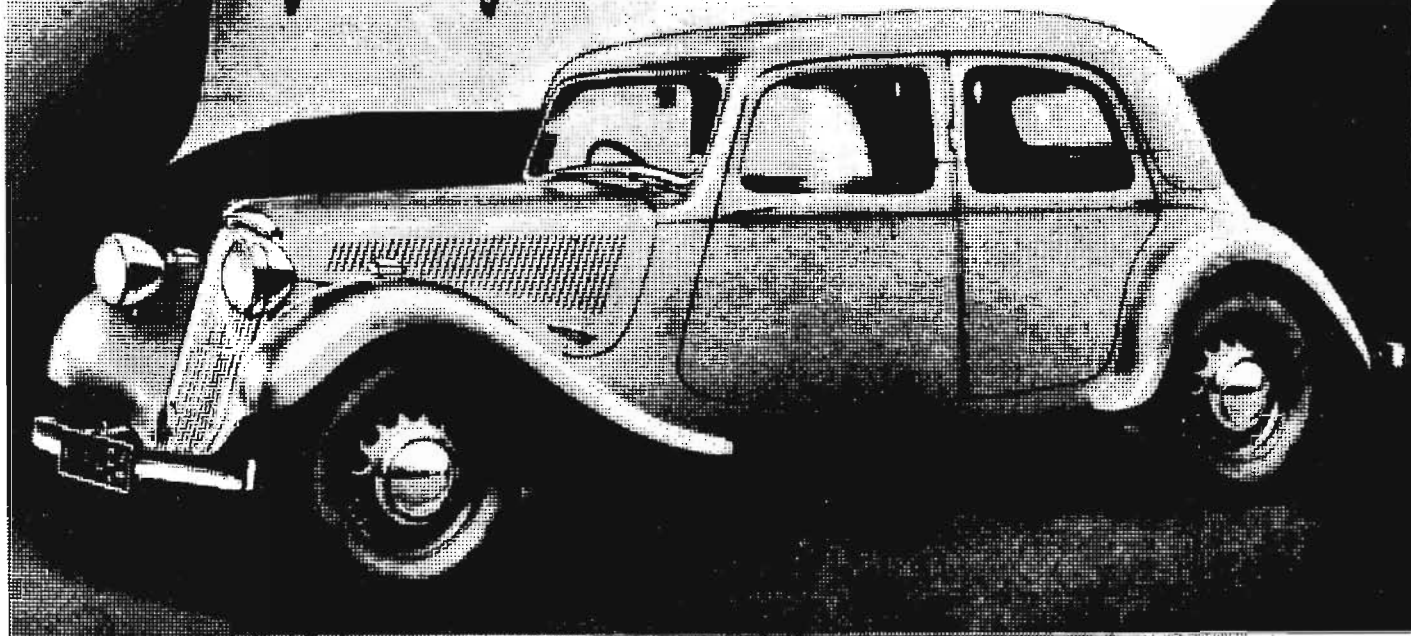


*Putting the Best Wheels Foremost"*



Writing in a recent issue of "THE MOTOR", Mr. D. B. TUBBS describes a tour in his Light Fifteen Citroën in which 8000 miles over four countries were covered. The conditions included ice-covered roads, pot-holed tracks, mountain climbs and tropical temperatures. Here are extracts from some of his comments.

**INDEPENDENT FRONT  
SUSPENSION and TORSION  
BAR SPRINGING**

*"Torsion-bar springing coped magnificently with uncarred macadam roads scored by the melting snow streams. It produced a contempt for potholes that would have broken many a car to bits."*

**INTEGRAL  
CHASSIS  
and BODY**

*"I once got the car in such a position that three wheels were on terra-firma and the fourth dangled unsupported in the air. Yet, even then, one could open and close any of the four doors. Rigidity never had a better tribute than that."*

**FRONT  
WHEEL  
DRIVE**

*"In the ordinary way of driving, skids are unknown, for even on ice the car follows a tram-like path."  
"Cold print does not do the Citroën justice. . . in average speeds these cars excel, thanks to the incredible road holding."*

**CITROËN** *Light Fifteen*

Saloon de luxe £735-9-6 with Tax

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# Floating Power

Volume Two Number Two,

April Nineteen Hundred and Seventy Seven.

I think that most members must have seen the articles in the March and April issues of 'Classic Car' - and that gleaming traction on the front cover of the March issue. Jonathan Wood's article was certainly a fascinating piece of meticulous historical research, and very valuable material for the archives! I hope that it might stimulate somebody somewhere to write with further information to dispel some of the mysteries that still surround the birth of the traction avant. We did, in fact, discover that great inventor J. A. Gregoire, whose story is so closely involved with that of the traction at certain points, alive and well in Paris, a couple of years ago. In spite of his very advanced age, he was still working, this time on the design of an electric car, in a small workshop in the back streets of Paris. This makes one more certain that ancient ex-Citroen employees, no doubt with memories of V-8's, and other stories worth their weight in gold, must lurk in various parts of France - if only one could prise them out!

A printing error last month converted the duration of the Rust-Ban underseal from eighteen months to eight months - it's not quite as short-lived as that!

This issue sees the first article giving technical advice in response to members enquiries; we intend to run this on a regular basis, so if you have any queries or problems, can you send them to the Technical Adviser, c/o The Editors. We also plan to begin a series in the near future along the lines of the 'Our Cars, corner in 'Classic Car', (it's that mag. again!) This will carry accounts of restorations in progress, with photographs and drawings, and all contributions from members will be gratefully received.

We apologise most profoundly for the late arrival of the last magazine - in fact, all those concerned are still sheltering from the shower of brickbats lobbed in our direction! It was largely due to a technical hitch in the production of the Stop Press - which did stop, only too literally. I hope very much that this won't happen again, and we shall do our very best to see that it doesn't.

As a departure from William Boddy's Motoring Dog, we have discovered that our cat thoroughly enjoys car rides, and curls up happily on the back shelf of the Six when she is taken for her weekly airing. He opens an occasional yellow eye to wink at startled motorists following in our wake, then goes back to sleep. A Motoring Cat . . . I wonder whether anyone else possesses a rarer beast?

For those luckier members who were in at the birth of the T.O.C, and who possess a copy of the first magazine -- hang on to it! Issue No.1 seems to be appreciating about as fast as the cars themselves at the moment; we have just heard of a copy of the first 'Floating Power' changing hands for £5. The whole trend is rather a strange one, and it is difficult not to have mixed feelings about it. On the one hand, if you already have a traction, you can only be pleased that the value is climbing steadily upwards; on the other, with memories of our own financial state as students when we bought our first Light 15, it is rather depressing that young, not-so-affluent people seeking their first traction are going to be increasingly hard-pressed to find one.

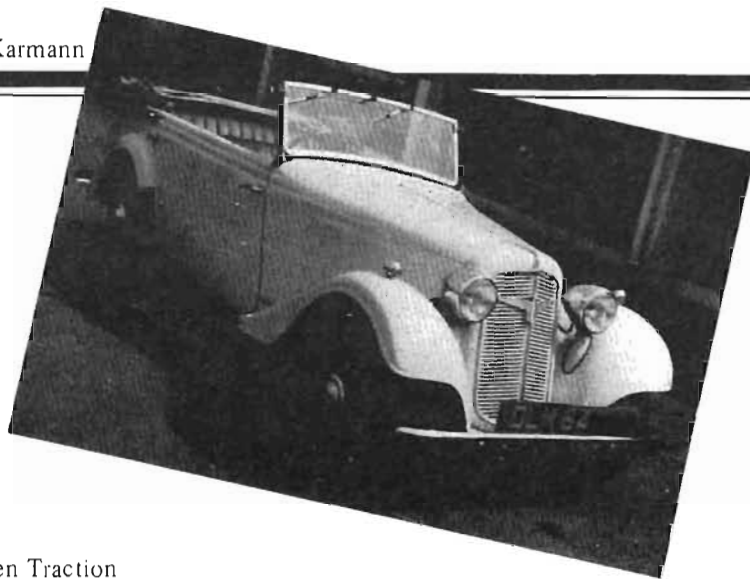
The winner of our club badge competition (wait for it), was . . . the Treasurer - David Shepherd! So he has awarded himself a year's free subscription to 'F.P'. The designs were voted upon at January's Social Meeting, and Dave's was universally declared to be the best. Our very grateful thanks to all those who sent in designs - there were some really excellent ones - and the winning design appears in the Stop Press.

