Sabrina



Hierdie uitstekende 1955 TR2 behoort aan Deon de Kock
van Bloemfontein

SABRINA

TRIUMPH SPORTS CAR CLUB OF SOUTH AFRICA

SEPTEMBER 1993 - VOL 18, No 3

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EDITORIAL

Time has flown past again, and this issue of Sabrina has reached you a week or two later than usual. This is partly due to me hosting a rather nasty virus which resulted in me being bed-ridden for two full weeks, and almost useless for another 4 weeks. However, the virus must have eventually lost interest in me, and left as suddenly as it arrived.

This issue of Sabrina is also a little thinner than usual, partly thanks to the lack of reports from some of our Centres.

I have at last managed to get the TR7 on the road. I took it for a roadworthy certificate at a particularly strict traffic department on purpose,and it flew through without any snags. I also stopped at a speedtrap and asked the traffic officers to check the accuracy of my speedometer. They were quite happy to oblige, and now I know what the error is. I have been taking the car out each weekend (weather permitting) to run in the engine, etc., and to sort out any problems as they arise. There have been some glitches, but by the time I have put 1 000 km on the clock, I am confident that the car can then be depended upon.

All persons responsible for their Centre reports are reminded that the next issue of Sabrina is the December one, and **the deadline date for all contributions is 12th November 1993.** I would appreciate articles of interests from members as I am now running rather low on material.

Sabrina costs have increased more this year than I had anticipated when increasing the Sabrina levy at the beginning of the year. Postage and printing costs have increased tremendously, but instead of increasing the levy for next year, I will cut costs if necessary by dropping the colour photograph on the cover (this amounts to a saving of just over R1,00 per copy of the magazine). I announce this decision now because some Centres start their new club year from 1st January and need to know before the December Sabrina is available what amount to invoice members.

Regards for now

Ken Boss

FROM THE CHAIR

Greetings to all from a very nice Spring day in Johannesburg. I don't like Winters, so the sooner it's over, the better I like it. The Transvaal Winter has really not been that bad. You guys in Cape Town had some real nasty days. Natal only has Winter for a few hours as a cold front moves across. Winter in an aero-screened TR3 has its cold moments!

I recall travelling to the P.E. National Gathering some years back. We left 4 or 5 days early and drove through Lesotho on the way down. Our first night was in Maseru. That night a cold front moved across the country. The next morning both cars stripped the teeth of the Tonneau zipper. The days travel took us through Cathcart and an overnight stop in Hogsback. That trip was without a doubt the coldest and longest run ever. But, that's the ingredients for fond memories of fun times in a TR. May there be many many happy returns.

Triumph Club activities here in the Transvaal are as hectic as ever, with something to do almost every weekend. My participation is restricted by priorities, and right now priority number one is to finish the ex-Peter Johnson TR3 rebuild. The car has been sold unseen to Jock Wiseman of Gilletts in Natal. He phones weekly to enquire as to its progress. He already has a BGT, so the TR will open a wonderful new experience for him. It's a deep wine red colour, with black leather seats and 72 spoke wire wheels. John Giles who has now done 10 TR2/3 body rebuilds has already started with my next project - the ex-John Sprake (Maritzburg) TR3. This one will be finished in BRG with a yellow Grill surround, single aero-screen, roll bar and 70 spoke centre-laced wire wheels, ala Neil Rivington's Racing TR3.

The Pretoria Centre annual weekend away to Magoebaskloof, was as always, well organised and a most enjoyable trip. The sundowner drinking time outside Nic and Judy's Rondavel was amusing with stories related by most everyone. Some of the stories were quite tall as the wine helped the exaggeration on a bit. The communal braai at the poolside with the Jag Club, who were at the same resort, was cozy with good tasty salads prepared by the resort kitchen, and home-made bread by Rudi Cloete. Dankie, Rudi,

jou brood is uitstekend! Thanks to Chris Gibbons and your guys for a very pleasant weekend.

By now you all should have read or received info about the Midmar National Gathering. Graham and his crew are well into the final planning stage. From snippets of info that I get back about the arrangements, it certainly sounds like we're in for a jolly time. I cannot overstress the intention of our hosts, to organise a fun National Gathering for all to enjoy. For this reason Graham has decided to make the d'Etat Concours event as simple as possible, so that we can all get on with the fun events they have organised. I call on all to support him in this regard. Time is getting few, so if you have not yet made your move, please do so now!! Don't forget to bring someone with you - be it a non member with a Triumph, who knows he or she may join when they see how much fun it is, or if you know of a member who needs to be encouraged, to make the trip. Do your best to see that they join us at "Midmar 94". We have made 100 (20th) commemorative badges, let's not have to destroy leftovers. Come and fetch yours. It's going to be worth the effort. That's enough nagging for now!!

I had the pleasure of seeing Piet Prinsloo's almost finished TR3 rebuild. It's so pleasing to see a thing of beauty emerge from a pile of scrap. The workmanship is superb, and the final result will be a joy to see. Piet is in the middle of moving house to Mossel Bay. Regrettably our loss will be the Cape's gain.

