



# BODA E-Newsletter

30th April 2022

Issue No 26

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## **Welcome**

This month has seen an explosion in local events. There are a number of evening meetings for all sort of cars, our local meet at Wray (better known for its scarecrow festival ).

Drive It day was well supported and has seen a new rally emerge, based on St Georges Day, attract a huge number of cars.

The Lakeland motor museum attracts great numbers of car clubs and classic car owners generally at all times, this year it was rather overwhelmed by the arrival of super cars, say no more. At least one owners number plate HOR 1D summed up my feelings, anyway it's a broad church, each to their own.

This month we have two events to report. Those of you who open our mail will see the gathering sponsored by Rob Horton looks to be a relaxed event, knowing Rob and Kate I am sure that great fun will be had by all concerned, it's in my car activities list.

The second event is reported by John Lawley, we are waiting for details, if they are not to hand by Saturday we will send out direct a news mail when we get them.

We also have an extract from an old magazine which we think is of interest. We have split it into two parts with the second being published next month.

*Andy Gibbs*

***Andy Gibbs, Paul Smith and Richard Sanderson  
April 2022***



## Chairs Bits

It is amazing how time passes so quickly, we are now a third of the way through 2022 and we are starting to plan for the NEC Classic Car Show in November. It is great to hear members are finding events for others to join them in attending so please do look at what is happening locally and see if there is something you could promote as a good day for other members of the Association.

The Association has applied for a stand again. I am so grateful to those members who stepped up and allowed their cars to be used last year. Ian Polson's restored 403 was a real joy to behold. We are keen to see members cars on the stand showing off what is great about owning these cars, so if you feel able to offer your car for display, do let John Tanner know.

A number of members have identified local events for members to attend in August so if you have any thoughts about events for June, July or September do get in touch. Also, the Association has been invited to join the Standard Car club for their International Weekend at Cranfield in June, if you are interested please let us know.

In the meantime, keep enjoying your cars and the friendships membership of the Association affords.

*Mike Hallissey*

## Membership Matters

### Welcome to New Members

<u>Member Number</u>	<u>Given Name</u>	<u>Family Name</u>	<u>E-Mail Address</u>	<u>Phone Number</u>	<u>Location</u>	<u>Cars</u>
539	Bertie	Guard	<a href="mailto:bertieguard@gmail.com">bertieguard@gmail.com</a>	07799418861	London	406

Note: If you have difficulties logging on to the BODA website don't hesitate to contact our membership secretary Jane Smith at [memsec@bristoloda.org](mailto:memsec@bristoloda.org)

*Jane Smith, Membership Secretary*



## Bristol 401 1951 NTF 633 Chassis No. 1045 Update

I have tested the new wiring harness and all works well. At the front I have opted to connect the fog lamps to the side light switch to use as daylight running lights. I have put amber LED bulbs in the wing sidelights. At the rear I have put an amber LED in the reversing lamp holder and inserted a white LED reversing light in the back of the casing. When indicating I can select with or without semaphores. Both the demister and panel light rheostats were shot so I bought two new ones and transferred the old spindles to these. I have had the brake shoes relined and with the repainted back plates look the part. I am hoping they will also stop the car. I have finished fitting new seat belts so I should be okay if the brakes don't work.





## **Bristol 401 1951 NTF 633 Chassis No. 1045 Update (contd.)**

I have just finished refurbishing the leather trim. Apart from suffering from age, as we all do, it had a couple of tears and had suffered some damage after being removed from the car prior to my ownership. The driver's door card was completely rotted. Because of all this there was no option but to restore the leather trim. It was a long job but I am pleased with the results.



Both Bill and Andy have continued to be a great help with parts and clarifying what goes where. By 2<sup>nd</sup> May the car will have gone for painting.

*Clive Perry*



## **Pegasus Parts News**

### **New windscreen and rear screen seals for Bristol models 406,407,408,409,410 and 411**

Pegasus parts have made a brand new EPDM seal from a new extrusion die. For a long time, buying good new seals has been difficult. When I needed new seals for my 411 back in year 2000, the first batch sent would not fit at all. It took several weeks to have other seals sent. These did fit but within 2 years, they had split at the corners. There is a lot of smoke and mirrors in extruded products. There are several companies with wonderful catalogues none of whom actually make what they sell.

