FRONT DRIVE VOLUME 9 No. 3 September/October 1985
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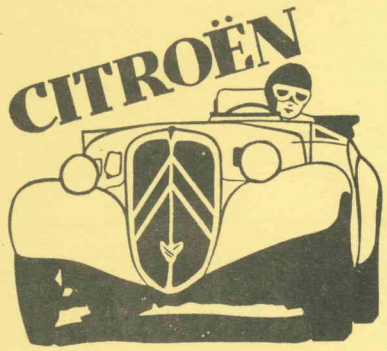
Windcheater & T shirt designs

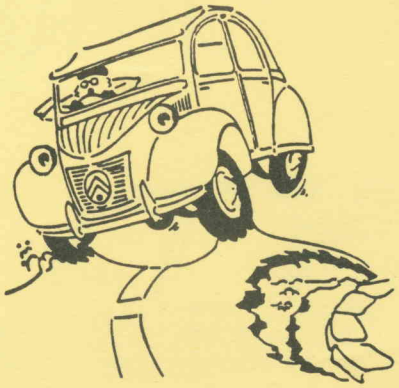


ROADSTER

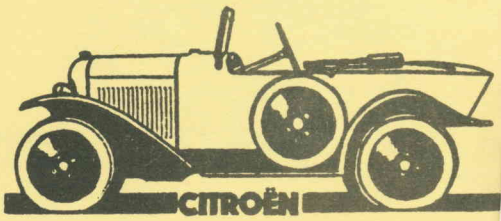
AVAILABLE ONLY TO
2 CYLINDER OWNERS
& ONLY GREEN ON
YELLOW COLOURS.

CLUB BADGE
3 SIZES:
SMALL (BREAST POCKET)
MEDIUM, LARGE

COUPE



2CV



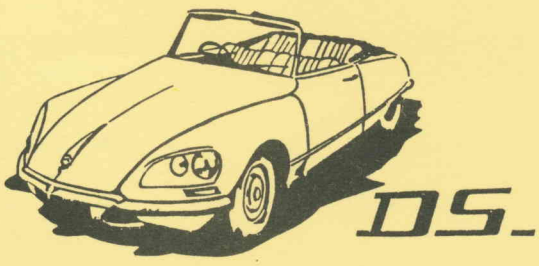
5CV
BREAST POCKET
SIZE ONLY

LIGHT 15

ANNIVERSARY

SCROLL
BREAST POCKET
SIZE ONLY

BIG 6



DS

CHEVRON BADGE

Dates of issue for magazine: Mid-January, March, May, July, September, November.

Closing dates for copy: Mid-February, April, June, August, October, December.

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FRONT DRIVE

The magazine of the Citroën Classic Owners Club of Australia

In this issue, we particularly salute the Citroën DS or Goddess which burst upon an astonished motoring world some 30 years ago. Perhaps the most singularly innovative motor vehicle ever produced for general use, it and its derivatives still say "France" and "Citroën" to anyone fortunate to see one glide past.

Otherwise, some vital comments on keeping your Traction cool (more to follow), a guide to motoring metrics, and our usual other features. Details of recent successful rallies are held over. Don't forget to let us know about your restoration tips, personal experiences, anecdotes etc, and, as below, we re-issue the call for someone to take up the challenge of being or assisting as Activities Officer (one offer of assistance to date).

Of course any club is only as good as the efforts put in by its members. If that well-known American had belonged to our club, he might have said: "Ask not what CCOCA can do for you" (and it can do lots!). "Ask what you can do for CCOCA". There is of course lots you can do for CCOCA and your fellow members. Perhaps you'd like to read the call for someone(s) to be the replacement Activities Officer following Robyn Couche? -- see the message inside the back cover.

Good reading and happy Citroëning

Bill Graham, Peter Simmenauer, Paul Chapman.

COMING RALLIES

September 25, Wednesday	General Meeting, Nunawading
October 20, Sunday	Club Auction & Barbecue
October 30, Wednesday	Night Trial, Nunawading
November 9-10, Weekend	Camping Trip
November 16-17 Weekend	Bendigo Swap Meeting
November 27, Wednesday	General Meeting, Nunawading
December 4, Wednesday	Christmas Breakup

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Meetings are held on the last Wednesday of every month at 8.00 pm at the Coffee Shop* Meeting Room at the Nunawading Civic Centre, Maroondah Highway, Nunawading, east of Springvale Road.

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*NOTE: THE COFFEE SHOP AT THE NUNAWADING CIVIC CENTRE IS NOW CALLED THE COURTYARD ROOM

BIRTH OF THE Ds

"AS EXPONENTS of the motoring *avant garde*, there's no-one to beat Citroën – indeed there's no-one who even comes near their advanced technical thinking. For years the French company have scorned the idea of a car being pushed along by its rear wheels, favouring instead front wheel drive traction.

Over those years Citroën have built up a reputation for being able to produce something out of the ordinary. And yet even in that knowledge, every new Citroën brings a gasp of astonishment from onlookers. Perhaps it's fortunate that the company are not unveiling new models once a year! But that gasp could not have been bigger than in 1955 when S. A. Andre Citroën took the wraps off the DS19 ('DS' standing for *Déese* or 'Goddess'). For here was a car so futuristic and advanced that ten years later most of the opposition had not begun to catch up.

Following the tradition set by the *Traction Avant*, the DS naturally had front wheel drive, and had its gearbox mounted ahead of the engine. But new to the public was the extensive use of hydraulics which by the end of the line was to be used for the suspension, brakes, steering and gearchange. Conventional the car was not; no wonder it has caused so many headaches and problems for mechanics new to the car.

Citroën can take a pat on the back for being one of the first volume manufacturers to recognise the importance of aerodynamics. All DS cars have shared the same wind cheating shape, though only the later cars took the theme to its natural conclusion, when the earlier prone headlamps were neatly hidden away beneath glass cowls. Indeed it is astonishing to find that in a time of change for change's sake, the DS was able to stay basically the same for so long. But then Citroën never did bow or compromise to fashion.

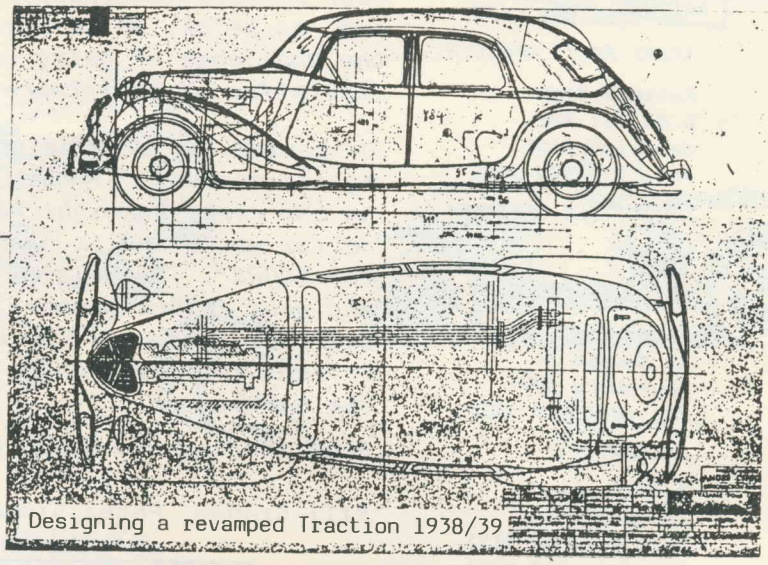
If there was one thing that hoisted the Citroën head and shoulders above the rest on the road, it was the car's supreme comfort. It was never a car for hurrying through a series of mountain hairpins, but show it a stretch of long, fast road and the car would be in its element. Britons have been fortunate that – up until recent times anyway – the roads have been the model of smoothness in comparison to the French *pavé* and heavily pitted *Route Nationales* where a bad camber means the road is virtually triangular.

But as always with the *avant garde*, the car is an acquired taste. The extreme smoothness — — — — — — —"

Old Motor. November, 1979.