I hear that six members of the Austin 7 Club are planning an attack on the standing record for 7 h.p and under cars on an endurance test. They plan to keep going round Goodwood for a continuous 3 weeks. O.K, tractionnistes, how about it? Are there any latter-day Lecots in our ranks?

See you at Silverstone - happy tractionning! G.W.



## TRUMPF CARD



In order more accurately to put the Citroen Traction in the context of the mid-thirties, the time of its introduction, and to assess its importance as an innovatory design against the backcloth of 'the state of the Art' and the market of this period, we thought it would be interesting to examine for the next few issues a few of the other FWD cars manufactured then.

This month we feature one of the most significant of these contemporary designs, the 'Trumpf' models produced by the Frankfurt factory of Adler. Its output in the twenties had consisted largely of stolid, conventional Detroit-inspired saloons. In 1930, however, they employed an individualistic designer from the periphery of the German industry, Hans Georg Rohr, to conceive a good-handling mass-produced light car. The result, the 'Trumpf', was unveiled in 1932.

It was conventional enough under the bonnet, in that it used a thermo-syphon-cooled short stroke 1½litre side-valve four-cylinder developing an unspectacular 30 b.h.p. The 6 volt electrics and gravity feed were typical of European small-car practice, but the rest was completely unorthodox, in that this engine drove forward to a four-speed unit-type crash box, via a single-plate clutch. The gear lever was on the dash, but Rohr wisely ran his lever shaft directly to the gearbox, thus eliminating complicated linkages that made for 'woolly' changes: Adler drivers delighted in demonstrating one-finger exercises that would have been out of the question for the contemporary Tractionniste. The drive was taken by short shafts from the differential, steering was by rack and pinion (which was not adopted by Citroen until 1936), and all four wheels were independently suspended: by transverse leaf springs at the front, and at the rear by trailing arms coupled to cantilever springs. Bodies were electrically welded to punt-type steel frames, though the more expensive tourers and cabriolets, were coachbuilt by Karmann. The end-product was not fast, since output was always restricted in the interests of long life, and it was almost impossible to drive an Adler into the ground. In its original 1500 c.c. form, the 'Trumpf' was hard put to it to exceed 55 m.p.h. (compared to 63 m.p.h. for the 1,628 c.c. 7 CV Traction), thanks to a weight of around 23 cwt. (2 cwt more than the 7CV). Wide gear ratios meant that the Adler had to keep up with other traffic on its superior handling. The Bendix cable-operated brakes worked well, and though the steering was heavy, it was accurate and free from backlash, even in old age: if tyres seldom lasted for more than 12,000 miles, this may have been due, as Paddy Halion, the Irish authority on the make, puts it, 'to a natural tendency to drive the car in a rather daring manner'!

Halion has also drawn some interesting comparisons with the Citroen. The German car had four speeds, and a good gearbox; the Citroen had more power - 46 b.h.p. for the 11 CV against 38 for the 1.7 litre 'Trumpf' - and hydraulic brakes. Citroen universal joints were complicated, in those early days they broke frequently, and they were expensive to replace. The relatively crude Adler ones broke less often, and at £2.15s. a time this was not a financial catastrophe if it did happen. It is also fair to add that the 'Trumpf' was in full production by 1933, whereas the Parisian tractions did not start to appear in quantity until the latter half of 1934.

In his autobiography, *Best Wheel Forward*, J. A. Gregoire tells the story of his patent difficulties when selling his Tracta universal joints to Germany, where they were adopted by D.K.W. as well as by Adler. The recovery of royalties on 75,000 sets (25,000 of them on 'Trumpfs' and 'Trumpf-Juniors') was a slow and painful business: this culminated in a sybaritic sojourn in the Third Reich, unloading 'blocked' marks which could not be used for the purchase of 'consumer goods'.

Adler's revolutionary gesture paid off handsomely, even in the doldrums of 1932, and by 1934 the 'Trumpf' was being built under licence in France by Rosengart, and in Belgium by Imperia, where by 1939 Adler-derivatives were the sole private-car products of the once proud Minerva empire.

Mindful of the misfortunes of the L29 Cord and the type 219 N.A.G., Adler - unlike Citroen - steered clear of F.W.D for their larger cars. These were over-shadowed, however, at the 1934 Berlin show, by Adler's real best-seller - the 995 cc. 'Trumpf Junior'. This was a scaled down 'Trumpf' in all respects but one, the rear suspension, which was by leading arms and transverse torsion bars (à la Traction).

The press was enthusiastic, the *Autocar* reporting on a 'Trumpf' cabriolet (by now fitted with 1,645 cc. engines) in August 1935, saying:

The aim has been to provide a vehicle which shall have an adequate top speed, but above all to be able to maintain about 50 m.p.h. for long stretches without stress, and furthermore to be able to do this almost irrespective of road surfaces . . . It feels solid on the road: it is essentially steady, so that corners are taken quite fast if desired, and with a feeling of safety; and to answer at once the question which is invariably put forward where front-wheel drive is concerned, it would be all but impossible for anyone unacquainted with the design to tell that f.w.d. is used.

We may question this last observation, but it is noteworthy that almost identical phraseology occurs in early road-test reports on the 7CV Citroën.

The Motor, trying the 'Trumpf-Junior', spoke of 'one of the smoothest rides we have experienced in any light car chassis' though their testers found the Bendix brakes fierce. Attention was drawn to Adler's world-wide service-voucher scheme, but neither car was particularly fast, the Junior recording an even 60 m.p.h. and taking 31 seconds to reach 50, while acceleration figures for the 'Trumpf' were actually a little inferior - perhaps due to the heavy cabriolet body.

Sales were very good, and export sales were helped by intelligent promotion and a friendly factory attitude - and also by the fact that the cars were designed for ready conversion to right-hand steering, in terms of interchangeable glove boxes and instrument panels and the clutch and gear-box outlets on gearbox and clutch housings were matched by blank flanges on the other side. The Traction had this facility on the Bellhousing for the clutch, but the inlet manifold and carburettor and dynamo precluded siting the Citroën gear linkage on the right side -- in both senses of the word. Despite this, they were not successful in England. Pricing was not at fault - the Junior sold for £225, the Trumpf for £320 (c.f. £265 for the basic 'Super Modern Twelve Citroën) - but Britons not only distrusted the third Reich, they were scared stiff of front-wheel drive as a principle. Dreaded things were rumoured to happen if one lifted one's foot in a corner - hence, presumably, the naive observations of road-testers - and even the Citroën, conceived in a friendly country and assembled at Slough was not destined to make a major impact until after World War II. Adler Cars (Great Britain) Ltd., came into being in May 1935, and went into receivership nine months later. 'Every effort', said the bankruptcy report, 'was made to publicise the Adler car in England, including an appearance at the Motor Show, but only a few cars were sold.' Even when the agency was taken over by Minerva Automobiles in 1937 the situation did not improve; as even fewer of the almost identical 14 h.p. Imperias found buyers, one must

1938 Minerva-Imperia TA-9B - a 'Trumpf' made under license.

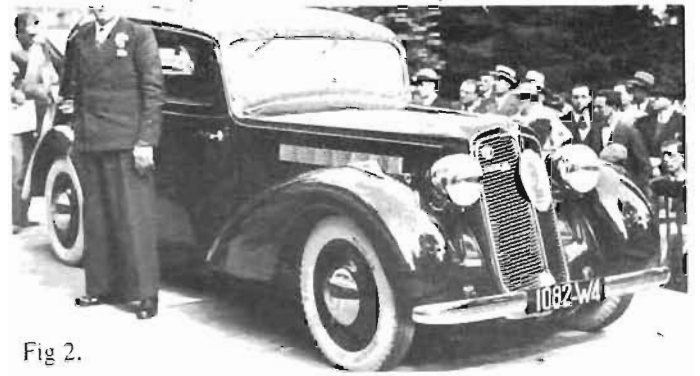


Fig 2.

assume that national prejudice was a secondary factor. In its native land, however, it had been a great success, 15,000 'Juniors' being produced in 1938, and 3,000 'Trumpfs'; and it must remain one of the most significant milestones in the evolution of FWD. The story of the firm in more detail can be found in the source book for these notes - 'Lost Causes of Motoring' under the name of Lord Montagu, published by Cassels, 1969.