Once again, may I extend an invitation to anyone who wishes to stay over in Jo'burg on the way to Howick (Midmar) to please feel free to accept our offer of being our guests. We will enjoy the company, feel free to take us up on this offer.

Best wishes to all.

John Roets
National Chairman.

NEW MEMBERS

We welcome the following new members and hope that they will enjoy and support their respective local centres:

1529 **JW Ashton** — **Stag**
54 Mellville Road, ILLOVO 2196

1530 **A Fletorides** — **Spitfire 1969**
3 Meiring Circle, Lambton. GERMISTON 1401

1531 **M Battersby** — **TR6**
P.O. Box 44286, LINDEN 2104

1532 **G Philp** — **TR7**
3 Montacute, 13 Stockville Road, GILLETTS 3610

1533 **M Malan** — **Spitfire Mk4**
Private Bag X351, PRETORIA 0001

1534 **M Pannicke** — **TR3 Devon**
1C Sutton Place, Stella Avenue, SANDTON 2196

1535 **M Weideman** — **Associate Member**
4 George Road, Florentia. ALBERTON 1450

1536 **W Barnard** — **GT6 Mkl**
1(B) Whites Road, GRAHAMSTOWN 6140

1537 **R Coleman** — **Spitfire Mkl**
347 Main Road, Charlo. PORT ELIZABETH 6070

1538 **C Clelland** — **Spitfire MkIII**
485 Alexandra Road, PIETERMARITZBURG 3201

1539 **J Griffith** **TR7**
P.O. Box 273, UMBOGINTWINI 4120

1540 **M Nathan** **TR7**
P.O. Box 776, DURBAN 4000

1541 **M Jones** **Associate Member**
268 Venter Street, Capital Park, PRETORIA 0183

1542 **J Spannenburg** **GT6 MkIII, Spitfire MkI**
P.O. Box 2074, WELKOM 9460

1543 **D & J Delport** **Spitfire MkI, TR6**
P.O. Box 957, WELKOM 9460

1544 **K Stonestreet** **TR4A**
P.O. Box 1515, WELKOM 9460

1545 **L Randall** **GT6 MkIII**
P.O. Box 66414, RIEBEECKSTAD 9469

1546 **J Loots** **Spitfire**
92, 12th Street East, Menlo Park, PRETORIA 0081

IN DEEP TROUBLE

A man was hard at work when his phone rang.
"Hello, Darling," said his wife, "I'm afraid the car has water in its carburetter."
"Really? Where is it? I'll have it seen to."
"Well, at the moment, in the river."

REPORT: JOHANNESBURG CENTRE

At the outset it is time that we chastise our members who chose not to join in on the various club functions.

For example, to compile a 2 hour route finding rally, it takes 2 dedicated members, a total of about 20 hours each, some 300 km, another team to prove the route, R60,00 on stationery and printing, begging various people for prizes etc., organising a venue, some R30,00 on phone calls and Fax (all at private expense). Then what do you get? - 7 cars from Johannesburg Centre and 1 from Pretoria Centre. This is to say the least, is very demoralising. This year we have not repeated any runs done last year and at best have had 9 cars and at worst, 4 cars. I for one (am getting) reluctant to organise an event that requires much of my time. Enough moans, I make a personal appeal to all our members to participate in club events and make it worthwhile for your committee to perform. After all, you elected us!

We had a nice run to Tarlton Raceway for "Drive" magazine's show day. We very nearly had a full house of TR's.

1	Harry Fairlie	TR2
2	Neville Cloete	TR3
3	Des Burton	TR3A
4	Campbell Miller	TR4
5	Pat Potterton	TR7
6	John Dobbins	TR8

It would be nice to see all nine TR's in one photograph on the cover of Sabrina.

Unfortunately our club was the meat in the sandwich, in between all the chrome, wide tackies, v8's, orange-on-the-aerial, and the Country and Western brigade. We were the only English Car Club there. We left early and went to that fabulous Irish pub in the country, Fibber McGees, to see the end of the Sunbeam Rally. To our surprise, our rally men, Garry Blake and Dave Beard in that ever so reliable TR6, (American left hand drive) came home first.Can you believe it, a magnificent achievement, when one considers that the only instrumentation they had was a stop watch and a not so accurate speedometer. A fantastic achievement, and we congratulate them!

The other runs were so dismally attended that they do not deserve a mention.

Johannesburg Centre has a good few members eagerly waiting for the National Gathering in 1994 at Midmar Dam. I hear in the wings of great planning of colonial fancy dress. We might even have a genuine British army General there!

A dinner dance is being planned for the 13th November 1993 in conjunction with the Jaguar, Sunbeam, Morgan, Austin Healey, Lotus and Triumph clubs participating. This should prove to be a big event and we request all members to make a concerted effort to attend.

Tickets for our raffle for a set of wire wheels are selling well. Please place your order with the Johannesburg Centre to avoid disappointment.