Over the last 60 years, several actual extrusion companies have made dies for our seals. Some dies clearly not right. These companies do not know what they are making seals for and dies have been lost in their huge stocks of pieces of metal to fit their extrusion machines. Seals are not made of rubber but Ethylene Propylene Diene Monomer, EPDM for short. This material must be blended for its purpose, hardness, flexibility, resistance to ageing and must be absolutely right.

John Lawley did a lot of very good work to have new seals made. I inherited a selection of good and bad seals to work with. Finding a company to make our seals was difficult but there is one here in the North of England near where I live. They already make a host of seals for classic cars such as BMC mini, minor, Triumph, Ford, Aston Martin, TVR so they know exactly the right EPDM required. I clicked with the owner of this long established company. They made a die for our seal, produced a small run of seal which was sent out for trial. Modifications were made to the die to increase the lip length for holding the chrome covering trim. I was chased by them to reply about making the actual production run. They had made the mix of EPDM for my rubber and it had to be used straight away.

There is real knowledge making good extrusions. When I collected the product run, 200 metres, I asked to see the die from which it was made. The answer was a civil but firm NO.

Pegasus have since April 2021 sold seals for 20 screens to 9 different members. One particular trade member has fitted seals to 10 screens. There have been no complaints. The price is less than any other.

*Bill Lawson*



## Continental Spares for Type 401 Car

When I read the piece about the Pegasus Spares kit in the last Newsletter I thought you might be interested in the one I have. A neighbour of mine, who has quite a few cars asked me if I'd be interested in this box of spares he had. I have to say I was delighted, such a find, as many parts are original in their original packing papers.

It seems these boxes were put together by the factory for owners to take when venturing abroad.

Items include:

- Gaskets Valve Springs
- Cylinder Head Gasket Cylinder Head Nuts
- Inlet Valve Water Pump Bearings
- Exhaust Valve Condensor
- Comprehensive set of bulbs Lucas Coil
- Spark plugs Oil Filter





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## CONTINENTAL SPARES FOR TYPE 401 CAR (contd.)



Guy Ferrington



## Events

### South East Region

The next Bristol gathering at The Bletchingley Arms will take place on the 28th May from 9am until 11.30am. This time a Saturday morning has been chosen because The Bletchingley Arms will serve breakfast on a Saturday (they only serve drinks on a Sunday morning).

At the February gathering eleven Bristols turned up despite the inclement weather. I think we can expect at least double that number in late May.

If you would like to attend please contact me at my [email](#) address. Also feel free to contact me if you have any questions or suggestions.

*Ian Dixon Potter*  
*South East Region Coordinator*

### Ireland Region

We are pleased to announce the following two events for the BODA Ireland Region

- Saturday 7th May at 11.30am. Starting with a visit to my house and garage (eircode R56DF44) near Kilcullen and then a drive to Burtown House and gardens for lunch at 2pm.
- Sunday 15th May at 10.30am. Our local Blessington Car Club's Spring Rally from Rusborough House, Co Wicklow, meeting up at 10.30am for a drive through Wicklow and Kildare finishing up mid-afternoon.

I look forward to seeing you at these two events. Please contact me at my [email](#) if you wish to attend so I can get an idea of numbers

*Keith Pearson*  
*Ireland Region Coordinator*



## Events (contd.)

### Challengers Motoring Event, Sunday 12 June

This year the event is starting at Frank Dale & Stepsons in Camberly (GU15 3BN), where guests participating in the drive will have the pleasure of touring the world's oldest independent Rolls-Royce and Bentley workshop while enjoying light refreshments. You will then navigate the bespoke route through the gorgeous countryside using the printed guide, with the drive ending at a very special, private motor museum. The museum only opens a few times a year exclusively for charity events, so don't miss your chance to see this incredible collection!

The event is run by Challengers which is a small charity providing play and leisure for disabled young people. 100% of the proceeds from this event, including all ticket sales, supports the cause. The event usually raises an incredible £10,000!

More details and tickets can be obtained from the [Challengers website](#).

