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Volume One Number Two
April Nineteen Hundred and Seventy Six

A great deal of news to pack into this editorial all of it quite exciting for the future prospects of the club .... First, and most important, concerns relations with the C.C.C. After the dust raised by the January meeting with the main committee had settled and, I think, everyone on both sides had realised how much we all had to lose by the rancour that would follow a complete split, the subsequent meeting between the two committees hammered out an extremely fair solution. I think that tribute should particularly be paid to John Mann, Citroen Car Club Treasurer, who worked extraordinarily hard to produce a plan acceptable to both committees, and, indeed, to those on the main C.C.C., Committee who still have obvious reservations but in spite of these have agreed to the proposed plan.

Details of subscription choices are published elsewhere in the magazine - inevitably, they are rather complicated, but I hope comprehensible! We wanted to give the widest possible choice both to those who wished to carry on receiving the Citroenian and 'Floating Power', and those who were only interested in receiving the latter, without imposing the burden of a double subscription rate on some members. It has thus been agreed that we should remain affiliated to the C.C.C., qualifying for full membership, and with the great advantage of their experience and finances backing us up. Our committee have accepted these terms, as they considered that they held every advantage for our Club, and I hope you will agree - any comments, derogatory or otherwise, will be most welcome!

As to our Committee - you will see elsewhere in the magazine who has been appointed to what, and who to write to on the relevant subjects I I say 'appointed' intentionally, as without a full election the present Committee can obviously only be regarded as provisional and this we hope to hold in the Autumn, postal voting and all, being good democrats! We want the organisation to be as open as possible, and anyone who thinks thay have anything to offer should write to us with suggestions. We should like area representatives from the West Country, the Midlands, the North and perhaps Wales/Avon/West Midlands - volunteers please! We have already had a few offers, and will be getting in touch with those who have written to us as soon as possible. We shall be publishing lists of
members in these areas in the future; the intention is that we shall eventually be capable of organising events in all these areas; instead of happenings invariable being in the South-East.

Finally, still on the topic of Committees, both Graham Brice and Fred Annells will act as 'liaison' members, between ourselves and the C.C.C, sitting on both Committees. Fred is making his register of Traction Avant owners available to us, and we are co-operating with him in bringing it up to date. The register will obviously be published in 'Floating Power' in due course.

We are having a special Committee meeting in April solely to discuss the question of a spares pool, or something similar, and will have news of this by the next issue. Traction Avant Nederland, the Dutch club, has very kindly offered us access to their vast pool of spare parts: we are trying to arrange with them the most practical way of taking advantage of this facility and I will publish full details in May. So lots of spares news in the next magazine!

We are organising our first major event for June: in the interval we shall be at Penshurst on May 9th, a motoring gathering that makes a fascinating and worthwhile day out for the whole family, and we should be very happy to see as large an assembly of Tractions as possible. Our aim for our first PROPER EVENT is to strike a balance between the social side of the meeting, and the active events side - this we want to encourage as much as possible, as we think that the orgies of nit-picking other people's cars we all tend to indulge in at present should only constitute a small percentage of our time! We will be offering a covetable trophy to the Traction owner who scores the highest aggregate points in events at our meetings during the year.

Other future plans include a raffle - (the more ambitious among us hoping for a Real Car) - and next year, a programme of exchange visits with the European Traction Clubs, staying in one another's homes, which will bring trips such as these within the pocket of the average impoverished 'tractioniste'. We have been tremendously heartened to receive so many letters bursting with enthusiasm: keep it up, and we shall have a Club to be proud of. Happy Tractioning!

devoid of all excrescences such as lamps, hinges, handles and petrol fillers.
To obtain a high performance without dependiag on a thirsty or over-stressed engine, attention was concentrated on weight reduction and he took the bold decision to adapt an existing car with integral construction, instead of building a body to go on an existing chassis frame. As independent front suspension and hydraulic brakes were considered essential the available choice at that time was limited to two vehicles, the Lancia Aprilia and the Citroen. A liking for front-wheel drive and the immediate offer of a fixed-head coupe in fair condition clinched the decision in favour of the Citroen.

The pen being nightier than the sword-yea, even than the spanner-


The handsome tail of the C.D.W.Citroen. Tail and stop lamps and the registration number are recessed into the face of the bumper, the number being illuminated from behind.
the first step was naturally to fill in some forms. In the fullness of time permission was obtained to erect a workshop in the corner of the orchard and a war surplus hut 18 ft by 15 ft was bought and erected on the site. All the work with the exception of fabricating the outer panels was subsequently done in this small space.

The engine, gear box, front-wheel drive, suspension units, steering and

## A view which emphasizes the graceful

 lines of the C.D.W.-Citroen. The spats over the rear wheels are edged with a plated beading, and are secured by two quick-release handles.

Mr. C. D. Waters with his Citroen special. The height of the car is only 4 ft $3 \frac{1}{2} \mathrm{in}$, but the owner can dispose his 6 ft gin within, and still has three inches of head-room.

## An Engineer's Ideal Car, Based on a Citroen Structure and Power Unit : High-performance Cabriolet with Many <br> Original Features

brakes were first removed, stripped, overhauled, and modified in detail. The engine was fitted with two semidowndraught S.U. carbirettors connected by short pipes to the inlet passages on the head and a fourbranch exhaust system was made up, merging into twin tail pipes leading to a new silencer mounted transversely at the rear.

Next the steel coupé top was cat off and other panels not contributing to structural strength were removed. Steering wheel and column, facia gear change and dash panel were scrapped and a new steering assembly with a very smooth steering column gear change was made up. This was partly fabricated and partly made up from Citroen, Lincoln and Mercury components. Some items were obtained from war dumps, and all were plated in chromium or cadmium before assembly. The new wheel had a rim in beige plastic and from then on all control knobs were specially turned from Catalin cast resin bar to match.