Regards
Des Burton

REPORT: BLOEMFONTEIN CENTRE

We are happy to say that we actually had a run even though it only consisted of Deon and myself. We went to Viviginia to meet and enlist the Triumph owners in that area. The turnout was small but 4 new members have signed up and we hope that they will in turn sign up the remaining owners there. The new members are Lionel Randsell, Johan Spannenburg, Donnie and Jackie Delport and Ken Stonestreet. Between them they have some nice cars including two GT6's.

In Bloem we are all busy on our cars. Deon has his engine out and Derek Rudd whose car has been laid up for many years hopes to get it going again very shortly. I am busy with the building up of another chassis for my car.

Regards for now,
Charles Mitchell

REPORT: PRETORIA CENTRE

One of the highlights of this year was our 3 day excursion to Magoebaskloof at the end of May. We all enjoyed giving our cars a good run and the scenery in that part of the country is spectacular.

With winter upon us we tend to hibernate for a couple of months, but still managed a couple of social events, namely our Pretoria "Cars in the Park" on the 1st August which once again proved to be a huge success.

Coming up at the end of August we have our local concours which has of course taken on a new look now that we have to pre-qualify for a place in the concours at Nationals next year.

Our membership is currently standing at 84 which we are very proud of. We have had excellent turnouts at most of our events; we really do have an enthusiastic club.

Till next time,
Paula Ryder

NATIONAL GATHERING 1994

A COLONIAL AFFAIR

There are eight months to go before we all get together at Midmar Dam Holiday Resort to partake of our Twentieth Anniversary National Gathering. And, I can tell you, things are really beginning to take shape.

First of all, Midmar Dam Chalet and Cabin accommodation has been taken, secondly, we have had excellent response from our overseas invited guests and thirdly, your organising committee has had its first meeting to get down to the nitty-gritty of co-ordinating all the various items that have to be arranged. Unfortunately, along with the good news, is some bad news. The Natal Parks Board require FULL payment for accommodation before 1st February 1994!! All R20 000 worth!!

I earnestly request all members wanting to attend to please send their deposits as soon as possible. I will then invoice the

deposit and send back a booking form. The booking form requests your choice of accommodation and on its return with FULL PAYMENT (minus deposit already invoiced), the accommodation will be booked and guaranteed. There are certain complications, in which members without partners, will need to share, otherwise not all the accommodation will be taken. In such a situation, we have asked for preferences in sharing.

I mentioned in the last report that Peter Buckles will be with us at the event. Peter is the Managing Director of Moss Europe, and on a recent visit to London I went to see him. The business is large and extremely busy (can you believe how much effort goes into one of their Parts Books?), Hence he will not be able to confirm his presence until next year. I can tell you though that the thought of driving a side-screen TR fitted with aero screens around sunny South Africa appeals to him immensely and he intends to come provided the business does not stop him. We have had a very positive "yes" from Leon Guyot (see letter in last Sabrina), and know that his tremendous enthusiasm will spill over on us when he comes next year. Leon has been the TSCC Overseas Liaison Officer for about the last 5 years or so, and in that time he has visited Triumph Clubs all over Europe, Australia, New Zealand and California - to add South Africa to his long list of overseas visits is a wish come true. Leon drives a hot Herald Convertible and has nearly finished building a 2 litre Vitesse Convertible.

A quick call to Ken Grace in Toronto whilst I was in America recently, confirms his every intention of being here. He is in the mining business and there is an international mining symposium that he will be attending next April in Johannesburg, so he will stay on and represent the Toronto Triumph Club at the Gathering. The fourth overseas guests have been quite difficult to make contact with - the letter I sent to Bernard Hagemeier, President of the TR-Register, Deutschland was received and arrangements were made for one of the committee to come, but when he bought his ticket over here, he suddenly realised that the event was in 1994 and not 1993. Both Bernard and Barbara Weber (Overseas Liaison Person) are keen to come, provided the dates do not clash with big functions in Germany. If that happens someone else from the committee will come. We really do thank all those Triumph sports

car enthusiasts for making contact with us and sincerely hope arrangements can be made for them all to come.

You all know that there will be a Concours at the National Gathering. With up to 36 trophies to award, this has to be the premier event of the weekend. But you either hate it or love it. What we are trying to do for the 1994 Concours is to simplify it as far as possible, but to ensure a high standard of judging. Entry to the Concours d'Elegance is not compulsory, but completely voluntary and certainly optional. It will take the usual form of judgement of cleanliness and condition only - originality/authenticity will not be part of it. Entry to Concours d'Etat is by pre-qualification at Centre level during the 1993 year, qualification requiring a score of 77,5% at these regional events. The idea is to have the best cars for judging so that judges can spend more time at their job and improve their thoroughness. However, there is always the problem of levels of judging (or fairness of judging) at the different Centres. For instance, a car judged in the Transvaal by people who have been concentrating on these matters for years may score differently to a car judged elsewhere in the country because the judges in those elsewhere areas have a different experience and ability about detection of originality/authenticity. It is well recognised by the organising committee that these differences on judging standard do occur, and therefore request Concours Organisers at the Centres to bear these matters in mind, in order to be as fair as possible. It is not going to be easy to overcome these problems, because of the lack of a rigid policy on concours judging and the lack of training of judges for concours.