Two subsequent articles on German FWD - N.A.G and D.K.W. will also be based on chapters of this work.

1948 Imperia TA - 8 1.6 litre roadster. (non-original flashers)



Fig 3.



## THE FACTORY 'COMMERCIALE'

It was already established Citroen practice by 1934 to offer a long wheelbase version of the saloon coachwork on the current model (C4, C6 and the 'Rosalie' series); and, in addition, such a model incorporating a fifth door at the rear, aimed at the commercial traveller/farmer market, presumably. It was hardly surprising, therefore, that at the 'Traction's unveiling in that year, six-window versions of both the eight-cylinder and Big Fifteen types were included in the range on show at the Salon. All the Lwb cars, right up to 1957, irrespective of their application - Limousine, Familiale, or Commerciale have a considerably strengthened floorpan (the wheelbase, remember, was over 10'9") incorporating a full-width shallow well aft of the front seats to receive the folding occasional seats on the nine-seater versions when not in use. Initially, only the 'Limousine' model was offered, without occasionals, and on this and the later Commerciales, although the well was fitted with all the fittings and captive nuts necessary for the installation of these excruciatingly uncomfortable small seats, it was filled with two thick planks to keep the floor level flat.

The 'Onze Commerciale' itself was not introduced until October 1937. Not only was the boot much deeper and wider than on the equivalent saloons, but the rear window and surrounding panel was hinged very far up the roof to give a cavernous opening at the rear. The absence of

full rear bumpers and quickly changeable restraining chains made the bootlid, complete with spare, able to be opened horizontally to give an even greater load platform; it was also easily detachable by means of slipping out the hinge pin. Commerciales were delivered with a sturdy wooden false floor to continue the level of the rear seat box section forward to the front seats.

Although the first l.w.b. cars (the taxi in the photo is, according to Citroen, a 1938 car, but the well-base rims, chromed rad, grille and lamps and backward opening bonnet vents contradict this, suggesting a 1934 model) were fitted with rear doors that seemingly are identical to the fronts, it will be seen from the other photographs that later cars had the standard saloon rear doors, complete with the new superfluous cut-out to clear the rear wing. Having produced the first type, which looks just 'right', why on earth did Quai de Javel alter their tooling to the subsequent specification, with the doors looking rather absurd? One of the countless minor mysteries surrounding inexplicable, apparently irrational and certainly expensive, minor changes to Traction's over the years, I'm afraid.

The Commerciale's load platform at its maximum was a healthy 2.7 square metres, though the brochures spoke not in these terms but of its ability to carry 'six 50kg sheep' - and similar cargoes. The car started a tradition of cavernous estate cars which the factory continue to this day, although no Commerciales were produced between 1939 and 1953, after the introduction of the big boot on the saloon models. The car illustrated here, which we owned for some time, is one of these later cars, and it will immediately be apparent that the post-war equivalents had one-piece rear doors (and very heavy they are to lift, too!). We talked a couple of years ago to a Traction specialist in Paris who told us that, although the body style was a catalogued option in the fifties, none ever actually left the factory in their final form; instead, Citroen delivered the Henri Chapron coachworks with big-standard Familiales off the production line, and they ripped out the occasionals, cut out the rear window panel and welded it to the boot, reinforced the resulting opening considerably, and gave them back to the dealers and distributors. I have never seen written confirmation of this, however. It is certain that the rear door is too big, however. Apart from the sheer weight, the location of the rather flimsy restraining strut (similar to that on the saloons), as can be seen, imposes great strain on the joining weld, and I have yet to see one of these machines without small fatigue cracks along this line.

Fig. 1, the 'before' picture of the car we owned, is in fact a montage of two photographs of the same car, both both as we got it from the Dordogne (from a farmer, of course), and, in front of the garage, half-way through that delicious stage when one takes everything to bits before (hopefully) rebuilding. The 'after' shot, car reassembled and painted cream and chocolate, displays its one unusual feature: the fact that, following the above-mentioned Chapron hypothesis, the first owner had stipulated that the occasionals be retained, making the car a Commiliale, or a Famerciale however you prefer it. On the basis of our experience with this car, we can certainly vouch for its robustness - and the pulling power of that little four-cylinder: ours carried a full complement of nine adults and their luggage to Cornwall and back in not inconsiderable style. A good and useful car - and not markedly less economical than its smaller siblings.



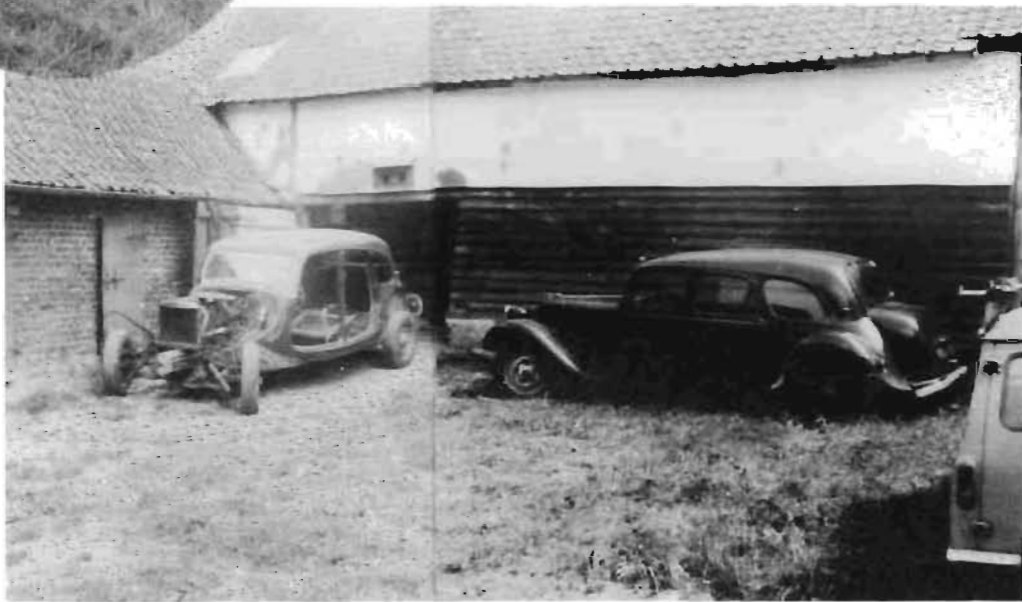


Fig 1.





# THE TRADER'S TRACTION



Several of the more authoritative recent sources of Traction lore - the Pierre Dumont 'Quai de Javel' book, and the 'Anthologie Automobile' No.29 in particular - have mentioned almost in passing the possible existence of Light Fifteen vans, although no such machine ever figured on a factory catalogue. Both publish a rough free-hand sketch made by Lucien Loreille, the automobile historian, of a panel van with, oddly enough the front doors of a fixed-head coupe, with the door post inclined instead of vertical, that he claimed to have seen in Paris before the war. The subject is then dropped, as no further documentation was available, with a strong hint that the beast in question was most likely apocryphal.

It is only in the last few months that photographic evidence of their existence has come to light: The Dutch Club's magazine, 'Traksjon' published the shots of the four light-coloured cars shown here - all of them Danish, as you can see. They are very obviously not one-offs, but proper professional conversions. Two variants are illustrated - the two-door 11 BL at the kerbside, with fixed rear windows and a side opening tailgate, a true hatchback 'avant le mot': and the panel trucks proper, in







the scrapyard and on the beach. Although both models are standard saloon forward of the central door pillar, the latter do not share the saloon's roofline at all. Presumably the vans with the sliding slatted wood tail doors don't benefit from any kind of rear window, either. And whereas the first-mentioned might well be a proprietary modification such as Crayford execute on today's saloons, the vans must have required considerably more tooling to produce.