The basic elements of sills and scuttle which give the Citroen its strength were retained and extensions were built on to the sills to support the new full-width body panels. At the front, sheet steel extensions were flanged on to the bolts which support the suspension assembly. These extensions carry a four-inch diameter tubular cross-member ahead of the gear box, and flanges on the ends of

The interior view shows the centrearmrest between the front seats, which can be dropped down to form a bench-type seat. The rear seats are intended for one adult or two children.
this cross-member support aluminium alloy shear panels which act as wing inner valances and which support the whole nose and front wing panelling.
The sill structure was extended at the rear by box-section members which support the panelling and take the weight of a new 14 -gallon petrol tank made op from tinned steel sheet. All the rear panelling is stressed, the wings and decking being welded into two main assemblies bolted together down the centre line of the car.
When the main body lines had been developed on the drawing board, wooden rigs were constructed for the shaping of the outer panels. As suitable timber was unobtainable without high priority permits these were made with five-ply obtained from
some ping-pong tables. The rigs were made for one side of the car only and slotted so that they could be dismantled and re-assembled in the reverse order for the opposite side. To ensure the required high standard of finish on the outer panels, professional sheet metal working faculities were called for, and Careys of Cheltenham undertook the work. The panels were made in their shops, checked on the rig and then transported out for mounting on the car.

The car began as a hobby, and as a means of trying out various new ideas on car construction and equipment, but the body has been designed with an eye to possible production in limited quantities. All the front panelling is attached by rivets or bolts and could be removed for repair in the event of a major crash. Front wing outer panels, bonnet, doors, locker lid and many of the structural reinforcements are in aluminium alloy. The rest is steel and no wood is used anywhere except for facia and door fillets.



The door trim is simplified by mounting the lock mech anism on the scuttle. Extra elbow room is provided by the curved window.

## A Dream Comes True-continaed

A slim chromium beading runs right through the centre line of the car and along the crown of each front wing, marking the joins in the panelling. To make this beading, lengths of brass tubing were bent to shape and slotted with a milling cutter. A flange of steel sheet was then brazed into the slot and the whole beading chromium plated. The same method was used to build up the radiator grille.
Patents have since been applied for on a method of producing a bright beading which will stand up against abrasion when the paintwork is rubbed down in production.
To break away from the type of front styling, which is dominated by the vertical planes of the flush-fitted head lamps, the lines were established first and the head lamps fitted in afterwards. The possibility of recessing the lamps behind movable eyelids was rejected on the grounds of complication, and ultimately a position as high as possible behind the radiator grille was chosen. For compactness and low weight two head lamp reflectors with twin-filament balbs were cut and merged into one oval assembly with a vertical partition down the centre. This unusual arrangement seems to work adequately in practice and the loss of light in transmission through the grille is partly counterbalanced by the greater efficiency resulting from the high mounting.
Each bumper was made up in three sections from 16 -gauge steel sheet radiused with a hammer over a small forming tool in the vice. The recessed face is painted to match the car and is expanded locally in the centre to accommodate the registration number, the one at the rear being illuminated from behind.
The door locks are particularly interesting. The whole mechanism is mounted on the scuttle and is accessible for lobrication and inspection. There are two push buttons at each side, one on the facia panel and one on the outside below the windscreen. To prevent accidental opening by children a trip mechanism ensures that two consecutive pressures must be

Two semi-downdraught S.U. carbarettors are mounted on special short inlet pipes. Below the drip trays can be seen the four-branch exhaust systern. Other items of interest are the linkage for the steering column gear change, and the tubular bonnet struts with over-centre springs, which weigh only a few ounces.
given to the facia button on the near side before the door will open, but a single pressure is sufficient to open it from the outside. As no available lock mechanism met these requirements or provided the smooth, quiet action that was required, Mr. Waters designed and made the whole assem-


Two constructional details: Top is the method of supporting the front wing panels on a vertical shear panel, with a chromiurn plated beading to cover the joint, formed of steel strip brazed into brass tubing. The lower sketch shows how the bumpers were built up from three strips of 16-gauge steel radiused with a hammer over a forming tool held in the vice.
bies himself. The actual door latch consists of a ball on an arm extending from the door post. This engages with a tube sunk into the door structure and the ball sliding smoothly into the tube holds the door firmly in position with only a slight click as the spring-loaded cam snaps home on the scattle. When a button is pressed to open the door the arm swings back and pushes the door open two or three inches. The doors themselves
are extremely simple, having inner and outer panels of aluminium alloy. They are not loaded with the weight of the lock mechanism and they carry Teleflex cable window winders which were chosen for their lightness and simplicity. The windows are made from curved Perspex carried in plated frames fabricated from brass channel section. The standard Citroen is by no means burdened with excess weight, but the original steel coupe doors which were scrapped weighed 65 lb each as against 25 lb for the new doors fully trimmed.
As the work progressed co-operation was obtained from a number of suppliers and friends in the industry. New Lucas electrical equipment was incorporated, the latest Smith's instruments and a Smith's interior heater were fitted and a Radiomobile was built into the facia. The black knobs on the radio were scrapped and replaced by specially turned controls in coloured plastic. This involved the manufacture of a special broach to cut the square holes in them. The radiator has a new header tank in polished copper, which incorporates connections for the heating and defrosting system.
The seats have Hairlok and sponge rubber overlays on spring case foundations. Between the front seats there is an arm-rest which can be folded away downwards. filling the space between the seats and converting them into a continuous bench. If you ask him why he made so many apparently trivial items himself, the owner will quote the case of the tension spring required for the armrest linkage. In response to his enquiry a major spring manufacturer replied, "We have a spring in our standard range which exactly meets your requirements. Price five shillings. Delivery three months." There were many items like that.

The hood frame is fabricated from lengths of square and round section brass tubing and the quarter-lights rise and fall with the hood itself. Antomatic operation was ruled out on grounds of weight and complication, as at that time it would have entailed designing and making the whole lifting


mechanism. The whole hood and quarter light assembly is therefore arranged to lift in one operation and it clips to the windscreen with toggleaction fasteners. There is a large curved rear light which opens for ventilation andi it has a plated gutter along the top and sides. The hood fabric is not attached to the car body at all but folds away with the frame behind the rear seats when not in use. The assembly weighs about 40 lb .

One of the many interesting details is the patented shroud for the direction indicator arms The normal method of fitting a semaphore indicator requires a hole which weakens the panel and which may start the paint flaking away at the edges. Moreover rain which flows in past the arm raus down to rust the structure from inside. Mr. Waters has evolved a simple surround capable of being pressed from sheet metal which provides a slim chromiam plated rim round the edge of the hole, grips and supports the panel against distortion and ejects all moisture which may penetrate past the semaphore arm. It springs into place and is secured by a single set bolt without drilling the panel.

## Individual Details

Throughout the car there are similar examples of detail work which bear the imprint of a fastidious and resourceful enthusiast. The petrol tank has a large 4 in filler orifice inside the luggage boot, but the filler cap is sealed with a spring-loaded disc of synthetic rubber and the tank is vented to the outside atmosphere.