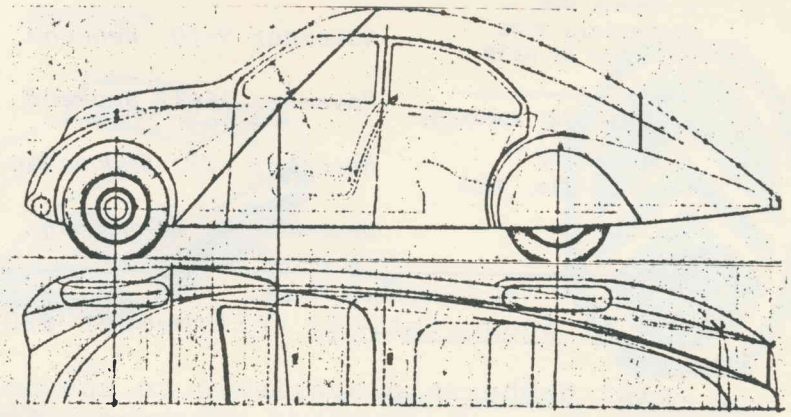
"Old Motor" of 1979 put it so well. Citroën does epitomize the automotive *avant garde* for the majority of observers. It was true then and it still is today. The most audaciously *avant garde* of all the Citroën models is still for most people, the DS or Goddess, released to the public at the Paris Motor Show at 9.00 a.m. on Thursday, October 5, 1955. Audacious for the sheer number and magnitude of its novel features; and the public responded enthusiastically - 749 orders in the first 45 minutes, 80 000 by the end of the Show. This year, the earliest Ds are 30 years old and still audaciously, unbelievably *avant garde*. Over 1.3 million were ultimately produced in various forms and models through to 1975.

The birth of the Ds was based on valiant conceptions and followed an extended and difficult pregnancy which commenced soon after the birth of "older sister" - the Traction Avant 15-6 - and was not made easier by the intervention of war.

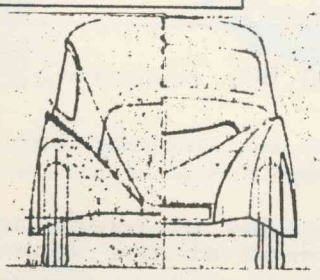


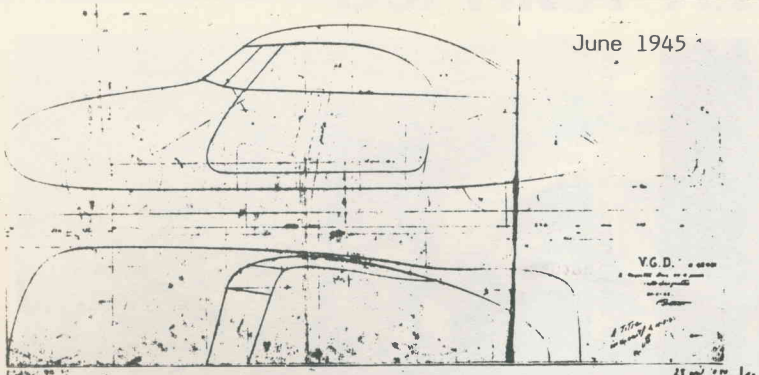
Designing a revamped Traction 1938/39

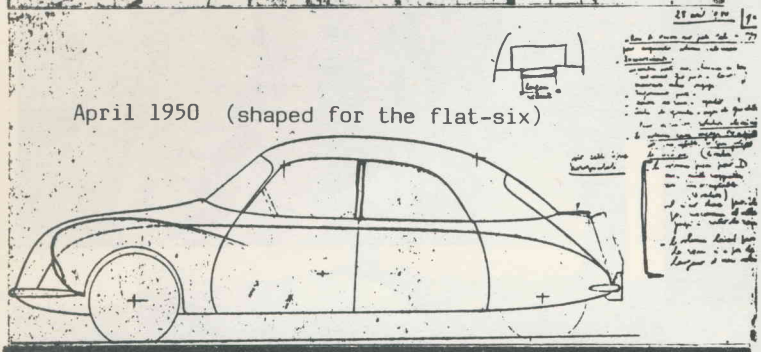
Some design effort went towards smoothing up the classic but not so aerodynamically efficient profile of the Traction Avant, with a view to releasing an improved interim model of the Traction in 1940. However, the real dream of Pierre Boulanger, head of the Citroën factory, was for a brilliant and prestigious successor to the Traction - his VGD (voiture à grande diffusion), capable of 125 km/h (VGD 125) or 135 km/h (VGD 135). Proposed for release in 1940, the VGD became the "grandmother" of the DS.

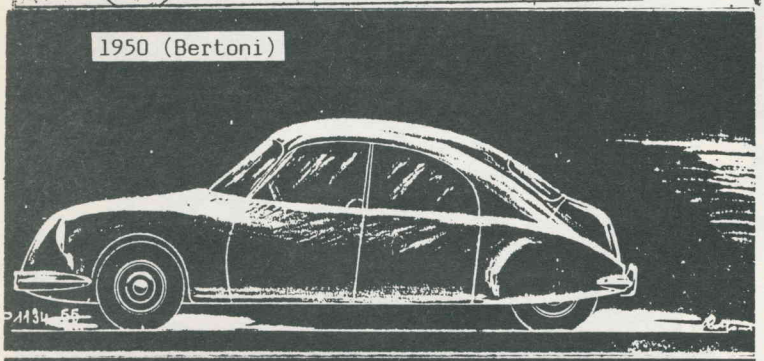


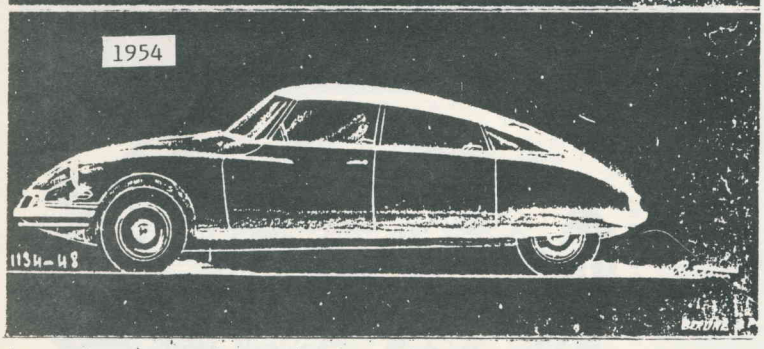
VGD design 1939



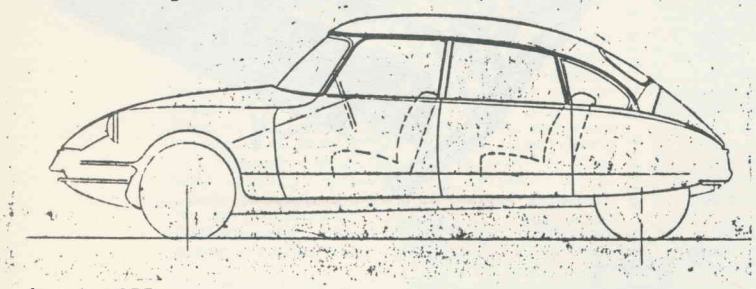




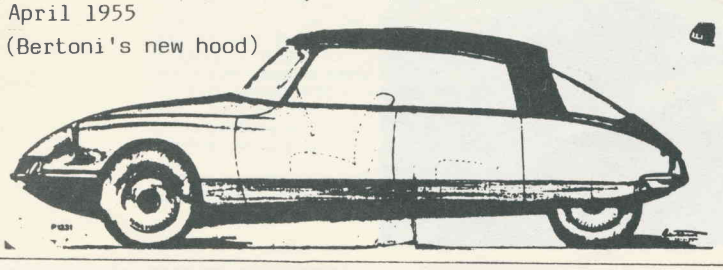




(six-glass version for Bercot)



April 1955
(Bertoni's new hood)



Various motor configurations of motor were considered for the VGD, especially to satisfy a desire that the spare wheel should be fitted under the bonnet - the in-line 15-6 motor aligned transversely; three cylinders in star formation with the clutch and gearbox set vertically (!); and a flat-six designed by Walter Becchia and inspired by the concept ot three 475 cc 2CV motors coupled in line. Eventually though, it was the tried-and-true 4-cylinder motor from the Traction Avant which in refined form, was to power the first Ds.