The dinner-dance on the Saturday evening really will be that. I have already reserved a band and we will be looking at the best menus we can (probably buffet with plenty of selection). But best of all, we want the dinner-dance to be warm, joyous and intimate for maximum pleasure, which means lots of prizes, lots of activity and lots of happy memories. That is why we want it to be fancy-dress (colonial style), to add character and atmosphere to the evening. We really would like to have all of you dressed accordingly, so start planning now for how you will dress in a colonial costume. Hopefully, I will get Helen or Val or Cynthia to elaborate on dress options in the next Sabrina, just to give you all an idea of what we

would like to see.

IF YOU HAVE NOT BOOKED YOUR ACCOMMODATION AT MIDMAR ALREADY, SEND IN YOUR DEPOSITS NOW. AFTER ALL, FOUR DAYS HOLIDAY IN NATAL MUST BE SOMETHING TO LOOK FORWARD TO!

Keep well and many regards,

Graham & Stewart

PERSONALITY PROFILE: NOLS PIENAAR

Born Petrus Arnoldus Pienaar 6th May, 1945, in Vanrhynsdorp. T.S.C.C. member number 120, joined 1976 (TR Register of S.A.), then resident in Alice, Ciskei.

In 1980 Nols & family moved to Pretoria, where he became a founder member of the Pretoria Centre.

His schooling started at Colesberg and Beaufort West, then on to high school at Cradock, and finally U.P.E. where he took his MA degree, Teacher's Diploma, and is now studying for his PhD. Nols is married to Cathy and has a daughter Jeannë and son Arnold. Nols holds the position of Senior Lecturer at UNISA, in the Department of Geography.

His interest in cars goes back to his very early days, having owned Triumphs from the start. He presently has his TR4A, 1967 which was exchanged for a Mini (Cathy's) and his '72 TR6, and others (Alfa's, etc). Other interests include stamp and coin collecting, and of course, Cathy. His interest in Club activities include, Past Chairman and Treasurer of Pretoria Centre. His sporting interest is his TR's.

His hope for the future is the new South Africa, he is a member of the Technical Staff of the Multi Party Negotiating Forum Commission Regions.

The family have 4 Dachshunds. His favourite food and drink is a traditional braai with Castle or a bottle of Cabernet Sauvignon.

IN THOSE DAYS

by

Charles Mitchell

One often meets people in this town who owned a TR2 or 3 in the early days of these cars and one always hears stories of trips, speed records, etc., and I'm sure some members could tell some stories of their own.

John who lives just down the road from me owned a TR3A (the first off the floor). I don't know whether it was his reputation or his car's, but he had a girl friend whose father would not allow his daughter in the car unless he followed in his own car to ensure that John behaved (with the car?). He has often told me of various trips, etc., and in spite of this he only had two mishaps. He once lost control and spun off the road in Dealesville, where farmers were holding an auction, scattering farmers, dogs and fowls in a cloud of dust, only to land up neatly parked on the stoep of a small shop.

He in fact thought much of his car and set up such incredible times that he became convinced that it could fly and once tried to take off and fly over a house. The front wheels cleared the garden wall, but the rear wheels and axle remained on the pavement. He made a perfect three point landing (front wheels and rear) and slithered across the lawn to come to rest with the front half of the car protruding through the bedroom window with John still sitting in the cockpit hanging onto the controls. He got such a fright that he refuses to even sit in my car today, let alone ride in it.

If you owned a TR at that time, distances were no problem and provided there was a good road you could spend a weekend anywhere in Africa. I recently met Gordon who bought his pale blue TR3 from, I think he said, Lindsay Sakers in Johannesburg. He tells me that he found himself spending weekends in Cape Town and the fact that he lived in Louis Trichardt in those days was not a problem. If he had done it once I would say, "That's OK", but he did it 14 times in the space of 12 months and for the record I might inform you that the distance one way is approximately 1200 miles

(2000kms). Average travelling time was 17,5/18 hours giving an average speed of 66 mph.

No need to mention the reason for these trips as I'm sure you have already guessed. She was worth it as he is still married to her today. However, as to the cost, she really did not cost him too much. He used a £10 (R20) note for fuel and still had a few bob left in his pocket on return.

His car had no special tuning or even overdrive and when possible he always travelled topless. He only stopped 4 times each way, and that at a place where he could fill up and grab a bite to eat while on the go.

On one occasion he brought his girlfriend back with him to meet his parents and on the way she noticed the dial nearest to her indicating "50", and not knowing anything about a TR she presumed they were travelling at 50 mph. It was only some weeks later when she again noticed the needle shoot up to the 50 mark while they were stationary at a robot, that she learned with horror the speed they were actually doing.