When it came to trimming the car, the head trimmer at one establishment which quoted for the job was so appalled at the task that he resigned on the spot. Mr. Waters, who works on the principle that all things are possible, given time, energy and an analytical approach, therefore undertook the job himself. He borrowed an upholsterer's sewing machine and taught himself to use it. At this stage it is perhaps needless to add that he began by stripping and rebuilding the sewing machine. The whole trimming and upholstery of seats, doors and hood are his own work, the hood being finished in a light brown mohair and lined with a cream plastic-impregnated fabric. This lining, coupled with the

The rear quarter lights form part of the hood structure and fold away with it. Light wires are used to tension the hoops and a spring-loaded wire sewn into the fabric holds the hood material firmly round the radius of the quarter light. The curved rear window opens for ventilation and the hood has a cream plastic-impregnated lining.


The door lock mechanism on the scuttle. To prevent accidental opening by children the facia button must be pressed twice to open the door. When the facia button $A$ is pressed the cam $C$ is pulled clear of the pin $D$ but is trapped by the trip catch $E$. When the button is released the second ramp of the cam springs from $E$ to $D$ and a further pressure on the button opens the door. The sketch below shows how the ball-ended tongre on the lock engages with a tube inset in the face of the door.


Left : The patented shroud round the direction indicator arm, showing the single-bolt fixing, and the projections which grip the panel.
large window areas, and the light vellum beige colour of the hide upholstery, lends a particularly bright air to the interior. The upholstery is piped in dark brown to tone with the polychromatic beaver brown exterior. Facia panel and door fillets were made from plywood and then sent away to be veneered in Thuyah, an African wood with a fascinating bird's-eye grain in a rich golden colour.

When the structural work was completed the car emerged from the shed like a butterfly from the chrysalis and was driven down to Cheltenham for painting. The total weight proved to be a little over $18 \frac{1}{3}$ cwt against
exactly 21 cwt for the original fixedhead coupe. It handles beautifully.
However, many a man has learned that a beautiful car, like a beautiful woman, can bring moments of refined anguish. On its first day out the C.D.W.-Citzoen so entranced a passing messenger boy that he fell off his bicycle and scarred the paintwork with his handlebars.

It attracts considerable crowds, and in remote places citizens seem to rise out of the ground waving cheque books or pound notes and demanding replicas. It is not impossible that their desires may be gratified.

# Ppoppressive Naninlenambe 

THERE is no reason why the presumed complication of front wheel drive snould deter Citroen owners from Hempting progressive maintenance at home. Mention will not be made of operations detailed in the instruction book issued with the car but many other quite substantial home jo's are easily possib'e and can be tackled single-handed. Although this should result in substantial saving, work best left to Citroën specialists includes torsion bar adjustment, front wheel bearing renewal, differential settings and camshaft and crankshaft repairs, including bearing remetalling.

Components needing maintenance or rencwal may be grouped as those requiring prior removal of (a) radiator, (b) engine, : bonnet oaly.
Group (a) includes gearbos, front engine mounting and pulley drive from camshaft fiont end. Under group (b) come clutch ind camshaft drive. Group (c) comprises starter, pistons and cylinder barrels.

Good quality metric spanners are essential --open-ended, ring and socker. Approximate eupivalents waste valuable time. Numbered consecutively, those most frequently needed are Nos. 8-14 and 16-18 inclusive. The remainder up to No. 25 are useful purchases but those above are disproportionately expensive and seldom used.
The whole engine design is. of course, back to tront," the gearbox-d:fferential


Fig. 1.-A) Gear-locking "Tee" rod. (B) Gear selector rods. C Front engine mounting. D. Gear control pillar displaced).
unit heing carried in the nose. Then follow clutch bell-housing. crankcase and finally timing case which carries the rear engine mounting.

## Dismantling

The ker 10 major dismantling lies in rapid disconnection of the inner drive shaft couplings from the gearbos after removal of the radiator. The latter rests on a pressing which combines the function of support for the froat engine mounting and upper cross-bracing to the cradle forming the front axle.
Proced by raising boh front wheels iairlv near the hubs so that the drive shafts an be rotated at the normal angle. Next, remove the nuts from the four cross-bracing bolts, set a iack under the gearbox drainplug, remove the studs supporting the front engine mounting and drive out the bolts from the ends of the cross-bracing which Lan then be detached. Raise the gearbox hali an inch by the jack and wedge the engine firmly against the bods shell on one side. Then remove the four nuts from the differenial drive flange o: the opposite side.

Free the drive coupling from three of the four studs, turn the drive shaft through 90 deg. and leave one stud in the coupling recess. Next, wedge the engine against the body shell on the opposite side whereupon the second coupling can be dismantled and will fall free. Eithe: the gearbox or the engine can then be removed.

## Gearbox Removal

Whether the car is in gear or in neutral the gear selectors (shown in Fig. 1) are locked in position. They are freed by depressing the clutch pedal which has the effect of drawing back the "T" locking rod against its spring, so releasing the pressure of two small balls in contact with notches in the selector rods.

The gearbox-differential unit (shown in Figs. 1, 2 and 3) draws forward off the front ef the clutch bell-tousing, the castings parting in the plane of the drive shaft axes.

Leaving the front wheels blocked up and free to rotate, transfer the jack from the gearbox to the sump drain plug. While the gearbox is draining, withdraw the speedometer drive, remove the gear control pillar (Fig. I) undo the nine nuts holding the geariox in place and unscrew the gear lock adjusting plate.

Drawing the unit forward is a combined operation of progressive raising of the engine by jack and rotation of the roadwheels in turn to free the drive shaft studs and clear them above the "axle" cradle.

Two safeguards are worth mentioning. Dismantling should begin with freeing of the clutch rod or cable, for if the chutch is freed with the gearbox withdrawn the clutch centreplate may move out of place. Also, the clutch bell-housing aperture should be stuffed with rag, for if anything drops in by mistake further dismantling will be necessary.

