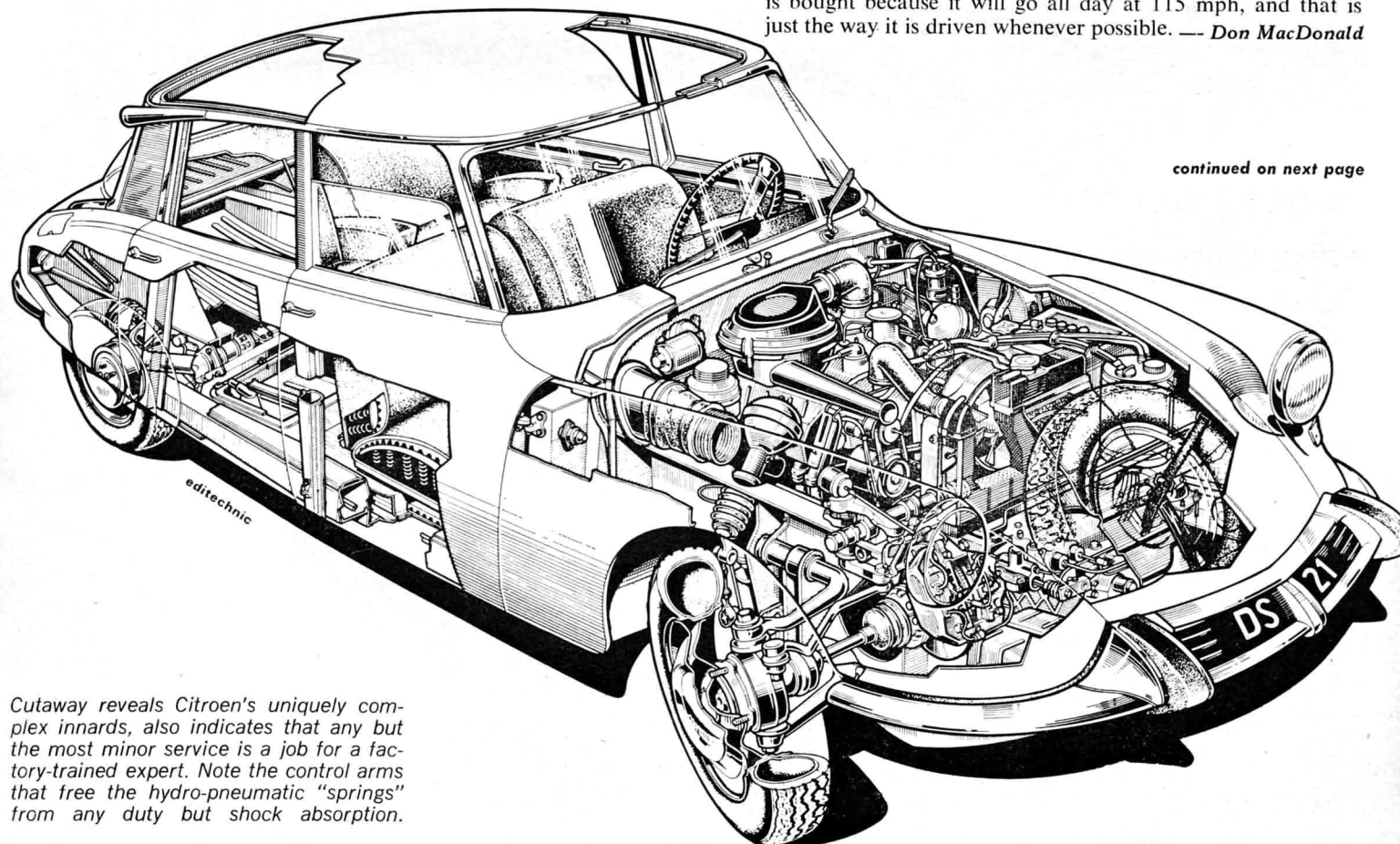
All controls should be marked in English. The owner soon learns them, but the problem with parking lot attendants and others who must drive your car on occasion becomes a downright nuisance and could be contributory to an accident.