On another occasion Gordon picked up a hitchhiker just outside Louis Trichardt. It turned out that this guy was some optimist as he thought he could get to Stellenbosch by 9 o'clock the next morning to write an exam. His luck was in this time.

I offered Gordon a spin in my car but this was declined as it would only have aggravated the hurt that still exists, as he had to sell his car shortly after marriage on his mother-in-law's insistence because his newly acquired wife kept on contracting fibrositis from those draughts that we all know about!

SIGN ON BACK OF BLACK TAXI

The following sign is displayed on the back window of a Black Taxi running between Durbanville and Bellville:

"Thou shalt give way to Taxis because sure as hell they won't give way to you".

LETTERS TO THE EDITOR

Lappies Labuschagne
P.O. Box 788
CARLETONVILLE 2500
10.08.1993

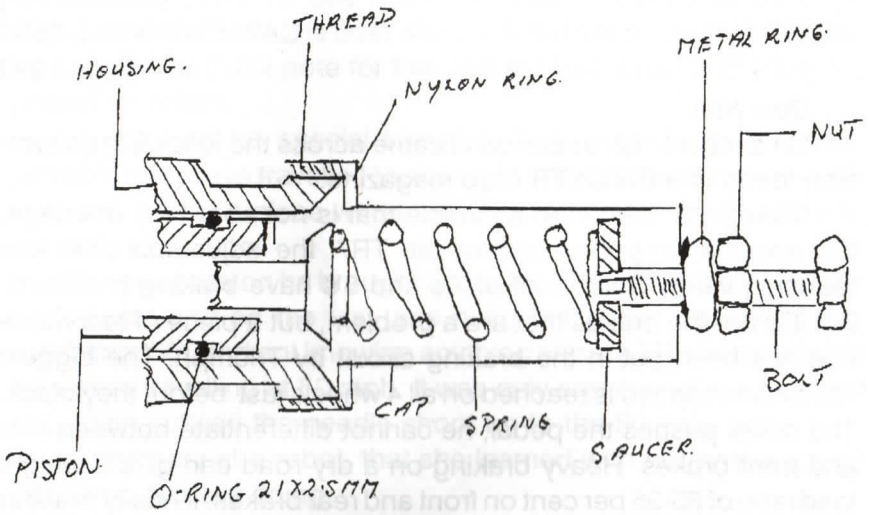
Dear Ken,

On a recent visit to London I came across the following conversion found in a British TR Club magazine.

"Here is for a change an article that is not about my marriage, but about an improvement for the TR7, the adjustable pressure reducing valve. Quite a lot of 7's and 8's have braking problems. But it is not the brakes that are a problem, but a piece of technique that has been put in the braking circuit by Triumph. The biggest reduction in speed is reached on all 4 wheels just before they black. The driver pushes the pedal, he cannot differentiate between rear and front brakes. Heavy braking on a dry road can give a weight load ratio of 65-35 per cent on front and rear brakes. If heavy braking is needed on a wet road, you cannot push the pedal as hard as on a dry road: the wheels will lock faster because of the water. In that case you need relatively more power on the rear wheels. To come to a system that limits the braking power on the rear wheels in case of an emergency stop, Triumph has put a pressure reducing valve in the circuit. (By the way is an invention from the 30's).

The thing works with a piston set and a spring for inside tension. Pedal pressure gives more or less braking power on the rear brakes. In theory a beautiful invention. In practice it has a disadvantage: the spring, used for the inside tension gets weaker in due time. And with weakening, braking power on the rear wheels fades away. The solution is very simple: find a way to re-strengthen the spring: Here is how I did it (see Sketch):

1. Remove the old cap.
2. Make a thread on the housing.
3. Make a new cap with inside thread to fit the housing as well as thread on top for a "belt and saucer".
4. Put it all together with a nylon gasket ring between the cap and the housing.



There is one handicap with reconditioning an old unit. Inside the unit you find four different O-rings. If you dismantle the unit, the best thing to do is to renew the old O-rings. So with the old O-rings used again the unit may leak. If you have finished the job, and you put the adjustable bolt on max, inside the cap, the rear brakes will work only by thinking about it!"

My son and I have altered our car braking system accordingly with great success.

Regards,

Lappies

WANTED AND FOR SALE

1 **FOR SALE**: 1973 TR6PI 150 BHP, yellow, good engine and body, ex U.K. Needs some TLC. R20 000 onco. Tel.: 011-886-7287(w) or 011-706-6531(H). Tim Stanleick.

2 **FOR SALE:** TR7 in really excellent condition. Red, Hardtop. Price R32 000. Phone Garry Philp on 031-7002861(W) or 031-7641929(H).

3 **WANTED:** Good clean TR7 coupe, preferably with 5 speed gearbox. Prepared to swop my TR3 for similar condition car. Please phone John Roets 011-849 2338(H) or 011-334 3068(W).

