FRONT DRIVE

AUSTRALIA'S NATIONAL MAGAZINE FOR CITROEN OWNERS AND ENTHUSIASTS

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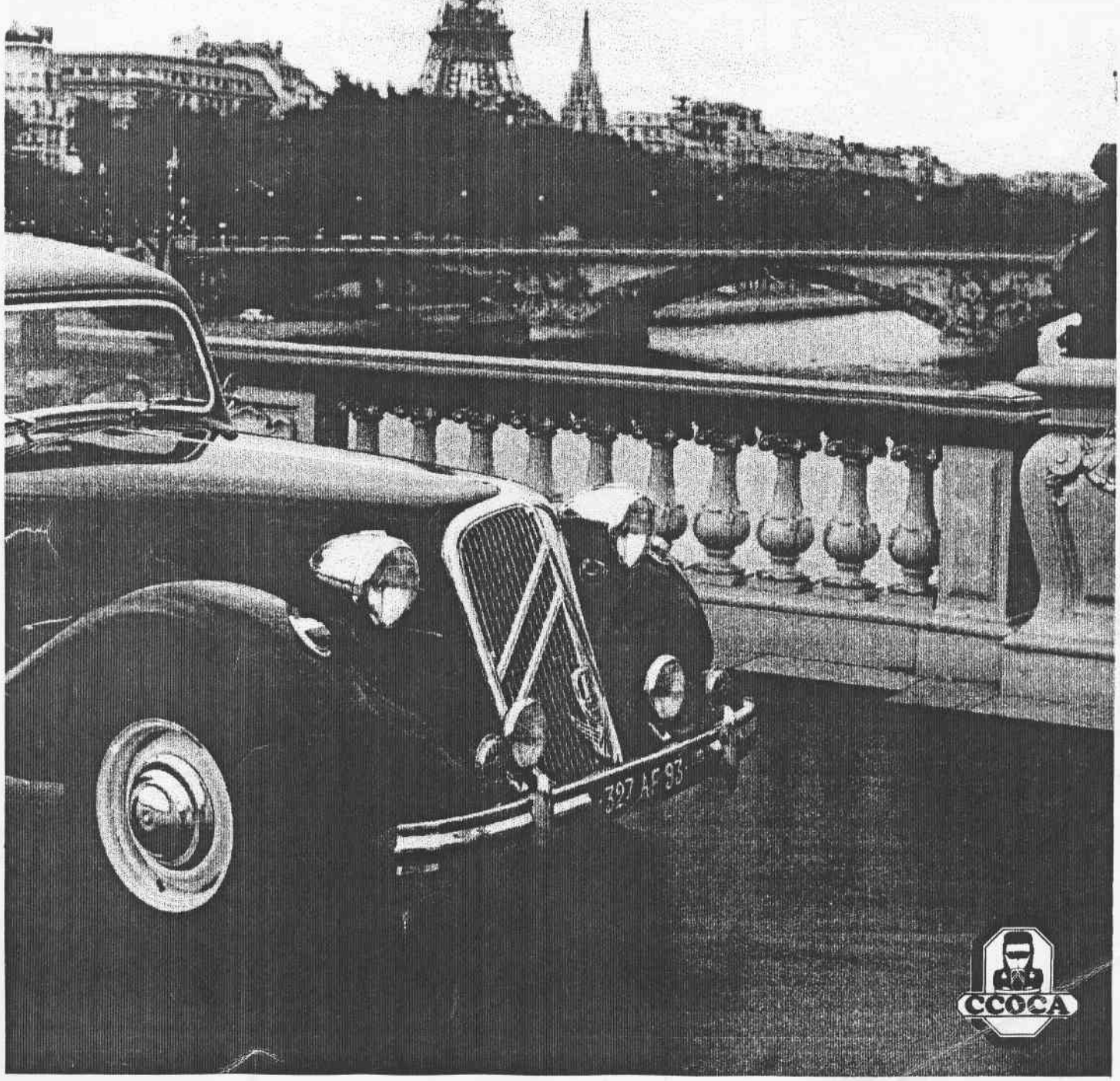

1999/00 CCOCA COMMITTEE

PRESIDENT — Ted Cross
173 Power Street, Hawthorn, 3122.
Phone [03] 9819 2208.
Email crossfam@ozemail.com.au

SECRETARY — Robin Smith
9 St Aubins Avenue, North Caulfield, 3161.
Phone [03] 9527 5429

TREASURER — Graham Barton
"Lillimur" Lot 1 Tucks Rd. Shoreham
Phone (03) 5989 6027 ah
0418 100992 mobile
Email G.Barton@chisholm.vic.edu.au

SPARE PARTS OFFICER — Mel Carey
10 Omeo Highway, Lucknow,
PO Box 469, Bairnsdale, 3875.
Phone [03] 5152 1040
Mobile 0412 526 126
Fax [03] 5152 2615
E-mail: citroencarey@net-tech.com.au

EDITOR — Leon Sims
2 Tolls Ave. Mentone. 3154
Phone (03) 9583 3972 ah
0412 348848 mobile
Fax (03) 9583 3972
Email simsfam@alphalink.com.au

MEMBERSHIPS — Peter Simmenauer
6 Stewart Ave. Blackburn Sth. 3130
Phone (03) 9877 0141
Email pcsimm@melbpc.org.au

ACTIVITIES — Steve Bartlett
24 Bayview St. Williamstown. 3016
Phone (03) 9397 8680
Email saintlywo5@aol.com

PUBLIC OFFICER — John Couche
31 Broadway, Belgrave, Victoria, 3160.
Phone (03) 9754 3583.

CLUB SHOP — Leigh Miles
16 Harrow Street, Blackburn South, 3130.
Phone [03] 9888 7506 [AH]
E-mail: leigh.miles@cussons.com.au
Business_Direct@msn.com.au

LIBRARIAN — Robin Smith
Phone (03) 9527 5429

ADVERTISING — Peter Fitzgerald
(03) 9696 0866 (BH & AH)

STATE ACTIVITY CO-ORDINATORS
VIC: PETER FITZGERALD
[03] 9696 0866 [BH & AH]
ACT: MIKE NEIL
[02] 6241 4556.
WA: STUART PEKIN
[08] 9386 9283.

CLUB PERMIT OFFICERS
Russell Wade (03) 9570 3486
Peter Boyle (03) 9470 8080
Mel Carey (03) 5152 1040

AOMC REPRESENTATIVES
Ted Cross (03) 9819 2208
Leigh Miles (03) 9888 7506
Russell Wade (03) 9570 3486

FRONT

POSTAL ADDRESS

CITROËN CLASSIC OWNERS CLUB OF AUSTRALIA INC.

The Club's and Front Drive's postal address is

P.O. Box 52, Deepdene Delivery Centre, Victoria, 3103.

The Editor's e-mail address is simsfam@alphalink.com.au

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DRIVE

Published by
The Citroën Classic Owners Club of Australia Inc.

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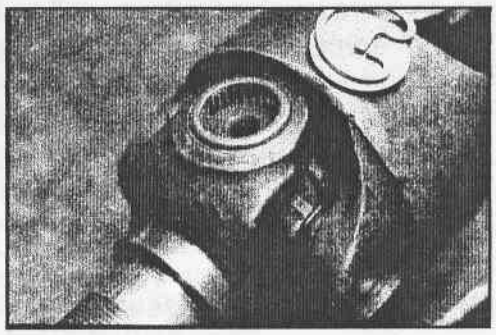
From Disaster to Grand Prix Winner



CV or no CV That is the question

Gaston investigates new model for the millennium

CCOCA MEMBERSHIP

Annual Membership $30
Overseas Postage Add $9

CCOCA memberships are due on the 25th of March, each year and run until the following March.

CLUB MEETINGS

Every fourth Wednesday of the month, except December, at 8pm
Venue:- Canterbury Sports Ground Pavilion, cnr Chatham and Guildford Roads, Canterbury, Victoria.
Melways Ref 46 F10.

LIFE MEMBERS

NANCE CLARK	*1984*
JACK WEAVER	*1991*

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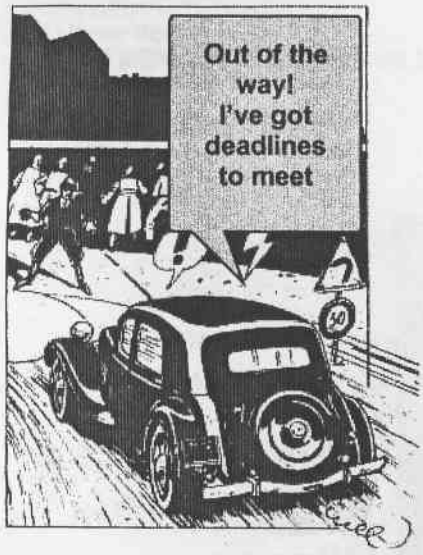
a-tractions inside back page

EDITORIAL VIEW



Welcome to the new year. Initially I must apolgise for the delay in getting Front Drive to you as I expected that it would be in you mailbox at the end of January.

Delays have been encountered in both production and the prioritising of personal time available. We had a software problem that required a reconfiguration of my hard drive and in the process I lost a third of the magazine.

Again I have to congratulate our enthusiastic contributors to this issue. Please take note of their names on the opposite page and if given the opportunity, let them know that you appreciate their input. Due to their articles, I believe that we have a great magazine.

The Mag seems to have evolved into a well balanced issue consisting of social, technical, historical with a touch of competition amongst the articles.

Mel Carey and Bernie Hadaway, our technical Gurus have given us all something to file away for future reference. Roger Brundle's contribution offers an insight to the early auto gearbox in the Light 15. The competition articles on DS and CX rally cars came from the internet. Alan Brown our correspondent from France sent the Gaston revelations to me on email and Bill Graham sent his book review to me written by quill and ink. Such is the diversity of our membership.

I hope you enjoy the reading in this issue.

Regards Leon

SHOW & SHINE

SUNDAY 26TH MARCH

Don't forget the Show & Shine run to help restore the Liberator Bomber. We will meet all Citroens at the Westgate Shell Service Station (Melway ref 42 H12) At 9.00am so we can depart in convoy to the display site to arrive at 9.30am.

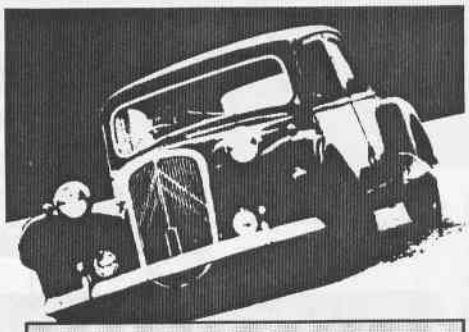
Please bring your picnic lunches and drinks.

BBQ sausages, hamburgers & soft drinks available on site.

CONTACT YVES SCHIESECK

9749 3376

PREZ SEZ



Picture the year 1975. The CCOCA club is still only a dream to a few enthusiasts. The fabulous DS series Citroen is on the road in good numbers. The cheery little GS is up there in design and performance, and the "last of the real Citroens" - the CX has just been launched in Australia.

The Traction is already 40 years old in design and even I have to admit would have been well out of date and confined to the margin if you were thinking about buying a car in those days. But with good luck and enthusiastic (and probably stubborn) people we see more of these models on the road in restored condition than most people would have imagined.

Fortunately the founders of our club imagined what would occur if CCOCA just stayed a club for Tractions. Our constitution provides for a rolling 20 years old rule and which enables the committee of the day to determine what is a classic Citroen. I know you are now saying BUT THEY ALL ARE!.
And I agree with you.

The point of this is that over the last 25 years another helpful benefit to clubs like ours was the arrival of the various club permit schemes throughout Australia, making ownership of a special interest car an affordable option.

Today you can now have your classic Citroen on Red Plates in Victoria. This means that today you can have all of the D series and some of the GS and yes even the CX series cars on Red plates and being preserved for future generations to enjoy. This has the risk of upsetting our CCCV sister club, but it should not . There is enough good will between the clubs with many members being joint members of both clubs that we can easily exist side by side in harmony I believe. The big challenge for both clubs is to decide what level of support can be provided to members to keep their cars on the road. Spare parts and replacement parts will be a crucial issue for us in the future as car makers reduce their inventories after only a few years.

I imagine that in future both of our clubs will provide information about access to parts rather than have too many bits on the shelves for sale. I cannot see how we can possibly meet the needs of our members without some limits in the future. It will be up to us to surf the internet to find our special parts and source them ourselves.

So what do we need to do today? Well DS, GS and CX series cars are the classics of the future, so many members could consider buying a good example of their next favourite model to store in the garage alongside of their vintage, traction, or 2cv. Many of us blessed with space will buy a spare or two as insurance for the future. In other words now is the time to look out for say the next ten or twenty years and start to plan what you want to restore and keep and think about buying your choice as soon as you can to get good examples that have not gone too far down hill.