The death of Pierre Boulanger at the wheel of a Traction Avant in 1950 could have also ended the development of the VGD project. In the custom of the time, he ruled alone and no one knew exactly what he had in mind. Only his cryptic concept notes survived in the little black notebooks which he kept. However, the development team soldiered on under the leadership of André Lefebvre, already renowned as the "Father of the Traction". Major refinements were added - the four-speed gearbox and the superb hydropneumatic suspension, already developed by Paul Magès. Overall, there was an obsession with lightness, aerodynamics and a low centre of gravity - the hallmarks of Lefebvre. The enthusiastic Pierre Bercot who later became head of the factory, chose to push the VGD project into the market-place as a vehicle far ahead of its time. The rest of course is well-known history.

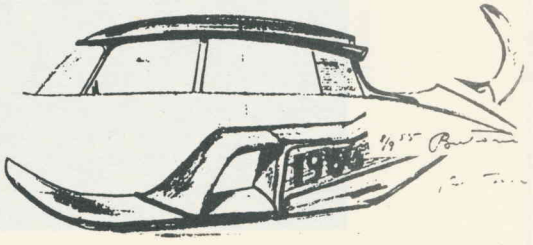
But there are some intriguing anecdotes and legends associated with the development of the D-series, and could be the topic of more research and writing. The use of the Traction 15-6H as a market- and servicing-exercise for the hydropneumatic suspension is well-known. Less widely appreciated is that the last of the four-cylinder Tractions (the 11D) served as a test-bed for some of the motor improvements intended for the DS e.g. the use of slipper bearings. It is also rumoured that other features of the DS were incorporated into a few of the 11Ds, especially those coming from Slough (U.K.). Some are said to have received the four-speed gearbox, alloy cross-flow heads and even "alligator-type" bonnets to provide easier access to the spark-plugs set centrally in the D-type head.

As well as its debts to the Traction, the DS owed much to its "little sister", the TPV (later to become the 2CV) - for example, the flat-six motor later abandonned (above), the rigid punt-type base carrying a light and largely removable body-work (the "four wheels under an umbrella" of the 2CV), and it was on one of the prototype 2CVs that Magès developed his hydropneumatic suspension and "sold" it to Boulanger.

Irrespective of such uncertainties and the difficulties of the DS's conception, gestation, birth and adolescence, the members of the D-series are now in mellow middle years and are assured of a unique place in automobile history.

Sources etc: Front Drive 4 (2) June/July 1980
L'Album de la DS. Borge & Viasnoff. EPA, 1983.
(?). Olivier de Serres (in preparation)

Bill Graham.



September 1955 (final bumper and hood)

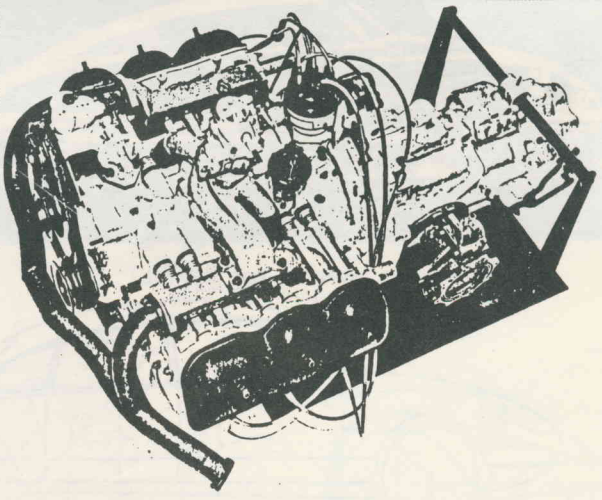
Behind the scenes...

Pierre Boulanger: conception and direction

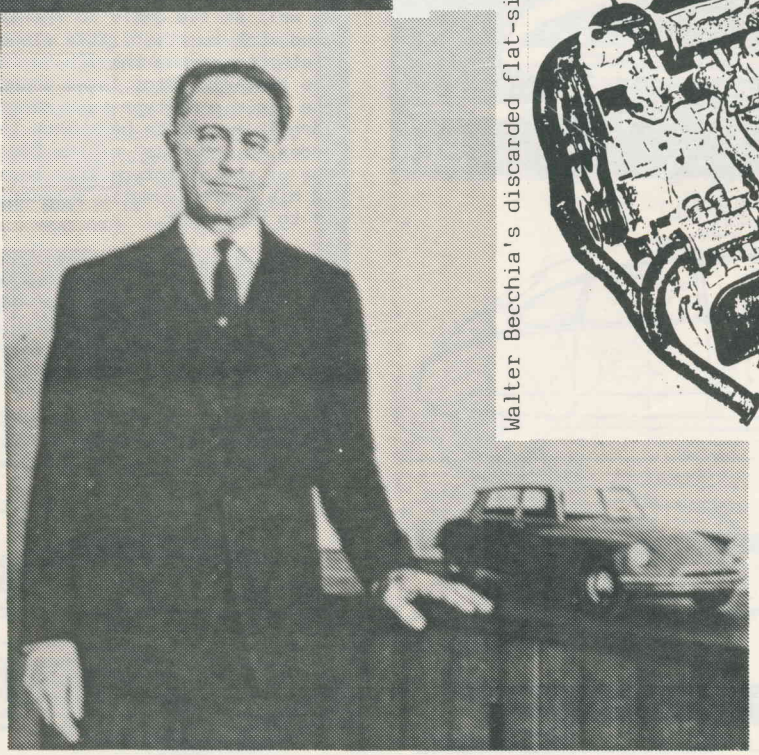
André Lefebvre: engineering

Flaminio Bertoni: styling

Paul Magès: hydropneumatics

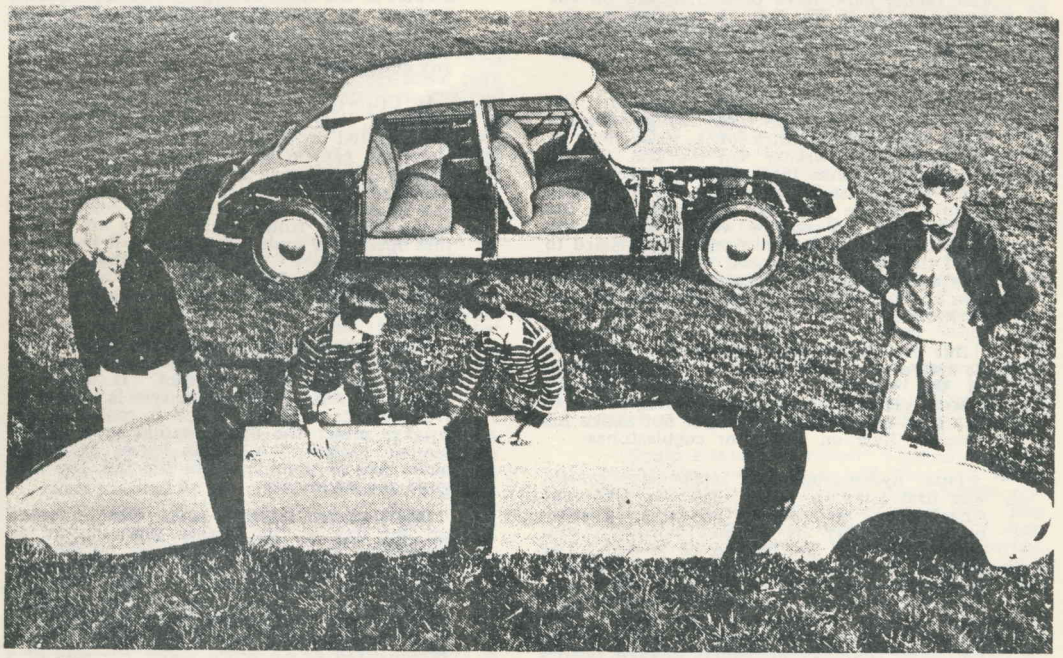


Walter Becchia's discarded flat-six motor



Pierre Bercot: direction and commercialization

DS: FIRST FEELINGS



IT was three o'clock on a cool autumn morning last October in Paris. A big trailer, carrying what appeared to be a white-sheeted wraith, backed up to the entrance of the Grand Palais, the huge turn-of-the-century exhibition hall which plays host every year to the Paris Motor Show. Slowly, while the trailer's crew watched for prying eyes and cameras, the white phantom was smuggled into the Grand Palais.