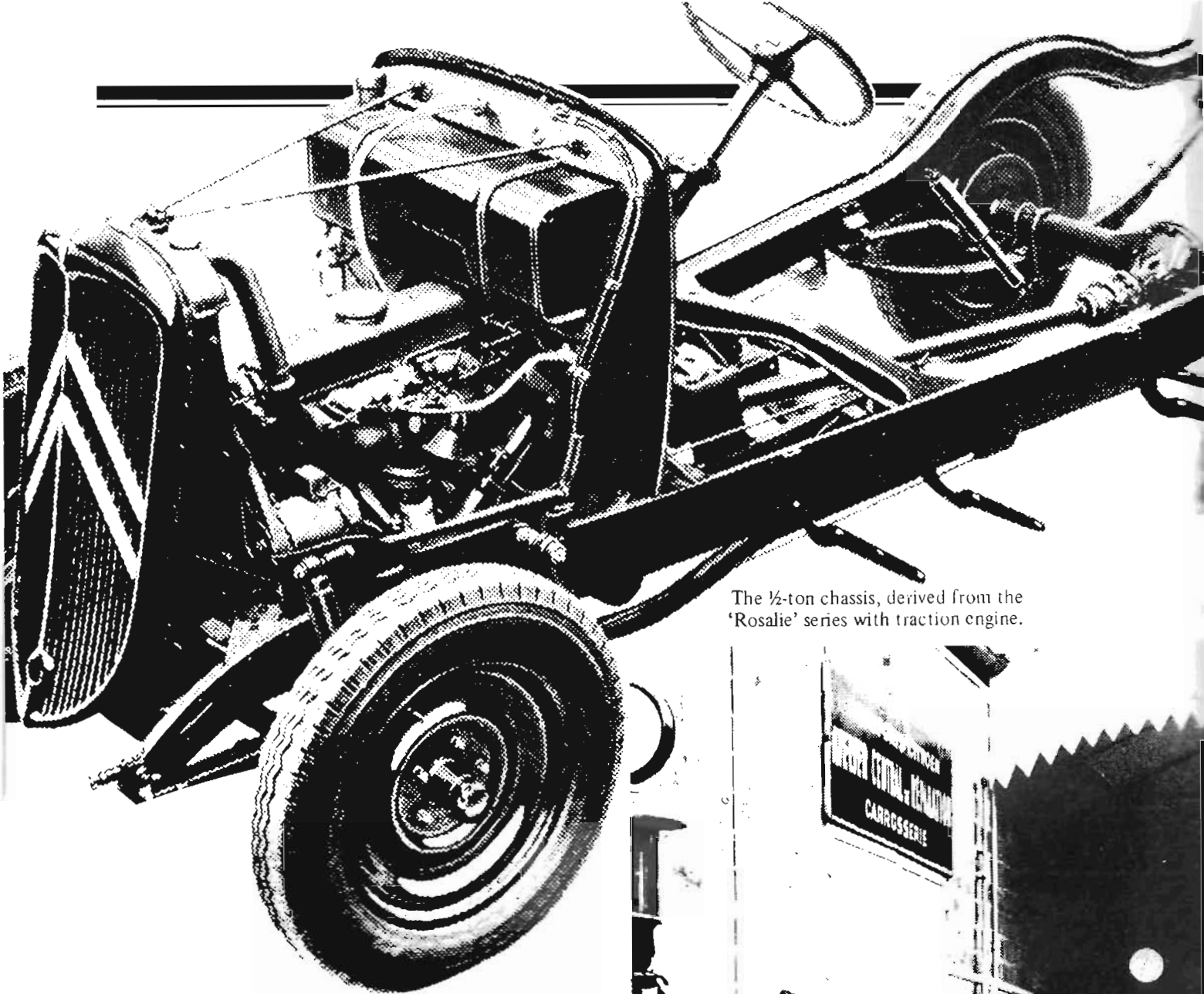
Were they manufactured by the Copenhagen subsidiary? Small-series manufacture by a large private concern? they certainly must have worked out as expensive light vans, so why did a market for them exist? So, although there is now no doubt as to these cars' existence (but not in the form Loreille drew it must surely have been one of these he saw), the mystery remains.

The Black Big Fifteen on Pilote wheels is a 1938 car which was transformed at a small coachworks on delivery into a hearse. In this case the entire roof is new, both flatter and higher, and there is but this one example known to survive. It now resides in the States.

The Slough estate car whose picture is published here for the first time is also something of a mystery. This Six was found playing out the last years of its decrepitude in a Cambridge timber yard a couple of years ago. It looks to have been converted in the fifties, as the styling seems to have that peculiar and typical air of ugliness about it typical of the period, and though it seems to incorporate panels (e.g. tailgate) from current production cars - recognise any of the panels? - it certainly wasn't a back-yard bodge when new. At best, an extremely talented amateur, though almost certainly a professional job.

And, finally, the oddest of them all - the 'Onze Legere' languishing in a French scrapyard with a pre-war 'Commercial'-type rear! Why did anyone bother? For, although the bootlid itself from one of these cars might be persuaded to fit a Light Fifteen (standard bootlids always were interchangeable on these and Big Fifteens and Sixes), the rear window panel has been cut out and made specially - it doesn't reach nearly far enough into the roof to be the factory part concerned.

There it is, I'm afraid. A lot of questions, and no answers. Hopefully a reader will be able to elucidate. We do need a Club van too . . . . .

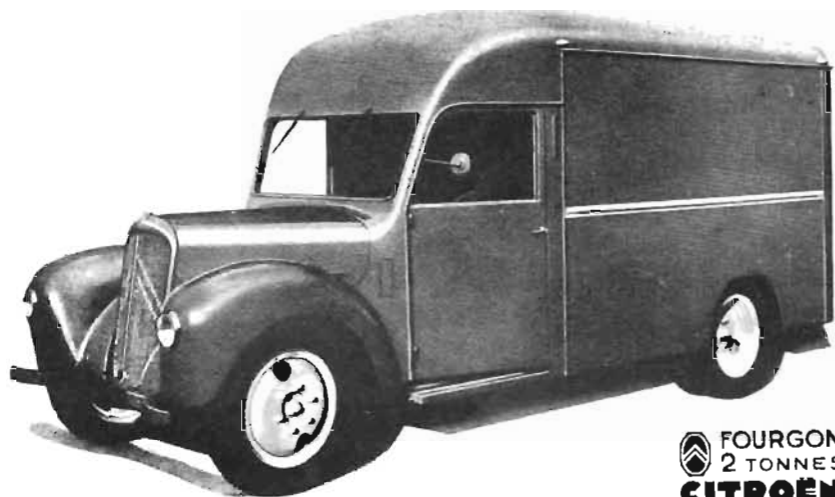
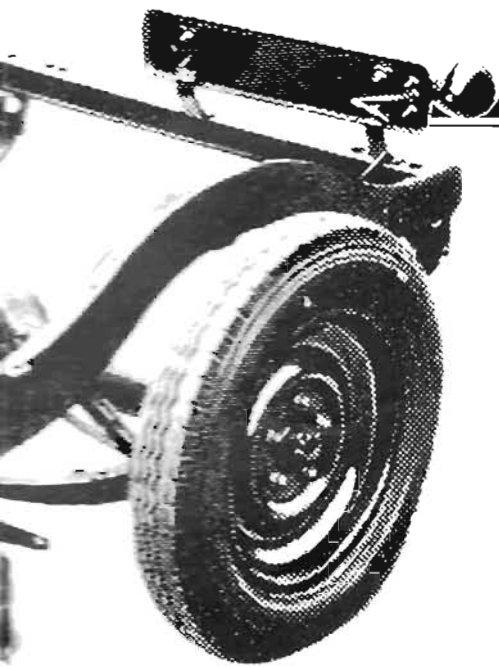


The ½-ton chassis, derived from the 'Rosalie' series with traction engine.

## CITROËN UTILITIES

All our readers who have recently spent touring holidays in France will have noticed that the majority of the few odd cars left decaying in hedgerows, etc., are Citroën vans of one sort or another. All the vintage models - Type A, B-2, 5 CV and B-12, not to mention the C-4's and 6's were delivered in three basic versions - the panelled van proper, the 'Boulangere'/Camionette, and the 'Normande', the last two sharing the same braced wooden pick-up bed. These were mechanically identical to their saloon equivalents, and had a carrying capacity of 8 cwt or thereabouts. The first specifically light commercial chassis was offered in 1927 with the 1-ton 'B-15', the first French truck with a fixed all-steel cab (this coincided with the introduction of the first all-steel B-14 car bodies).