## The Three Graces,

### an Article by L J K Setright in Old Motor from March/April 1974 (Part 1)

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**The article will be published in two parts. The second part will appear next month.**

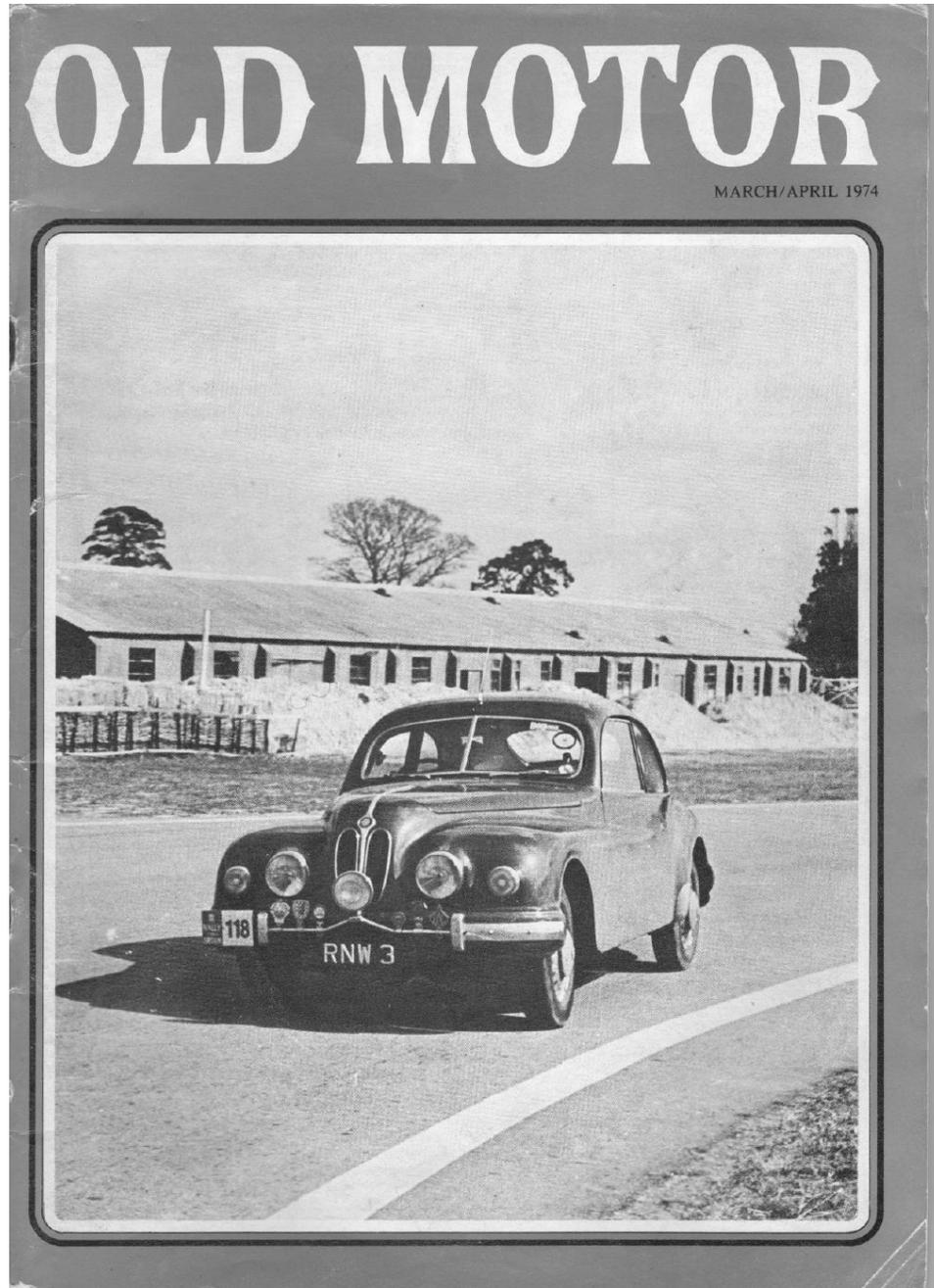


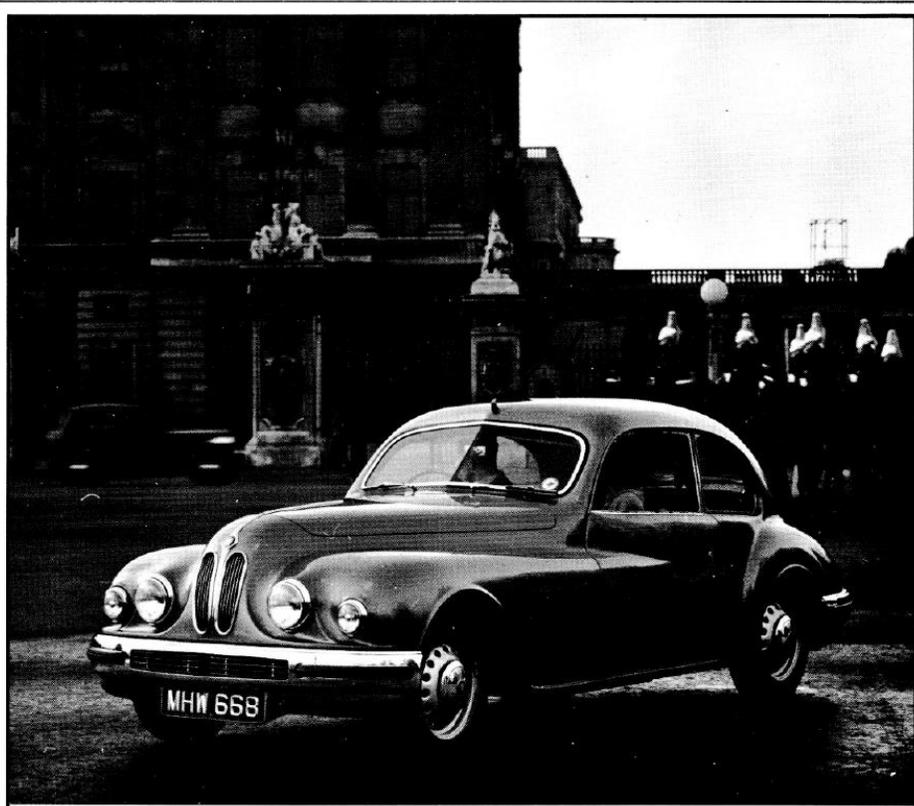
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## Part 1





Early 401 bodles had a ridge along the bottom edge, as had the 402; most cars were rounded in, like the 403.

## THE THREE GRACES

**When a famous aircraft manufacturer turns to car production one can imagine the high standards of material and workmanship employed. Whether the resulting car looks and performs like a thoroughbred is a matter of personal opinion, and in this article L J K SETRIGHT is in no doubt that Bristol achieved all their objectives.**

WHATEVER your enthusiasm for Rolls-Royce, or Lancia, or Lago Talbot, or any such repository of a hard-earned, long-established and ill-used reputation, the best car you could buy in the early 1950s was almost certainly the Bristol. Other cars might be bigger, quieter, and occasionally a little faster; but only the most *outré* of sports-racing 2-seaters could match its cornering and handling properties, and there was nothing to rival it in aerodynamic efficiency, in the sensual gratification

it offered the driver, or in sheer quality of design and manufacture.