## Engine Removal

As the weight to be lifted is some six cwt. a light chain block is essential, as is adequate strength of garage roof frame.
First, disconnect the exhaust downpipe, clutch cable or rod, and all essential fuel, electrical, throttle and gear connections; then jack down the front wheels. Sling carefully under the water pump casing. Slight raising will first clear the drive couplings and allow the rear engine mounting to come forward free of its socket. The engine weight rests mainly on two transverse helical spring supports. As the compression goes from these they can be slipped on br hand. With further lifting the car can be pushed back and clear. The engine is then lowered


Fig. 3--A further view of the gearboxdifferential housing. (A) Differential drive flange. B) Gear lock ball housing. (C) Gear locking spring and rod. D Main shaft.


## Dismantling the Engine : Ge

 Timing Chain Replacement Adjustment and RenReprinted from
June
on to blocks or, for preference, on to a simple wooden cradle.

## Timing Chain Replacement

The timing case is now free for removal.
The camshaft is driven from its rear extremity by a doub!e roller chain which for preterence should not have a frce link. It it does, see that it is securely fixed. The sprockess are keyed and an easy sliding fit on their shatis. For the first chain renewal the original sprockets can reasonably be retained, but shouls he renewed the second lime. Retention of correct valse timing presents no problem if the shafts remain stationary. A tooth on each sprockes is centre-punched. Firs: lay the sprockets on a Hat surface with the punchmarks inne:most and in line with the sprocket centre-lines, then fi the chain in that position and shide the complete assembly on tc both shafts in one movement, wathing that the keys remain in position. If cither haft has moved, rotate the


Fig. 2.-The gearbo Bellhousing aperta cradle. (C• Drive sha bellhousing. E) Cam drive housing. $F$ erankshaft until both kewways come into the fitting pasition. Then thoroughly tighten the sproket ring nuts and secure firmly with ner locking washers.

## Fitting New Pistons

The new assemblies coms from the makers complete, comprisint pistons with four rings fitted, gudgeon pins and cylinder barrel, with their base gaskets

Having removed the cylinder hedd as for normal decarbonising, take of the sump and note that the big-end cap and connecting od. are centre-punche numerially at their forward ends. Then cut a hardwond block to fit across the cylinder barrel skirt and tap sharply upwarss to break the harrel gasket seal. . Remove No. big end cap and Jraw the whole assembly-piston, connecting rod and barrel-up by


Fig. 4.-Timing

arbox and Engine Removal : Fitting New Pis!ons: Brake pval of Starter Motor

Practical Motorist
1957.
hand and out of the ellinder block. Repeat for each cylinder, finally stripping the connecting rods from the pistons and trying one of the new gudgeon pins through each little end. Unless ther are a very good fit, have the latter rebushed, sending one of the new gudgeon pins as a patiern.

## Check Big Ends

Before despatch check the big cods lor lift and soundness; also measure up the crankpins. If ovality is negligib'e, lift not excessive and the bearing surfaces even, most of the clearance may be tiken up very carefully on heth cap and connecting rod equaily without remetalling. 1t in joubt, however, have the hig ends remetalled along with the rebushing of the little ends, bearing in mind that slackness at either end will be more audible with the new pistons.
To begin assembly of the replacement parts, fit one circlif in each new piston and get ibem fairly hot. See that the piston skirt slot will be firted on the nearside of the n the same side as the pushar, The cold gudgeon pin is a sliding fit in a hot pisfon. Follow up with the second dirclip and position the ring gaps alternately opposite one another. Then stand the barrel upside down on a Hat surface and work the piston s!owly jown into it with a slight rocking motion. *sing the rings past the barrel chamfer one by one with the fingers. Keep th: piston well within the harrel. for if the top ring eccapes free at the other and it will have to go rack in at that end with no chamfer to felp because the connecting roj will not follow througin the barrel.

## Cylinder Block Seatings

Each harrel has an external Hiet from end to end and these have to be set Hush with one another in pairs. Carelully clean the seatings in the cylinder block on which the barrel
base kaskeis are to rest, applying jointing material and placing each pair of gaskets in position. These gaskets will have cooling water above them and engine oil below, so careful fitting is important.

Turn the crankshaft until No. I ©rankpin is in the lowest position, push the new No. 1 piston half way down its barrel with the skirt slot on the correct side, lower the whole un:t on to the gasket, press on the piston top to seat the big end, and wedge a block of wood between all the cylinder head studs to prevent the fitted barrel from rising again when the others are placed in position. Connect up and secure each big-end cap, using new bolts and new locking washers. Finally refit the cylinder head after checking that all the barrels are standing $2-+$ thou. proud of the cylinder block. Fill the radiator and check for watertightness of the harrel gaskets before replacing and topping up the sump.

It is not worth considering reboring; replacement is easier and more satisfactory.

## Camshaft Extension Drive

This forward extension shaft carries a belt pulley driving the fan, water pump and dynamo. It is carried in the clutch bellhousing on two roller bearings and has an oil-thrower and a driving tongue at its rear extremity. The forward end of the camshaft carries a similar tongue. These tongues, which should clearly be allowed to suffer as little wear as possible, are connected by a cylindrical slotied dog coupling. Replacement of the dog at, say, yearly intervals is the best safeguard against wear. Withdrawal of the shaft is straightionward and a piece of wood cut to fit the slot firmly will retricve the dog. The same piece can be reused for replacement if its end is first pared down to be a slack fit in the slot. There are eight alternative positions in which the new coupling can be fitted and it is worth while checking which position results in the least backlash.

## Lubrication

A simple wire-gauze filter strains the engine oil and should be taken apart and washed in petrol whenever the sump comes off. A supplementary bypass filter is casily fitted and is a good investment, as is a spare oil-pressure indicator. In course of time the pressure indicator will cause the warning light to flicker on in normal use. Unless the oil level is too low this shows the need for replacement of the indicator. If topping up the sump makes no Jifference, nor dies a new indicator, have the lubrica-


Fig. 5.-Hub puller dismantled. (A) Collars on hub and puiler. B) Hub nut to be removed.
ion sustem thecked hefore running tis engins agsain.

## Brakes

The handbrake cables 10 the rear wheel are unenclosed at the front and are at Bowden wpe towards the rear. In time the cables tend to rust a fow inches inside the Hexible casing near its forward end, thus annual attention at this proint gre:al! prolongs table life.

First disconnect the cables at their forward ends and $=$ lein them well. Then remose each brakejrum. Unhook the rear enj il the cable from its operating arm in th: brake mechanism and withuraw it backwaris to the fullest extent. Clean the witharawn length of cable thoroughly, treat well with graphite grease, slide forlary igatr and reconnect.