 **FOURGON**  
**2 TONNES**  
**CITROËN**

*Citroën 2-ton van of 1952.*



Three years later, the C-4 derivatives of both ½-ton and 1-ton types, always painted in a drab mottled red or green on black ground, were supplemented by the first European fast truck in the American idiom the 'C-6 F'. It was on this two-ton chassis that the enormous fleet of the Citroen Transport Co.'s coaches were constructed. These buses, resplendent in their chocolate and tangerine livery, were to ply across France on 126 routes with nearly 800 buses. It is one of these machines that is illustrated here in a splendid period picture of the depot. Rumour has it that the formation of this Public Transport concern was an expedient precipitated by serious over-production of the 2-ton chassis. The same had been said of the formation of the Citroen Taxi company ten years earlier- suffice it to say that Renault retaliated with their own coach line in 1932.

Simultaneous with the 'Traction's' introduction in '34, the first real heavyweight was unveiled - the Type 45, a 4½ litre five-tonner of the type we were negotiating to buy on behalf of the club last year - pictured in 'Floating Power,' No. 5. Publicity-conscious as ever, Andre Citroen sponsored that celebrated and indefatigable 'Marathon Man', Francois Lecot, to enter a Type 45 Coach in the Monte Carlo Rally! Lecot, whose staggering non-stop ¼ million miles in a Light Fifteen is well documented elsewhere, started from Warsaw with a dozen or so passengers (authorities vary) and finished a creditable, in the circumstances, 98th place. Before entering Monaco, the coach was cleaned, the passengers changed into their Sunday best, and arrived, after a tortuous 1500 miles, as if they had just cruised along from the bus stop up the road! They won the 'Prix Special

de Confort' hands down, of course.

Contemporary with the 45 was the Type 32 Three-tonner, and both were made in three chassis lengths and with a wide variety of bodies. The smallest of the new models was the Type 23 which had the o.h.v. Traction engine, the 11 CV, driving the rear wheels as on the later Rosalie cars. The small Diesel engine (see F.P. No.6) was fitted to this chassis. These three models are especially appealing to the tractionniste in as much as they share scaled-up Light Fifteen grilles.

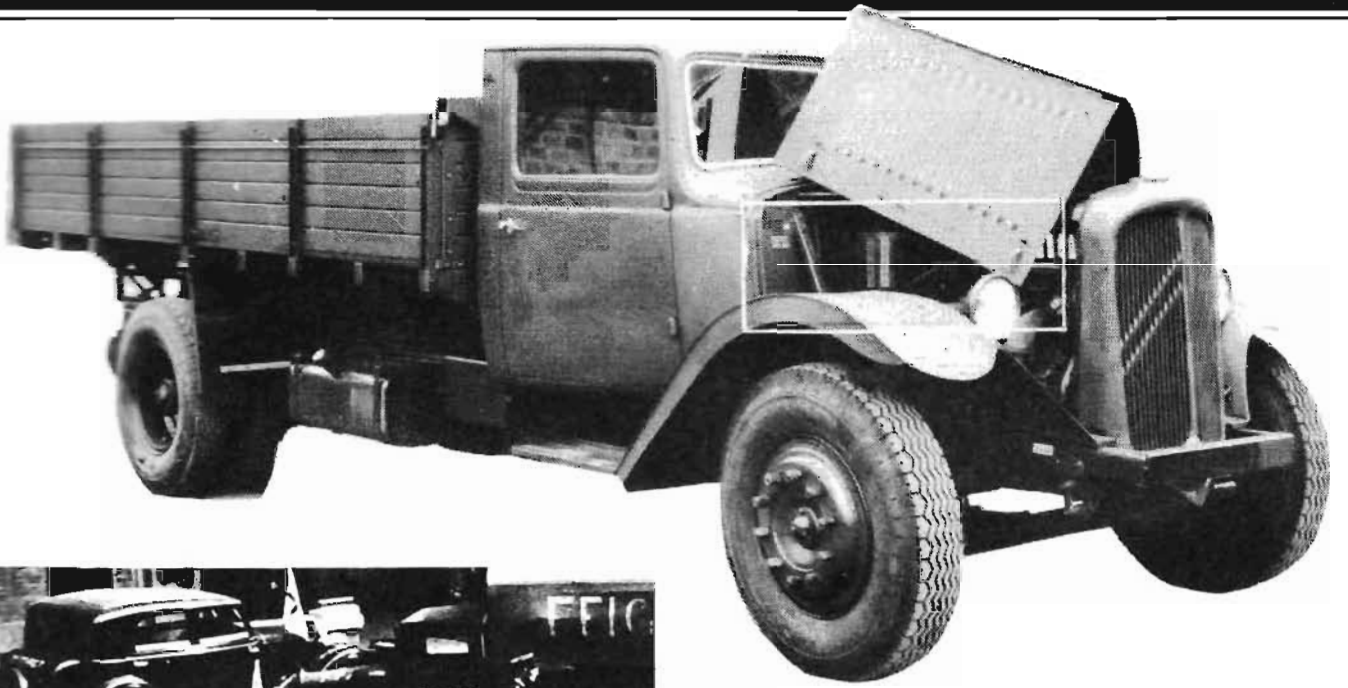
The most radical design ever to come out of Citroen's commercial division was the relatively little-known T.U.B. series, which proved (as if it needs proving) that by the mid-Thirties, Citroen were in the vanguard of automotive technology. Introduced in 1938, but never on the open market - production was destined for the Military, and most were used as ambulances - it seems in retrospect little more than the precursor to the 'H' van, which it was. But consider how revolutionary a forward control monocoque front-wheel drive sliding-door box van was at the time: an example of the completely original and innovative design philosophy that rockets Citroen a decade into the future every twenty years or so.

The 'T.U.B.' was fitted with the 17 CV Traction engine, the T.U.C, with the 2-litre unit, though the writer is ignorant of its exact transmission arrangements. The H, its post-war equivalent, still in production in the late sixties, shared a great many parts with both four and Six-cylinder Tractions. A fitting point on which to end our unfortunately rather cursory survey of Commercial Citroens.



The immaculate Type 45 coach, Lecot at the wheel, as it arrived at the Monte Carlo finishing line





A T.U.C. in use during the war.  
1939 T.U.B 1-tonner.



A Danish post-war showroom line-up - 2CV 'Boulangere', 'H' van, Traction van and T32.



# TECHNICAL ADVICE COLUMN

Q. My Light Fifteen suffers chronically from the dreaded clutch judder when moving off from rest. What causes this, and is there a cure?

A. There is, of course a remedy for this recurrent Traction malaise, but the possible causes are so numerous that it is very difficult to isolate one and point to it as the primary cause. It is perhaps better to list ALL the more common reasons - some can be checked quickly and visually but most require pretty extensive dismantling to find out if they are responsible.

1. Varied strength springs (due to age) in cover (pressure) plate.
2. Toggles (3 of) badly adjusted (probably due to age) in cover plate.
3. Adjusting nut loose on toggle(s).
4. Badly worn clutch, pressure or friction plate.
5. Scored friction surfaces.
6. Rust on friction surfaces.
7. Oil on friction surfaces.
8. Loose flywheel.
9. Loose clutch parts.
10. Misaligned thrust race.
11. Thrust race breaking up.
12. Misaligned flywheel.
13. Excessive endfloat on crankshaft.
14. Loose timing chain.
15. Misfiring engine.
16. Vacuum advance/retard leaking.
17. Other engine faults.
18. Slack splines between mainshaft and friction plate.
19. Excessive endfloat on mainshaft.
20. Wear of chipped teeth in gearbox differential.
21. Wear in driveshafts.
22. Wear in wheel bearings.
23. Drum/hub loose on stub axle.
24. Wheel loose.
25. 16 tyres on 400 rims.
26. Engine mountings slack/broken.

As a general principle the first two thirds of the above list are major basic causes, the last third are rather more obscure and contributory to a judder that is already there.

Q. How do the outer door handles come off a French car?

A. On French cars undo the two screws, turn the handle downwards about 20° - 30° and gently pull, using both hands, one against the door for leverage. On English cars it pulls straight out.

