



CITROËN DS 21

Subtle Changes Update The Classic Gallic Grand Coach

Over the years a lot of words have been written about the weird and wonderful Citroën DS series. The French automobile company has never been the type to stick to conventional forms when designing new models. A new car from Citroën is generally expected to have a model run of at least ten years, and most of their vehicles go much further in longevity on the market. The majority of French cars are somewhat different that the accepted styling of the moment, and French designers seem to have a free hand with innovative concepts as applied to cars destined for production. Therefore when Citroën introduced the revolutionary DS line way back in 1955 it appeared to be far ahead of its time in concept and actual appearance. From the odd looking, but aerodynamic, body to the heart of the complicated hydropneumatic suspension system the car was truly new.

Evolution of the model over the years has brought many refinements, but little actual change from the original ideas. And the DS is still as different from its competitors in appearance and operation as it was fifteen years ago.

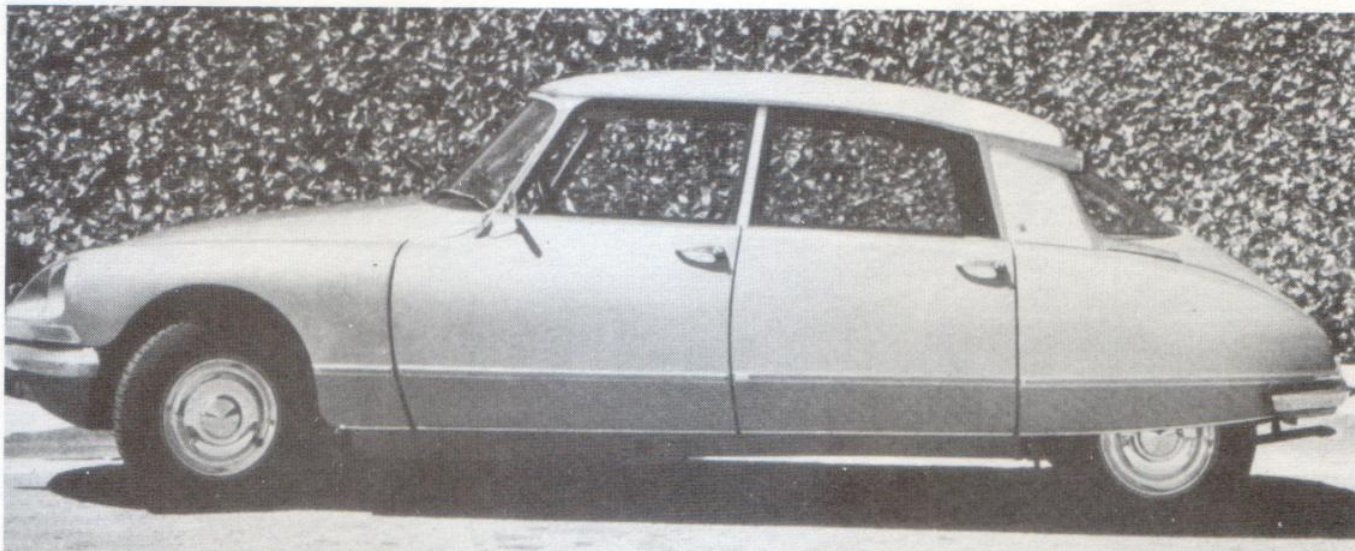
The current model has a bit bigger engine than the original, but it remains the four cylinder design that many consider inadequate to power such a hefty sedan. The nose design has changed a bit too. First, it was lowered some and lately the single headlights have given way to a faired in dual set-up that is enhanced by a unique driving light installation. The driving lights are not legal for use in this country so domestic consumers are denied the use of the directionally controlled quartz iodine lamps that swivel about to pick out roadside hazards. Inside the original Helanca nylon upholstery has given way to leather coverings on the massive armchairs in the export models. And for 1970 the rectangular dash panel window and adjacent light switches and knobs have been supplanted by three

Quad headlights for American consumers fit nicely into the space designed for the swiveling driving lights fitted inboard on the Citroën in other countries. Smooth nose is an aid to high speed stability.

round dials that inform the driver of all conditions in a more conventional manner. Other newer items are changes in the hardware that operates the seating positions and the addition of flashers, brake warning lights, three way harness, etc., to conform to the U. S. federal safety requirements.