The next morning, every newspaper in France dusted off headline type usually reserved for a declaration of war to scream: La Bombe Citroën! The effect, to tell the truth, was no less startling than if a bomb had actually exploded under the glass roof of the old Grand Palais. For the first time in more than two decades, the Société André Citroën has changed the lines of its front-wheel-drive sedan.

Although the Grand Palais boasted such creations as the Vega, France's latest entry into the high-powered sports car field (see cover), the Citroën stole the motor show. This was more than just a new car: a landmark on the French scene was changing.

During the early hours of the show, Citroën promised delivery within three months. Ten days later, after thousands had patiently waited for a squad of policemen to allow them to glimpse the car, delivery delays had soared to twenty-seven months.

The cause of this mass hysteria was the front-wheel-drive Citroën D.S. 19. In French, D.S. is pronounced déesse, which means goddess, and it is doubtful whether Venus or Diana ever received such homage from their worshippers. French newspapers and magazines had offered as much as five million francs ($14,000 or £5,000) for a sneak photograph of the car before the show. Reporters tried to photograph it by helicopter and even managed to steal a set of plans (the wrong ones, though) from the Citroën factory. One paper actually published an exclusive photo —only to learn that it had bought a picture of an Oldsmobile sporting a hand-made radiator-grill decorated with Citroën's double-chevron trade-mark.

In point of fact, the D.S. doesn't look like any other car on the face of the earth. Its low sloping hood might bear a resemblance to that of Raymond Loewy's Studebaker, but there the kinship ends. Under a plastic roof, the D.S. tapers out to a flat, streamlined rear end, broken only by two direction-signal lights jutting out from both sides of the rear window, as big in area as the windshield.

This unconventional rear end has served as a rallying point for the anti-déessistes. In cars as well as in everything else, there is always an opposition party in France and anti-déessisme was founded within half an hour after the opening of the motor show by a sweet young thing who squealed: "But it doesn't have any tail!" In 1934, when Citroën's previous model (still in production in 1956) was introduced, experts predicted that it would not last six months. The reason: no one would buy a car without running-boards and with a strange gadget termed by the manufacturer as hydraulic brakes.

The revolution in the new Citroën does not end at its rear. The D.S. 19 is the first "automatic" car to be produced in Europe where designers have always been forced to shy away from such fuel-eating aids to driving as clutchless transmissions, power steering and power brakes. The French motorist pays the equivalent of $.65 a US gallon (5s. 7d. an Imperial gallon) when he stops at a pump, and he cannot afford a 200 h.p. engine to shift his gears for him.

Citroën's engineers kept this in mind as they worked behind an iron curtain of secrecy in the company's rambling factory on the Quai de Javel, out where the poetic Left Bank of the Seine suddenly begins to look like Detroit or Birmingham. They came up with what is literally a hydraulic power-station tucked under the snout of the D.S. 19. It consists of a pump—less than half the size of an ordinary starter—which compresses a mixture of liquids and gases into a series of seven reservoirs. When the pump is working, it draws less than one horsepower from the Citroën's 75 h.p. engine. But, 90 per cent. of the time, it does not work because the reservoirs do the job (unlike other automatic cars where the pump must work continually to maintain pressure needed to operate driving-aids). This means that the D.S. 19, with a four-cylinder engine, can carry five passengers at a top speed of 87 mph or cruise at an average of 45 mph and only eat fuel at the rate of 23 miles per US gallon (28 miles per Imperial gallon). A big boon for thrifty drivers.

Meanwhile, the reservoirs keep busy. First, they take nearly all effort out of gear-shifting. There is no clutch-pedal on the D.S. 19: instead, the driver changes gear by flicking a lever above the dashboard. A hydraulically operated clutch, which disengages automatically when the motor slows down to 500 rpm, does the rest. The Citroën has four speeds forward and the driver selects his gear himself—which is as close as you can come to automatic gear-shifting, Citroën's engineers believe, without sacrificing fuel economy.

Secondly, the miniature powerhouse takes care of the braking—the driver merely pushes

his toe on a small rubber button on the floor and pressure from the reservoirs stops the car. Disc brakes, hitherto the monopoly of sports and racing cars, have been mounted on the front wheels of the D.S. 19. Cooled by air-intakes below the front bumpers, these brakes eliminate loss of stopping-power through over-heating.

Citroëns have always been famous for the way a driver could spin them around a right-angle turn with a flick of a wrist—but he required strong wrists. On the D.S. 19, the powerhouse comes into play and the driver need only caress his goddess's steering wheel. Citroën, by the way, has eliminated ALL the spokes from the steering wheel: the steering column bends as it comes out of the board to meet the rim of the wheel. The result is not only a flexible wheel in case of accidents, but also a virtually uninterrupted view of the dashboard.

But the major innovation of the D.S. 19 is its system of suspension, conceived by Citroën as the answer to the French motorist's eternal plea for a car that will hug the road like a Le Mans winner and yet not shake his sensitive liver on bumps or cobblestones.

This "hydro-pneumatic" suspension system was first tried in April, 1954, on the rear wheels of the six-cylinder Citroën, a big sedan used principally by cabinet ministers and drivers who do not like to be passed. The D.S. 19, however, uses it on all four wheels. The independent "spring" of each wheel consists of one of the powerhouse's seven reservoirs and it resembles a large globe. The weight of the car compresses a liquid in the bottom of the reservoir which, in turn, pushes up against a rubber membrane to compress the gas. Ordinarily, the D.S. has the "hard" feel of a sports car, but, when it hits a bump, the liquid flows out of the reservoir to give more play to the "spring," then flows right back in again. Automatic height-correctors adjust the pressure in the reservoirs according to the car's load or changes in road conditions.

Here, too, the hydraulic powerhouse and its little belt-driven pump do the work. But what if the belt snaps? Theoretically, this should be as total a disaster as a dead battery on the normal "automatic" car which leaves its owner with two tons of chromium-plated machinery that he must push at 30 mph.

Not so with the D.S. 19. With fine Gallic distrust of the machine age, Citroën's engineers have pessimistically thought of everything that could happen to a car. The D.S. can be placed in gear and pushed—and they have even provided their goddess with a crank.

If the belt snaps and the pump stops, a red light flashes on the dashboard. The driver turns a button and locks the hydraulic system to keep the pressure up in the reservoirs. This reserve of pressure enables him to change gears and use his brakes from thirty to forty times, which Citroën deems sufficient to enable him to reach a garage where a mechanic can fit his spare belt (a three-minute operation if he decides to do it himself). If he does manage to use up his reserve of pressure, there is a pedal-operated mechanical brake next to his left foot (ordinarily, this brake can be locked to serve as a parking brake). In all, the D.S. has three independent braking systems—two hydraulic and one mechanical—in case of a leak in a brake line. As in other "automatic" cars, the steering gear immediately becomes hand-powered in case of a pressure failure.

Since the starter of the D.S. is operated by the gearshift lever from the neutral position, the car cannot be started in gear. However, a twist of the same emergency button enables a driver to leave his car locked in reverse while parking on a hill. On the road, the braking effect of the engine is the same as in any conventional car.

If Citroën has overlooked any perils of motoring, it is only because they have yet to be invented by French drivers. Flat tyre? Only one central nut (instead of five) need be turned to remove a wheel from the D.S. 19. Smashed fenders? A rear fender of the D.S. can be lifted off by loosening one bolt; loosen three and the front fender comes off. Hood flies open at 60 mph (even though it has three separate locks)? The back of the hood is almost a semi-circle; when it is open, the driver can still see the road through his windshield.