But back to the plus side, there is a warning light that warns of both a low level of hydraulic fluid in the accumulator and/or brake-lining wear at the point where it requires replacement. Should the light come on, don't inquire for which reason. A safety valve insures enough fluid for one complete emergency stop from high speed, but no more.

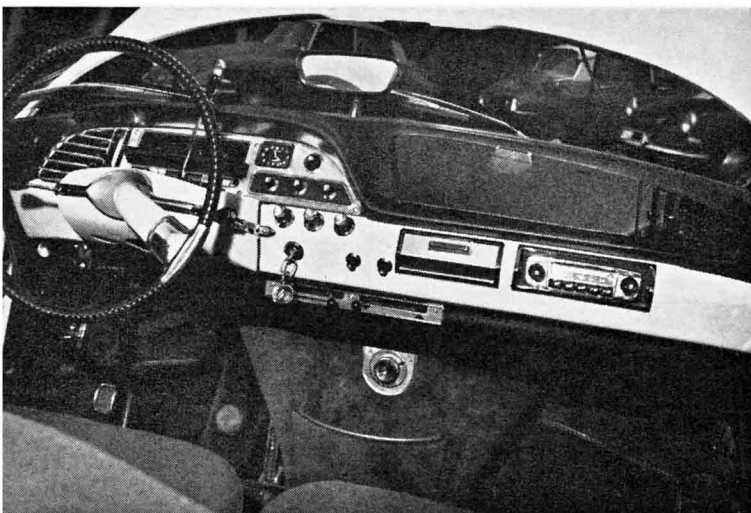
On the Pallas model, which we had, the interior is made up from a soft but probably not too durable velour. Everything, including the fiberglass roof, is deeply padded. What it may lack in durability, though, is made up for by the fact that all upholstery units, including the carpeting, may be replaced as easily as seat covers.

The Citroen people tell us that their clientele in the U.S. is made up mostly of engineers, lawyers, doctors and others of imaginative ilk who are willing to depart from the conventional. In Europe, as anyone who has driven there knows, it is bought because it will go all day at 115 mph, and that is just the way it is driven whenever possible. — Don MacDonald

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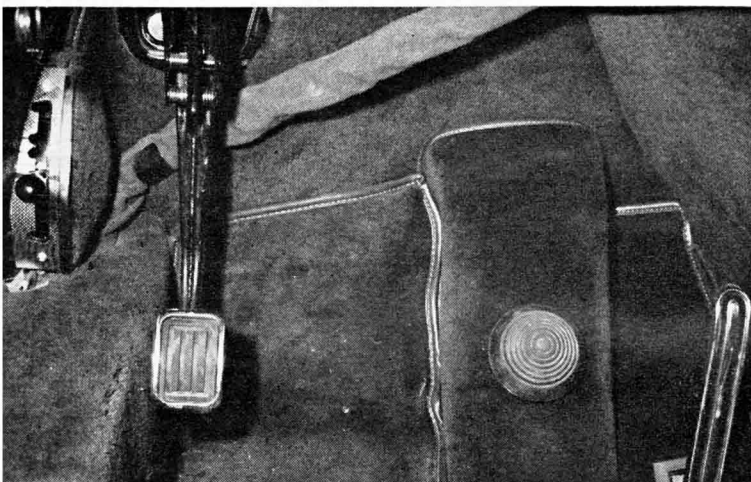
Cutaway reveals Citroen's uniquely complex innards, also indicates that any but the most minor service is a job for a factory-trained expert. Note the control arms that free the hydro-pneumatic "springs" from any duty but shock absorption.



Cockpit contains all the usual controls in unusual locations, plus some that are exclusive to Citroën. At lower left is the lever to raise and lower the car; the button on the floor is the brake "pedal"; and the knob in the center regulates heat.



With the spare tire up front, the trunk is unusually commodious, although the high ledge makes unloading difficult. The lid is hydraulically propped, and its shape permits rear vision even when it's open. The high lights are for turn signaling.