Generally speaking though, sliding into the plush surroundings and sinking gratefully into the deeply cushioned seat reminds the driver of visiting an old friend who just bought a more modern suit of clothes. The familiar hiss or sigh from the suspension adjusting to the new weight load is more like a whisper than an audible annoyance. The view over the long sloping nose is little changed and the car retains the really fine visibility factor with its slim door and windshield pillars. For our test model we chose the manual transmission version of the 21. The Citromatic model was last tested here, so we returned to the less costly model for the 1970 evaluation of the current crop of Citroëns. After a brief checkout by the

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After fifteen years the Citroën has a classic profile. The body is a good aerodynamic exercise, and the engineers wished came before the designers when the body shape was finalized.

While the Citroën DS 21 is not designed especially for back country trails, the adjustable suspension gives it the capability of traversing the worst roads at reduced speeds.

genial folks at the West Coast Citroën depot, we glided away on the super soft suspension to tackle the horrendous hazards of the Los Angeles freeways.

What's Under The Hood?

In the Citroën, just about everything that moves is under the long hood. The complete power train for the front driving car is neatly packed into the nose with space left over for the spare tire, tool kit, battery, and a spare can of hydraulic fluid. Of course the back of the engine does protrude into the cockpit forming a neat divider between the driver and passenger, and it is restricting on leg room should one want to carry a third party in the front seat. The engine is barely visible under the maze of plumbing that accommodates all the proper piping for the hydraulics and the federally required anti-pollution devices. Servicing does require some special tools, and a plug wrench is supplied with the car. The quick checks done in a service station are simple though, since the dip sticks and so forth are right on top within easy reach.

The engine is a conventional four cylinder, overhead valve, in-line unit, water cooled with wet liners in a cast iron cylinder block and it uses a husky five main bearing crankshaft. The latest engine has pushrod operated opposed



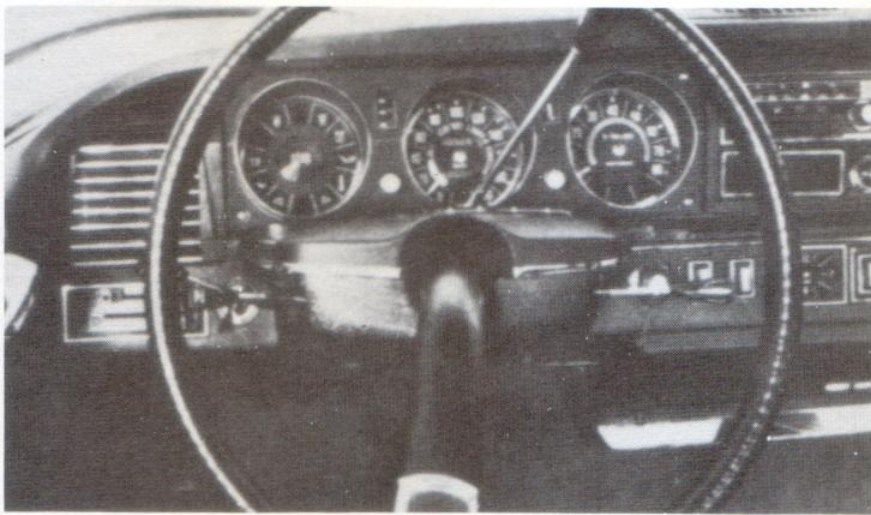
valves in the light alloy head and hemispherical combustion chambers. This engine also has the increased displacement of 2175 cubic centimeters (132.7 cu. in.) and is over square with a 90 mm bore and an 85.5 mm stroke. The compression ratio is 8.75 to 1 and induction is by a single dual throat Weber carburetor. Twin exhaust manifolds pair up ports 1 and 4 and 2 and 3; the pipes meet at the muffler and split to twin pipes at the rear of the car. Maximum SAE horsepower is listed at 115 at 5750 rpm and the torque figure is 126 ft/lbs at 4000 rpm.