Not many people realised these facts at the time. The few hundred who were lucky enough to buy one might congratulate themselves, but nearly everybody else assumed from their superficial knowledge that the Bristol was just a reincarnation of the pre-war BMW. Some people were critical of this emulation, but when voicing their opinion they inevitably confused the shadow with the substance.

In fact, when the Bristol Aeroplane

Company decided in June 1945 to enter the passenger car market, they saw BMW as a source of inspiration and of basic designs upon which further work might be done — and they enjoyed the support not only of the War Reparations Board but also of the people remaining at BMW who would rather see things go west than go east. If it were important that Bristol decided to model their new car on established BMW practice, it was at least as important that they decided to do everything as well as they knew



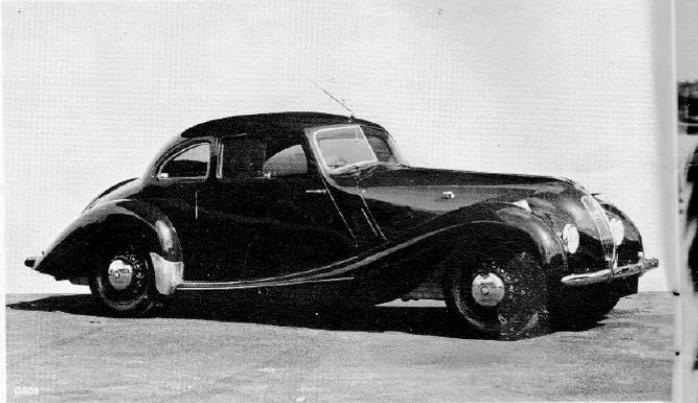
how. The BMWs, for all their remarkable competence on the road, were not all that well made; the Bristol would be made as superbly as the best aviation engineering practice in design, inspection and materials selection would allow. What was more, the Bristol team conceived a combination of design elements that BMW had never had the wit to envisage: they chose the 326 chassis, installed the 328 engine, and clothed it in a body reminiscent of the 327 coupé. Thus they combined the best suspension (for the 327 and the 328 carried their rear axles on mere cart springs), the best engine (complete with knowledge of what made the 1940 racing versions so blisteringly fast in the short-circuited Mille Miglia of that year), and the best-looking bodies.