Even when a layman—or his wife—looks under the hood of a D.S. 19, he can see that something has been changed. It would be impossible not to: the spare tyre is tucked in front of the radiator, which is cooled by air intakes under the bumpers and by a multi-bladed plastic fan. This leaves seventeen cubic feet of clear space in the D.S. 19's luggage compartment.

Shortly after the Paris Motor Show, I turned up one day at the Citroën plant where an automatic elevator deposited me outside the public relations department of France's third largest car manufacturer. (Until recently, Citroën was in second place after Renault; however, since Simca and Ford amalgamated, their new company has taken second place.) It consisted of an office about the size of a modest hotel room, and a staff of two, an engineer and a pleasant woman executive who took care of the press.

"We advertise on the road," said Citroën's one and only spokesman, who insisted on remaining anonymous. "When a front-wheel-drive Citroën passes you on a wet winding road, that's all the publicity we need."

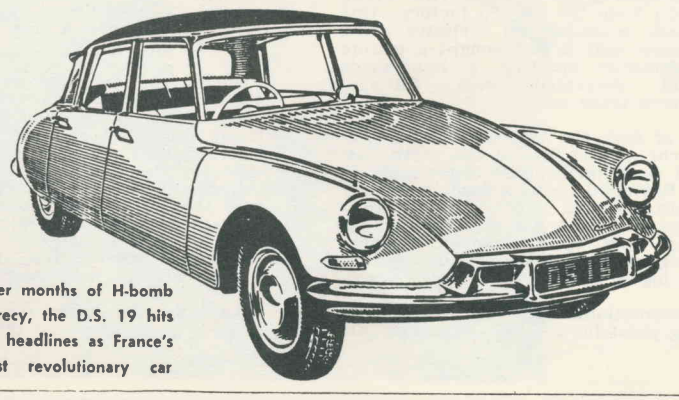
The Citroën man sounded like a voice out of the past when a man needed only to build his better mousetrap without describing it in lush prose or poetry set to music.

"We received more space than any other make during the Paris Motor Show and we didn't spend a franc on advertising," said our spokesman, then suddenly corrected himself with a smile: "Oh, yes, we bought a bouquet of flowers for a French film actress who posed with the D.S."

Citroën used the same hush-hush policy in 1949 when it launched its two-cylinder 2CV Deux Chevaux (Two Horses), rated at only two French fiscal horsepower, as compared to eleven for the D.S. 19 and twenty-one for a light American car. Not only that, but it exhibited the car in the Paris Motor Show without its motor.

"They told us we wouldn't sell a single one," recalled our spokesman comfortably. Citroën did not try very hard to sell the 2CV, either. Instead, it doled out cars only to doctors, nurses, farmers, travelling salesmen and other drivers who could be counted on to use them hard.

"When a driver rolled up 35,000 miles in a year without any repairs, he talked about it," the Citroën man went on. The delivery delay of the canvas-backed 2CV—whose suspen-



After months of H-bomb secrecy, the D.S. 19 hits the headlines as France's most revolutionary car

sion system was recently copied by one of America's highest-priced cars—has now risen to very nearly three years.

Both the 2CV and the D.S. 19 are now being sold in the United States in Citroën's first venture into the American market since 1937. Citroën has its own asembly plant in England at Slough, where it turns out Anglicized versions of its cars complete with right-hand drive, leather upholstery and sedate mahogany-coloured dashboards. Needless to say, it does advertise in Britain and in the United States.

As for the Citroën 11—the front-wheel-drive traction avant used by all French gangsters because of its prowess on turns—it is still being produced in 1956. Except for a rear trunk, new wheels and a changed hood design, it has the same lines as its 1934 ancestor (which introduced torsion-bar suspension, now being adopted in the United States). Only one part from the old 11, the cylinder block, has been used in the D.S. 19.

"Suppose we take a ride in the D.S.," the spokesman suggested. "Then you can see why we don't have to advertise it." He led the way out of his office and down to a vast basement where a blue-and-grey goddess was parked next to a rack filled with bicycles. Two colours are a surprise to the majority of Frenchmen who are familiar only with the dark-toned models of the last twenty years.

"We've eliminated the window frames on the doors," said our Citroën man. "This means that the width of the windshield support is less than the distance between your eyes, and you don't have any blind spot." Conventional deflectors on the front windows have also disappeared and are replaced by adjustable interior vents on both sides of the dashboard.

I asked him about the complaint that the D.S. had no tail. He laughed: "When we designed the body of the D.S., we started out with five passengers and built a car around them. It's not our fault that passengers don't have tails!"

Just then, a young test-driver turned up. He slid behind the wheel, started the engine and we rolled out of the basement. It was raining and the axle-crunching cobblestones on the Quai de Javel glistened.

At the first intersection, a policeman smiled broadly and stopped traffic to let the D.S. go by. Now we were running along the Seine out toward the Meudon Forest in the southwestern suburbs. The speedometer read 50 mph, but the "spring" ironed out the paving stones. We might have been riding on air—and we were.

"This is nothing," said the spokesman contentedly. "Wait until we get into the woods." He was right. To demonstrate the D.S., Citroën uses a road in the Meudon Forest which consists principally of curves and potholes, all on a hump-backed surface.

Our driver put the D.S. up to 65 mph in third gear and shifted into high (although it has four speeds, its top gear is not an overdrive—Citroën has always shied away from the overdrive for safety reasons). A few yards away, a small Renault had backed out into the middle of the road. Our driver calmly ran the D.S. up onto the shoulder of the road at 60 and, without even a jar, came back onto the highway. At a touch of his toe, the speedometer slid down to 30 mph, without the trace of a skid on the wet, treacherous surface.

"Could I take the wheel?" I asked, remembering that I had been told that only three living mortals (all Belgian journalists) not employed by Citroën had driven a D.S. The spokesman hesitated, looked out of the rear window and nodded to the driver. I slid behind the wheel and discovered that someone had finally built a car for a driver six feet two inches tall.

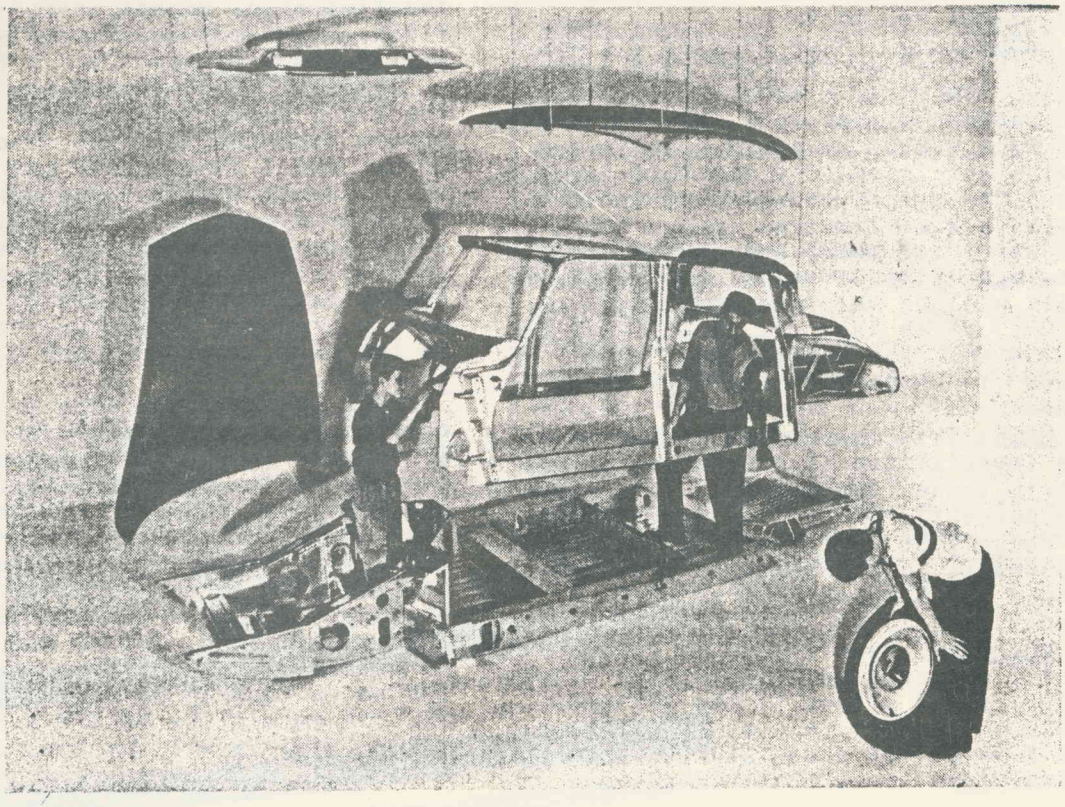
Near the Villacoublay Air Base, I put the D.S. through its paces as a family car: that is, starting, stopping and cutting the wheels to turn around handily at a narrow crossroads. Then I cruised along over the potholes at 50 mph. The D.S. rode as steadily as an airliner in the stratosphere. I could hear the noise of wheels hitting the holes, but that was all.