Probably in twenty years some new president will be encouraging you to find and store a good Xantia or Xsara whilst you still can.

Keep the Citroen dream alive and enjoy your interest.

Regards Ted

Thank you to our contributors for December / January

Graham Bradshaw
Alan Brown
Roger Brundle
Mel Carey
Bernie Hadaway
Bill Graham
Peter Simmenaeur
Roger Williams
& the internet

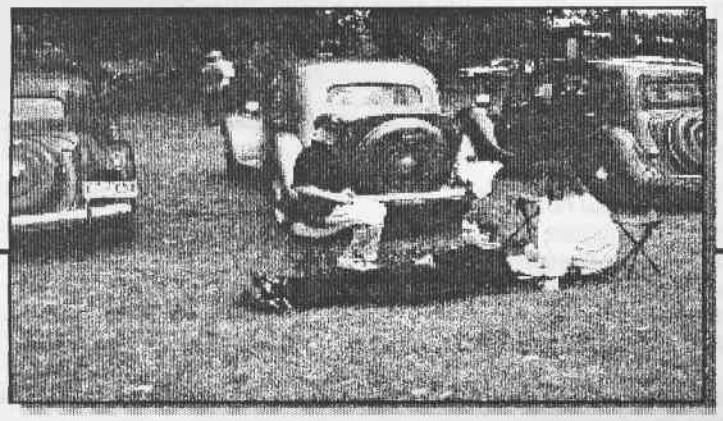
Past Events

CCOCA / CCCV CONCOURS – November 7th

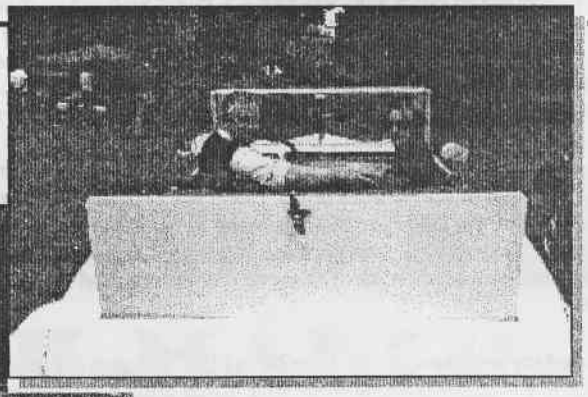
Left, Le posure, Peter Fitz & Rosey

Above, Claire & Bernie Hadaway looking relaxed as usual.

Below, The Editor's Traction's first outing in three years. Sue, Andrew & Mitchell reluctantly pose for the photographer.



Below, Max & Roz Lewis enjoy the sun in the roadster.



Left. Newly acquired Big 15 roadster now owned by Max & Roz Lewis.

Right: From the archives:
Adrian Rousseau and Geoff Pamplin at the MG Inter-club Concours Arkoonah Park, Berwick. Around 1976

CCOCA XMAS PICNIC at ROB ROY – November 28th

ROB ROY HILLCLIMB picnic was attended by a small band of CCOCA members including the Hadaways who had not been to Rob Roy since the early 50s when Tractions were common sights in the spectator car park.
You may notice the Editor's Light 15 with what appears to be a Doona on the roof. In fact it's our new dog bed for Murphy our wolfhound, kindly delivered by Graham Barton.
With luggage like this, you soon realise the limitations of the Traction boot.
The weather was very kind to us and an idyllic day was enjoyed.
Pictured are the cars of the Hadaways, Sims, Barton and the Cross Dolly. (actually it was only slightly upset.)

WELCOME to our NEW MEMBERS

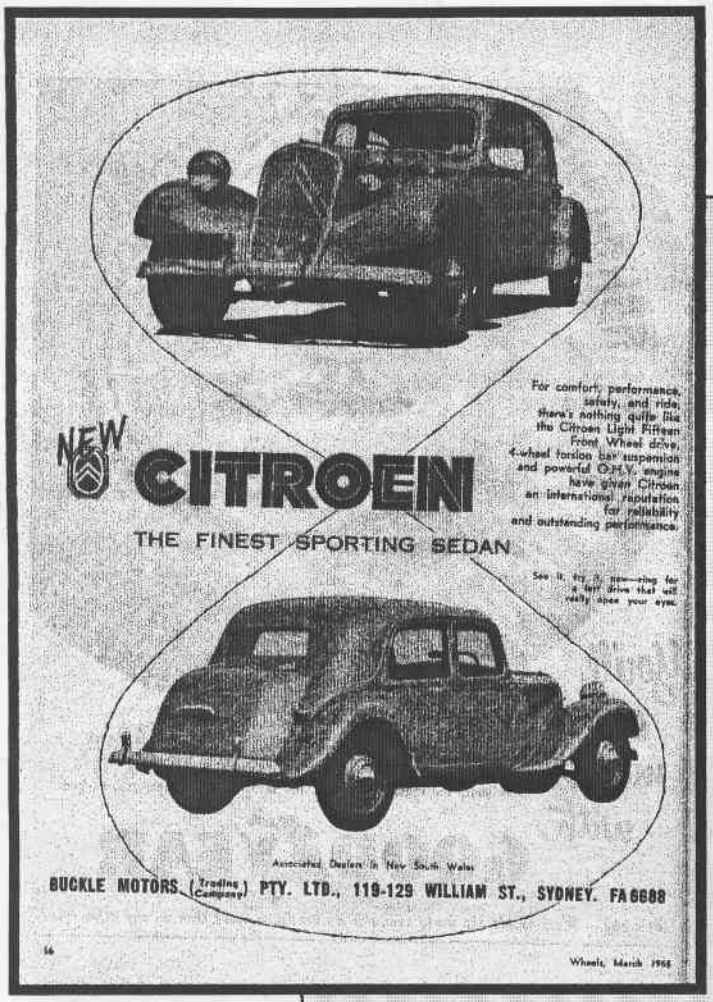
Greg & Noela McKenzie, Mosgiel New Zealand
1952 Light 15
Tim & Iris Waters, Mt Nelson Tasmania
1951 Light 15
Phil Ward, Newlyn Victoria
1983 2CV6, 1963 2CV 4x4, 1965 Ami 6
Scott Howard, Buninyong Victoria
1981 CX
Michael Moloney, Hampton Victoria
Leo Pagoli, Chadstone Victoria
DS 21
Richard Homersham, Upwey Victoria
1952 11B
Tim Cottrell, Preston Victoria
1962 ID19, 1964 DS19
Brinley Hodges, Forestville NSW
1922 5CV, 1924 C4F

BEST NEWS-PAPER HEADLINES OF 1999

1. Include Your Children When Baking Cookies
2. Something Went Wrong in Jet Crash, Experts Say
3. Police Begin Campaign to Run Down Jaywalkers
4. Drunks Get Nine Months in Violin Case
5. Iraqi Head Seeks Arms
6. Is There a Ring of Debris around Uranus?
7. Prostitutes Appeal to Pope
8. Panda Mating Fails; Veterinarian Takes Over
9. British Left Waffles on Falkland Islands
10. Teacher Strikes Idle Kids
11. Clinton Wins Budget; More Lies Ahead
12. Plane Too Close to Ground, Crash Probe Told
13. Miners Refuse to Work After Death
14. Juvenile Court to Try Shooting Defendant
15. Stolen Painting Found by Tree
16. Two Sisters Reunited after 18 Years in Checkout Counter
17. War Dims Hope for Peace
18. If Strike Isn't Settled Quickly, It May Last a While
19. Couple Slain; Police Suspect Homicide
20. Man Struck by Lightning Faces Battery Charge
21. New Study of Obesity Looks for Larger Test Group
22. Astronaut Takes Blame for Gas in Space
23. Kids Make Nutritious Snacks
24. Local High School Dropouts Cut in Half
25. Typhoon Rips through Cemetery; Hundreds Dead

Submitted by
Graham Bradshaw

CITROEN advertising in australia



Citroën

best design of the century

The Citroën DS, already one of the French car maker's three nominees in the finalists for the Car of Century, has beaten off competitors as diverse as the Boeing 747, the Apple Macintosh computer and the Biro ball point pen to be elected by the FX International Design Awards as the best design of the century.

The Citroën DS was chosen because it introduced a raft of new technology and design features that have become common place in car design, from power steering and brakes to the use of aerodynamics to reduce fuel consumption. This technological tour de force was wrapped in a body that was so advanced that it still looks modern and eye-catching today and yet it retained all the essentials of large family car, with a spacious interior, large boot and it set new standards in all areas of driving.

Joining the Citroën DS in the Car of the Century nominations are the Citroën Traction Avant and the Citroën 2CV, making Citroën the only car maker with three nominees in the finalists. The Traction Avant won its nomination because it was the first car to use mass produced front wheel drive, the most common layout in cars produced today. The Citroën 2CV laid out the basic design parameters for all today's small cars: Front engined, front wheel drive, light engine, spacious body and all independent suspension.

ANDRE IN CARICATURE

the DS in MOTOR SPORT

The DS may seem like an unlikely rally car - it was too big, too heavy, not fast enough, too complicated, unreliable - or so logic would imply. Conventional logic does not always apply to Citroëns however and the DS and ID proved to be formidable opponents - especially when the going got rough. They excelled on poor terrain, beating much more powerful competition and thereby proving that the vehicle was robust and reliable. Drivers seemed divided in their choice between manual and hydraulic cars - many claimed the hydraulic shift was faster than the manual.

The DS' first outing was in the Monte Carlo Rally in January **1956** when a car driven by Courtes & Court de Payan achieved a first in its class.

In **1959**, an ID 19 driven by Paul Coltelloni won the Monte Carlo. Coltelloni also won the European Rally Championship that same year.

1960 saw Dussert & Rouet win the Critérium Neige et Glace in a DS 19, Trautmann & Verrier won the Tulip Rally in an ID 19 and later that year they won the Tour de Belgique, again in an ID 19. Trautmann & Ogier won the Critérium de Cervennes in an ID 19 while Claudine Vanson & Ginette Derolland won the ladies team prize in an ID 19. Vanson also went on to win the Coupe des Dames du Tour de Corse and the French women's championship.

1961 was the beginning of the Grandes Années for Citroën in rallying - Bianchi & Harris winning the Liège - Sofia - Liège Marathon in a DS 19 and then being one of only 2 cars (the other also being a DS 19 driven by Trautmann & Ogier) to finish the Tour de Corse under blizzard conditions. Again, Claudine Vanson won the Coupe des Dames and the new Championne de France in her ID 19 while René Trautmann won the European Rally Trophy. A future star in the Citroën rally world, Robert Neyret, made his debut in an ID 19, winning in his class in the Acropolis Rally. **1962** saw Citroën repeat its success with Toivonen winning the Scandinavian Rally Championship, their cars winning places of honour in the Routes du Nord, Critérium Neige et Glace, Critérium International Alpin, Acropolis Rally, Coupe des Alpes, German Rally, Critérium des Cévennes and the Liège - Sofia - Liège Marathon. Claudine Bouchet won the French Ladies Championship. **1963** was the year that Citroën totally dominated rallying - the Monte Carlo - 2nd place - Toivonen, 4th place - Bianchi & Ogier, 5th place - Neyret & Terramorsi, 7th place - De Lageneste & Dugenestoux, 10th place - Verrier & Alexandre. Citroën, with five placings in the top ten won the Constructor's Cup needless to say. Not content with that, the invincible Citroëns went on to win in the Rallye Lyon - Charbonnières, the Liège - Sofia - Liège Marathon, the Coupe des Alpes, Routes du Nord, Tour de Corse and Rallye du Mont Blanc. Lucien Bianchi was the Belgian Rally Champion while Trautmann won the French Championship. Claudine Bouchet won the French Ladies Championship for the 4th time.

1964 saw the DS reign supreme in the Liège - Sofia - Liège Marathon, Critérium Neige et Glace, and the Acropolis Rally. Once again, Lucien Bianchi won the Belgian Rally Championship and Claudine Bouchet won the French Ladies Championship. **1965** was the year when Citroën took to rallying outside Europe - in the East African Safari, out of 85 vehicles at the start only 16 finished; 5 of which were Citroën DS 19s. The **1966** Monte Carlo was won by Toivonen & Mikander in a DS 21 and Lucette Pointet won the Ladies Cup.

Also in a DS 21, Lucien Bianchi won the Critérium Neige et Glace, the Coupe des Alpes and the Tour de Corse.