## Relining

The rear brake shoes slide readile ofl their pivots for relining, but before ordering new linings sheek whether the rearmost lining covers the whole shoe or only hali. Al-o the linings for the front and for the rewer brakes are not interchangeable; they wifter both in curvature and in rivet hole spacing.

Front hrake relining is equally straightforward onec the wheel hubs have neen removed Figs. 5 and 6;. A cimple hutpuller is needed. hut can be made inexpensively and is a useful, it seldom use: adjition to the toul kit. The hub, with the brake drum, is keyed to the tapered stuk axle and must be a tighr fit with the kes properly positioned on reassembly. The


Fig. 6.-The hub puller assernbled in position.
lack-nu: must on no acount he movei wio the new excuring pin has been fitted.

The sarter is secured to ihe slutch hellhousing hy a single stud and lock-nut. Hasing lackened these undo the lok-nes holding the offside helical ongine vupori and sorew the spring down 6 its fulle-s extent. Then undo the cathle to the stamer olenoid at its upper end, whereupin the body of the starter can he Jrawn back, rosated through about 180 deg. and the rear end lifted in one continuous operation. $R_{y}$ (i) doing it can be lifted clear and reinserte. 11 the reverse manner.

Shown above and left are the brake drum pullers shown in issue No. 1 in use; these drawings will be continue in May number, together with dimension, instructions for use and information relative to the machining of rough castings (which can be made available through the club).

# SLOUGH BUT SURE. 

'And so you see, people really do work here ...' said R. A. Richards, chief sales executive, Citroen Cars Ltd., Slough, when I had sunk gratefully into a chair in the canteen, after a day of note taking as I walked around the shops in heat-wave time.

What does an up-to-date mass-production car factory comprise? Body-assembly lines, paint shop, trim line, finishing of chassis assembly line, and the parallel ancillary processes of upholstery trimming and possibly a saw mill.

There will be a machine shop, for engine units, but in all probability the press shop will be an outside organisation. This means that only the machine shops are lacking in the case of the imported-car assembly factory.

At Slough, over 400 employees work a 44 hour week, and work hard. There is a vast incoming goods or marshalling section, various body assembly lines, an extensive paint process shop, trim lines (implying the fittings of accessories and upholstery). Component fitting and finishing lines, and test and rectification bays.

Let us see for ourselves. At the door of the Incoming Goods shed, which is like an elephantine parts department, a B. R locomotive passes slowly trucks clatter and stumble to a standstill and in a little while quantities of body side, roofs, wings, bonnets and major mechanical components for the Light Fifteen and six-cylinder Citroens are unloaded.

These parts are subsequently stacked along with scores of others in tall angle-iron racks, and await their turn to go into the factory. Power
units and heavy components are handled by means of a travelling gantry-crane. When engines go into the shops they are swung aloft, five at a time in their racks.

Body pressings come from France, bright under their bluish protective coating; all parts, in fact, seem quite unaffected by their transmarine journey and I learnt that only minor damages are suffered occasionally.

The most important body component is the coque which serves both as floor and 'chassis' - the Light Fifteen, of course, having long been an integrally built four-wheel-drive car. This component is the subject of the first production operation which actually takes place just before entry to the body-assembly lines proper. The operation consists of making certain very small modifications to the coque (which is identical with that of the French Citroen) to Anglicise it; thus, for example, the battery mounting is, if necessary, altered to take a 12 volt unit.

Body assembly follows normal modern procedure. The sides are erected in a master jig-frame and clamped securely. Edges are scribed in situ and trimmed up with shears. This is done with considerable skill by operatives working by eye alone, there is no jig reference for the trimmed edge. Then the back and scuttle are gas welded in place.

Sides-back-and-front assemblies are then lifted by crane on to a tubular-iron stand, on which a half a dozen may lay side by side to be the subject of a cleaning-up treatment. Workers carefully panelbeat the welded joints where necessary, then coarse-

file them, aiming at an even surface. Final treatment at this particular stage consists of imparting a smooth finish with portable emery wheels.

Each assembly next goes on to a master jigframe for attachment to the coque, this being a process effected by spot-welding with Sciaky equipment. Then the shell goes on to an interesting jig-frame which is rotated on its longitudinal axis so that the spotwelding plant can be used on the underside on the 'chassis', which is then uppermost. This operation is perhaps typical of the Continental flair for simple logical action at all stages of production.


Immediately afterwards each shell is given pause for a little in a quiet corner where small parts such as seat brackets are gas welded into position.

Now on a manual conveyor (i.e. railed trolley) the shell receives its roof panel, which may or may not be pierced to take a sliding head. The roof section is neatly trimmed with a rotary cutter as it is fitted into the aperture formed by the top-margin of sides front and back. Then the spot-welder is brought into use again and the roof and the rest made as one.

Hinges and doors are then fixed, and slots are cut in the central pillars to take the trafficator arms. The latter operations is curiously refreshing in its sheer manual simplicity, whereby a hole is drilled at each end, and the metal sawed, and filed out.

Now, however, comes the stage when body solder is applied to fill shallow depressions, in the usual manner. The amount of body solder used on the job is not great, neither is a lot of time used up on this operation, which says a lot for the assembly methods. In some cases, of course, a little panelbeating is called for, too.

Body shells can than go to the special booths for Deoxidine cleaning, after a quick manual rub-over with rags. The Deoxidine 202 dry process is used, with a quarter-hour bake. The resultant powdery green deposit is carefully removed by means of Sturtevant Turbine vacuum cleaning plant, the brush type nozzle being passed over every part of the shell.

At the same location, wing undersides are painted with bitumastic compound by brush, the spray process having been discarded as less satisfactory.

Next operation is the spraying, inside and out, of the shell with zinc-chromote primer. It is then given a one-hour bake which includes forty minutes at 250 F . This primer has a glossy surface, and any defects or uneveness are shown up at once.

The shell is now on a moving conveyor, and after entering the next booth it is sprayed with primer-surfacer, being given two double-cross-coats,
wet on wet. Incidentally I observed here that the spray-hand has to work very fast on a really hot day such as this was. As it leaves the gun, the volatile fluid is already drying superficially. A nicety of this spray operation is that an extra thickener coat is put neatly along all seams. This time the shell moves into a steam-heat bake-oven for one hour fifty minutes, being given an effective one hour bake at $250 \mathrm{~F}-260 \mathrm{~F}$.