Suddenly, a horn blared and a black Citroën 11 loomed up in the rear-view mirror. Clutching his steering wheel like grim death, the driver howled behind me at 55 mph in second gear with his two left wheels off the road.

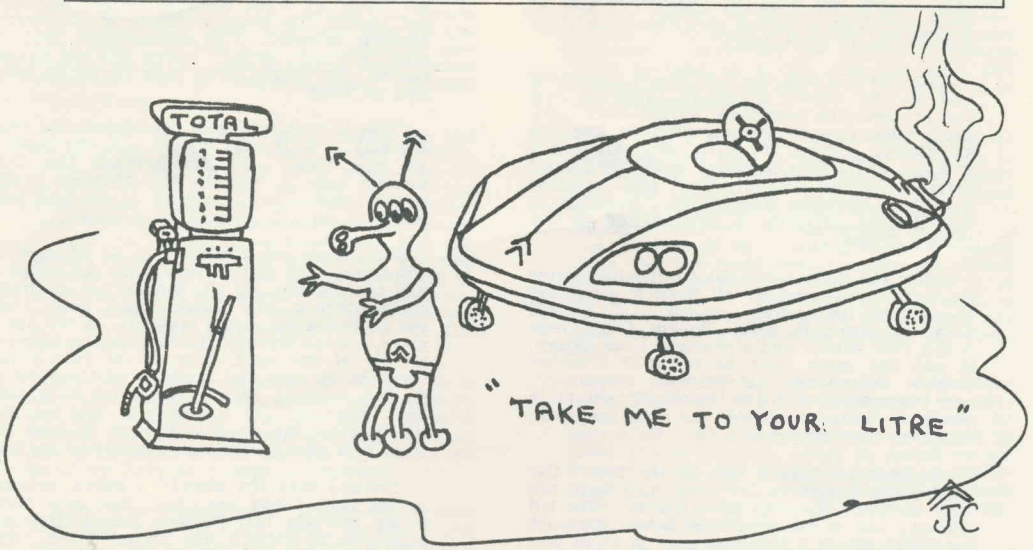
"Wait until he gets home," said my Citroën man. "He'll be able to tell his wife that he passed a D.S."

DANIEL BEHRMAN

Reprinted from "REALITES", Le Magazine de France



TAKE ME TO YOUR LITRE



Sometimes, like the Little Green Man (LGM) trying to chat-up a poker machine, or seeking directions from a petrol pump, I feel like I've landed on the wrong planet. Apart from every Monday morning, I also get the feeling from time-to-time when I mix metrics with motoring. Perhaps you do too? What we need is a few rough-and-ready but good enough, stick-in-the-mind factors. Let's see how we go.

DISTANCE AND SPEED: This is not bad since one km is very near to 5/8 (0.625) of a mile (the error is less than one percent). Thus you can say 50 miles = 80 km, 100 km = 62.5 miles and so on. A bit rougher, and you can say 1½ x miles = km or 2/3×km = miles. The same with speed: 40 mph is roughly 60 km/h (64), 100 km/h is roughly 67 mph (62.5) and so on.

DIMENSIONS: These overlap distance but I've decided to treat them separately. They could be a complete topic for another discussion. Now let's see. One inch = 2.54 cm or 25.4 mm (rough equivalent 25 cm (250 mm) ≅ 10 inches). Note: The proper thing to do is to always use millimetres (mm) - let's not worry too much, but in metric drawings (Citroën etc.), unspecified units will be mm. One thousandth (0.001) of an inch ("a thou") will be 0.0254 mm. Put another way, each "thou" is about 1/40 mm, or 1 mm ≅40 "thou".

MASS: This is not bad either since one Imperial ton is very close to one metric tonne (the error is less than two percent). A hundred weight (cwt) is roughly 50 kg (within two percent). A pound is just under half a kilogram (error ≅10 percent). A kilogram is almost exactly 2⅕ lb.

VOLUME: I seem always to remember that 1 gallon (Imperial) = 4.55 litres (L) - (say 5 litres to the gallon). Hence a 4 gallon can has become 20 L, and a 44 gallon drum 200 L. A 75 L petrol tank holds about 15 gallons and so on. Note: The capital (L) not the lower case (l) is now the proper abbreviation for litre.

Fortunately, in Australia, we have always (or for many years) been happy describing engine sizes in litres. The Americans however, have preferred to describe engines in cubic inches (in^3). There are roughly 60 (61.02) cubic inches to the litre. Hence an American 250 is just over 4L (4.1).

However, remember that the American gallon is smaller than the Imperial gallon. A cubic foot holds 6¼ Imperial gallons, while it holds roughly 7½ US gallons (7.48). The US gallon is just under 4 L (3.78). This is important when you are considering US fuel consumption reports - multiply their claimed mpg by 4.54/3.78 = 1.20 get the figure you expect, i.e. add on a fifth. Their 25 mpg is the same as our 30 mpg.

PRESSURE: Long experience has well and truly established pounds per square inch (psi) in the minds of most of us, and I think we'll get away with it for a bit longer. The corresponding metric unit is kilopascal (kPa) which has a value about 7 times bigger (6.895). Thus 30 psi is roughly 210 kPa. Pretty easy. Unfortunately, other metric pressure units have been used in the past, e.g. 1 kg per square cm = 14.2 psi.

FUEL CONSUMPTION: This is the most difficult to cope with I think, because we've gone from distance/volume (miles per gallon) to volume/distance (litres per 100 km). Thus, as your mpg goes up, your L/100 km goes down - i.e. there is a reciprocal relationship, and there is no single conversion factor. Of course one mpg is roughly 1/3 km/L (0.354), but no one talks in km per litre. I remember that 10L/100 km is roughly 30 mpg (28.3). Hence 20L/100 km will be 28.3/2 = 14.2 mpg and 5 L/100 km will be 28.3 x 2 = 56.6 mpg. What about reference points

the other way?

10 mpg = 28.3 L/100 km ↑ Thirsty
20 mpg = 14.2 L/100 km ↓
30 mpg = 9.4 L/100 km
40 mpg = 7.06L/100 km ↑ Frugal
50 mpg = 5.7 L/100 km ↓

One neat way is to remember that mpg x L/100 km always equals 282.5 (say 280). Hence, divide what you've got into 280 to get the other (try it - 7L/100 km → 40 mpg and so on).

Another way round the fuel consumption calculations is to carry the handy little slide rule called the Total Economy Convertor, free from Total Service Stations (remember: "Citroën préfére Total"). It does most of the conversions easily, e.g. feed in litres used and kilometres travelled, get out mpg or L/100 km. I note it has an error in the tabulated kPa → psi factor - it should be 0.14504, not 20.8854, but this error doesn't affect its normal operations.

POWER: I've always found this easy since one horsepower (hp) (Imperial) equals 746 watts which is very close to 750 watts or 3/4 kilowatt (kw). Hence to go from kw to hp, add 1/3. A motor developing 60 kw is the same as saying it is developing 80 hp (normally called brake horsepower (bhp) to distinguish it from rated (fiscal) horsepower). You might also care to remember that the watt ≡ joule/sec and that one hp = 550 ft. lb/sec - useful at times, e.g. checking my gas bill (measured in kilojoules) against my electricity bill (in kilowatt hours) shows that gas is about ¼ the price for the same heat!