In **1967** Neyret and Terramorsi won the Monte Carlo in a DS 21. The moral winner of the **1968** London to Sydney Marathon was Lucien Bianchi in his DS

21. After 15,000km across Europe, Asia and Australia, he was a day ahead of Andrew Cowan in a Hillman Hunter; 50 km/30 miles outside Sydney he was involved in a collision and wrote the car off. His victory had already been announced. Cowan went on to win. **1969** was the year Neyret & Terramorsi won the notoriously difficult Rallye du Maroc in a shortened DS Coupé ahead of the DS 21s of Verrier & Murac and Ogier & Veron. The Constructors Cup was won by Citroën. The Portuguese TAP rally was won by Romoazinho & Jocames in a DS 21.

In **1970**, Neyret & Terramorsi won the Rallye du Maroc ahead of Consten & Todt, also in a DS 21. Verrier in a DS 21 Injection won the Ronde Hivernale de Chamonix ahead of Neyret.

1971 saw the DS up against its more powerful stablemate, the SM. Driven by Deschasseaux & Plassard, the SM won the Rallye du Maroc with the DS 21s of Consten & Motte and Neyret & Terramorsi being beaten into 3rd and 4th places respectively. The driving force behind Citroën's Service Compétitons since 1960, René Cotton died in July and was succeeded as Director by his wife Marlène.

Despite the loss of one of his wheels, Waldegaard in a DS 21 Coupé achieved 2nd place in the Ronde Hivernale de Chamonix in **1972**. Neyret & Terramorsi were placed joint second with Ponelle & De Serpos (both in DS 21s) in the Rallye du Maroc. In the Portugese Rally, the TAP DS unfortunately failed to finish - the official reason was an electrical problem though it has been suggested that the real problem was suspension-related. In **1973**, Citroën won the Constructors Cup for the 3rd time when the new DS 23s driven by Neyret & Terramorsi, Bochnicek & Kermayer and Ponnelle &

De Serpos were placed 2nd, 3rd and 4th respectively in Rallye du Maroc.

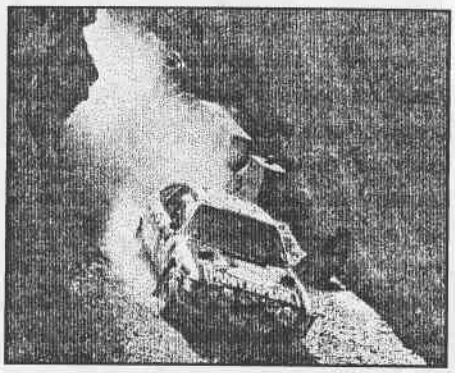
Also in **1973** the DS 21 of Romaozhino & Bernardo was placed 1st in the Tourism Class and 3rd overall in the TAP rally. The Tourism Class of the Acropolis Rally was won by Bochnicek & Kermayer in a DS 23.

Due to its parlous financial state, Citroën reduced its involvement in motor sport in **1974** but the Australian team of Welinski, Tubman & Reddiex won the World Cup Wembley to Munich rally in a DS 23.

The DS's final victory was in **1975** when Deschasseaux & Plassard were placed 4th overall in the Rallye du Maroc and 1st in the Tourism Class. The CX was to take up the mantle the same year in the Rallye Côte d'Ivoire - Côte d'Azur - but that's another story.

CITROEN CX RALLY CARS

The ageing DS, despite its impeccable rallying history was replaced by the CX in the competition department headed by Marlène Cotton and like its forebear, demonstrated its ability to cover hostile terrain in a manner few other cars managed.



The CX's métier was long distance endurance rallies and its outright victories included:-

1977 - *Sénégal* - **CX 2400**
1978 - *Sénégal* - **CX 2400 GTi**
1979 - *Sénégal* - **CX 2400 GTi**
1980 - *Biarritz* - **CX 2400 GTi**
1981 *Paris - Dakar* - **CX 2400 GTi**
1981 *Terre de Provence, Mille Pistes* - **CX 2400 Gti**

Under absolutely gruelling conditions, the CX also achieved the following placings:-

1976 - *Rallye Côte d'Ivoire - Côte d'Azur* - 4th, 5th and 6th places in the 2 wheel drive touring cars class and 13th, 16th and 17th places overall in a **CX 2200**

1976 - *Rallye du Maroc* - 4th place overall - **CX 2200**
1977 - *Rallye Acropol* - 6th place overall - **CX 2400**

1977 - *London to Sydney Rally* - 3rd, 4th, 7th and 10th plus the Constructor's Trophy - **CX 2400**

1977 - *Tour Automobile du Sénégal* - in addition to taking the first prize, four CXs came in 2nd, 3rd, 4th and 5th. Only two other vehicles out of thirty starters completed the course - **CX 2400**

1978 - *Rallye du Monte Carlo* - First place in the diesel touring cars category - **CX 2200 Diesel**

1978 - General Diesel Class in the *Tour de France Automobile* - **CX 2500 Diesel**

1978 - *Tour Automobile du Sénégal*; in addition to the overall win, the 2nd, 3rd and 6th places also went to CXs, together with the Constructor's Cup - **CX 2400 GTi**

1979 - *Rallye Mistral (Coupe de France des rallyes sur terre)* - 1st in Group 2 and 2nd overall - **CX 2400 GTi**

1979 - *Rallye Terre des Merveilles (Coupe de France des rallyes sur terre)* - 2nd place - **CX 2400 GTi**

1979- *Coupe de France des rallyes sur terre* - 1st place in Group 1 - **CX 2400 GTi**

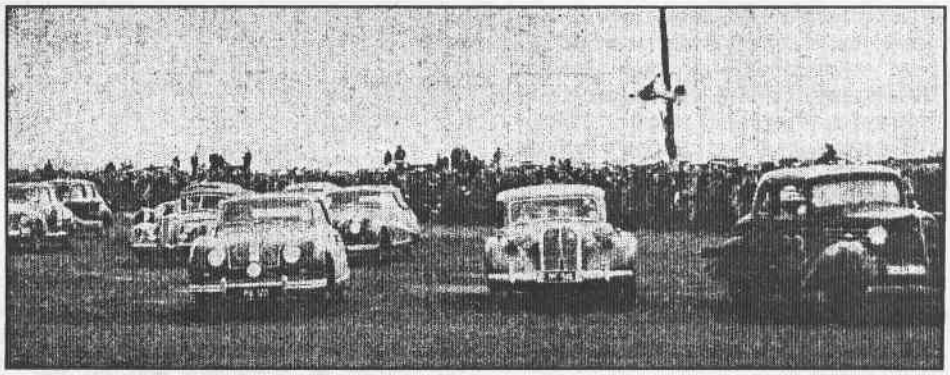
LOCAL RACING CITROENS

The cover photo of Australian Motor Sport Magazine July 1954 carried the following caption:
REDEX TRIAL ROADS — Mac. Robinson and Martin Law, both of Sydney, in their Citroen on one of the better sand roads near Christmas Creek. Much of the going was very much worse than this. The 1956 Redex Trial consisted of 263 entries. The event covered 9,600 miles. Citroens entered included:

No. 4	R. Akers & R. Fallon QLD	L15
No. 45	Commonwealth Motors VIC	L15
No. 77	R. Pomroy VIC	Citroen
No. 130	V. Dekyvere NSW	Citroen
No. 141	Mac Robinson NSW	Citroen
No. 210	C. Doidge NSW	Citroen
No. 212	P. Howie NSW	Citroen
No. 246	A. O'Shea NSW	Citroen 6

Don Wrights monoposto Light 15 powered racing car at Bathurst.
Note the Pilote wheels.

Light Car Club of Australia
BALLARAT AERODROME MOTOR RACING
November 18 & 19, 1950
From Australian Motor Sport Magazine December 1950



STOCK CLOSED CARS.
At 12 noon, the first car race of the day was due to start; it was a five lap scratch race for stock closed cars, and starters were A.E. Copland (Ford V8), M.Passmore (Terraplane), P. Damman (Citroen 6), D. Whiteford and W.H. Carr (Austin A 90's), J. P. Nind (Riley 2.5), S. Cabot (Bristol), P. McKenna (Bristol), D. Kingsley (Jowett Javelin), C. Warren (Austin A40) and N. Borsari (Cisitalia). At the start, Whiteford pressed determinedly into a lead which he was never to look like losing, with Damman hard on his heels in his Bathurst race winning Citroen, sporting a windscreen this time. In third place, looking beautiful and going just as well except that it sounded hopelessly high geared, was the lovely little Cisitalia, followed by Copland in his green Ford sedan (which has many thousands of miles up) and McKenna in the Bristol.

Competitors strung out as the laps piled up, about the only changes in order taking place between the back markers, who included Carr (A90), Kingsley (Javelin) and Warren (A40). Whiteford drove his A90 exactly the same as he does the Ford racer, calmly and very fast; Damman did his best to catch him with the Citroen, which started to sound tired towards the finish, and the Cistalia, looking dicey sometimes on the corners and driven in typically Italian fashion, motored on in third place. At the finish, competitors were placed in their capacity classes, and the result of the race was:—
Stock Closed Car Race (5 laps, 15 miles)

Over 3,000 c.c.
1. A. E. COPLAND (Ford V8), 16-34
2. M. PASSMORE (Terraplane), 17-28

1,500-3,000 c.c.
1. D. WHITEFORD (Austin A90), 15-40
2. P. DAMMAN (Cilroen 6), 15-47
3. J. P. NIND (Riley 2.5 litre), 16-14
4. P. MeKENNA (Bristol), 16-28

Under 1,500 c.c.
1. N. BORSARI (Cisitalia). 16-03
2. C. WARREN (Austin A40), 18-12
3. D. KINGSLEY(Jowett Javelin),18-13

Fastest time,
D. Whiteford,
15-40' (57.3 m.p.h.)

Fastest lap,
D. Whiteford and P. Damman, 3-03.

Submitted by Roger Brundle

FROM DISASTER TO GRAND PRIX WINNER - Part 1

"de Lavaud's transmission wont help you. Ditch it before you get ditched yourself because of it!"

The July 7, 1928 issue of the "Science News-Letter" reported that "a new transmission for automobiles that eliminates shifting gears and automatically changes speeds was described to the Society of Automotive Engineers by its inventor, D. Sensaud de Lavaud, a French engineer. Automobiles running on the streets of Paris fitted with this new transmission have convinced M. de Lavaud that his device not only is sound technically but also can be applied commercially to motor vehicles. Development of the transmission has required seven years."

The intriguing story of Citroen's involvement with this Sensaud de Lavaud transmission was well described in *l'automobiliste no.7*, March 1975, under the heading

"A Franco Russian Inventor's "Turbine".

"There seems no doubt that the wizard of the Quai de Javel was bowled over at the 1927 Motor Show when he first saw a stepless automatic transmission fitted in a cast aluminium chassis. Citroen, who it seems disliked gearlevers, had visions of an automatic gearbox combined with front wheel drive. His dreams were realised in the Sensaud de Lavaud, and one can visualise with what enthusiasm he inspected the low built car with it's 5' high roofline. Much too advanced for the period, few, if any, were sold.

It's creator was a strange man; inventor, multi-millionaire, and also a most cosmopolitan man, common enough now but exceedingly rare fifty years ago. Robert Dimitri Sensaud de Lavaud was in fact born of a French father and a Russian mother in 1884 at Valladolid in Spain, whence he was taken to Brazil, and became naturalised there in 1900. He emigrated to the United States, where he amassed such a fortune that when he arrived at Paris in 1920 he was worth 50,000,000 Poincare francs.

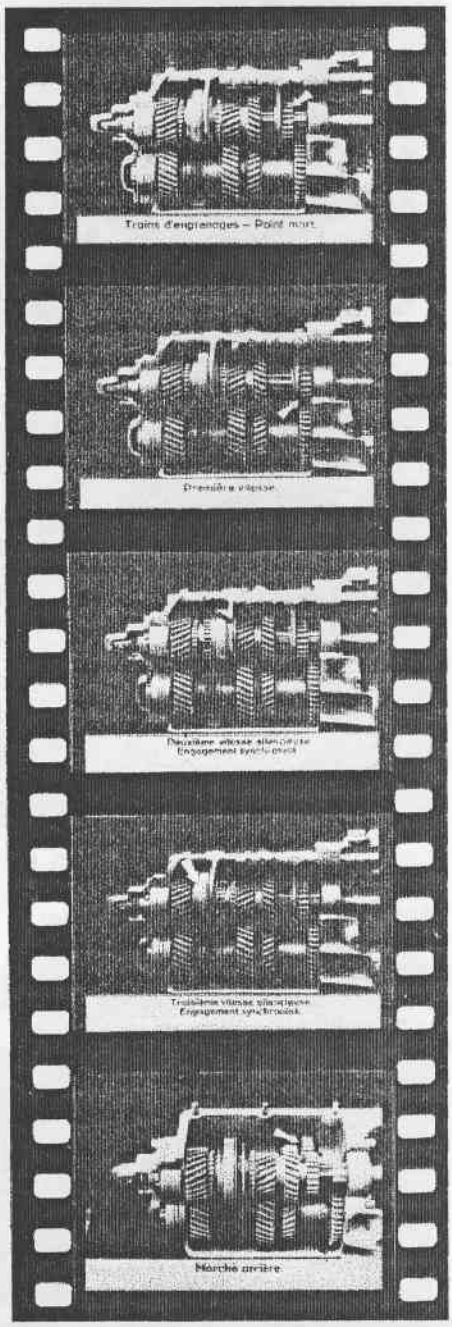
A profilic inventor, he annually lodged either five or six new inventions or amendments to previous ones at the Patent Office. Many of these related to hydraulic converter type transmissions, although the inventor of the principle - in about 1905, was the German Fottinger.