Q. Where is the cylinder back drain-tap on my '53 11 Legere?

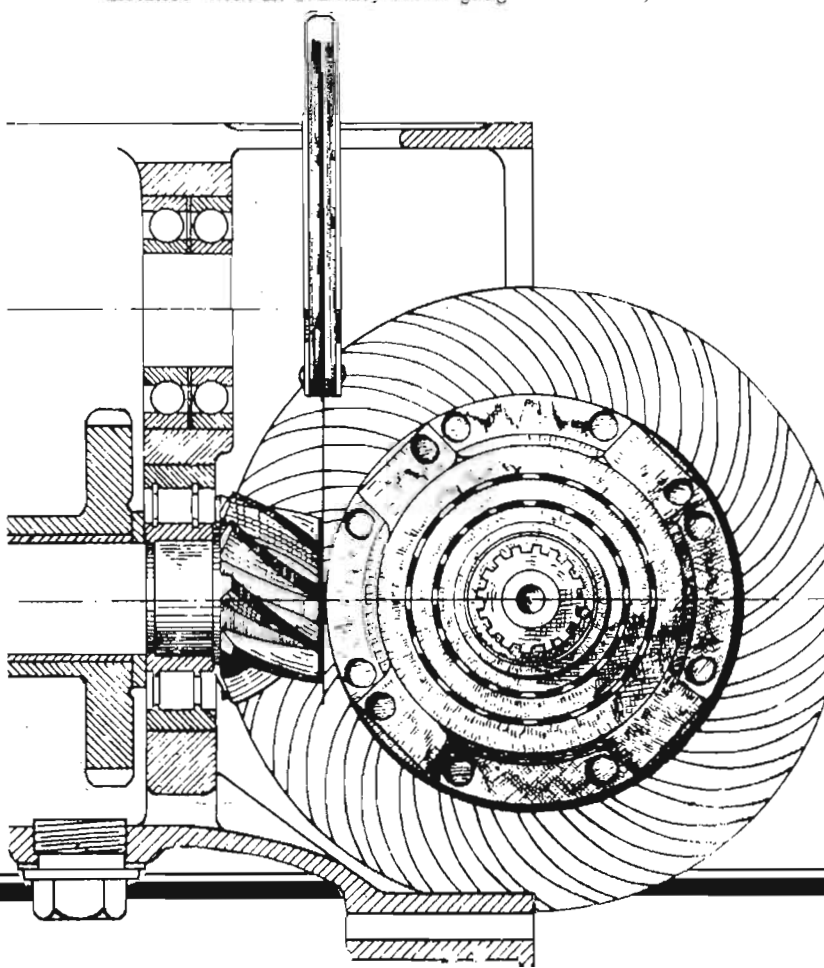
A. It is a deep-headed bolt on the left hand side about three inches below the dipstick hole in the block

(or where the dipstick guide tube goes in), immediately above the crankcase breather (or blanking place). It has a 21 mm. hexagon. It will almost certainly be blocked and gentle probing with ¼ inch drill may clear it. Be careful the drill doesn't snap off. If it won't clear you'll have to wait until you strip the engine for whatever reason.

Q. How do I make the final adjustments to the second-hand crown wheel and pinion I am installing in the otherwise sound gearbox of my 1951 '11 Legere' (Light Fifteen)? I don't, or course possess special tool No. whatever it is mentioned in the workshop manual.

A. In the absence of this tool, 2040T, the following method should be adopted:

- with pinion in place, fit the differential in its normal position: tighten the bearings to ensure that there is no side-play.
- the external facing of the differential casing, which locates the crown wheel, is rectified to a diameter of 110mm.
- the dimension from the centre of the crown wheel to the face of the pinion is etched on the pinion face.
- to adjust the pinion find the difference between this dimension and the radius of the differential casing (55mm.) e.g. - let the pinion dimension be 56.2mm., when the difference is  $56.2 - 55 = 1.2\text{mm.}$
- adjust the pinion so as to obtain a gap of 1.2mm between the front machined face of the pinion and the rectified face of the differential casing. Care must be taken not to measure the pinion dimension from the pinion shaft cap which may stand proud of the pinion face. Measure this distance with an ordinary feeler gauge (see sketch)



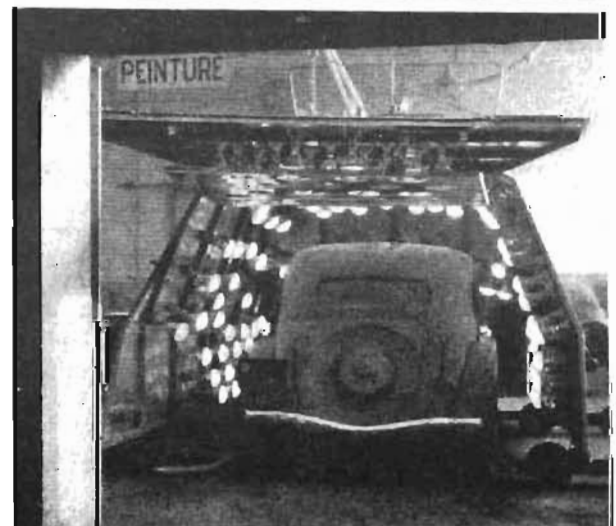
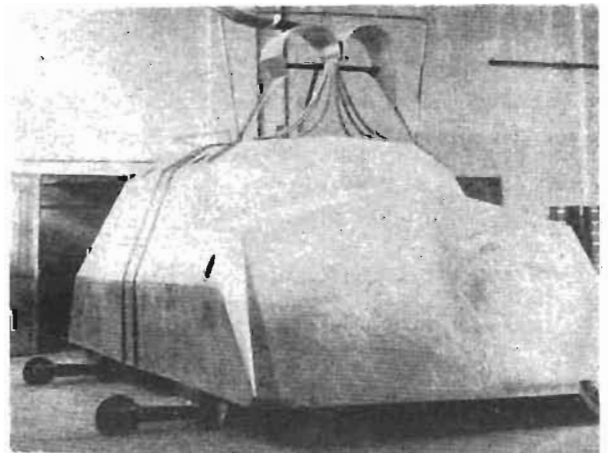
## OFF THE SHELF

1. Brake hoses, front and rear, English only. Lockheed KL 101026L - a rationalised number, not everyone will stock it but the number is brand new, it does exist, and you may need to order it. About £2.30 - £2.90, depending on discount.
2. Master cylinder - all models, inc. 6 cyl. French and English. Lockheed DBA 611007. You'll definitely need to order this from a DBA stockist. About £7.50 - £9.50.
3. Fan-belt - 11CV engines (Light Fifteen) B39 - probably from an engineering suppliers or conveyor belt manufacturers. About £1.50 - £2.50.
4. Radiator hose - 11CV engines. Top or bottom. Rony-flex 38 - 400 probably the same people as the fan-belt - probably need to order it. About £2.50 - £3.00
5. Rocker Gasket. Triumph TR4 (Hall/Paven Number JM 277) buy two and slice them up with a razor sharp blade then staple gently the ends together and put a blob of sealing compound above and below each splice. Make sure the splices are square. Measure lengths laid on the head and double check by laying the rocker cover in position over the top. The cover tends to be larger than the head suggests. I don't recommend inserting a piece unless you're desperate because that makes two splices per side which gives alignment problems. Incidentally, make sure the two gaskets you buy are the same thickness. Very early Austin A40, 1200 c.c. (pre '54) rocker gaskets (Hall/Paven number JM 274) will do the same, if you can find them, and they are bound to be cheaper. TR4 gaskets are about 70 - 80p. each. BMC 'B' series 1200 cc. and 1500 cc. are no good because the ends are curved.
6. Front wheel cylinder kits. 1 1/4 inch. Two numbers you are likely to find. KL 71430, contains two cups and two boots, the boots are slightly fatter than original you may need to slacken the cylinder mounting bolts to fit them. SSB 412, contains 1 cup and 1 boot, the boot is closer to the original but the centre hole is too large. You can close the gap with a dinky toy tyre or a valve stem oil seal of suitable size around the piston. The cup is very slightly different so I would recommend fitting either kit only to both sides, don't mix them, unless desperate. KL 71430 is about £1.30, and SSB 412 is about 85p each (you'll need two per cyl.)
7. Rear wheel cylinders. 1 inch. KL 71427 - very nearly the same as original about £1.05, contains 2 cups and 2 boots. 412 and 71427 should be 'off the shelf' items at any factors, 71430 may have to be ordered. You may also find other numbers if the above aren't in stock. G.I.