It was a surprisingly small team of men who set themselves to transform all this into a new car. The Chief Designer was Dudley Hobbs, assisted by Dennis Sevier and backed by three or four design engineers, of whom we might single out for mention Jack Channon, who threw himself into an analysis of suspension and handling with such enthusiasm that he soon became the greatest expert on them in the industry. Add to this the stylistic and structural flair of Hobbs and the unremitting perfectionism of Sevier, and it was hardly surprising that when the Bristol 400 appeared early in 1947, it was at once a paragon among touring cars, a mocker of sports cars, and a pointer towards a long and distinguished future.

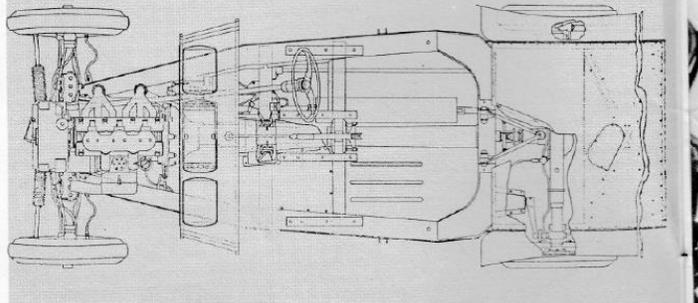
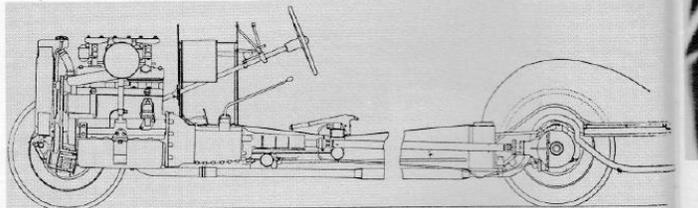
### Outstanding 401's

Two years later came the first of the real aerodynes, the brilliantly streamlined 2 litre Bristols that remain to this day the best-known models the firm ever made. Somehow they were extremely idiosyncratic without being in the least iconoclastic, somehow extremely advanced in their engineering without ever looking unconventional beneath their wind-shaped skins, and somehow far nicer to drive and more competent in every kind of road-going circumstance than their paper specifications might suggest. The Bristol 401 which came on the market late in 1949 whilst the 400 was still in production was essentially a 400 graced by a new streamlined saloon body, such as might be expected from an aircraft builder intent on showing his skill. There was a little more to it than that, a little more that (despite the fact that it had more shortcomings than any of the others) made the 401 perhaps the most outstanding of the entire series.

The morphology of the Bristol type 85 engine was famous, even notorious.



The 400: a paragon among touring cars and a pointer towards a long and distinguished future.



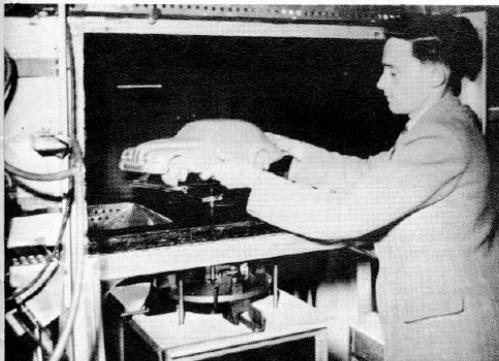
General arrangement of 401 chassis differs slightly from production practice. Most cars had a straighter underlung exhaust pipe, and the steering wheel was different; all 401 engines had Solex carburettors, moreover, not the SUs shown here.