Using pads of soft rag, operatives put a guidecoat on the grey-paited shell. This coat consists of a thin solution of vegetable black, and its purpose is to act as a guide for the rubbing down which follows. In other words it is used on much the same principle as mechanic's blue, $\mathrm{i}, \mathrm{e}$, to differentiate between the high and low areas.

Then there is the first of a series of strict inspection, involving marking of those areas which must be filled with stopping and rubbed down again. After stopping, there is a twenty minute bake at
180 F . The first coat of colour is than applied and followed by another inspection and possible tubbing down and stopping. Stopped areas are 'Blown-in' with colour.

One more cross-coat of colour is given ten minutes to 'flash' and another is applied and the shell oven-dried before a final flatting operation and another inspection. The final colour coat actually consists of $25 \%$ colour and $75 \%$ thinners, but a local coat of thicker consistency has first been put on flatted patches. After a rough hand-polish the shell is ready for the trim line and all subsequent operations. It does not receive its final polish until after all operation, including the road test, have been completed.

The trim line, which I examined, seemed quite normal. A small point of interest, however, is that the company has its own plating plant which deals with many small parts, notable those cadmium plated.

Actual upholstery trim is done in a separate spacious shop, the processes involved being also quite normal, i.e. bulk marking-out and cutting, use of prefabricated fillings, etc. In a smaller shop, window frame mouldings, door pillar cappings, sash mouldings and facia boards are treated with wood-finish cellulose paint, giving a hand some high finish.

The trimmed shell is lifted onto an elevated tubular stand for fitting front and rear axle assemblies. As the finish would otherwise easily be damaged, the shell is lifted by means of a big gantry-mounted grab with heavily padded jaws.

At the end of this finishing line, as it is called, the car rolls off across two miniature weighbridges, one in front of each ramp. These give a final check on adjustment of the independent suspension. Then is goes on to a big turn-table for the finishing-line inspection. After that it is up to the test driver and those who will ever so carefully attend to any small matters requiring adjustment. Then, and only then, it the finish touched up if necessary and polished, and a car given its last inspection.

And so another British Citroen goes on its way in all probability to a far-off corner of the world where there are no roads as we understand them, and where the renowned toughness of the historic marque will be once again tested to the ultimate and not found wanting.

Reprinted from 'Motor Industry'

## Ohe Iatest Accessories

## MARCHEPIEDS

RUNNING BOARDS

C. A. P.

Rubber-covered. with heavily chrome plated brass end trims.

Please state whether
Light 12 or 15 - Big 15 - Familiale -
Roadster - beffire lst Jan 1938
or Pilote type 1938-39

## O. L. D.

Black enamelled with polished aluminium with rubber inserts.
Extra charge for different colours.
Please state model when ordering.


## SPEED

With aluminium wing trims.

## 66 E. T ${ }^{9}$

Completely Rubber covered, fully adjustable to ensure a perfect fit.

This type is only suitable for cars equipped with Pilote wheels.

All letters to Traction Owners Club, North Cottage, Mongers Farm, Barcombe, Nir. Lewes, Sussex.

## Dear Editor,

As I am a Traction nut from aesthetic whim and a 2 CV one of practical necessity, and I believe in the excellence of Citroen through out it's range.

However, at last . . . . . . a magazine full of useful and interesting information. I hope this high standard can be maintained. As an enthusiastic but comparatively new Tractionist I've found any information both historical and practical difficult to come by, so I'm looking forward to receiving my next 'Floating Power'.

One comment, is it possible to include in the mag. the source and date of historical items, such as the Traction advert, torsion bar explanation and accessories advert.

The latter I found very interesting as my 1951
Big 15 has a none standard 'big boot'(photo enclosed) * Enough for now, best of luck with our new club,

## Yours tractioning (occasionally),

## Tom Cockeram.

* To be published soon - Ed.

Dear Editor,
'Floating Power' seems an excellent idea and I am more than willing to lend an extra hand in any way with its organisation if needed.

I bought my Traction, when working in Southern France four and a half years ago from a local viniculturist with whom I had become very friendly. He had bought the Traction in 1953, but had kept it garaged for most of the time only taking it out for a run at week-ends. Consequently, it had remained in prime condition. Since then, however, the English weather has made its mark, unfortunately, on the paint-work.

When it gets a bit warmer I hope to start renovating and no doubt will need a fair bit of advice, so I will be keeping in contact with you,

Good luck with the venture, Yours sincerely, Julian Ledingham.

## Dear Friend,

We are a club in Sweden with about 400 members. We will congratulate that you will start a real Traction club, and I hope the collaborate will be the bests for the future.

Our club started 1966 so this year it is 10 years old. We make a magazine twice a year and every month we make a smaller paper with news and advertisements. We use to make a lot together with the club in Holland.

I hope to hear from you, and good luck,

> Regards,
> Bengt Olsson, Public Relations, Svenska B11-Klubben, Pl 239 Sodra Nas, 43200 Varberg. Sweden.


#### Abstract

Dear Editor, My apologies for not having acknowledged yours of 14 Feb before. This have been something of a hectic week, with the loose ends of Christie's Geneva auction to tie up.

Definitely you will get some publicity in either Running Commentary or Club News of $V$ \& V. It depends where it fits in best. I am also interested to hear at any time of any interesting Citroen discoveries.

Interestingly enough I am still trying to find out whether there is any truth in the story that one o the six $15-6$ roadsters made before the War still exists. This one has been told me so many times in Geneva (where the car is alleged to be) that I begin to wonder if it may not exist. (I'm not of course confusing this story with the ex-Roquet 15-6 Worblaufen 4 seater cabriolet which Christies sold for a then ungodly sum in March 1973.

Good luck with the new venture, Sincerely, Michael Sedgwick.


We only know of 4 factory bodied Six roadsters:
Mr. Joannon's supposedly ex - Michelin car, Walter J. Mead's 'Challenger'Six in the States, the black car at Rochetaillee and the roll-top coupe pictured in the 'La Traction' book. The pedigree of the latter two are dubious, possibly being modified Big 15 's, but the former seem genuine examples - Ed.

## Dear Editor,

Thank you so much for the copy of the first magazine of the Traction Owners Club. You really are to be congratulated on this quite exceptional production which I read from cover to cover with the greatest interest and can only describe as superb.