The four speed manual transmission is fully synchromesh on the forward gears. The gear pattern is the standard H, and the shift lever is located on the steering post on the right side. The drive axles have three-armed homoscinet universal joints at the inboard ends, which are a Citroën design; the outboard universals are double Hooke-type joints. The inboard universals were new just a few years back and replaced a very complicated and expensive expanding cone center-lock device for the front wheels. The change called for new stub

axles, and the single lug nut assembly was replaced with a five lug pattern for the wheels too.

The hydropneumatic suspension system is relatively unchanged by the years and the mechanics of it have been well explored before. Briefly the conventional metal springs are replaced with air cushions. Each of the four independently sprung wheels is linked to a suspension sphere in which a variable flow of liquid is used to compress a volume of gas. Automatic height correctors maintain a constant ground clearance regardless of the load being carried. Also in the cockpit, on the left side near the floor, is a manual control for the ground clearance. By moving the lever into various slots the car can be raised and lowered depending on the conditions of the terrain.

Citroën was one of the first manufacturers to use disc brakes in production, and to operate the full power system from an engine driven pump. The car is equipped with inboard discs on the front and outboard drums on the rear, as it has been since introduction. Presently the front main caliper is fixed and has a self-adjusting piston at each side. It is



The DS has a new dash panel for the seventies. Round instruments replace the earlier rectangular panel. Dial on left depicts various warning lights by use of Gallic cartoons, center speedometer also lists stopping distance in feet, per federal regs. The tachometer, on the left, is a welcome item for the enthusiastic driver, and badly needed for some years.

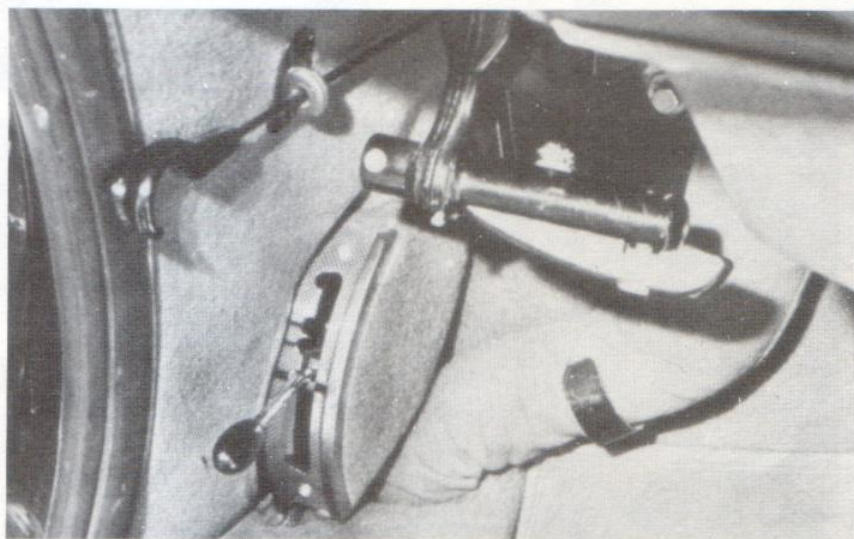
Suspension height adjuster is handy for the driver. Lever is pictured on "normal" drive height. The extremes of low and high settings are used only in extremely rough terrain (high) and changing a tire (high and low).

quite a simple matter to change disc pads now. The brake system has the usual twin circuit and is fully power operated. Special cooling ducts route extra air to the front brakes and a dash light signals when excessive pad wear occurs. The parking brake has independent pads and linkage. The ten inch rear wheel drums are of the leading and trailing shoe type. Hydraulic pressure is taken from the rear suspension units and in this fashion it is automatically reduced as weight is transferred to the front wheels during heavy braking, and varied in proportion to the load being carried in the car. The power assisted steering is of the rack and pinion type with a positive feel under most conditions.