Despite its 6 cylinders, it was a very short engine, allowing the crankshaft in its 4 main bearings to enjoy a torsional stiffness and aptitude for high rpm that made it superior to the 7-bearing type which is better suited to low speeds. It was also a tall engine, for its hemispherical combustion chambers carried opposed inclined valves operated from a single camshaft in the crankcase — and this called for a forest of 18 pushrods and a head full of small pieces of polished valve gear. Odder still, the inlet ports were practically vertical, tumbling straight down between the banks of valves

from three downdraught Solex carburettors sitting on top of siamesed manifolds. The result was exceptionally free breathing and consequently very high volumetric efficiency. Whether it could keep it up for long would depend on the quality, and here there was no doubt that everything was of the best. The crankshaft was made of an aircraft steel known as S11, with its journals nitride-hardened to 900 VPN allowing the use of Vandervell's best indium-bronze bearings of very high load capacity. The dry cylinder liners were of an alloy steel called Brivadium



Anthony Crook celebrating at Montlhéry after putting 104 miles into the hour in a 401. Inside the car is his racing mechanic John Dennis (still with him at the London depot of Bristol Cars), while the two portly gentlemen on the left are believed to be the make's French agents.



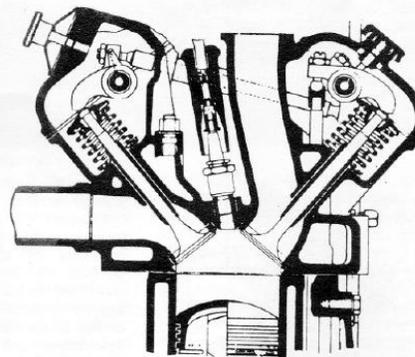
Wind-tunnel work with a model of the 401.

concocted originally for the sleeve valves of the very powerful and incomparably reliable Centaurus aero engine. This steel was so hard that the running-in marks could still be seen in the bores after 2000 miles; indeed Bristol never considered an engine sufficiently run-in for racing until it had done 8000, while it was considered at its peak of condition at 20,000.

With the best of materials and the best of workmanship, it was hardly surprising that the thing should be very costly, but it was this expensive quality that most distinguished the

Bristol engine from that of the 328 BMW it so closely resembled. When Bristol adopted the design they made a lot of detailed modifications but the metallurgical changes were probably the most significant. The difference was summarised by a wag who said that you screw down the Bristol cylinder head as tightly as you can (this was the one job for which the factory would never specify torque figures) whereas you lay a BMW head on with a trowel!

By the time the 401 appeared, this engine had reached the 85C version giving 85 bhp at 4500 rpm and a



Probably the clearest-breathing head of any production car?

BMEP of 134 lb/in<sup>2</sup> at 3500 rpm. It might not be all that much for a car weighing 1¼ ton laden, but with a compression ratio of 7.5:1 to suit the appallingly poor petrol then available it was not at all bad; nor was there ever any temptation to risk low-speed detonation from this 74 octane rubbish, for it was in the character of the Bristol engine to be happy when turning fast, and the gearbox gave every encouragement. Its three topmost ratios were furnished with Bristol's own synchromesh, employing light alloy friction cones of extraordinarily large diameter; the



bottom gear had a freewheel mechanism allowing instant recourse to bottom (in traffic, or perhaps when being baulked on a steep hill) without use of the clutch pedal. Many owners had cause to curse the device, which had to be treated gently lest it burst. This feature apart, the transmission was rather well done and certainly of quite exceptional mechanical efficiency. The same applied to the suspension. The live rear axle was constrained to move only in the vertical plane, for transverse links and a trailing A-bracket held the axle square with the frame at all times, eliminating any roll steer effects or misbehaviour when subject to torque. Suspension loads due to spring deflection were fed into the chassis at the anchorage points for the long torsion bars, so that all suspension loads were ultimately led into the main structure over a wide area.

The front suspension was even more carefully studied. Apparently a crude affair embodying a transverse leaf spring with forged upper wishbones, in fact the whole front assembly was made as a separate unit so that every specimen could be jig tested for wheel alignment over the full range of suspension deflection before it was fixed to the front of the chassis. It was a remarkably full range, for the entire spring was live, with nothing but rubber bump stops to prevent it binding on the chassis frame, so that the total range of wheel movement was no less than 9 in. Despite the enormity of this figure, Bristol contrived a geometry that kept variations in toe-in



Different rubber bumper strips on this 402.

and camber negligible throughout the normal working range.