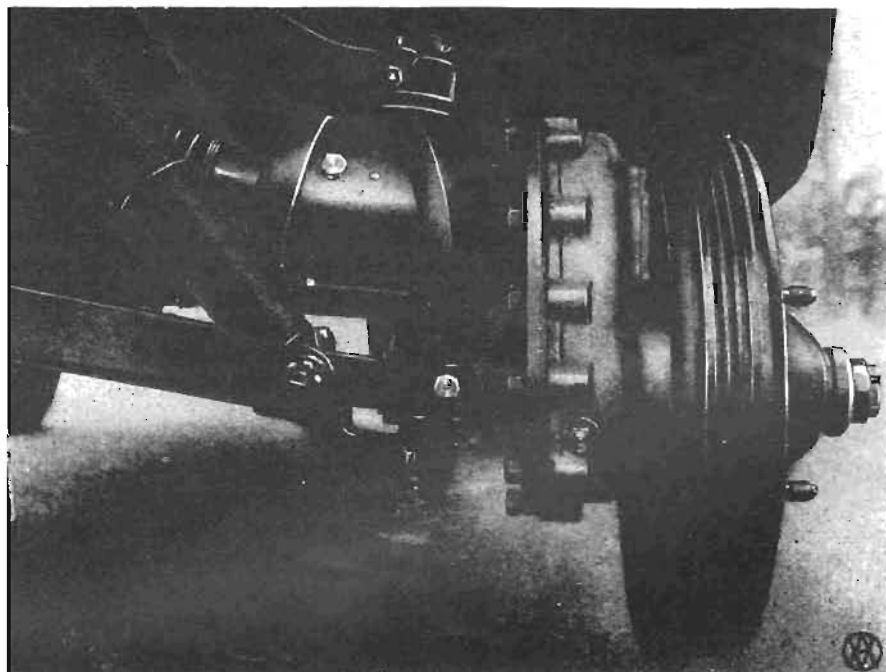
## QUAI DE JAVEL'S PAINT BOX

Those of our readers who have ever bought a post-war Paris traction in original condition will, perhaps, as we did, have spent fruitless hours on first getting the car, trying with T-cut or some such to achieve some sort of shine on the dull and lustreless paintwork, all to no effect: for the paint specified, whether the ubiquitous black, grey, or RAF blue, was intentionally semi- (ha ha) matt, theoretically so as not to show the dirt. And those of you who, realising the futility of your polishing labours, have stripped the paint off prior to respraying with a more cosmetic product, will be able to vouch for the thickness, strength and strong adherence of the stuff they put on in the first place.

These original six coats were baked in the one portable oven illustrated here for the first time. It was constructed for Citroen specially by Mazda. The shell was built in such a way that it followed the general contours of the car, and incorporated one hundred and sixty 250 watt hemispherical Infra Red bulbs. The rear part was hinged, as can be seen, for entry and exit, and the entire apparatus was mounted on tracks so that the booth could be easily manoeuvred from one of the three painting bays to the other. The use of this equipment meant not only that tougher synthetic paint could be employed, but the total drying time for all six coats was reduced to a mere 55 minutes. So now you know why the wretched stuff is so difficult to get off!



# The Latest Accessories



Marketed after the war primarily for Colonial, forestry and Military applications, the extraordinary device shown here is part of a comprehensive modification to give Tractions ground clearance a Land Rover would envy. Those of our readers who have ventured at all far off the beaten track will be painfully aware of the car's vulnerability to large protrusions. The writer did a considerable mileage over tracks at best like those illustrated, in Algeria, and broke two steering racks in the process. The sump is very liable to get a bashing too.

The French Army apparently conducted prolonged tests with this conversion, in snow, ice and cross-country and eventually specified its fitment to a fleet of staff and reconnaissance 11 Normales for their use, although it enjoyed its greatest sales in the French colonies.

There must have been French farmers who saw its advantages, presumably, despite the ready availability of ex-Army cheap Hotchkiss Jeeps, and the fact that the standard Traction can be persuaded to ride at least three inches higher by screwing up the torsion bar adjusting bolts.

The Duriez company tackled this problem by the horns and designed a transfer box for vertical mounting on a cast hub carrier; new driveshaft ends and stub axles are employed, although the standard brake backplate is retained. The internal gearing was such as to give a level ride height (much less complicated, of course being only a dead axle). As a result, the car rode some eight inches higher, and the track was increased by 11"—and it must have looked extremely bizarre!





# Correspondence

All letters to the Editor, Sutton House Cottage,  
Sutton House, Iford, Nr. Lewes, Sussex.

Dear Editors,

At the end of 1973 (October) a friend and I and Dave Shepherd went to one of the Dutch Club's 'Jaar-fests' in two cars - my old saloon (now in Bristol!) and Dave's Normale.

After the rally, we went to N. France to Arras looking specifically for a Familiale for this friend of mine, a lunatic lawyer who had best remain anon.

By sheer luck, we learned of an 11F in a little village near Arras where a farmer/agricultural engineer chap had two tractions out in his farmyard. The car, a 1957 (June) model with 11D engine, had been unused for about two years, and we discovered that the pistons had seized! Dave and I took the head off and freed the pistons with hammer, blocks of wood and diesel oil. We refitted the head, charged up a 2CV battery serviced the electrics, greased it and it started up perfectly - a bargain was struck and we set off for a tour of Normandy in three tractions!

Tragedy struck three days later. I stayed in France a further day to do some shopping chez Depanoto. Dave and my friend went to the ferry; My friend got the 11F through Customs easily enough and set off to London in thick fog because he had a conference to attend the following a.m. He said he saw a car coming directly towards him (it was about 3 a.m.) and he swerved onto what he fondly hoped to be the grass verge in order to avoid collision. There was no grass verge - only a 15 foot, near vertical drop! He got off with a broken wrist three cracked ribs, and a broken nose!

I inspected the car at Martin Walters of Dover where it was taken after the prang. It looked O.K. apart from the headlamps and the rad. grille. Undemeath, it was a different story - the suspension front n/s was wrecked and the box section pushed in about one to two inches

and up about half an inch. It had been 'airborne' and landed on one wheel, the damage was therefore localised (all the doors open and shut O.K.)

I pronounced the car restorable and about one month later, we brought it to my friend's home in Kilmarnock on the back of a lorry. I stripped the front down and set about amassing all the bits for a rebuild - new front cradle, new torsion bars, one new wing (by new I mean s/h), new steering rack, front bumper, grill, headlamps (brand new Cibie's). The engine and gearbox are O.K. as are the drive shafts and wishbones etc.

The parts were collected over a period of a year. My friend then got himself into all sorts of bother and ended up broke. He is now having to sell his house and a rescue job will be necessary to save the Familiale because I'm contemplating a move down south (if I can get a new job) Two coachbuilders have seen the car and said the box section can be straightened out, 'Och, nae bother pal, ah kin doe it so's it'll be near enough true so's it'll mak nae difference' or words to that effect. The car is otherwise A.I. the paintwork is even pretty good. and rust is confined to the wings. (See advertisement in Classified).

A picture of the car is shown taken at an M6 service area in Nov. 1973 on the back of the lorry. (It's been under cover ever since.)

Kind Regards  
Walford.

Dear Editor,

A word of warning about the Betco front hub puller advertised in Floating Power. I purchased one of these about 2 years ago and found it worked very well the first time used, but when used on a stubborn hub the puller slipped off burring the hub and the puller. Curses thought I, but then an idea came to mind. If the puller is positioned open face upwards, an axle ramp placed underneath it then the car lowered so that some of the cars weight, but not all is supported by the puller he y presto it works! This method cannot be used of course if the front axle is removed from the car. I have tried using 'G' clamps etc. to hold the puller, but they don't work. Anyone want to buy a Betco puller, going cheap?

Tom and Rosie Evans.



# Classified



This could be the last issue of 'F.P.' that you will receive, if you have not paid your subscription. There will be no further reminders.

Can those who have not yet paid their subscription send it post-haste, (quoting their membership number which appears on the envelope in which they receive their magazine) to: - Mike Wood, 119 Danebury Avenue, London S.W.15. (Make cheques payable to C.C.C and the rates are T.O.C only £6.50, joint membership of T.O.C and C.C.C. £9.50.