It really took me back to the mid 60's when I ran Light l5's all aver Europe - learning the idiacyncracies of the mighty Traction by experience the gearbox splitting asunder after a too rapid gear change and the machine gun rattle of worn driveshaft universals on hairpin bends. All set at naught by the uncanny ability to outcorner anything on the road and take you in Pullman-like comfort over atrocious underwheel conditions.

All this leads me (despite a wife, 3 kids, 3 I.D's and a Riley 9) to the overwhelming desire to again own a real Traction. To this end may I request that an advertisement may be placed in the next issue. (See Wanted.)

All the very best for the future of the club,
Yours sincerely,

## J. A. C. Smith

We would like to thank Jonathan Wood for giving the Traction Owners Club a mention in the 'Trees' column of Classic Car Magazine, and for Michael Sedgwick for offering to publicise us in $V \& V$.



Les Amateurs de Citroen Anciennes are organising two important events over the next few months; a twoday meeting at le Touquet on the 12 th and 13 th June, including a treasure hunt, concours and social activities. If you are interested, the address of the A C A is 41, Rue M. Sembat, 59184 Sainghin-en-weppes. The other event is more ambitious, being something of a marathon - a Traction rally from Lille to Toulouse and back, stopping at camp sites and motor museums en route. This exciting rally starts on the 15th August, and could only be enhanced by a Traction owners club contingent. Please contact us as well as ; M. Decour, 42 Rue de l'Eglise 59390,

Dear Friends,
The swedish club are going to have their annual meeting. I want to inform something about this meeting. The meeting will be in Leksand in middle of Sweden. The date will be the 5-7 th June 1976. You can live in hotel or make camping. Price for hotel and food for 24 hours will be 80 skr.

We want you to tell us before the 25 th April how many persons are coming, so we can plan for this meeting.

## Program:

Saturday - We hope people are coming during Saturday noon or afternoon. The program are rather movable, because it is long way for a lot of people. Dinner in the evening and films.

Sunday: - Rally and market for spare-parts. Dinner in the afternoon and after that dance and ....

Monday: - Our guests can leave the meeting, it dependes on how long way they have got to drive.

I will inform more and better with maps and what you need, if you want. You are very welcome

Please write to: Bengt Olsson, 239 Sodra Nas 43200 Varberg,


At Penshurst on the 9th May, we intend to amass as many Traction as we possibly can. This will be the first opportunity for many of us to meet, and it is invariable an extremely enjoyable meeting. Please try to come - 'TRACTIONS RULE - O K?'


JOHN AUSTIN has the following new spares available. For Light 15's: Brake pipes 1946-1955, Brake shoes (exchange), Front and rear wheel cylinder kits, Master cylinders, Brake drums front and rear (skimmed), Wheel bearing front and rear, 1 new set easy clean wheels (4), Wishbone pint and brushes (exchange), Driveshafts (reconditioned) when available, New clutch plates, Reconditioned pressure plates (exchange), I new rear door (big 15) off side, Shock absorbers front and rear, Exchange cylinder heads, Timing chains, Exhaust front pipes, Torsion bars (new), Cardin couplings (exchange), Fan belts, Radiator hoses, Front cradle, Exchange radiators.
For Big 6's: Brake pipes (English or French - please state year of manufacture), Wheel cylinders, Master cylinders, Brake shoes, Front wheel bearings (when available), Brake drums, Driveshafts (reconditioned) when available, Secondhand gearboxes, Crown wheel and pinion (new), Timing chains (new), Reconditioned heads, Valves (new) inlet and exhaust, Shock absorbers, Rear wheel bearings, I new rear door $(\operatorname{Big} 6)$ off side, Front wheel cylinderso

Front end tools for hire - substantial deposit required. Stock of secondhand spares too numerous to list. PLEASE STATE YOLR EXACT REQUIREMENTS.

When replying please state year of manufacture, model and whether English or French, and enclose s.a.e. to Wellington House, High Street, Shirrell Heath, Southampton, Hants.

THE FOLLOWING PARTS are being manufactured new in limited quantities: hoses, gasket sets, wheel cylinders and repair kits, bub and brake pullers. Will those interested please contact Guy Isbell, 'Filkins', Forestside, Rowlands Castle, Hants, with a view to establishing quantity of demand.

## Is your TRACTION TRAILING? GEARBOX GRAUNCHING? WHEELBEARINGS WOBBLING?

- Then phone Compton (Sussex) 213 for relief of symptoms (and wallets). Ask for Guy; mobile mechanic extraordinaire.


## THE FOLLOWING ARE NEW PARTS, EXCEPT WHERE STATED OTHERWISE.

Gearbox casing and cover and Bell housing, Big 15 rear skirt, 4 Light 15 sprung bumpers (French), 1 Light 15 Windscreen, 2 Light 15 Bushed wishbones, 1 small bootlid and hinges and handle, 2 Big 15 side panels (between bonnet and wing), IL Light 15 side panel, 2 Big $15 \mathrm{~N} / \mathrm{S}$ Bonnet sides, 1 Pressure plate, 40 Pressure plate springs, 10 Bendix springs, 1 Big 15 Radiator, 1 Big 6 radiator blind, 2 Light 15 radiator blinds, 2 Outer wheel bearing 1 wiring loom complete, 4 Cardan repair kits, 20 Valve guides, Fonnet ornament, 112 hp . inlet manifold, 1 Six-stud front drum, 3 Big 15 rear axiss, 612 h .p, hubcaps, 3 Pilote hubcaps, 2 Late hubcaps, 16 cv dynamo, 1 Starter ring gear, Early no. plate, 4 Window carriers, Set alloy trim strips, Big 15 fuel tank, 2 Water pump, spindles.
Used: 3 Big 6 driveshafts, 1 Big 6 front N/S wing, 1 Big 15 Driveshaft.

The above are available in France and are for sale as one lot, the price being negotiable. As a rough guide however, $25 \%$ of the list price or thereabouts may be possible. We have had enquiries for about $25 \%$ of this stock so far. If we can be sure of reselling more than $60 \%$ of these parts, there is a possibility that the club might be able to buy them. So, if you are interested in particular spares mentioned, please drop a line to the magazine.

SET HEPOLITE PISTONS for 1934 C4H - David Shepherd, Flat 2, Field House, Esplanade, Bognor Regis, Sussex.

I PERFORATED 'easy-clean' $165 \times 400$ Slough wheel free to anyone who needs it. Apply to the magazine.