Sensaud de Lavaud was naturally extremely interested in the possibility of Citroen using his transmission in view of the size of the firm. He finally managed to get Brogly in 1932 to fit them to a pair of experimental C4 and C6 cars which were part of a publicity caravan in le Puy-de-Dome. Unfortunately for him Citroen came along on this stunt, and, egged on by the inventor became wildly enthusiastic about it. It is common knowledge that Citroen drove but rarely, as strange to relate, he hated driving. Despite this Sensaud de Lavaud persuaded him to take the wheel of the C6 to try it's astonishing smoothness. As a result of this trial, without consulting his engineering advisers, he decided to fit this automatic gearbox to all Citroens as soon as possible. This unfortunate decision was to lead to his financial ruin within two years.

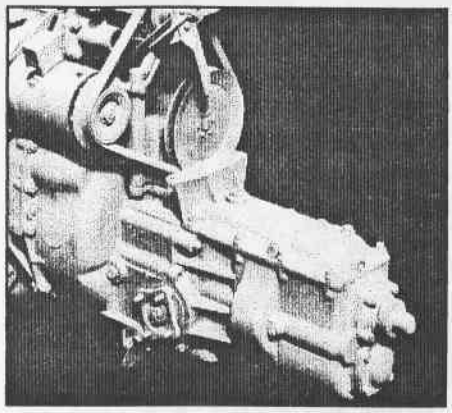
The engineers, both in the design office and the development department already knew what they were landed with; the test drivers soon called it "the turbine". It was not without merit and gave no trouble at Monthlery and on flat roads; but in hilly or mountainous going "the oil started to boil" and it stopped working. It only worked properly, and very nearly as designed, when it was cold and the oil viscous.

Pierre Prevost demonstrated that it was useless on the PV by taking four prototypes to the precipitous hill at Laffrey which they all failed to climb. Charles Brull, director of engineering, also shared his opinion, especially since he had always opposed the front drive concept. So at the beginning of 1934 he submitted a report to Citroen condemning the Sensaud de Lavaud box out of hand. This earned him much opprobium, during the course of which he was told that "the converter was inviolable", and that the factory must turn out 1000 a day! According to Reiner it was then that Brull shouted at Citroen "de Lavaud's transmission wont help you. Ditch it before you get ditched yourself because of it!" Yet Citroen himself could find no fault with it and frequently used it because of it's smoothness, though only around the Bois de Boulogne.

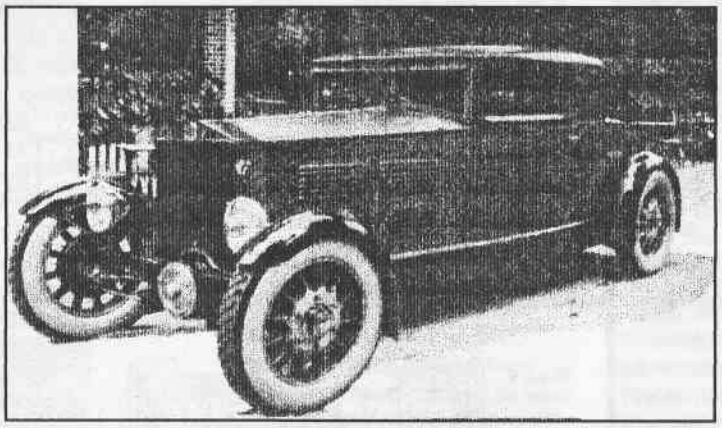
Norray, Brogly, Brull and Houdin, the PV design team, forsaw the inevitable demise of the turbine, and took it into their heads to secretly design a normal



gearbox that could replace it. This had to use the automatic gearbox's housing, which made the job very awkward.
It was then the turn of Maurice Norray, technical director, since Brull had now resigned, to take his courage in his hands in an attempt to bring Andre Citroen to his senses. He suggested to



him, that since all his engineers agreed that using the box was impractical, a test of five prototypes up the hill at Meudon would be held on a Sunday morning in May 1934, and that they should all climb it. In the event only one car reached Paris by noon, and it's doubtful if that reached the top of the famous hill. Citroen finally decided in face of this incontrovertible proof to abandon it. Sensaud de Lavaud had been warned of this likelihood but when he arrived Monday morning to defend it Citroen promptly showed him the door.
Meanwhile the new gearbox, mounted ahead of the wheel centreline and of two shaft design because of the limitations previously mentioned, was finally developed. This was conceived in the record time of three weeks, and due to this and lack of testing time this "cobbled up" box was bound to be troublesome. In short it's congenital weaknesses, like broken sleeves and forks, led to it's failure rate of 50% on the new "12s" in the first 600 to 2000 miles use."
This fascinating record of the Sensaud de Lavaud saga doesn't include the back-drop of the company position. At the beginning of 1934 the financial situation of Citroen was grave and getting worse. Eight days before the end of February, creditors pulled the plug on credit and the company went into panic mode. Desperate pleas went out to the dealer network for funds, which were forthcoming but too late to recover the situation.
On 3 March 1934, Citroen made a presentation of the new cars to potential financiers. The prototypes were fitted with the Sensaud de Lavaud box which functioned badly, and the presentation was a failure.
In their book "La Traction", Jaques Borge and Nicolas Viasnoff reported that the "turbine" was known to be delicate, and difficult to control. When the oil in the system heated,, the gearbox stopped operating and it was necessary to let it cool down to get the car going again.
Little appears to have been published on the details of the 'turbine'. One report refers to " a complicated amalgam of swash-plates and hydraulic couplings" and it is interesting to reflect on whether modern lubricant technology could have made it work. Johnathon Wood, in an excellent article on the TA published in "Thoroughbred & Classic Cars", March 1977 wrote that as applied to rear wheel drive.... "the system consisted of six free wheels mounted on a rear axle shaft each wheel having an eccentrically mounted connecting rod attached to it. The other end of the rod was secured to a swash plate or 'wabbleur' which wavered like a coin at the end of its spin so that the rods attached to it were moved by the same



The 1927 Sensaud de Lavaud car which so impressed Andre Citroen: Sensaud de Lavaud himself; an early prototype manual transmission showing transitional selector arrangement and gearbox mounting.

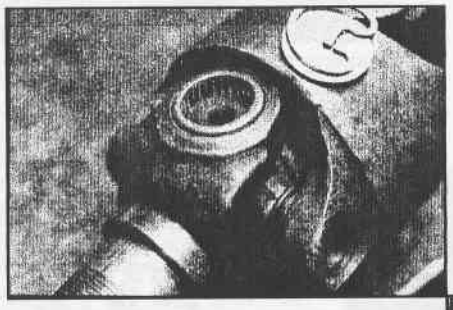
amount. Now the inclination of the plate was determined by the resistance encountered by the road wheels, the steeper the road, the longer the stroke of the rods and the higher the ratio; the shorter the stroke, the lower the ratio."
It appears that this same principle was adopted for the front wheel drive TA together with a torque converter or fluid coupling.
Despite a laughably short timeframe, the PV design team came up with a classic manual gearbox layout which became the paradigm for all subsequent transaxles used in unit with inline engines, mounted either at the front or rear. Volkswagen, Renault, Porsche, to name but a few, and of course Citroen themselves continued with this transmission layout for the D series, GS and 2CV.
However, it is difficult to accept the statement in the *l'automobiliste* article and reported elsewhere that the design team had to use the automatic's housing. Anyone who has worked on these gearboxes will recognise that the housing is purpose-designed and not cobbled-up.
The gearbox was a simple 3 speed plus reverse design in unit with a spiral bevel final drive and conventional differential, all housed in a aluminium alloy casing. The (upper) first-motion shaft was driven by the clutch, and passed foward over the differential unit and beside the crown wheel. It carried the free running helical third and second gear pinions, and a sliding straight-cut first gear pinion at the rear. A synchromesh selector dog assembly was fitted between the second and third gear pinions. The (lower) second-motion shaft was forged at the rear end of the shaft to form the bevel pinion and carried the fixed third and second gears, and a free-running first gear. The latter drove back to the first-motion shaft via an additional pair of gears and through the second gear set to the second-motion shaft. This unusual arrangement enabled a satisfactory first gear ratio to be obtained, and provided a means of fitting in a reversing gear via a separately mounted intermediate gear driven by the sliding first gear pinion. The intermediate gear accounts for the bulge in the right hand side of the gearbox casing. Two selector shafts were used - one selecting first or reverse, and the other picking up third or second. The crown wheel and differential assembly was mounted to the gear casing with separate aluminium bearing caps on each side.
Altogether a quite elegant engineering solution, not deserving of it's dubious reputation. At 75 mm, the shaft centre distance was generous and the gears and bearings were well sized for the torque available. It was rushed into production before being fully developed and suffered the consequences as described in the *l'automobiliste* article.
According to the Citroen parts book, the gearbox was seriously upgraded in May 1935 - the type B gearbox. These detail modifications addressed the problems suffered with the initial release. Although continuously developed over two decades of TA production, it was never completely re-designed by Citroen which in itself is a tribute to the original hurried design.

C.V. or NO C.V. That is the question!

By Bernie Hadaway

When the inevitable happens and those SPICER/TRACTION drive shafts start to contribute more noise than all the other Traction noises combined, one has to consider "what to do"?

If one is looking for the optimum long life and performance solution, a modern C.V. joint transplant by Carey Motors is the only way to go, but if like me, one tries to keep some originality, there are difficulties! Two of them to be specific, consisting of the two (2) spider (cross) components that provide the universal action of the "Double Cardan" constant velocity assembly, they always deteriorate due to the progressive brinelling of



their journals until the noises suggest that a disaster is about to take place, but rarely does!!

These spider components are special with extra material in the forging, to compensate for the hole for the clearance of central C.V. control numbers.

Replacement spiders are as scarce as hens teeth. Repco forge (Unidrive) have scrapped all the forging dies and machining and grinding processes have long since gone! I've tried to modify larger spider series as replacement, with mixed success and I've even considered machining new spiders from the solid. Possibilities – but hardly a practical solution.

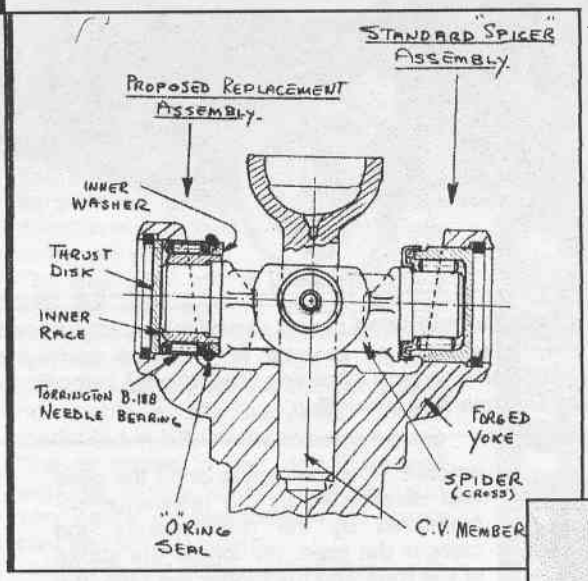
A recent visit to Unidrive (ex Hardy Spicer) looking for spider component's for conversion revealed that some recent imported CARDAN type joints are using drawn thin wall Torrington type needle bearings, pressed and staked permanently into forged yoke cross holes. These take up less room than the SPICER type machined cup and needle combination, allowing larger diameter spider journals with improved load carrying capacity.

Well I got out the Torrington Catalogue and got lucky – Torrington Part No. B-138 has an outside diameter 1 1/16" and a length of ½" which will press nicely into our drive shaft yoke cross holes.

But what was very convenient – the inner operational diameter of the needle race – 11/16" diameter! This compared to the spider journal dia. of 21/32" which means that substantial inner races can be fitted over worn spider journals suggesting a practical recovery method, with new bearing journals on old spiders!

The shown arrangement required some exploration with pencil and paper before the method was decided upon, and eight sets of bits were made.