Styling And Appointments

The styling on the Citroën is now classic and as delightfully different as ever. The body shape has been called everything from beautiful to downright ugly, and it does remain a matter of personal taste. The strikingly different body shape is a result of the desire for aerodynamic smoothness and low drag. The drag coefficient is quoted to be the lowest of any four door sedan in the world. This is no doubt true, and it is a function not only of the body shape, but the complete underpanning of all the underpinnings. For those who express horror or worse at the strange looks of the Citroën, there is a saying around automotive circles to the effect that the car gets better looking each time you drive any distance, motoring along in the solid comfort afforded by its unique design.

The DS has an integral steel chassis and body frame, but all the body panels are unstressed and easily detached, a handy feature for major maintenance or in the unhappy event of a fender smash. In fact, the entire rear fender must be removed to change the rear tire, and the whole works slides off with the removal



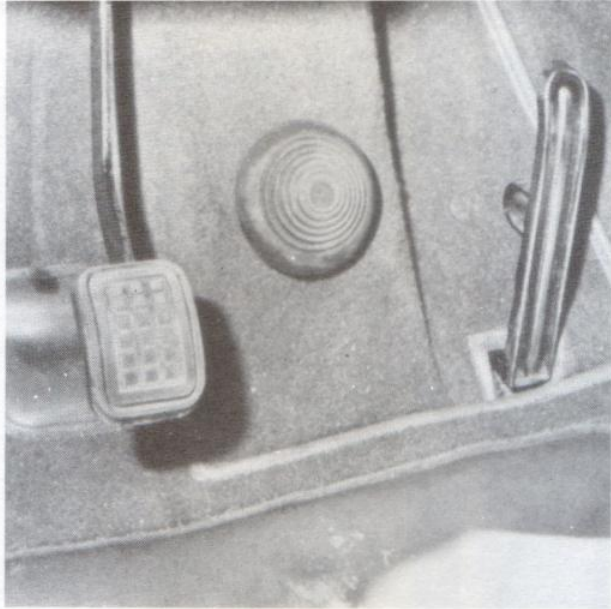
of a single bolt on the rear. As noted before, the body has changed very slightly over the years, but the quad headlights do give it a more attractive and purposeful look.

The interior appointments of the sedan are far more luxurious in many ways than far more expensive brands of cars. Deeply padded with foam rubber, the carpeting extends wall to wall and up the firewall. The leather seats with wrap around head rests on the DS 21 seem to be lifted directly from some exclusive men's club in London. The padding is extensive and seats are massive. Fully reclining and adjustable for height and rake as well as fore and aft, the seats are marvelously comfortable for anyone regardless of the physique. The rear seats are done in the same expansive fashion and a center arm rest can be put away when three people travel in the rear. Usable sized ashtrays are attached to the outboard ends of the front seat backs, and the whole rear side of the seat is lavishly padded for the added safety of the rear passengers. The clever door handles encompass a safety lock

on the opening mechanism and are the same on all four doors. Also on the doors are huge and heavily padded arm rests and the front doors have leather covered pockets that hold a good bit of odds and ends. Nice leather straps hang from the center door posts for the use of faint hearted passengers.

The big, ventless windows are well fitting and rattle free. The shape of the windows is a contributing factor to the lack of wind noise at highway speeds. In fact, the design there is so well thought out that one can drive fast with the front windows open and not a hair will be out of place. If the windows are half up the car must be slowed before the windows will wind all the way up and fit properly into the rubber stripping. The windows tend to bow out slightly at speed.

An elaborate heating and ventilating system has the controls strong all over the cockpit. Air ducts with adjustable blades are positioned on the ends of the dash panel. Air flow to the windshield or the body of the car is controlled by two levers on the hump caused by the back side of the engine. A round dial is just

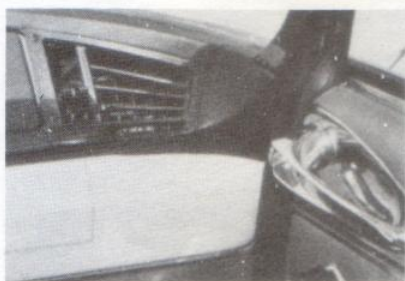


Foot controls are certainly different from most. Clutch pedal is somewhat standard, but accelerator is skinny and metal faced. Center button is power brake pedal and quite sensitive.