4 **FOR SALE:** It is with sadness that I have to advertise my TR5 for sale in Sabrina. Unfortunately I have developed serious back problems so severe that I can't even get into the TR5 any more. This is the ex-Ken Boss TR5. Price is going to be a problem in these tough times, so I would leave it as negotiable. Mike Martin, P.O. Box 148, CAPE TOWN 8000.

5 **FOR SALE:** 63/64 Spitfire. 90% complete and ready for restoration. Please phone Len van der Merwe on 031 465 6297(H) or 031 44 1494(W).

6 **IMPORTANT! IMPORTANT! IMPORTANT!**

Len van der Merwe of Durban is in charge of Regalia which will be available at the Midmar National Gathering. He needs us to advise him what we would like to see on offer. Please give him a ring on 031-465 6297(H) or 031- 44 1494(W) with your suggestions.

Len is thinking along the lines of aprons, T-shirts, Sportsbags, Beer Mugs, Caps, Golf Towels, Decals, Bunting, Coffee Mugs, Beer Glasses, Ashtrays, Flags, Table Cloths, Umbrellas, Cushions, Jacket with TSCC embroidered on the back, Triumph Scarves.

FUELS AND HORSES

from an article submitted by

Dave Gordon

While I personally do not agree with some of the contents of this article, I think it gives a straightforward explanation of how fuel injection systems work. The fault-finding techniques, while by no means exhaustive, may still teach the reader one or two new tricks. - Ed.

INTRODUCTION

Fuel Injection offers many advantages over carburettors; increases in power and efficiency are among them.

Carburettors and classic cars are a natural combination, but fuel injection and classic cars - well that's another story.

At a time when legislation regarding exhaust emissions is using up enough paper to kill the average rain forest, fuel injection has never been more popular. Its use isn't being limited to sporting models - soon every new car sold in the UK will be carburettor free.

The fact that the carburettor has been with us for this long speaks volumes for the ingenuity of its design. Even with fuel injection so established, the carburettor has much to offer. It carries out its tasks reliably, if not with the total efficiency of its successor. And - as DIY-ers know, it can be fixed!

If anything puts people off fuel injection, it's not knowing what secrets lie under the covers. If a carb goes out of tune, all it takes is a screwdriver and some patience to rectify it. Try the same approach with fuel injection, and it's likely to bite you.

However, it's a myth that all fuel injection systems are out of bounds. The aim of this feature is to prove that early systems, primarily from Bosch and Lucas, can be repaired by you at home. Sophisticated electronic systems are best left to the experts though; and while classic car owners are unlikely to come across any at present, the day they do isn't that far away.

Before we discuss what goes wrong and how to fix it, let's take a look at how fuel injection came about, the advantages it has over carburettors and how it actually works.

HISTORY

How old do you think the concept of fuel injection is? 30 years 40 years, perhaps? In fact, Bosch were experimenting way back in 1912, using an oil lubrication pump to force the fuel into the engine. This idea was short lived; since petrol possesses no lubricating qualities the pumps quickly seized, and the idea was abandoned.

In 1922, Bosch issued a development order for fuel injection pumps, and a way of accurately metering fuel was deemed essential. In 1927 the first precise injection pump was unveiled, and a pump designed for high revving diesels swiftly followed. In fact, it was this pump which made mass produced diesel engined cars - the first of which appeared in 1936 - a reality.

At the beginning of the 1930's the German Research Institute for Aviation got the ball rolling for petrol fuel injection, aided once again by Bosch.

The advantages of fuel injection for aircraft engines couldn't be ignored; such a system would eliminate the problem of carburettor icing at high altitudes, and would also allow fuelling to continue when the engine was upside down - increasing the aircraft's manoeuvrability.

In addition, a direct injection of petrol into the combustion chamber gives increased power thanks to an improved cylinder charge. This was proved in 1939, when a fuel injected Daimler-Benz engine propelled a piston engined aircraft to 471,94 mph - a world record which was unbeaten for 30 years.

At the end of World War 2, fuel injection was developed for motor vehicle engines. A Gutbrod sub-compact car with a two stroke engine was the first production vehicle with a fuel injected engine, followed by the Goliath.

It wasn't until 1952 that a production vehicle with a four stroke engine - the Mercedes

Benz 300SL - received fuel injection, although prior to that it had been tested on racing cars around the world.

In the USA, Indianapolis racing cars were among the first to use fuel injection, followed by the Daimler Benz Silver Arrows, the Mercedes Benz W196 and British racing engine manufacturers BRM and Vanwall.

The Mercedes 300SL's injection system was basic, consisting of a two cylinder pump and a distributor box to feed the petrol to each cylinder.

The system worked well, but Bosch felt there was room for further improvement. A major advance was made in 1958, when Bosch moved away from direct injection - where fuel is squirted straight into the combustion chamber - to manifold injection, which offers greater control over the air/fuel mix.

Despite being a major advance over carburettors, fuel injection wasn't an immediate success - mainly because it cost as much as the complex carburettor-per-cylinder arrangements found on expensive sports cars of the 1960's. It wasn't until the 1980's that injection became widespread.