Well, I don't know about you, but I think that has helped me a bit (after I've read it over a few more times!) And if that fails, take me to your litre, I'll have a complaint to make.

BILL GRAHAM.

P.S. I hope we can follow up with some notes on bolts, nuts and threads, and also on various power units - anyone care to take up the challenge?

P.P.S. The metric system of weights and measures was developed by the French Academy of Sciences and made compulsory in 1795. It was dropped by Napolean but was re-established in 1840, and by 1900, had been adopted by 40 nations. Metrication is voluntary in U.S., but is well advanced in G.M., while Caterpillar is said to be 100 % metric.

PFERDESTARKE?

While we're dealing with units to do with cars, perhaps we should say a bit more about power. James Watt invented the unit of the horsepower (33 000 foot-pounds per minute = 745.700 (say 746) watts) in 1782 when he was trying to sell his steam engines. He calculated that this was the rate at which an average horse could work. You will guess that there is, in addition to the British unit of horsepower (HP) above and the watt (W), a metric horsepower unit as well. Fortunately, the (British) horsepower unit is near enough for our purposes to equalling the metric horsepower unit (metric HP = 0.986 HP or 735.5 W). These are units of developed (real- or brake-) HP as measured under test conditions. The French choose to call the metric HP "cheval vapeur" (CV) - literally "steam horse", while the Germans choose to call it "Pferdestarke" (PS) - literally "horse power or horse strength". While there are different codes specifying how power is measured, we can say roughly 1 HP = 1 CV = 1 PS (!).

Rated horsepower was devised by the Royal Automobile Club (U.K.) for taxing purposes in 1921, based on no. cylinders X diameter squared (inches) on 2.5. Thus four cylinders of 78 mm diameter do equal 15.09 rated HP as in the Traction. Now there must be a French version of rated HP also, whereby they are able to call the Traction 11 CV (will it never end?). Fortunately, rated HP has little relation to engine performance, so let's forget it, OK ?

CLEAN IS COOL

THE youngest Traction Avant models are now 30 years old and the number of units still on the road in New Zealand is truly amazing. To cope better with modern-day motoring conditions, or perhaps unable to find the required components when a major breakdown occurs, some owners put "originality" into the back of their mind and opt for an engine transplant. They install the later-model Citroën engine from the ID19 models, complete with it's high-ratio 4-speed gearbox. The car then becomes a "real goer."

OUR notes this issue refer to such models.

"D engined" Tractions do not necessarily need a radiator fan fitted. We know of one case where over 100,000 miles were travelled in a Big 15 with a 1963 ID block, surmounted by a 1957 DS head with no radiator fan fitted. During that mileage the temperature was at most times well under 180°F. It is probable that a "bunch of bananas"(free-flow exhaust manifold) may have helped keep temperatures down, but the "coolness" of a D-model head did away with the necessity of needing a fan.

TO anyone contemplating running their ID Conversion without a fan there are two major recommendations to be made:

(1) That a temperature gauge be fitted so you can keep an eye on the heating;

(2) That the radiator is kept clean, right from the outset.

In regard to (2) it is well worth the $40 or so cost to have the radiator serviced prior to mounting in the car at the time of the conversion. This involves having the top tank removed and each core tube cleaned out thoroughly. Radiator specialists do the job in a day and usually pressure-test the unit when finished.

YET another wise move in this situation is to install a CRUD-CATCHER in the top hose/radiator tube area. A simple, inexpensive method is to cut the foot area out of a pair of pantyhose, then feed the toe end into the radiator top inlet, fold the stocking part back over the tube leading into the radiator, then fit the top radiator hose over this.

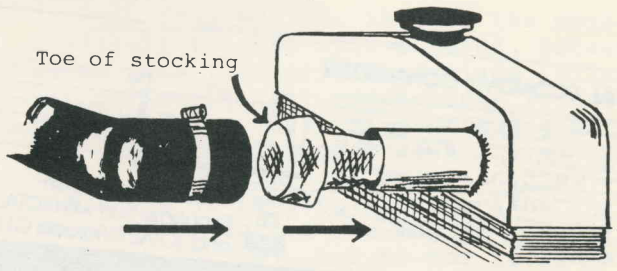
THE "specially patented" Crud Catcher will now collect all the rust particles which are pumped up from the block and so save them from filling the radiator core tubes and blocking the free flow of the coolant.

REMOVE the stretchable nylon filter after the first 1,000 miles and you'll be surprised how much matter has been trapped. From then on, change the filter every 10,000 miles or so, or else once a year. It will save overheating problems, and you will not have to have the radiator cleaned so often, if in fact, ever again. Fears that the filter may become blocked and thereby stop the flow of coolant are not valid, as the nylon simply stretches further into the top tank as required.

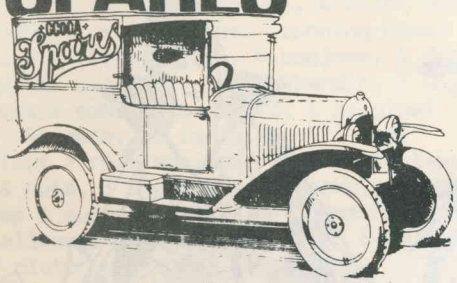
FOOTNOTE: A Crud Catcher is well worth fitting to any model, even if anti-freeze is added to the cooling system. It would be especially desirable to fit straight after a radiator clean, even if it is only a temporary measure.

Lew Stappit and "R.C." "The North Island Citroën".

(The rising interest in Traction-ID conversions in Australia suggests that the above comments would be appreciated by CCOCA members. The "crud-catcher" sounds excellent, though we suggest that it should not be acquired without the owner's consent! (Is this how Kiwis" put a sock in it")- Ed).



SPARES



SPARE PARTS, contact
Russell WADE
Phone 9 am to 7 pm No Sundays
(03-5703486)
Order Forms take precedent over phone calls.

HOURS: 9 AM to 7 PM. MON to SAT

HOW THE PARTS SYSTEM WORKS:

Considering that we have had a large influx of new members over the last 2 or 3 years, I will give a few details of how the Parts System works:

1. *Parts Order Forms serve 2 purposes:*
   (a) You can use it to order parts listed in the magazine
   (b) You can order new parts which are not so listed. This gives me a guide as to what people want and how many to order.

2. *Method of payment:*
   You order your parts on an order form or other paper (read the fine print on the order form), and I will send what is available. Several days later, I will send an invoice when I know full package and postage costs. You should send the money to match the invoice (we have only had one bad debt so far!).

3. *Second-hand parts:*
   I can't justify the time needed to chase up second-hand parts, so if you need them, please advertize for them in the Classified Ads in the magazine.

STOP PRESS:

As these notes were being prepared, some exciting new stock has come to hand, some from overseas e.g.: Traction crownwheel-and-pinions, scuttle vent rubbers, front hub oil-seals (I&O), rear oil seals, mufflers and tailpipes. Prices to follow.