Safety feature on the hand brake is positive, unreleasable lock when tiny screw is turned to the left.

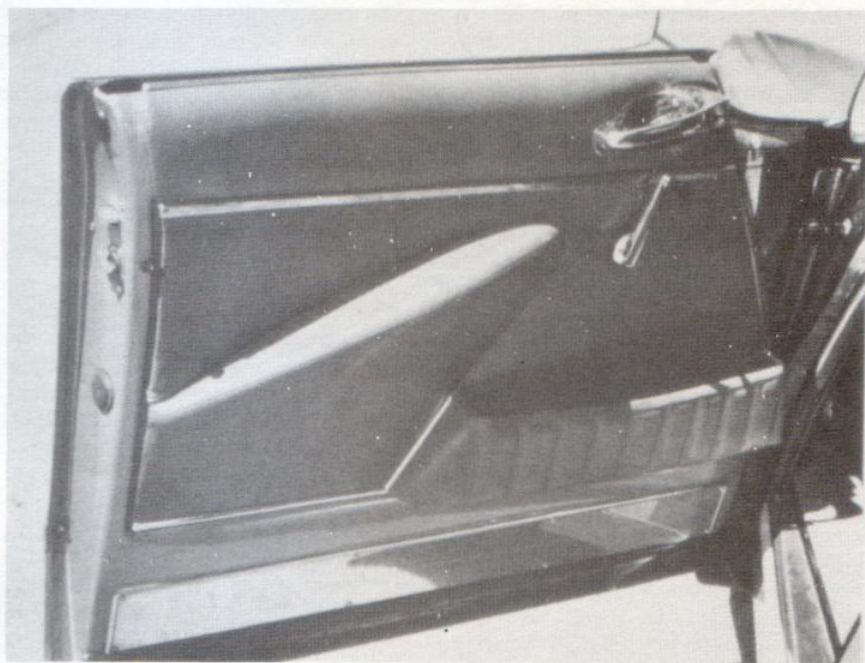
Front doors hold husky armrests and a handy door pocket for small items needed on the road. Bright metal kickplate protects the leather upholstery.



Fresh air vents on either side of the dash have myriad adjustments to control air flow.

below the levers to control the amount of desired heat. There are extra ducts at the base of the windshield pillar to deliver defrosting air to the side windows, and the rear window is fitted with impregnated electric wires for quick defrost in cold climates.

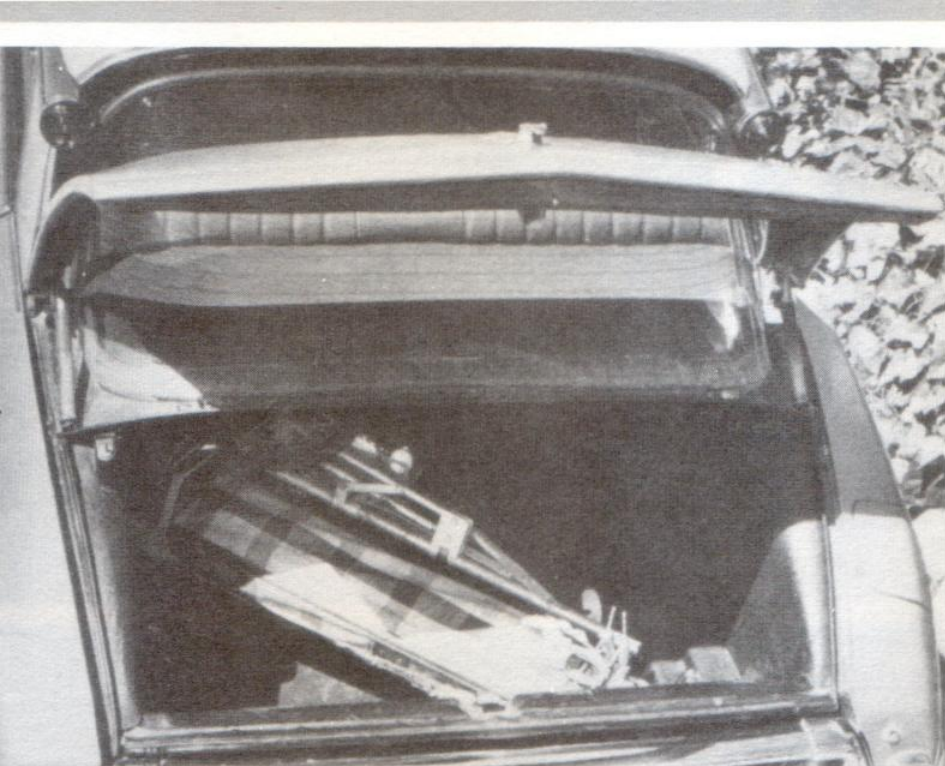
The dash panel is molded in the familiar shape, but British style, white on black, round dials have replaced the square instruments of the past. On the left dial are a series of warning lights clued by small pictures of their function in the Gallic style. The center dial contains the speedometer with a trip and total mileage counter and the braking distances are marked in feet on this instrument. On the left is the long awaited tachometer, and below, depending on the model, is the usual line-up of toggle switches for windshield washers, wipers, test lights and so forth. Both the manual or the Citromatic shift lever are attached to the right side of the steering post, and just in front of the gear lever is another stalk that actuates the road and parking light switches, and