The first systems were purely mechanical, and some still are, but it didn't take long for electronics to appear. In 1967, the Volkswagen 1600LE became the first production vehicle to be equipped with an electronic fuel injection system, known as D-Jetronic. For the first time, the air/fuel mixture could be accurately controlled by a computer.

D-Jetronic was a milestone, not only because it enable motor manufacturers to keep within increasingly tough limits for emissions in the USA, but also because it heralded the beginning of increased electronic influence over the engine's functions. Bosch, aided by Bendix in the USA, had overcome the problems of extreme heat and vibration destroying complex and fragile electronic control units.

Up to 1973, motor manufacturers were concerned more with outright performance than with fuel efficiency and emissions. This changed dramatically when the Arab-Israeli conflict made petrol a valuable commodity, and fuel economy became a priority.

In 1973, Bosch launched two more injection systems, the K-Jetronic and L-Jetronic. K-Jetronic was a mechanical system offering a continuous injection of fuel, while the L-Jetronic evolved from the D-Jetronic. The main difference between the D and L was that on the D inlet pressure is sensed compared to airflow on the L. In case you're wondering, K stands for Kontinuous (continuous), L for Luft (air) and D for Druck (pressure).

1976 saw Californian emission controls tighten up even more - to the point where it was almost impossible for conventional fuelling systems to cope. To overcome this, Bosch developed the lambda control as fitted to some TR7's for that market. Lambda is derived from the Greek symbol used to denote the air/fuel ratio.

The lambda control consists of a sensor in the exhaust, which measures the composition of gases passing through. The information is passed to the fuel injection system computer, which compensates by adjusting the air/fuel mixture. Lambda became a feature of the K-Jetronic from 1976, and the L-Jetronic from 1977.

The majority of fuel injection systems today are developed from the K and L, although they are obviously more sophisticated. Integrated systems which combine fuel injection with ignition, were first introduced in 1979, and are really the cut off point for any user involvement.

Of course, Bosch weren't the only company to be involved in the development of fuel injection; Lucas in the UK, Bendix in the USA and Marelli of Italy all developed systems of their own, and continue to do so today.

Early Lucas systems closely resembled those made by Bosch, and the first was fitted to a Le Mans winning Jaguar D Type in 1957. Various Maseratis, including the 3500GT, Sebring, 109, 5000GT and 107, were similarly equipped, but the real breakthrough came when Triumph ditched carburettors in favour of the Lucas system for the TR5. The Triumph 2.5PI

saloons and estate followed, along with the TR6. The TR5 was the first mass produced sportscar to feature fuel injection. Ironically, most TR6's sold in the USA weren't equipped with fuel injection.

Other manufacturers such as Kugelfischer, Tecalemit-Jackson, AE-Brico and GKN put a tentative toe in the water, but their offerings floundered. The credit for the basic concept and design of early fuel injection remains with Bosch.

FUEL INJECTION vs CARBURETTORS

Carburettors and fuel injection share a common task - to give the engine fuel mixed with air in a combustible form. They go about their work in entirely different ways though.

It's vital that the engine receives a good mix of air and fuel, so that the best possible combustion can be achieved during th poser stroke of the four stroke cycle.

The exact theoretical value for complete combustion - also known as the stoichiometric ratio - is 14.7:1. This means that around 10 000 litres of air is needed to burn just one litre of fuel.

Obtaining the correct mixture of fuel and air is essential; an excess of either can cause misfires, poor efficiency and high emission levels.

To prevent this, carburettors were often set up to give a part-stoichiometric mixture - one which has no excess of fuel or air.

In theory this is great, because the engine has a perfect mix. But in practice it's not so good - an engine on full throttle needs a rich mixture to use up all the available air in order to prevent detonation and to obtain a cooler, and therefore denser charge.

On part throttle a stoichiometric mixture can cause problems too, since excess air will be needed to burn up all the available fuel. Go 10% either side of stoichiometric and the engine probably won't function at all.

Where fuel injection scores over the carburettor is its ability to accurately deliver the goods regardless of engine speed, load or temperature. Fuel injection systems can change the

mixture instantly, adding enrichment when it's needed - eg for cold starts - and weakening the mixture for the sake of economy.

Cold start enrichment is vital to reduce emissions for the first part of the journey, but on carburettor engined cars this control is performed by a manual - even worse - automatic choke. While the former can be efficient in the hands of an experienced driver, the latter generally isn't; but again fuel injection can get around this.

Carburettors perform, they simply don't offer the same efficiency and control as fuel injection. So how exactly does fuel injection work?

HOW FUEL INJECTION WORKS

K-JETRONIC

K-Jetronic is a driveless mechanical fuel injection system, in which the fuel is continuously metered in proportion to the amount of air inducted into the engine. The mixture is governed by a mixture control unit, which comprises an air flow meter and a fuel distributor.

Intake air is purified by a filter before flowing through an air flow meter. This consists of an air funnel and an air flow meter plate mounted on a lever. The plate is compensated by a counterweight, and is deflected by the air passing over it. The position of the plate is directly related to airflow, and this information is transmitted to the control plunger of the fuel distributor by a lever.