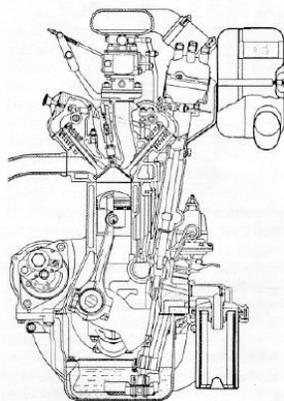
Channon and the others at Filton were extremely particular about the geometry of the suspension and steering. The entire front suspension was tilted back at 9° to soften the ride but the kingpins were angled to give a castor angle of only 2° and the Ackermann angle was zero. These angles and the minimal offset or scrub radius made the steering unusually light, while the hand-lapped rack and pinion assembly made it uncommonly positive and accurate all the way from one lock to the other—which took just three turns of the energy-absorbent (in 1949!) steering wheel. Even after a quarter of a century, a decently kept Bristol will still have only 1/16 in play at the rim of its steering wheel.

There was a lot of painstaking handwork in other unexpected places. Even the carburettors did not go unattended: the circular faces on which the Solex mixture-enriching valve discs rotated were hand lapped at Filton until the production

'ploughed field' faces were perfectly flat.

Lapping valve discs was an activity that became altogether too frequent among the men responsible for the production of Bristol's own exquisite and formidably expensive suspension dampers. The performance of these things when properly set was instrumental in giving the car an amazingly good ride, especially over rough roads charged at speed; but the opposed cylinders of each damper were controlled by valves that were hypersensitive in operation, and the absence of a suitable testing machine for checking them with sufficient sensitivity over a wide range of operating speeds made the development of these hydraulic marvels rather difficult. By the time they had been perfected the decision had been taken to substitute king-size Newton and Bennett telescopic, a step that was taken at the rear on chassis no 696, and at the front on no 1006.

Production quantities should not be



Transverse section of 85C engine with Solex carburetors. The 100 series engine introduced in the 403 is most readily distinguished by the wider sump.



The pair of 401s sold to Stewart Granger and Jean Simmons.

inferred from these numbers. The run of the 401 lasted until 1953 by which time six hundred and fifty specimens had been made. Numerous modifications were made in the course of this, most of them little detailed revisions which exemplified the Bristol insistence on perfection. Some were applied to the last of the seven hundred type 400 saloons as well, as appropriate; all were made as and when they were proved rather than being saved for the next Motor Show. But if the 401 was mechanically similar to the 400, its distinction was in bearing one of the most outstanding body designs ever to appear.

Once again the inspiration was foreign, coming this time from Touring of Milan, but it was a mere stylistic inspiration upon which it is generally agreed that Filton improved enormously. What was important was their adoption of the Superleggera system of construction in which the body contours were framed in small-diameter welded steel tubing around which hand-beaten aluminium alloy

panels were wrapped. Bristol refined the system by making proper cruciform joints in the tubing, where the Italians were content to lay one tube over another; and a further refinement was to grade the thickness of the panels according to their duties — the aluminium alloy sheeting was of sixteen gauge thickness along the top surfaces of the front wings (where mechanics tend to rest their elbows) and the top of the bonnet, whereas in other areas it was thinner eighteen gauge stuff. Insistence on doing the job properly went even further: the hardness of each of the aluminium alloy panels from which the body was built up was varied according to the amount of panel beating involved, for work hardening alloys were involved and the object was that when the shell was complete a substantially uniform degree of hardness would be achieved overall.

Above and beyond all this, where Bristol really excelled with this body was in achieving great aerodynamic efficiency. They did so thanks to the

availability of first class aerodynamicists, of wind tunnels, and of a two-miles-long runway (built for the big Brabazon airliner) where it was possible for any car to be driven at any speed of which it was capable while the airflow was studied with the aid of wool tufts or (when there was a question of fumes reaching the interior) of oil-enriched exhaust gases. Even today the 401's body ranks as aerodynamically one of the best production cars yet seen: the Motor Industry Research Association measured the drag coefficients of 118 assorted cars (only seven of them pre-war) in or about 1969 and the then 20-years-old 401 was bettered by only four others. Of these the DB5 Aston Martin of the middle 1960s beat it by so insignificant a margin that the cars may be considered virtually equal, while the smallest of the Alfa Romeo saloons probably won its third place by a fluke since a virtually identical car ran somewhere about twentieth. The two that remained, Porsche and Citroen, by virtue of being rear-



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