Accelerator is too close to hump, catching driver's foot on carpeting, but judicious use still gave up to 24 mpg. Brake button is best operated with left foot. Parking brake may also be set up to function as a secondary emergency system.



Accumulator for central hydraulic system has visual gauge to check level of automatic transmission fluid used. From this are operated the automatic clutch, suspension units, brakes, power steering, and self-leveling and height-control features.

PHOTOS BY DARRYL NORENBURG

CITROËN DS-21

4-door, 5-passenger sedan

SPECIFICATIONS FROM MANUFACTURER

ENGINE IN TEST CAR: Ohv hemi 4
Bore and stroke: 3.543 x 3.366 ins.
Displacement: 132.7 cu. ins.
Advertised horsepower: 109 @ 5500 rpm
Max. torque: 128 lbs.-ft. @ 3000 rpm
Compression ratio: 8.75:1
Carburetion: 1 2-bbl. Weber

TRANSMISSION TYPE & FINAL DRIVE RATIO: 4-speed, fully synchromeshed, manual or optional hydraulic shift with centrifugal-action clutch. 4.275:1 final drive ratio

SUSPENSION: 4-wheel independent. 2 suspension arms and 1 hydro-pneumatic unit for each front wheel. 1 suspension arm and 1 hydro-pneumatic unit for each rear wheel. Anti-roll bar and leveling device front and rear. 1 shock absorber at each wheel

STEERING: Rack and pinion; power assist standard
Turning diameter: 36 ft., curb to curb
Turns lock to lock: 3 1/4

WHEELS: Steel disc; 15-in. dia.

TIRES: Michelin XA's radial steel cord, asymmetrical construction

BRAKES: Hydraulic power-assisted dual independent system; discs on front, drums on rear

SERVICE:

Type of fuel recommended: Premium
Fuel capacity: 17 gals.
Oil capacity: 4 3/4 qts.; with filter 5 1/4 qts.
Shortest lubrication interval: 3000 mi.
Oil- and filter-change interval: 3000 mi.

BODY & FRAME:

Unitized all-steel construction
Wheelbase: 123.0 ins.
Track: front, 59.0 ins.; rear, 51 1/4 ins.
Overall: length, 190.5 ins.; width, 70.5 ins.; height, 58.0 ins.
Min. ground clearance: 4.2 ins.; max. ground clearance: 11.2 ins.; normal driving ground clearance: 6.4 ins.
Usable trunk capacity: 17.5 cu. ft.
Curb weight: 2860 lbs.

PERFORMANCE

ACCELERATION (2 aboard)

0-30 mph	4.3 secs.
0-50 mph	9.3 secs.
0-60 mph	13.4 secs.
0-75 mph	19.0 secs.

TIME & DISTANCE TO ATTAIN PASSING SPEEDS

40-60 mph	6.9 secs., 505 ft.
50-70 mph	7.5 secs., 660 ft.

STANDING-START QUARTER-MILE: 19.7 secs. and 78 mph

BEST SPEEDS IN GEARS @ SHIFT POINTS

1st	35 mph @ 6000 rpm
2nd	55 mph @ 6000 rpm
3rd	80 mph @ 6000 rpm
4th	(not maximum) 60 mph @ 3000 rpm

MPH PER 1000 RPM: 20

STOPPING DISTANCES: from 30 mph, 31 ft.; from 60 mph, 152 ft.

ACCESSORY PRICE LIST

*Rear heater and defroster	\$ 86.00
Air conditioning	395.00
Leather interior (Pallas model only)	328.00
*Seat belts, front	20.00
*Outside rear-view mirror	8.00
*Power steering	std
*Blaupunkt AM/FM short wave radio	185.00
*On test car	

MANUFACTURER'S SUGGESTED LIST PRICE: \$4051 (incl. taxes, safety equip't & PCV device)

PRICE OF CAR TESTED: \$4350 (incl. excise tax, delivery & get-ready charges, but not local tax & license)

MANUFACTURER'S WARRANTY: 12,000 miles and/or 12 months