the high beams, a hefty punch inward on this stalk produces a raucous blast from the town and country horns. Over on the left is the turn indicator stalk which sadly is still not a self-canceling unit. The ignition key slot (key goes in either end up) is just behind that on the left, and the rather antique starter button is on the right side of the post. The steering wheel is space age looking with a single spoke; it is quite a safety item and part of the original design. The good sized ash tray and cigarette lighter are located near the center of the panel and on top of the right hand section of the

dash is a smallish but adequate glove box.

Three point shoulder harness is installed on U.S. bound cars. We found it to be comfortable, which is rather rare these days. Of course it took a while to get the hang of the relatively tricky adjusting mechanism on the belts, but they could be made to fit quite well. On the DS most of the controls are well positioned for the driver's use, but it does take a bit of orientation to become accustomed to all the knobs that are labeled in the Continental fashion with pictures of their function. One of the



The huge trunk will accommodate golf carts or grandmother's trunk. Electric defrost is standard on the rear window, and notice the visibility out the back window with the trunk lid raised. Lights on the roof are the highly visible turn indicators.

most unusual features of the Citroën is the foot controls. The semi-automatic, of course, has no clutch pedal, but our manual shift test unit had the ordinary clutch pedal in the usual place. Over on the right a skinny metal faced accelerator pedal is perfectly usable too. But between these two pedals is an odd, round, rubber faced button that looks like an oversized dimmer switch. This folks, is the brake pedal, and with the power boost it is overly sensitive at first feel. It does take only a bit of pressure from the big toe to stand the 21 on its nose. The driver does get used to the brake pedal after a bit, but most drivers would prefer a more normal device for such a critical function.

On The Road

Most of the desirability of any car for the thinking driver is in its performance. How does it go on the road and in traffic, and does it have enough power to cope with domestic demands in driving. Many imported cars are viewed as a handy second car for running to the market, taking the kids to school, and other similar chores. But the family car must hold the whole clan in comfort, hold enough luggage for the vacation trip, and handle the interstate highway speeds without complaint. There are not many of the larger sedans from foreign

shores that are equal to these demands. The Citroën effects a compromise between the two worlds. Now the DS with its curb weight of nearly 3,000 pounds and a small four cylinder, 115 horsepower engine is not a sparkling performer at the drag strip by any means. The standing quarter mile, on the manual shift model, comes out in the middle 20 second bracket. Top speed also is around 100 mph, but it does take a fair amount of time and road to get there, especially the last 10 mph. However, the average driver of a four door sedan seldom runs it on the drag strip and he rarely has the occasion to cruise at 100 per. Still the accelerative values of a car are important in the hectic day to day driving of the average motorist. In acceleration the DS 21 is neither close to the best or absolutely the worst. Like many relatively underpowered vehicles, the DS must be stirred vigorously through the gears to get the best performance from a dead stop. But, once rolling the car performs admirably and its low drag body contributes heavily to effortless cruising at turnpike speeds.