The parts are simple but have to be produced with reasonable precision from good materials. The inner races were turned from 11/16" diameter ground "Silver Steel" bar, which was



bored to be an easy press fit (size for size) over the worn spider journals (surprisingly, in spite of fairly bad brinelling of journals, the original dia. remains)

Hardening was carried out using a propane/oxy torch followed by a water quench and a minimal temper (light straw). No distortion or damage to surfaces occurred and pre-heat treatment dimensions remained.

The other two components were turned from 1045 steel (because I had it in stock). The inner washer was not hardened but the outer disc, which takes end thrust from spider trunnions, was.

By the way, the heat treatment temperature before the water quench is judged by bringing the component to a Cherry Red before dropping into a bucket of water! Bingo 60-62 Rockwell hardness which is pretty hard!!

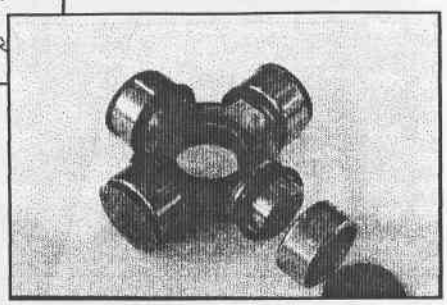
The "O" ring I selected is 3/32 diameter section with a 15/16" bore which provided stretch at assembly.

I made my assembly by pressing the inner races onto the spiders in a bench vice with an application of Loctite 280, to be on the safe side, but one can visualise making the assembly whilst the old spiders are still in situe with the main assembly still intact (no need to extract central C.V. members – only outer cup races).

Assembly is straight forward. All the bits go in through the yoke cross holes followed by the circlips.

I haven't yet tested this first drive shaft but it looks good and I don't anticipate problems. It should be an improvement due to the larger journals having an increased load capacity and better resistance to brinelling because of the through hardened inner races (not case hardened). Equally the Torrington races should support a comparable load to the original with their more generous proportions.

Cost wise the Torrington Races



are $4.00 to $6.00 each depending upon who you know, and "O" rings about 10 cents each. Who else is game to try?

In Answer to Bernie

In reference to Bernie Hadaway's informative article on second gears in the Traction Box, I posted the article on the Internet to fellow Traction enthusiasts. The following comments were returned from Roger Williams of the UK.

Dear Leon,
Many thanks for the article - here are my comments. Firstly the section in the repair manual covering the gearbox was translated from French in 1934 and referred to the A series gearbox. It was never corrected when they brought out the B series gearbox which was similar in principle but with many detail differences.

1. The majority of mainshafts I have measured have been 29.42mm diameter and the splined section should be nominally 30.00mm but is usually down to 29.97 or lower. I have never come across one that has been as much as 30.00mm diameter.
2. About ten years ago I measured approx 30 2nd and 3rd gear bores and found them all to be a little smaller at the synchro cone end usually between 0.04mm to 0.06mm.
3. I have not come across this taper on the bearing area at the end of the splines - the bearing area has usually been consistent at 29.92mm diameter.

One important point that Bernie has not mentioned are the bushes. The original specification was for two bushes, one with a left hand spiral groove and the other with a right hand one - the right hand spiral goes at the synchro cone end. They appear to have been pushed in from each end of the gear thus leaving a gap to allow the oil to be forced through the three holes drilled in the base of the teeth of the gear and out along the spiral grooves. I cannot remember a second gear where the two bushes have not crept together and closed off the oil holes drilled in the base of the teeth.
My approach has been to manufacture a new one piece bush which is a tight press fit in the bore of the gear - there is a slight undercut of about 7mm long under the holes in the base of the teeth between the two spirals. I press the bush in from the non synchro cone end, drill the oil holes through the bush and then chuck the gear in 'soft jaws' and true it before boring out the bush to suit the mainshaft. At the same time as I checked the bores of the gears I checked the angles of the synchro cones and of the eight I checked they were all different – varying from 1 in 8 to 1 in 11! Settled on a standard of 1 in 10 ie approx 6(and made a jig to this angle. Having got the bore true to the teeth of the gear I could now mount the gear on an expanding mandrel and grind the synchro cone to 6(. New inserts are put in the synchro hub and turned to the same angle.
After surface grinding the thrust washer that fits in the synchro cone end of the gear I press the gear along the shaft over the splines - in the main a clearance of 0.05mm can be achieved but what is quite difficult is getting the end float of between 0.05mm and 0.10mm for 2nd gear. Citroen never made celeron washers with a close enough tolerance to achieve this. Even if you can find original celeron washers they are unlikely to be thick enough to take up the wear that has occoured to the gearbox in the last 50 years or so. I have made a series of new thicker celeron washers which in combination with surface grinding the retaining washer allows the specified tolerance to be achieved. I must say I do not like the idea of using grinding paste to lap in the bronze bush - bits of grit will get imbedded in the bush and cause wear. Much better to bore it out which can be easily done to a tolerance of 0.01mm.
I am completely lost on the use of Loctite 680 on the anti rotation key and the 0.07mm chamfers/clearance. Could Bernie enlighten me please.
Hope the above is of interest.
Best wishes Roger Williams

Bernie's Response

Roger—you have obviously found my discussion on second gear problems with Traction gearboxes, and possible improvement, difficult to comprehend. This suggests a shortcoming in my descriptive material which I will try to put right—as follows:

1. The proposed improvement involves locking (with Loctite) a one piece bronze sleeve (on bush) to the mainshaft, its outer diameter providing a new, larger stable bearing surface, for the second gear to run on.
2. The second gear itself, minus its pressed in bronze bushes runs directly upon the outer diameter of the bronze sleeve (or bush) which has become a fixture and part of the mainshaft. The new running bearing surface of the second gear in its steel bore surface which is improved, both finish and dimension wise, by lapping with abrasive incorporated in a bronze lapping tool.

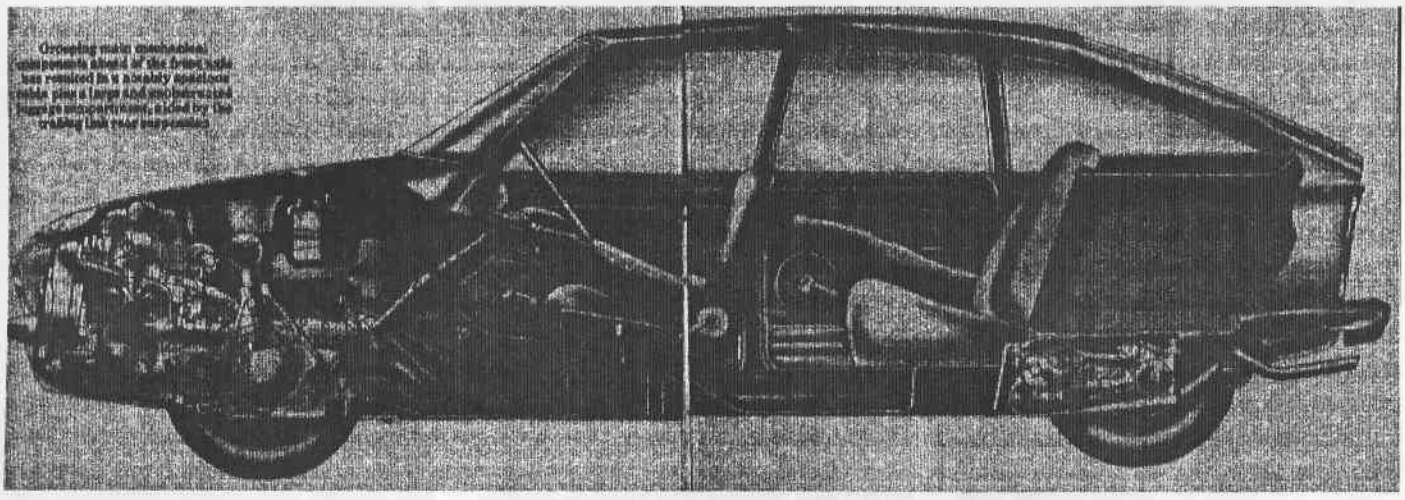
Bronze bushes are never lapped as you have rightly commented upon—where hard steel is OK.
Roger, I hope you can comprehend the above proposed change to the traditional design, and then upon re-reading the original discussion, become familiar with my attempt to find a practical way of improving the original, and promote improved second gear life.
Thanks for the interest and comments.
Bernie Hadaway

Roger's Retort

Hello Bernie, Leon et al,
Thanks for the above information - I now understand what you are doing but have to say I do not agree that it is a good idea
at all! The main reason the bushes on the second gear crept together was because at least one of them had been pressed through the synchromesh cone end of the gear which is slightly smaller than the rest of the bore and lost quite a bit of the intended interference fit. You will be achieving the same when you push the bush over the splines which are at least 0.05mm - 0.10mm (depending on how good the top shaft is) larger than the bearing area the bush is to be fixed to. Also the bore of the gear is fairly rough and I think you will find it difficult to get a good finish in here that is concentric with the gear teeth. At one time I honed out a few gears to a fine finish and pressed in a bush of finished size, allowing for the interference fit, and found it was not true to the gear teeth. It is much easier to press in a one piece bush with a good intereference fit and then bore it after truing up the gear in soft jaws in a lathe. I have to say that I have had no problems in the 50 plus gearboxes I have repaired in the last seven years or so using the above method. The gearchange is good and the gears quiet in operation. Thanks for keeping me posted and I hope we can continue to converse on matters technical!
Best wishes
Roger

Gaston Investigates New Model for the Millennium

By Alan Brown

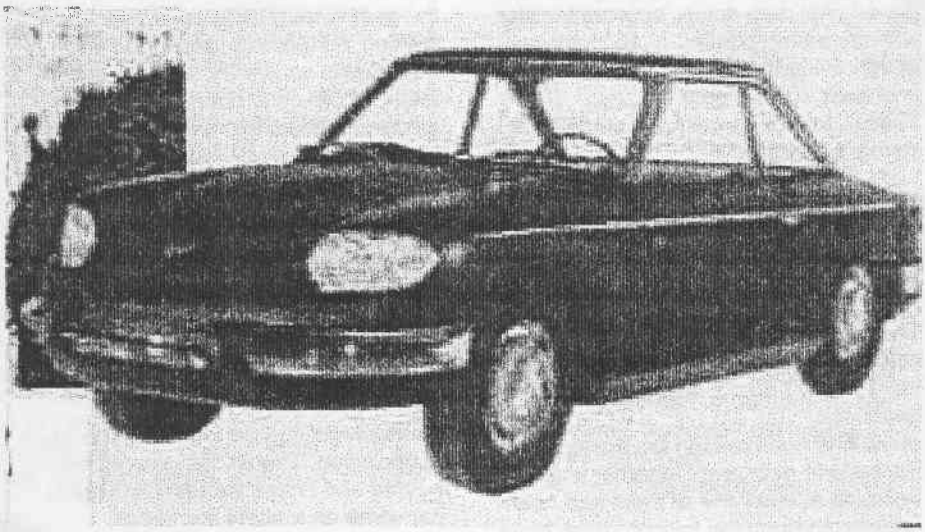


Readers will recall that last time we heard from CCOCA French Correspondent Gaston Pommille-Batard was in 1998 following the Easter Cit-in in Busselton WA. Many readers have been in contact, wondering what our intrepid Frenchman has been up to in 1999....

"Auriez-vous accepte un cafe, monsieur Pommille - Batard? "The question was a seminal study in sociolinguistics. Gaston looked across the table to Monsieur Lecouvreur, a gentleman frangais of slight stature and some seventy years who was wearing a smart tweed sports coat of indeterminate age, green corduroys and a curious paisley patterned winter shirt. The gentleman, had his pedigree not forbidden it, might have said more simply "un cafe?" or perhaps "je vous propose un cafe?" His actual utterance, "Would you have accepted..." employing the conditional mood of the future perfect tense made no assumptions on behalf of either of the two men present at the baroque kitchen table in the breton maison bourgeoise, and was of an elegance matched only by the coffee cups which appeared from the oak kitchen cupboard the moment Gaston replied; "Volontiers, monsieur Lecouvreur" They sat for half an hour, chatting, sipping coffee and eating buttery Mont St Michel biscuits. The gentleman had owned the very first Panhard 24CT sold in Brittany.