**For Sale**

THE CLUB has for sale : Sets of four pistons and barrels (please state year of car), £65 inclusive of p & p. All orders to John Gillard, 19 Carol St, London N.W.1. Cheques payable to the Traction Owners Club.

CLUB MANUALS for all models are available for loan from the Secretary, £1 p & p., together with a cheque for £20 as a deposit (returnable able of course).

SPARE PART CATALOGUES reprinted by the Swedish B11 Club (Text in French) superb printing and illustration, better than the original. 45 skr each plus postage. From Bengt Olsson, 239 Sodra Nas, 432 00 Varberg, Sweden.

BRAKE HOSES (for English cars). Front - No. 4044; Rear - No. 4036. Vincent Works, Vincent Lane, Dorking, Surrey.

BIG SIX SPARES. New copper radiator, new rear doors, (suit Big Fifteen), Decoke set, used gearbox, starters and dynamos and new gearbox support casting. East-clean wheels. Brynn Hughes, (see committee members, p.1.)

ALUMINIUM WHEELS, full set of five together with three 185 x 400 tyres - £95. Green tinted Triples windscreen for Light Fifteen - £30; Charles Bugeia, 9 Allee Louis Leymaire, 78130, Les Mureaux. France.

RACK AND PINION steering gear, Brand new, for r.h.d. Big Fifteen £20. M. Dufosse, 10 Rue Robilliard 28110, Luce, France.

TRACTIONS IN FRANCE. We receive on a regular fortnightly basis lists of all kinds of tractions for sale by private individuals over the channel - prices vary from £60 or so to £1,000. If you would be interested in their inclusion in the Top Press, please drop a line to the magazine. Please don't hesitate to make the fullest use of these columns yourself - it's your mag., insertions are free, and photographs are likewise reproduced without charge.

BRICEMOBILE. Our secretary and her spouse have reluctantly decided to part with their Light Fifteen, owing to their acquisition of a pre-war model. The 1953 Light Fifteen in question, resplendent in silver, is in genuinely extremely good condition - carefully maintained, in regular weekend use, completely rot-free and almost totally original. Substantial offers are required. See address on p.1. (This isn't sales-talk it really is a super car, and the Brices didn't write the ad.)

MICHELIN 'X' - one new 165 x 400, £17.25 plus postage. Wanted - one hub cap, all chrome type, with nut attached. Can exchange other type with paint surround. Also pair of yellow headlamp bulbs, 6 volt 36/45W Marchal 66 665. S.P. Prigmore, The Brunside Hotel, Bowness-on-Windemere, Cumbria LA 23 3 EP.

FOR SALE 1939 TRACTION 11BL Perfo LHD, Mechanics and bodywork excellent. Interior needs finishing. Has MOT until November, £600. Can be seen in Sussex. Tel. Bob Winrow, Crawley 511496.

11 FAMILIALE 1957, for sale in kit form. Must be sold. Will not break. Has repairable accident damage to n/s box section. £60. apply, Walford Bruen, Barns House, Barns Crescent, Ayr. Tel. Ayr (0292) 62160 or Irvine (0294) 74100 ext. 207 daytime.

PANHARD X86, circa 1950, R.H. drive version of nearly all-aluminium car (subject of a forthcoming article in Floating Power.) In good condition but needs restoring - present owner just hasn't got time. Comes with masses of spares and possibly a parts catalogue. What offers? Phone Chris Terry at Woolhampton (073521) 3620. (Near Reading).



1955 CITROEN Light Fifteen RHD Saloon. Famous late example of this historic line. Perfect condition maintained by two owners regardless of cost. Low mileage (nominal in last seven years). New parts too numerous to list; recent work includes entirely renewed braking system and new steering rack. Original metallic blue. Tax and MOT. Many spares. £1800; Tel. 01.888 3728.

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1955 CITROEN Big 6. Comprehensive restoration just completed. Appreciating Cars Ltd., Soho Garage, London Rd, Studley, Calne, Wilts. Tel. (0249) 812337.

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#### CITROEN TRACTION AVANT SPARES AVAILABLE FROM GUY ISBELL.

Gaskets, 4 cylinder, all except sump and gearbox gaskets £5.00 per set.  
Radiator hoses, top and bottom £2.35 each.  
Valves, exhaust and inlet (better than original) £2.10 each.  
Clutch pressure plate reconditioned. Exchange £16.50 plus £5.00 surcharge.  
Clutch centre plate new £12.50. Reconditioned £10.00.  
Brake shoes, set of 8, relined and new bushes £15.50 plus £5.00 surcharge.  
Wheel cylinders, reconditioned ready to fit £3.75 each complete  
Master cylinder £9.60  
Reconditioned radiator (new core usually copper) with 12 months guarantee £42.50 plus £5.00 surcharge on old unit.  
Fan belts, 4 cylinder car £1.87  
Fan belts, 6 cylinder cars available.  
Starter motor reconditioned 4 cylinder cars 12V exchange £24.00 plus £5.00 surcharge. New £38.  
Starter motor reconditioned 6V exchange £31.-- plus £10.00 surcharge on old unit.  
Dynamo's 12V reconditioned exchange £8.00 plus £5.00 surcharge. New £14.00.  
Dynamo 6V reconditioned exchange £31.00 plus £10.00 surcharge.  
Dynamo 6 cylinder cars, 6V and 12V recon. exchange £50.00 plus.  
Top and bottom ball joints, recon. Exchange £2.30 each plus 50p. surcharge.  
Carburettor Solex 32PB1 suitable for French and G.B. cars (state which, slight difference) Recon. exchange £16.25 plus £5.00 surcharge.  
Carburettor as above, new £33.50  
Brake hoses, G.B. Cars, front and rear £2.35  
Brake hoses, French cars, front and rear £2.10 approx.  
Speedometer cables available for all models 4 cylinder cars £2.75.  
Brake cables. All models, new £4.25 each.  
Distributor, 4 cyl. Ducellier or S.E.V. New £30.00  
Wiper arm G.B. Cars £1.04 each  
Wiper blades, G.B. cars 95p. each.

Coming shortly exhausts in stainless steel.  
Stainless steel downpipe £14.00 approx.  
Stainless steel straight pipe £12.00 approx.  
Stainless steel box £14.00.  
Starter 6 cyl. cars, 6V and 12V recon. exchange £50.00 plus.  
Top wishbone pins and bushes recon. Exchange £13.50 plus £3.00 surcharge.

## Events

April 16th  
V.S.C.C. Silverstone Meeting. We hope that William Sellers will be fielding his car, and would appreciate a traction back-up! Make sure that you are in the 'Interesting' car-park, and the TOC members can assemble there.

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May 7th & 8th  
Historic Vehicle Silver Jubilee Tribute, Windsor Racecourse. An entry of five cars from the TOC will be in the parade on Sunday. Saturday is Rolls-Royce only day.

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CLUB CITROEN SUISSE are holding an International Rally at Orbe over Whitsun - the 28/29/30 May, and have sent a very friendly invitation to all TOC members who might want to go along; It will be a camping weekend, and might just be within the pockets of our (richer?) members . . . certainly sounds a nice way to spend Whitsun. Further details from Club Citroen Suisse, Case Postale 230, 1001, LAUSANNE, Switzerland.

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June  
Combined Summer Rally - TOC and CCC. Date and venue to be announced. French and English Concours, driving events, etc.

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July 17th  
Lingfield Racecourse: the once Penshurst Pageant of Motoring.

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August 13th & 14th  
Yeovil Car Clubs 2 day event, pageant, etc.

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August  
Classic and Thoroughbred Car Concours, Shipnall, Staffs. The TOC will be fielding some entrants!

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September  
French Picnic at the London Gliding Club, Dunstable. Date to be announced.  
A combined meeting with a 2CV Popcross at Chelmsford,

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October  
Lunchtime pub meeting followed by an Auto-Jumble at John Austins barn, Shirrel Heath, Hants.

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November  
Noggin & Natter, London area.

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December  
Christmas Nosh-up, Meantime Restaurant, Greenwich.

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Whilst every effort is made to ensure the accuracy of the information and advice given in the technical articles in this magazine and the replies to readers enquiries, neither the Citroen Car Club, T.O.C or the officers and members thereof or the authors accept any liability whatsoever for such information and advice.

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