The DS is right at home on secondary roads. Remember that most French roads, other than the Autoroute, are really poor by American standards. On less than perfect surfaces the Citroën really shines as its suspension soaks up all kinds of road shocks. The handling is really fine too. There are few cars of any size as sure footed as the Citroën. The front drive and the good weight distribution coupled with the standard equipment Michelin radial tires combine to give the car excellent handling on twisty roads, on any surface, and in any kind of weather. The power steering can feel a



The Citroën has many unique mechanical features. For instance the front disc brakes are mounted inboard, and the brake is accessible for service from the top. In fact the pad can be changed in just a few minutes without ever getting under the car.

bit notchy on really tight turns, but on the whole the car handles without the very heavy feel so common to many front drive vehicles.

Braking action is quite good also in the wet or dry. The power system for the brakes, suspension, and steering has a built in security device. The system is phased so that in the event of failure, warning is given first by heavy steering, second by the suspension sinking, and finally, after a number of applications, failure of the power assistance to the brakes. Of course there is the brake warning light to also warn of low pressure, but Citroën's progressive system ante-dated the lights by many years. Another kind of nifty safety device is the button under the handbrake ratchet bar; it can be turned to lock the brake so that anyone merely trying to release the handle would find the hand brake unmovable.

A nice feature of the DS on the road is the restful, bounce and pitch free ride enjoyed by the rear seat passengers. The exceptional directional stability of the car and the suspension compensation keeps all the occupants comfy regardless of the type of road. There is little tire roar or road noise either, but the engine is quite audible when it is working hard.

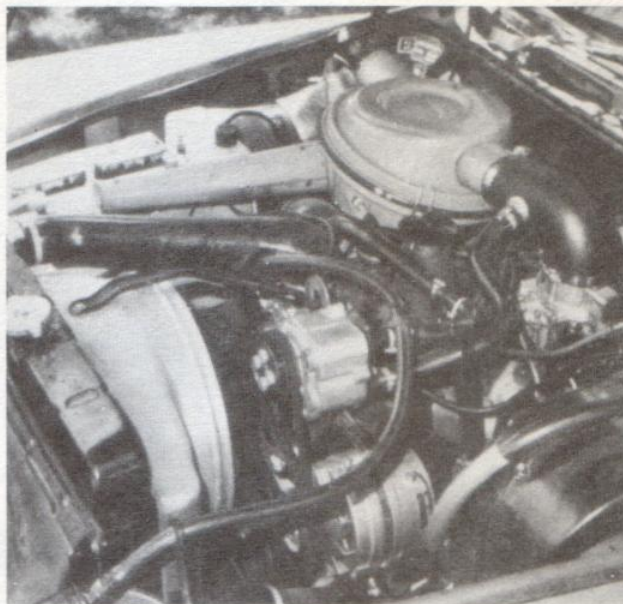
There is another handy item in the huge trunk with its enormous carrying capacity. Unhampered by a rear drive unit, the entire space is devoted to luggage and the seventeen gallon gas tank is located forward of the trunk under the rear window. Speaking of the

rear window, another slick thing about the Citroen is this: when the trunk lid is open, it is still easy to see through the rear window using the center mounted rear view mirror.