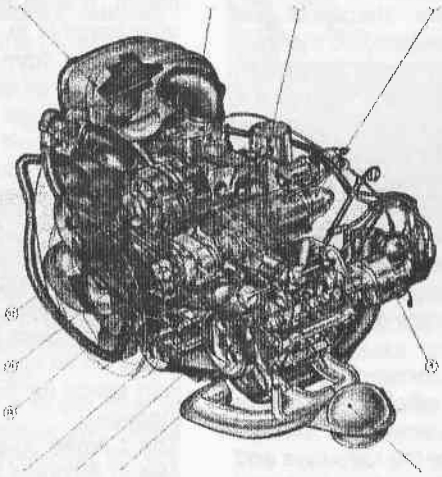
"165 kilometres per hour, monsieur. For a car with two cylinders in 1963 this was tout & fait exceptionnel. And the handling was delightful. I still have that car in my garage. We will look at it later. My colleague, he is 86 years old, and he will help me to rebuild the gear-box next week. I have five gearboxes you know, in my shed. There were so many different ratios..."Gaston was fascinated. He was here to visit the Lecouvreur museum of roof architecture, and after the visit had enthusiast. "Of course, Rennes is the capital of Citroen. And I tell you something many people do not know. I promise you will never look at your GS with the same eyes again..." Gaston's battered, beige GS station wagon was in the courtyard on the other side of the kitchen window, and he glanced through the four panes of glass across to its ageless silhouette. On the drive north that morning, he had reveled once more in the driving characteristics of this masterpiece, whistling along with turbine smoothness, and rock -steady road holding.

"Your GS, you realize that it is more Panhard than Citroen, no?" Gaston had never given this a thought. "Oh, yes, monsieur. Just think of it. Citroen, when they took over Panhard, kept many of



the good ideas. For example, for the DS, the shape of the headlights they took from the 24BT. You know the 2CV Sahara? Now there are very few left, but the idea, it came from Panhard who already had manufactured armoured cars with two engines, even two drivers. They could go backwards and forwards at any speed!"

Gaston commented that this was perhaps as fortunate as it was symbolic, given the history of decolonisation at the time. "Well, I was saying about the ideas of Panhard. Come and look at the documents in my garage." Gaston recalled seeing a book during his visit to friends in Australia at an Easter car meeting. He had taken time off from the conviviality to visit a bookshop in Fremantle. There, in the gentle warmth of an autumn afternoon and oblivious to the presence of visiting American sailors, he had unearthed a book called "Blokes and Sheds". The edifice he now entered should have been its centrefold. It would have been hard to imagine an element of 1960's Citro-Panhardabilia you couldn't find there. There were experimental dashboards, polished and adorning three of the four walls. Dismantled and polished two cylinder engines. Three studded wheels and rims. And many pictures on the fourth wall.



"Look at this, monsieur. Did you know that a new Pan-Pan was due for launch in 1968? Here it is!" At the rear of the shed were four pallet-sized packing crates. The holiest of holies. The owner lifted the corner of a tarpaulin, and Gaston saw a number of carefully wrapped, pale blue bodywork parts. "It will never be assembled now. But come, and I will show you the pictures". Pinned to the central roof beam, invisible from the doorway but well illuminated by almost horizontal December sunshine from a clear roofing panel, were four works' drawings of an elegant blue four-door sedan car, its lines quite unlike anything Gaston had ever seen. The beauty of the object took his breath away. The elderly man had observed his guest's reaction.

"Yes, I see you also are a true enthusiast, monsieur, who appreciates beauty and the finer things. I know it is sad in a way that Citroen never went ahead with the project. Remember that the DS was at the height of its popularity, and Peugeot was about to launch the 504 - another beautiful, classic car in its own way. But there is one element from this car which I think you will recognize. ..."

They walked back to the packing crates. The one on the right was smaller than the others. They lifted the lid. Inside was a four cylinder air-cooled engine.

"You notice something familiar?

Gaston examined the cowlings and the exhaust system. Of course, they were almost identical to his GS. "So, you see. In the same way that dinosaurs became birds, the GS was born!" The two men talked together for the next hour. Lunchtime approached as they walked to the garage door.

With only the sound of Michelins on crushed breton granite, Monsieur Le had only launched the car a few days before, and evening TV schedules featured Seguela's latest ad for this new model. "Picasso - l'imaginaire avant tout" was the ad's punchline.

Gaston's imagination moved up a gear at the sight of the oversized chrome chevrons, the Picasso signature on the side of the door, and most of all when his eyes met those of the driver. Gaston looked at the outline of the car, and then thought of the Panhard project drawings. Then back again at the Picasso. Then back again at mademoiselle Lecouvreur. Then he thought of Claudia Scheiffer in the Xsara ad.

"May I introduce my grand daughter Caroline, monsieur... she often has lunch with us on Fridays. She works in the publicity department. I think you can guess which company, no?"

He was not thinking of Panhard, Citroen or dinosaurs as Mademoiselle Lecouvreur shook his hand and smiled, saying: "Aunez - vous accepte de dejeuner avec nous, monsieur?"

The next morning, Gaston's was the only GS travelling into the winter sunrise on the road south. He overtook a container truck with CITROEN in confi-

dent red capital letters along its side, and removed a long, golden hair from his jacket. He steered the car into the service station half an hour south of Rennes, and made a phone call to his mother.

FROM Alan Brown

CITROEN NEWS

WOMAN OF THE YEAR CITROEN'S MAGDA SALARICH

The influential motor industry magazine, Automotive News, has chosen Citroën's Magda Salarich as its Woman of the Year for her prominent roles as the French car maker's Director of Sales in Europe, Director of European Advertising and Managing Director of Citroën Spain.

Under the leadership of the 43 year old Spaniard, Citroën sales in her home country have moved forward to more than 200,000 cars in 1999 or more than 11.5 per cent of the market, giving Citroën second place in the market. But this is only part of her work for Citroën. As Sales Director for Citroën, she is responsible for the launching and sales growth of all models in all European markets and she manages Citroën's relationship with its advertising agency, Euro RSCG. Her influence has seen Citroën sales grow in Europe's largest car market, Germany, by more than 10 per cent while the rest of the market has moved forward by just 10 per cent.

Salarich has worked for Citroën since she joined the company from the University in the mid-1970s after training as an engineer, the only woman in her class. Married with two children, she splits her week between Madrid and Citroën's Paris headquarters.

CITROEN FAMILY CAR of the future

The family car of the future will be on display at the 2000 Brisbane International Motor Show (4-13 February 2000) in the unique shape of the Citroën Picasso, a car that has the interior space of a traditional Australian wagon, but takes the up the road space of just a small hatchback.

Due for launch in Australia later in the year, the Citroën Picasso is the most advanced of a new class of car, the mini-MPV, that provide outstanding interior space combined with a small exterior, high tech engineering and a shape that is like nothing else on the road.

The high tech engineering ranges from one of the most fuel-efficient and cleanest engines in the world, to storage lockers in the floor for the kid's toys and a rear hatch that adapts for short and tall people. It even has a built in shopping trolley!

The Mini MPV class, although it has just three members, will over take the big MPV class in Europe sales during the next 12 months with this new style of car set to become for the new millennium what the 4WD has been for the 1990s: The car to be seen in.

The Mini MPV, exemplified by the Citroën Picasso, has achieved this by offering a unique combination: An exterior size and footprint on the road little larger than a conventional medium hatchback, but, thanks to the monospace, or single box design and added height, a level of interior space that is unimaginable in a hatchback. Yet, it is as easy to drive and maneuverable as a conventional car.

To this package Citroën adds the features that would be expected of such an innovative and stylish marque.

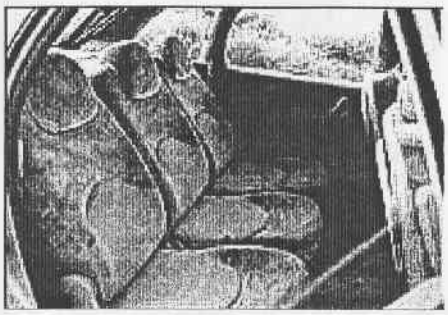
It is based on the platform of the acclaimed Citroën Xsara, which endows it with class-leading ride quality, handling and roadholding. Its unique exterior styling that sets it apart in an already innovative class houses an interior that builds on an already spacious envelope with space for five occupants and their luggage.

The Citroën Xsara Picasso will go on sale in Australia at the end of 2000 with prices expected to start from just over $30,000. Full pricing and Australian specifications will be announced when the Picasso goes on sale.

Citroën Xsara Picasso: Innovation in vehicle design

Unveiled at the 1998 Paris Motor Show, the Citroën Xsara Picasso owes its exterior and interior styling to the Citroën Creative Styling Centre. Reflecting new concepts in style, ergonomics and practicality the Xsara Picasso is spacious, user-friendly and versatile.

CITROEN NEWS

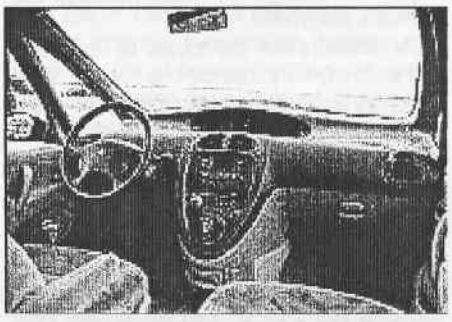


A single-box vehicle with the continuous line of the windscreen and bonnet, the Xsara
Picasso is a hatchback at the rear with its raked rear window. The morphology of the vehicle is a first in the world of automotive design. The dimensions of the Xsara Picasso place it squarely in the family of compact vehicles, but the interior is exceptionally user-friendly and spacious as a result of the vehicle's astonishing proportions. Its overall length (4.27 metres) places it between the Citroën Xsara and the Citroën Xantia, while its height (1.63 m) places it between the Xantia and the Citroën Evasion people mover. The width is 1.75 m.

With its interior space and generous wheelbase of 2.76 m, the Xsara Picasso offers five real seats (the three at the rear being of identical size) and a vast boot of 515 litres or in other words, a load capacity equivalent to that of an wagon in the Class above.
The range is based on a single level of trim and three powerplants: two petrol (1.6i and 1.8i 16V) developing 65 kW and 85 kW respectively, and one diesel 2.0 Turbo Diesel Hdi developing 66 kW.

The name Xsara Picasso, surprises and catches the imagination. One of the greatest artists of this century, Picasso broke with accepted conventions to share his personal vision of the world. It was therefore natural for an original and inventive marque such as Citroën, a marque with a worldwide reputation as an innovator, renowned for its ability to design cars with a difference, to associate the name of Picasso with the first Citroën car of the third millennium.

Responding to customer requirements, the Citroën Xsara Picasso combines the versatile and modular practicality of an all-purpose vehicle with the looks, safety, robust design and driving pleasure of a saloon. The Xsara Picasso combines the qualities of several automotive families. It can be compared to a saloon, a wagon, a people-carrier and even a cabriolet when it is equipped with a large sunroof extending back over the second row of seats.
The vehicle is designed to offer a living area in which the well-being of all occupants is taken into account. The spacious and modular interior, the three rear seats, the flat floor forming a walkway and the generous stowage space illustrate Citroën's determination to make life on board a pleasurable experience. The height of the driving posi-



tion - mid-way between a saloon and a people-carrier - is a major improvement. The vehicle is designed to make everyday tasks easy. Moreover, the Xsara Picasso is equipped with a wealth of features to make sure that children travel in comfort and safety.
The vehicle is designed to combine driving pleasure and comfort with a high level of safety. The multiplexed electrical architecture offers a number of new functions including smart front and rear windscreen wipers and automatic locking.
It also rationalises the electrical equipment for increased reliability and simplifies repairability through improved diagnostics.
The Xsara Picasso offers a generous level of equipment for the safety and comfort of vehicle occupants. In terms of safety, it is equipped as standard with twin front airbags (the passenger airbag can be deactivated) and twin side airbags to protect the head and chest, front seatbelts with force limiters and pyrotechnic pretensioners, ABS, a transponder, and wide-field rearview mirrors among other features.
In terms of comfort, the Xsara Picasso is equipped with variable power steering, electric front windows with one-touch control and an anti-nipping device on the driver's side, two electric, defrosting rearview mirrors, central locking with HF control, an onboard computer and height-adjustable driver's seat and steering wheel.

To meet customer requirements, the Citroën Xsara Picasso provides generous stowage space and focuses on a host of "minor" details that simplify everyday use: an indicator on the instrument cluster to show whether the child safety lock has been activated; warning signals to indicate a risk of black ice or inform the driver that the key has been left in the ignition, the doors are open or that he is over the speed limit; doors designed to open in three positions, an indicator showing the distance to be covered before the next scheduled maintenance operation, automatic locking if the driver forgets, a driver's footrest, and a car radio with automatic volume adjustment and fingertip controls.
The Xsara Picasso was developed within the framework laid down by Citroën's Product Development Charter. The project took 151 weeks and involved an investment of FF 1.9 billion of which FF 1 billion in development costs (design, quality, tests, prototypes, process engineering).
The Xsara Picasso is scheduled to arrive on the market at the end of 1999 in Europe and in Australia at the end of 2000. It will be assembled at the Vigo plant in Spain.