*PARTS IN STOCK, SEPTEMBER, 1985. (Except *)*

Liners*, pistons & ring set	295.00
Head gasket 4 cyl	35.60
VRS gasket set 4 cyl	56.60
Complete gasket set 4 cyl	76.44
Sump gasket set 4 cyl	8.84
VRS gasket set 6 cyl	60.00
Liner seals L15 thick set	7.50
Carby gasket set 32PBIC	5.75
32PBIC throttle shafts .5 OS	24.00
Fuel pump kit AC	9.75
Water pump shaft & bush	18.00
Steering rack rubbers pair	26.00
Wiper shaft grommets below WS	4.00
Shocker end rubbers each	1.00
Pedal rubbers each	5.50
Radiator hoses each	10.50
Fan belts	12 .25
Door dovetail blocks set 8	6.96
W/screen rubber ali frame	9.18
W/screen rubber steel frame	20.00
Door seal rubber set	22.00
Flat boot rubber seal	13.50
Big boot top seal	11.00
Big boot bottom seal	5.50
Petrol filler grommets	7.50
R/bumper seals pairs	21.00
Exhaust hanger rubbers	2.00
G/box gasket sets	7.00
Output shaft seals	8.50
Pinion shaft rear bearings	26.80
Springs g/change gate	3.50
Woodruff key f/hub each	1.50
D/shaft rubber boots each	12.30
Clamp bands for most	1.00
Inner front hub bearing	16.80
Outer front hub bearing	16.80
Door lock springs each	3.50
Bonnet strip clamps each	1.25
French T/lights big boot	30.00
Master cyl kits	9.50
Front brake hose French	28.00
Rear brake hose French	21.00
F/R brake hose Slough	28.00
Rear wheel cyl 1" 4 cyl	40.70

CLUB SHOP

Contact:

Robin Smith
411 Glenhuntly Rd.
Elsternwick 3185
(03) 527 5429

Windcheaters & T-shirts

Designs: as shown inside front cover, plus: Club design as on back cover.

Supply your own windcheater or T-shirt and we will print your chosen design for $2.00 each, or

Order a T-shirt printed from our stock for $6.00.

Fiftieth Anniversary T-shirts at $6.50.

PLEASE SPECIFY SIZE, COLOUR AND DESIGN WHEN ORDERING.

Windscreen Stickers

Club Emblem - $1.50

Cloth Badges

Club Emblem in blue on white oval background - $1.75

Lubrication Charts

High quality reprint of original Traction "Oil and Grease" chart - $1.00

Metal Grille Badges

Blue and White - $12. Awaiting new stock

Front Drive Back Issues

Cost $1.00 each, plus postage.
If issue requested is out of print,a good quality photocopy will be supplied.

Posters

Full colour Light 15 - $2.50.

ALL PRICES PLUS POSTAGE AND PACKING

Big on quality. Small on price.

Yes, that describes the three copies of Olivier de Serres' superb book being held in the stocks of the Club Shop. La Grande Livre de La Traction is essential for the shelves of the serious Tractionist. At the special club price of $47.20, it's a steal, even if you aren't 100% on the French - the marvellous photos in colour and B&W are worth the price. Lots of Aussie material, including CCOCA members' cars.

CLASSIFIEDS

AND THE BAD NEWS, FOLKS:

After organizing some tremendously successful and very enjoyable rallies for the Club, ROBYN (SUPER SALLY) COUCHE wants to hang up her clipboard, motel list and receipt book and take a well-earned rest back in the work force! Well done and many thanks, Rob ---- after all, who could forget Ballarat etc.

AND THE GOOD NEWS IS:

The club now needs URGENTLY one or more members to take on the position of RALLY CO-ORDINATOR (ACTIVITIES OFFICER). This is yuor big chance to show what you're made of!

Duties: 1. Organize Austraction '86 & CCOCA participation at Bendigo Swap Meet (sites already booked)
2. Co-opt a sub-committee to assist as required
3. Attend committee meetings (if member is Melbourne based)

Qualifications:
1. A desire to see two of CCOCA's main annual events continue in '86
2. Ability to offer a small amount of spare time to CCOCA

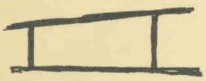
Consequence of no-one volunteering:
1. No Austraction '86
2. A huge gaping hole in the Club's reason for existing

Please consider offering your services now and volunteer to John Couche as soon as possible. N.B. You do not have to be a Melbourne-based member to do this job. Ring (03) 729 7470 now and do something for your club.

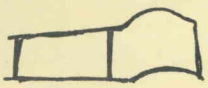
FOR SALE: 5 CV, circa 1921-22
1 short chassis, 1 extended chassis, 3 diffs (1 of different shape), 4 axles (new), 2 axle nuts, 1 cross member (running board support) & battery holder, 4 engines, 1 dipstick holder assembly, 1 crankhandle, 2 magnetos, spare exhaust manifold, 1 original carby, 1 SU carby, 2 radiators & 1 cap, 1 set front & rear springs, some spare leaves, 4 rims & nuts, 1 spare wheel bracket, 1 petrol tank, cap & support brackets, 1 complete gearbox & bellhousing, 2 gearbox cases & bellhousings, 2 clutch units & 1 cover plate, 1 set of 3 pedals, 1 handbrake lever & linkages, ! transmission brake unit & universal, 2 rear brake assemblies & drums, 2 front mudguards (rounded type) & support irons, numberplate front surround, 2 side skirts, 1 bulkhead with with windscreen support irons, 1 door with hinges & handle, 1 bonnet, 2 steering boxes & columns & 3-spoke steering wheels (less wood), 2 headlight supports, 2 headlights less glass, 1 dashlight(?), 1 starter & 2 generators, 1 fan unit.
Photos of frames for rear body. Body has never had RH door. Rear body missing, but I have measured an original and have drawn plans for the single-seat boat-tail which I think this one would have been.
1 jarrah former for building the rear guards.
The book Citroen 1919-26 A, B2, B10, B12 & 5 CV would still be available from EPA and, although in French, is a good parts and workshop manual for the above. As you have guessed, the car is basically dismantled!

Contact: Jeff Harris
138 Haines Rd,
Banksia Park, SA, 5091.
(08) 251 3761.

Short original chassis



Extended chassis



WANTED: Radiator grill to suit Big 15/F9.
Phillip Gall
16 HENRIETTA St.
HAWTHORN 3122. (03) 819 2008.

NEW MEMBERS

Mike & Jennie Killingsworth
8 Goorama Dr.
Cambewarra, NSW, 2540.
(044) 460156. 1955 L15.

ADDRESS CHANGES:

Neil Rankine
12 Poplar St.
Wonthaggi, Vic., 3995.
(056) 723180.

Noel Cammock
2/48 Power St.
Hawthorn, Vic., 3122.
(03) 818 5718.

Louis Belcourt
29 Pamela St.
Mt. Waverley, Vic., 3149.
(03) 2777892.

LETTERS

8 O'Shanassy St.,
Curtin, ACT, 2605.
30 July, 1985.

Dear John,

In spite of the salutation, this is not a "Dear John" letter - I'm not leaving the club, just a bit slow at staying in it.

Of course, it is your records that are more accurate than your memory and I have to confess that I haven't yet paid my dues. Actually, if it wasn't for Bill Graham, I probably wouldn't have paid even yet! Your polite invitation got me as far as filling out the Membership Form, but it was Bill's heavy-handed threat of towing my '25 Stude away that hit the right spot and jolted me into pulling out the cheque-book. I'd like you both to accept my apologies for putting you in the position where you had to ask. I have no excuse - I'm just slack. Living so far away from the Traction action makes it easy to put the important things aside, too. At the same time, I'd like to point out to Bill that this is probably the only time when he can get tough with the cops and live to tell about it.

I should be honoured that you included a photo of our Light 15, "Simone", in the latest issue of Front Drive, but I can read you like a book, Couche! It was just another sneaky trick at embarrassing me into paying my membership, wasn't it? Well, I hope Leigh Miles and Phil Ward have taken the hint too. I notice, too, that you've published a photo, on page 13, of our car's gearbox and diff. in the condition that it is frequently in - exploded!

See you at next Austraction,
Rod Greschke.

[We reprint Rod's letter to indicate the frightful psychology which can be applied to recalcitrant members! However, it is pleasing to note that modest (and now financial) member Greschke has been doing his bit to ensure that a bit of Traction action goes on in the national capital too. Last issue of Restored Cars showed a couple of Light 15s at "Wheels 85", a Canberra turnout of cars spanning the last 75 years. One Traction, "Simone" no less, was the excuse for a good plug for CCOCA. All is forgiven, Rod, and please, no heavy footfalls in the middle of a dark night, OK?
-Ed.]

Left: Citroen Light 15. Year: 1950. Owner: Rod Greschke. Club: Citroen Classic Owners Club of Aust.
Right: Citroen Light 15. Year: 1953. Owner: N. J. Henry.


CITROËN CLASSIC OWNERS
CLUB OF AUSTRALIA