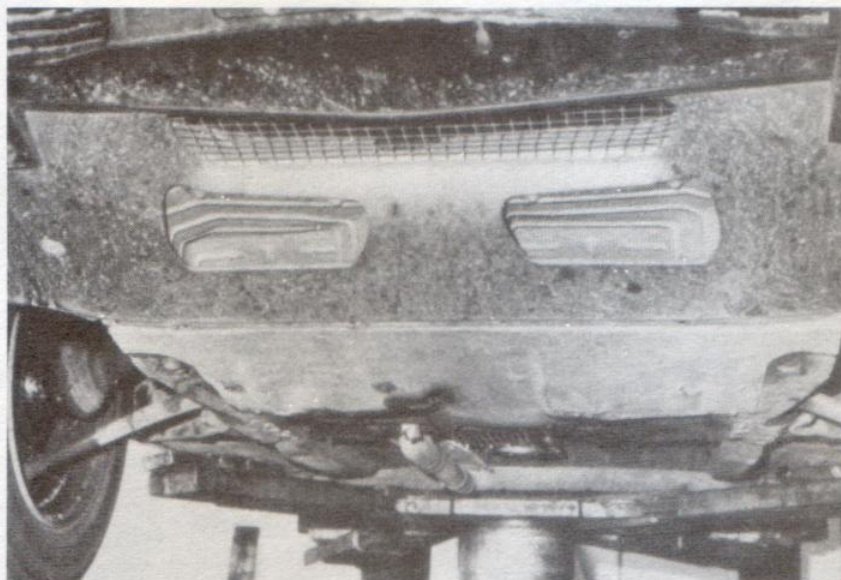
Summary

The DS 21 Citroen is certainly a controversial vehicle, loved wildly by its devotees and scorned by many as too radical to be practical transport. Naturally its many strange engineering and design features are the very things that endear it to the loyal fans and owners. The real buff revels in the very differences that can make service a hard to find and expensive proposition.

We found the car to be practical transport. It holds five adults and their impedimenta in exceptional comfort, performs with reasonable spirit on the road, rides like nothing else on four wheels, and gets over 23 miles to the gallon of premium gasoline. After a



The engine compartment is stuffed with plumbing. The engine itself rides back toward the firewall. Large air cleaner and air injection pump (over the alternator) handle the air pollution controls. Entire power train is up front as is the spare tire and tool kit. Large cannister, bottom left, is fluid reservoir for extensive hydraulics.



The DS 21 is completely underpanned, a feature that adds to its aerodynamic qualities and quietness of operation. The air intakes for the radiator and brakes are visible under the nose and the rest of the car's underbody is smooth except for the exhaust system.

week behind the wheel of the Citroen, any other automotive seat begins to look and feel like a sixteenth century torture rack. But the drawbacks to owning a sparsely distributed vehicle heavily laced with highly specialized parts are something to be considered. Depending on the options the Citroen costs between four and five thousand five hundred bucks. That is a considerable investment for any car buyer. The DS is a big car even by American standards with its 123 inch wheelbase. But the

overall length is near to the domestic intermediates at 196.5 inches. There is not much overhang on the Citroen which makes it appear smaller than it is from some angles. The performance is adequate, but less than most sedans in its price range. However, inside there is spacious head and leg room, and the rich trim gives an aura of luxury beyond its price.

The lasting impression gained from the DS 21 is of the great comfort and the complete "differentness." Everyone likes the car much better after becoming accustomed to its many oddities. It is packed with strange and wondrous details, and offers the very best in relaxed and level ride motoring. It is truly one of those cars that must be evaluated by the individual, and it must be driven for a goodly distance before it can be fully appreciated.

ROAD TEST

Citroen DS-21

Data in Brief

DIMENSIONS

Overall length (in.)	190.5
Wheelbase (in.)	123.0
Height (in.)	58.0
Width (in.)	70.5
Tread (front, in.)	59.0
Tread (rear, in.)	51.0
Fuel tank capacity (gal.)	17.0
Luggage capacity (cu. ft.)	n.a.
Turning diameter (ft.)	36

ENGINE

Type	four cylinder, in-line, water cooled, OHV
Displacement (cu. in.)	132.7
Horsepower (at 5750 rpm)	115
Torque (lb./ft. at 4000 rpm)	126

WEIGHT, TIRES, BRAKES

Weight (lb.)	2855
Tires	180 x 15 Michelin XH Radial
Brakes, front (inboard)	disc
Brakes, rear (outboard)	drum

SUSPENSION

Front	independent, parallel semi-leading arms, hydropneumatic struts with height control, anti-roll bar
Rear	independent, single trailing arms, hydropneumatic struts with height, anti-roll bar

PERFORMANCE

Standing ¼ mile (sec.)	20.1
Speed at end of ¼ mile (mph)	73.4
Braking (from 60 mph ft.)	n.a.

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