Twin Pot Topics

CITROEN 2CV
the complete story

Author Matt White
Published by Crowood Auto Classics, Crowood Press LTD, Ramsbury, Wiltshire SN8 2HR. Pub. 1999 ISBN 1 86126 2108. 192 pp.
Review copy courtesy of Technical Book Co. Melbourne. Price $59.95

"What?" you exclaim, "Another 2CV book—and in English too. What is going on?"

My theory is that the authors more or less separately recognise a gap in the market, and set out to fill that gap—initially at least, quite ignorant of the other's efforts. Inevitably each would have become aware of the other's efforts, and then would have attempted to push the book in slightly different directions so that they did not clash too severely in the marketplace. Good in theory, not so easy in practice!

Matt White's book is printed on low-gloss paper for text and black & white photo reproduction. Eight pages of color prints are on full-gloss paper and add very markedly to the attractiveness of the volume. A selection of colored shots (most notably of a "plums & custard" Dolly) give a major boost to the vitality of the dust jacket. The book is in the same series as Jon Pressnell's recent book on the Citroen DS.

Among the credits, Matt White lists Ken Smith, ex-Chief Engineer for Citroen at Slough; The National Motor Museum at Beauliue; 2CVGB archives and "our own" David Conway (Honorary Ozzie) for advise on the scale model scene. Credit is also given for input on 2CV racing (yes, true!)

The book (or at least the Publishers!) claim the following achievements:

Coverage of full design and development history; full specifications of all models; includes Ami, Dyane and commercial vehicles; the 2CV in motor sport; and full illustrations in black & white and color photos. To a large extent I would support their claims.

Competitive cars in the period of 2CV production, Renault 4, Volkswagen, Morris Minor, Panhard Dyna PL-17 are examined in comparison to the 2CV. Not surprisingly, the 2CV comes out on top, even though that wasn't always the public's judgment.

2CV variants are examined in more detail than in, for instance the recent 2CV book by John Reynolds. However I feel that even the White book is not complete with respects to variants, some of which were produced in small numbers and odd shapes in many locations around the world. Perhaps the subject for a <u>really</u> comprehensive compilation!

The major feature of the book in describing the nature, sequence and timing of evolutionary changes to the 2CV will be appreciated by many readers. However, even here, I felt there were occasional omissions.

Editing appears to have been thorough, though I did note some problems remaining.

e.g. — transposing of the captions (but not the photos) between pages 40 and 43.—the strange inclusion of Traction Avant variants on page 104 (C.D. Walters Special) and page 105 (15 Six H by Franay), at least one instance (page 188) where the dreaded DTP has left the reader wondering how a sentence was meant to finish.

The tables of specifications and written descriptions of various models should be useful to many Citroenists. The bibliography should also provide further information.

Bill Graham

EXPRESSION OF INTEREST
2CV RAID #4-2000

I plan to do the above Raid from Alice Springs to the tip of Cape York over the period—12 August to 9 September 2000. It is likely that I will also do the preliminary leg of Capeheeuwin (SW corner of the continent) to the centre, before the Raid itself.

The car I will drive was prepared for the Raid #3, 1996 and of course I will have the benefit of acting as co-driver in that Raid.

The Raiders are a genial but competant group of 2CV enthusiasts, with good support-vehicle back-up.

Typically, the group numbers 100+, and vehicles number 50 to 60+.

In 1966, nationalities within the group numbered 14, with very strong European content, as well as Australians and Kiwis.

I would like to receive an expression of interest from anyone who would like to join me as a co-driver/co-participant in this "experience of a lifetime" in 2CV Raid Oz #4.

Costs (entry, fuel, food, etc.) would be shared 50/50, roughly about $1500 each.

Please reply to:
Bill Graham, 87 Rosemary Cresent, Frankston North. Victoria 3200, Australia
Tel. +61 03 9786 2710

THE UPS & DOWNS of CITROEN SUSPENSION

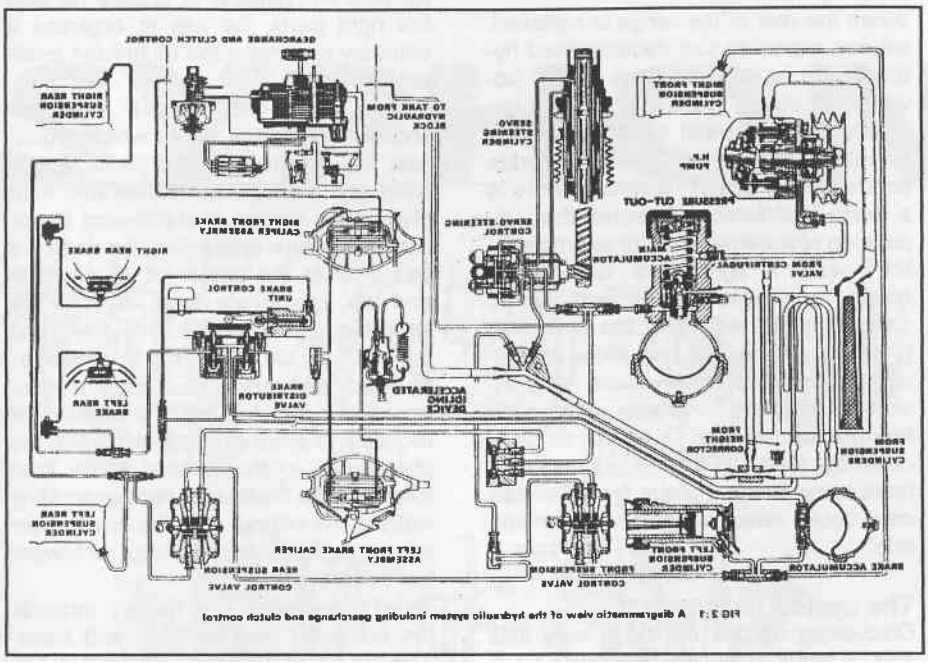


FIG 2:1 A diagrammatic view of the hydraulic system including deaerating and clutch control

DECENTRALISED HYDRAULICS

History

Citroen's famed hydraulic system first saw the light of day in 1953 with the introduction ot the I5CV Traction Avant where it was used to power the rear suspension

In 1955. the DS 19 was launched; equipped with hydropneumatic suspension on all four wheels, the hydraulic system was also used to operate the power steering, power brakes, clutch and gear change.

In 1957, the ID19 was launched and on this car, the hydraulic system operated the suspension only. Steering was unassisted, as were the brakes which made use of a conventional master cylinder. Transmission was conventional.

Later IDs acquired power brakes and power steering.

In 1970, the high pressure hydraulic system was extended to two new models - on the GS it was responsible for suspension and brakes while on the SM it was employed to operate a novel power steering system (DIRAVI).

In 1974, the CX was launched and the hydraulic system was employed for suspension, brakes and power steering (based on the DIRAVI system fitted to the SM).

The BX of 1982 used the hydraulic system to operate suspension, brakes and a conventional power steering set up.

The first major development of the hydraulic system was the use of electronic control of the suspension (known as Hydractive) in the XM of 1989 The XM made use of the high pressure system for the brakes and steering (some continental models used the CX's DIRAVI system while lesser models made do with the BX set up).

The Xantia used hydraulics for suspension, brakes and conventional steering. Laser Xantias made use of a revised version of the XM suspension set up (Hydractive II) which was also fitted to post-1994 XMs) and in the Activa it was extended to prevent body roll.

Centralised Hydraulics

All of these systems can be termed `Centralised Hydraulics' to differentiate them from the new decentralised system.

Centralised hydraulics employ a hydraulic pump driven by the engine. This pump pressurises the hydraulic fluid which is stored in one or more accumulators. Pressurised fluid is then available for use in the suspension, steering, brakes, clutch or gear change, depending on the model. When pressure in the accumulator drops to a predetermined level, the pump kicks in automatically and pressure is restored.

The brakes problem

Depending upon who you speak to, there are problems with the centralised system.

The Dutch have been told that the European Commission is concerned that in the event of engine failure, there are only a limited number of brake applications available before the accumulator loses pressure. Here in Britain we are told that the problem is the punters' dislike of the zero travel brake pad.

Whatever the reason, Citroen has taken the decision in divorcing the braking system from high pressure hydraulics and to fit a conventional system with master cylinder and servo.

Having taken this decision and having effectively abandoned DIRAVI, it therefore makes sense to either drop high pressure hydraulics altogether or to rework the system.

The former option would be a case of throwing the baby out with the bath water - hydropneumatic suspension is the marque's USP (Unique Selling Proposition - that which differentiates Citroen from the competition).

Computer control

Hydractive and Activa suspension make use of electronics to control the hydraulics.

Put simply, the car is fitted with an additional suspension sphere on each axle. The sphere can be switched in and out of circuit. thereby making the ride soft or hard.

Electronic sensors are fitted to measure vertical and lateral body movement, road speed, throttle opening and rate of throttle movement, braking pressure and rate of retardation, steering wheel movement and rate of movement. The signals are sent to a computer which then switches the additional spheres in and out of circuit according to a predefined set of parameters. Activa takes this one step further by employing hydraulic rams that eliminate body roll.

The new system

Where the new decentralised system differs from the old is the elimination of the engine driven hydraulic pump and the removal of hydraulic interconnections between the suspension units.

Instead, there will be an electric pump fitted to each suspension unit. Instead of the hydraulic interconnections, there will be electronic interconnections, all linked up to an on board computer which will be tasked with maintaining levelling, anti roll and variable damping. Full details of the new system are not yet available and some of the information is quite frankly contradictory. Some sources have suggested that in addition to the electric pumps there will be pumps driven by the wheel rotation. Suspension spheres may be similar to current ones or may be square (if that is not an oxymoron) and fitted with up to three diaphragms. Variable viscosity fluid may be employed (the viscosity is changed by passing an electric current through it).

Future developments

The Activa prototype demonstrated the feasibility of steer by wire - a system employed in aircraft. This system replaces the mechanical or hydraulic connection between the steering wheel and the steering rack with an electronic control system. The steering wheel provides input to a computer which then provides the necessary pivot angle to the steerable wheels (four wheel steer can be easily implemented). Feedback can be provided via high pressure hydraulics, driven by an electric pump, in a manner analogous to DIRAVI. The steering rack could be dispensed with. thereby allowing considerable weight reduction and also avoiding the compromises caused by Akkerman steering geometry. However, there would be likely to be major legislative hurdles to be overcome, not to mention the fears of the punters.

Another development is brake by wire which is possibly more likely. The system operates along similar lines to steer by wire and by using a computer one can introduce all sorts of refinements - ABS and traction control specific to each individual wheel spring to mind as examples. If the brake computer talks to the suspension. steering and automatic transmission computers (or if there is but one computer managing all of these functions), even more possibilities open up.

To provide electronic back-up, the principle of triple redundancy could be used. You have three identical but independent computers and decision making operates on a consensus basis - a majority decision is required at all times.

The immediate future

It is certain that X4 (the Xantia replacement) will be fitted with the decentralised suspension system, conventional brakes and steering. X4 at its three-year restyle may acquire brake by wire. C6 (which has just been given the green light) will also use the decentralised system and may make use of brake by wire.

When the rest of the range is replaced, we can expect to see decentralised hydraulic on all models. One of the advantages of the system is that the hydraulic and electrical components can be standardised (with commensurate economies of scale) Obviously there is a world of difference between the suspension requirements of for example an MPV and a lightweight two seater coupe - and these requirements can be catered for by adjusting the computer program. One could also allow an element of user control over the suspension parameters - those who were brought up on the D series or 2CV could opt for a soft ride while those who have come to the marque from German cars could select a posterior-pounding ride.

The cynic's view

Discussing all this on the e mail lists and by telephone with friends who have not yet entered the virtual world of the late twentieth century leads me to believe that while most people think this is heady stuff there are concerns that the electronics and electrics may be insufficiently robust. Experience gained from Hydractive cars suggests that Citroen had better achieve a quantum leap in both component quality and quality control. If Citroen do indeed go down this road, they really must ensure zero defect quality. Failure to do this will see the company's products ignored: no matter how well they ride, no matter how sophisticated they are. Furthermore, in our highly competitive world. Citroens must be priced competitively since few mainstream customers will be prepared to pay a premium for technology that offers few identifiable advantages over conventional products.

The cynics will also view the introduction of conventional braking systems as a retrograde step, irrespective of the reasons.

Centralised maintenance and decentralised diagnosis

Something that will he introduced over the next couple of years is the use of on board radio `phones with modems to allow the various computer systems to talk to a central depot. Some very clever things can he done with this technology:-

First scenario. Your brake pads wear. At present, a light comes on in the instrument panel and you then phone your dealer who orders the pads if he does not have them in stock and books you in for a service. He has to ask you for your RP number to ensure he gets the right parts, he has to organise a courtesy car, make the technician available, etc.