WINDSCREEN, RADIATOR, Rear axle, and tyres for Light 15 - Peter Cotterell, Downham Mkt. 2115

SVENSKA B 11 - KLUBBEN, Door and Windscreen sealing rubbers, spare parts catalogue (in French) in process of preparation. Please apply through the magazine.

DRIVE SHAFTS! Sympathetic light engineer is happy to set his machines to turning them out cheaply - providing we can demonstrate worthwhile demand. Contact Alan Maryon-Davis, 33 Fitzwilliam Road, London S.W.4.


TRACTION BOOKS - 'Quai de Javel - Quai Andre Citroen' by Pierre Dumont. The most complete history of the marque so far.
Two special numbers of l'Automobiliste - specifically traction, authoritative text (English translation) and unpublished pictures. Chater and Scott, Motor Bookshop, Syon House, Isleworth, Middlesex.

CITROEN 1919-1939 A mint copy of this very rare collection of high quality profiles, with text in English. Haggle around $\mathfrak{f 2 0}$. Apply Box 4, the magazine.

SALES LITERATURE AND CONTEMPORARY DOCUMENTS for Pre 57 Citroens wanted. Apply Box 4.

## Wanted

MECHANICALLY SOUND Lt 15, Big 15 or Six Bodywork imperfections not objected to providing hull structure is sound. J. R. Smith, 26 Beaconsfield Rd., Clifton, Briston 8. Avon.
D. GEOFFREY MINNES, Our first Botswana member needs hub caps, either 114 - hole wheel or 310 -hole wheels, a radio, heater and ' $D$ ' tail lamps for his Slough Light 15. His address is Private Bag 49, Gabarone, Botswana.

JONATHAN FRASER requires a good set of Driveshafts for his Light 15. Phone him on Eye (Suffolk) 312 if you can help.

WILL ANYONE part with a spare gearbox to Arthur Pope, who needs one? He lives at 'Hawkslyn', Hawksworth, Guisley, Leeds。LS 20 8N8

AUSTRALIAN TRACTIONISTS! Can any of our antipodean subscribers help a compatriot with a lame Big 6? - C Pearce's car needs driveshafts, Institute Rd, Montacute, S. Australia, 5134.

JUDY AND GINNY lack a grille and Front bumper for their bent 1953 French Big 15 - please contact c/o the magazine.

SCALE MODEL TRACTIONS WANTED - all types write to Pierre Sterckx, Ave de la Bergere 30-1080, Brussels, Belgium.

HAS ANYBODY A SPARE SET OF PILOTE WHEELS? ( $185 \times 400$ ) Box 6, The Magazine.

DAVID SHEPHERD (see for sale column) would like Thrust bearings, valves and guides, wheel/master cylinders and gearboxes.

The Committee would like to deny categorically rumours that a Big 6 splinter group is in the process of formation. Suggestions that Light 12 owners represent a Special Case are entirely unfounded and will be ruthlessly quashed!


OUR NEXT ISSUE:

We hope to publish more information
on Slough Tractions, as we are still in the process of researching new sources in time for issue No. 3
Our main feature will deal with another aspect of the racing Traction.

## On Tactictub <br> 

North Cottage, Mongers Farm, Barcombe, Nr. Lewes, Sussex.

Chairman John Dodson, North Cottage, Mongers Farm, Barcombe, Sx,

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Reg and Ginny Winstone, Sutton House Cottage, Iford, Lewes, Sx.

Treasurer David Shepherd̀, Flat 2, Field House, Esplanade, Bognor Regis, Sx.<br>P. R. O.<br>Judy Smith, North Cottage, Mongers Farm, Barcombe, Sx.

Secretary Tricia Brice, 27 Forest Hill, Tovil, Maidstone, Kent<br>Standing Committee Fred Annells John Austin Graham Brice Mr. \& Mrs. Tony Garratt John Gillard

Tony Hodgekiss (Events)
Brynn Hughes
Guy Isbell (Technical)
Graham Sage
John Watson
Mr. \& Mrs. Martin Vickerstaff

Walford Bruen
(Scottish Representative)

Now that our Club is affiliated to the C.C.C., arrangements for subscriptions have had to be altered; we have turned over our funds to John Mann, main club Treasurer, on the understanding that our expenses will be met by the C.C.C.

Two alternatives are open to members of botir clubs, depending on which magazines they want to take.

For those of you who require only "Floating Power", the rate is 26.50 . If you yould like to receive the monthly "Citroenian" (covering all models) as well, an aditional $£ 3.00$ is needed. To T.O.C. members who have paid $\$ 7.00$ annual subscription £2.50, is required, this money should be sent to John Mann, 49 Defoe Crescent, Mile Ead, Coichester, CO45LQ. T.O.C. members who have paid $£ 7.00$ and do not wish to take the Citroenian, the extra $50 y$ will be held in club fuads. If you have joined both ciubs separately, please apily to our Treasurer for a e4.00 refund.

We have had news from Leon sims of 149 pleaty Rd., preston, Victoria, Australia, who is forming a register of Antipodean Tractions and is organising a spares pool. We wish his venture well.

Our thanks to Bill Boday for the mention in "Motor Sport". Rhodri Prys Jones (see address in issue no. 3) has located two sew $165 \times 400$ 's in Caernafon fon anyome who is desperate. He has also been broadasting Traction lore on BBC Wales: We have news of a rough Big 6 in horfolk for sale. Letters will be passed on.

For any owner of a slough built car whose dash requires refurbishing, we have been recomended carpenter and French polisher who will restore or make up a new dash (yood to choice) - at reasonable rates - Ian Bourn, lo Sunnmead Ave., Gillingham, Kent. phone - Medway 53863.

The Dutch Club have had a batch of ventilator sealing rubbers manufactured and we hope to obtain a number.

Regaraing the classified section of "ploating power", not only the insertion, but also photographs we will publish free.

Ian Stirling (061 928 2553) is desperate for a copy of the FW D Citroen Profile (no. 95). Can anyone help?

Guy Isball has kind y volunteered his services as Techaical Adviser; any queries on the construction, meintenance and repair of mrastions should be addressed to him at Pilkiss' Forast Side, Hr. Rowlands Castle, Hants, marking the emvelope T.O.C, and enclosing a S.A.E ano mentioning part nos. whore jossible. We are most grateful to him for trying to cope with this Herculean task.

The Dutch club are boldins their Spring rally at Arhem on the 16th Bay, and have invited our participation,

Don't worry about mabership cards; they will be duly formarded to you in the next issue.