In the brave new world, your car phones the central depot which organises the purchase of the pads, it then gives you a choice of dealers who then give you a choice of dates and times. You make your selections, the pads are delivered to the dealer of your choice and the appropriate time slot is made available in the technician's diary and the courtesy car is also made available.

Second scenario. Your engine management computer has a problem that requires re-programming. It makes the phone call to the factory which then transmits the necessary reprogramming instructions without you, the driver, ever being aware that anything untoward has happened.

Third scenario. The factory amends the computer programming and transmits the new program to your computer, again without you being aware of it.

Fourth scenario. Your car breaks down. Your computer phones the emergency breakdown service of your choice, tells them what is wrong, locates the nearest supplier of the requisite part and organises and manages the entire breakdown.

Fifth scenario. You have lost your car in a multi storey car park. You press a button on your key transponder, a geostationary satellite locates your car for you and then provides you with a series of instructions to direct you to your car.

Sixth scenario. Your car is stolen. The car is immobilised, all the doors and windows are locked and the police are directed to the car's location.

This is not science fiction. Of course if John Prescott has his way, it will be pie-in the sky because we will go everywhere by bus or train and cars will belong in museums...

talking technical

SPARE PARTS OFFICER — MEL CAREY

SYPHONING

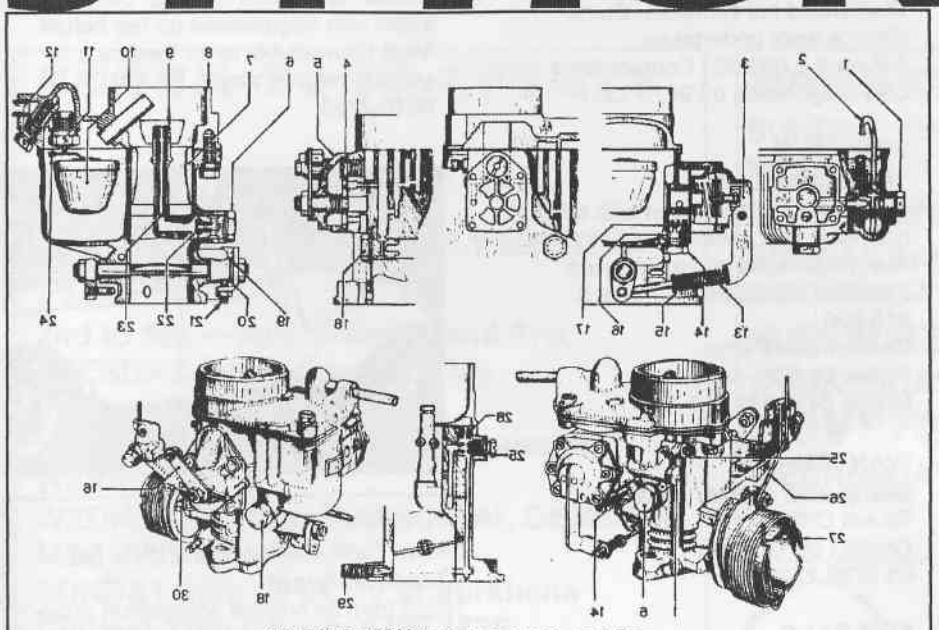


FIG 3:19 Details of the Solex 34 PBIC carburettor

Key to Fig 3:19 1 Pump jet 2 Injector 3 Pump lever 4 Starter air jet 5 Accelerator pump 6 Main jet carrier 7 Choke tube 8 Float chamber cover 9 Air correction jet 10 Float 11 Needle valve 12 Filter plug 13 Spring 14 Non-return valve 15 Spring seat 16 Filter 17 Steel ball 18 Starter fuel jet 19 Washer 20 Support 21 Butterfly regulating screw 22 Main jet 23 Emulsion tube 24 Float spindle 25 Slow-running jet 26 Spring 27 Throttle control 28 Idling air bleed 29 Volume control screw 30 Throttle stop screw

To continue our talk on carburettor problems;

This fault should not be confused with flooding which we discussed last issue. Syponing is an effect whereby fuel will overflow from the main spraying outlet or from the accelerator pump jet after the engine is turned off, causing fuel to collect in the throttle chamber or inlet manifold, [both the 4cyl. & 6cyl. Traction manifolds have an external drain tube to dispose of any access] No fuel will escape whilst the engine is running, so this problem only becomes noticeable when the engine has been standing for a short time, whereupon the excess fuel renders hot starting difficult due to fouling of the spark plugs by an over rich mixture. The manufactures standard float level setting should be low enough to prevent fuel escape when the engine is turned off, however, at the end of a run, heat acting on the carburettor will cause the fuel in the chamber to expand slightly and if this expansion is sufficient to raise fuel height to that of the main outlet into the choke tube, then fuel may drain away due to syponing action.

Carburettors with accelerator pumps can be particularly affected by this problem as the fuel trapped in the pump housing is generally subjected to a greater temperature rise than that in the float chamber, whilst the amount of expansion which must take place before the fuel begins to overflow from the pump injector is relatively slight. Low accelerator pumps can be particularly troublesome in this respect, as once fuel begins to flow from the accelerator pump nozzle, a great deal can drain away.

To counter syponing, the first action would be to see that the standing level of fuel in the float chamber is not higher than that intended by the manufacturer and that the needle valve and float mechanism are in good order. In addition make sure that the motor is not overheating.

On accelerator pump carburettors fitted with anti-syphoning valves, ensure that the valve is working freely. In hot climates, it is sometimes advisable to make up a shield which can be placed beneath the carburettor to protect the float chamber and pump assembly in particular from the hot air rising from the exhaust system & engine block. Make sure that if there is provision for an insulation block between Carby & manifold, that it is fitted. The effect can also be tried of using an additional needle valve washer to lower the fuel level so the greater expansion will have to take place before syponing occurs.

On certain carburettors some limited syponing will be unavoidable. Under these circumstances, hot starting can usually be achieved by opening the throttle fully and then operating the starter, without moving the accellerator pedal until the over rich mixture is cleared and the engine fires.

To be continued.

Regards,

Mel

Carburettor Rebuild Kits are now available through CCOCA Parts.

CCOCA classifieds

Please note. By law advertisement cannot be accepted without one of the following: registration number, engine number or vehicle identification number.

FOR SALE
VINTAGE CITROENS
1928 B14 Sedan Vin. 506400
Only known sedan of its type in Australia. 90% assembled, part restored.
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90% assembled, part restored.
Also numerous spare parts including body parts, engine, gearbox, wheels, tyres, radiator and surrounds, complete front end mounted to a 6x4 trailer, tow away. Various other spares, too numerous to list.
Asking $9000 the lot
Phone Rex Gercovich 03 9874 3469

FOR SALE
MICHELIN TYRES
Five brand new 165x400 tyres & tubes
$370 each or $1755 the lot.
Phone Graham 03 5989 6027

FOR SALE
1948 Light 15
Documented history, original reg. Papers, manuals.
Original black & white plates MA 860 available ($350). Spare engine block.
$4950
Phone Graham 03 5989 6027

FOR SALE
51' 11BL
Complete car but dismantled.
Fully rebuilt motor, gearbox, steering and front end. Front brake cylinders re-sleeved, flywheel machined & lightened. Excellent restoration project.
Original Reg. TS 590
Chassis No. 552610
Asking $7000
Contact Sam Crisi 03 9439 4558
This car has been owned by Sam since I first met him in the early 70s. It's a club car with a long history. It's sad to see Sam offering it for sale but Que Sera, may the car continue its CCOCA membership.

FOR SALE
Citroen Vans all unregistered
Ex-Alan Brown
AK400, AK250, H Van
Acadiane (Dyane)
Mixte (4 seater)
Contact Ralph Hibble for further details 08 9459 1636

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Restoration project for sale.
Owned last 20 years. Sound body already painted BRG. Interior complete but needs restoration. Engine and gearbox not touched but complete. Dismantled but complete. Some chrome work undertaken.
Asking $ 3,000-00 . Contact John Cleverley Phone 03 9878 1357

FOR SALE
1963 Ami 6 LHD
63,000 Klms, Gris Leban with original red nylon seat covers.
Always garaged and maintained.
Excellent condition. Reg. AMI 6
$15,000
Contact Carl Perrin
Ph/fax 08 9386 3268
Mobile 0412 472 527

WANTED
Sump and starter motor
To suit DS21
Contact Bill Graham
03 9786 2710

FOR SALE
1950/51 CITROEN BIG 6
This Slough built classic collectors car is immaculate and restored to original condition. Plus complete stainless steel exhaust, electric fuel pump, A1 mechanical condition and on full rego.
IANW 098
$21,859
Phone 08 9377 7365

FOR SALE
GS Pallas 1977
in immaculate original condition. Gold metallic paint with beige cloth interior, tinted glass, low mileage, always garaged. Price $5,000.00 ono. Reg. AAM-238
Ph. [03] 9510-2183

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DS 23 Pallas
Hyd. Auto. 1974 Champagne gold metallic paint with gold cloth interior, tinted glass, low
mileage, always garaged at Burleigh Heads in Qld. Price $12,000.000 ono.
Reg. 814-ACV.
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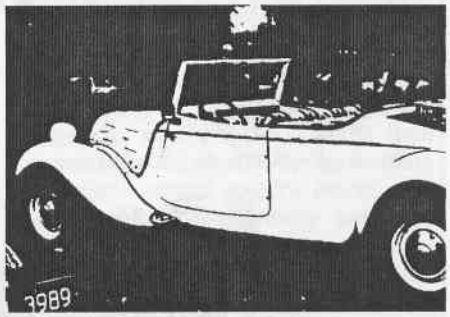
FOR SALE
1986 BX 16 TRS
(Reg No. OUP 264)
Automatic, pale light green metallic original paintwork. Only 71,000 kms, mechanically excellent. Whole car is in very good condition. Must sell to make space for another.
Asking $3500
Contact: Julian Madeley
Phone (03) 9842 9088

WANTED
Citroen enthusiast to assist Citroen seller with negotiations on her behalf. Must be available to do Test runs & general running about. Ph. [03] 9510-2183.



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New Twin Carby manifolds for Traction Avant
Cast from an original aftermarket manifold which utilises two standard carb's. This manifold has been tried and proven to give excellent results.
Enables your engine to perform better, make use of the extra power or the extra fuel economy depending on your driving style.
$450.00. fitting extra. Phone for a free quote.
Carey Mtrs. 03 5152 1040

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4 cyl & 6 cyl Traction reconditioned engines and gearboxes
Short or Long engines , standard or modified.
Reconditioned ID engines & gearbox', Short or Long.
Reconditioned 4 & 6 cyl Traction Front Ends , complete.
Reconditioned 4 & 6 cyl Traction front Ends , Silentblocs only.
Reconditioned 4 & 6 cyl Traction & ID Water Pumps
Reconditioned brake master/wheel cyl's
Relined brake shoes
Part engine rebuilds , to customer requirements [Top or Bottom end]
Reconditioned Driveshafts , 4 & 6 cyl Traction with modern CV joints
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WEDNESDAY 23rd MONTHLY MEETING

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2nd to 5th — Australian Grand Prix
TUESDAY 8th — Pancake Day
Contact Steve 9397 8680
SUNDAY 19 — National Concours at Werribee Park
WEDNESDAY 22nd — ANNUAL GENERAL MEETING
SUNDAY 26th — CCCV Motorkhana
Contact Tom Grucza 9728 1779

APRIL
APRIL EASTER 2000 — Citin 2000 Jindabyne CCCNSW
WEDNESDAY 26th — MONTHLY MEETING

MAY
SUNDAY 14th — Mother's Day Run
WEDNESDAY 24th — MONTHLY MEETING

JUNE
JUNE LONG WEEKEND AUSTRACTION
WEDNESDAY 21st — MONTHLY MEETING

JULY
FRIDAY 14th — Bastille Day Dinner
WEDNESDAY 26th — MONTHLY MEETING

AUGUST
SUNDAY 13th — Winter Warmer Run
WEDNESDAY 23rd — MONTHLY MEETING

SEPTEMBER
SUNDAY 3rd — Father's Day Run
WEDNESDAY 28th — MONTHLY MEETING

OCTOBER
WEDNESDAY 28th — MONTHLY MEETING

NOVEMBER
WEDNESDAY 23rd — MONTHLY MEETING

Citroën

email EMAIL email EMAIL
Could all members who have access to email please email Ted and Helen Cross with their email address, either work or home or both, so that we can set up a central register.
Members will then be informed of upcoming events and all the news and hot gossip!.
crossfam@ozemail.com.au

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