Fuel circulates from the tank to the distributor aided by an electric pump, and is filtered to get rid of any impurities. Once filtered, it continues its journey to the fuel distributor.

The fuel distributor consists of a number of metering slits, one per cylinder. A certain amount of each slit is opened depending on the position of the control plunger, and fuel is sent to the injectors, a pair at a time. To retain a constant fuel pressure, a differential pressure valve is located downstream of each slit. Unused fuel is returned to the tank.

K-Jetronic injectors have no fuel metering function; this is carried out by the system as a whole. At a guage pressure of 3,6 bar the

injector opens, and when the fuel has been delivered, closes at a frequency of around 1500Hz.

Other important parts of the system are the warm-up regulator, auxiliary air valve and the electric start valve/thermo time switch.

The warm up regulator, controlled be an electrically heated bimetallic spring or expansion element, enriches the mixture by reducing the counter pressure on the control plunger. This causes the air flow meter plate to move a greater distance for the same air flow, which in turn increases the amount of fuel made available. This wouldn't work without the assistance of an auxiliary air valve, which supplies additional air to the engine during the warm up phase. It's this additional air which causes a greater deflection of the air flow meter plate, effecting a higher - and therefore smoother - engine speed during idle.

Finally, the thermo time switch triggers the electric start valve, which causes an additional charge of fuel to be injected during low starting temperatures.

So, in summary the K-Jetronic functions as follows:

Air: - Air Intake - Air Filter - Air Flow Meter - Intake manifold.

Fuel: Fuel Tank - Pump - Fuel Filter - Fuel Distributor - Injector - Inlet Manifold.

L-JETRONIC

With the L-Jetronic, the explanation process is further complicated by the introduction of electronics!

The L-Jetronic is different from the K in another way, too. It meters fuel intermittently, instead of continuously.

From 1977 onwards, L-Jetronic systems featured a lambda sensor, but for this example we'll be looking at the pre-'77 type.

Like the K-Jetronic, the L uses direct air flow measurement as the core of its operation; however, electronic control makes this process more sophisticated.

Working backwards, electromagnetically actuated injectors spray fuel onto the intake valves of the engine. Each cylinder has its own solenoid injector, which is actuated once with every crankshaft revolution.

The injectors are connected in parallel to simplify the circuitry. The quantity of injected fuel is entirely dependent upon the open time of the injectors, since the differential pressure between the fuel pressure and intake manifold pressure is kept constant.

How long the injectors stay open for is decided by the electronic control unit, which processes information about the quantity of inducted air, the engine speed and the engine temperature.

Fuel is supplied by an electrically driven roller-cell pump, which also generates injector pressure. Paper filters purify the fuel as it travels along a delivery line to the pressure regulator, which keeps a constant pressure across the metering slit.

Air is drawn in and filtered before passing through the air flow meter. The force of incoming air deflects a flap through a defined angle, pushing against the restoring force of a spring. A potentiometer converts the deflection into a voltage ratio, which determines the pulse length of a timing element in the electronic control unit. An intake air temperature sensor is also incorporated, to detect changes in air density.

Other vital parts of the L-Jetronic are the throttle valve switch and the engine temperature sensor. The first has two contacts for the two end positions of the throttle valve, and sends a signal to the ECU (electronic control unit) when the valve is closed (at idle) or wide open (full load). The temperature sensor is responsible for controlling warm up enrichment.

Parts shared with the K-Jetronic are the auxiliary air valve, electric start valve and thermo time switch.

MECHANICAL SYSTEMS - REPAIR AND MAINTENANCE

Early fuel injection systems are basically mechanical pumps which deliver an air/fuel mixture to the compression chamber via a metering distributor and control unit.

The two most essential pieces of diagnostic equipment are a pressure guage and a vacuum guage. An ammeter and volt meter are also useful.

The pressure guage should be

calibrated from 0-160lb/sq.in. with a rubber tubing T piece and two 0.75in. BSP connections, male and female. The vacuum guage should be calibrated from 0-30Hg, again with rubber tubing and a T piece.

Connect the vacuum guage to the depression signal line, which is the pipe running between the air intake manifold (centre pair) and the metering distributor vacuum connection. A 3in. length of rubber tubing will be needed to connect the T piece and the signal line.

The pressure guage should be connected into the petrol inlet line, ideally at the metering unit. With these two gauges in place. we can now diagnose the two most crucial elements of mechanical fuel injection systems.

LUCAS MK2 SYSTEM

Lucas is credited as bringing fuel injection to the masses with its Mk2 injection system, via the Triumph TR5 and TR6. The Mk2 system consists of the following: A motor driven fuel pump, a paper element fuel filter, combined metering distributor/control unit, pressure relief valve and interconnecting pipes. The metering unit is driven at half engine speed, and supplies - via the injectors - accurately timed and measured quantities of fuel to the inlet port.

Control of the air/fuel mixture is achieved by the mixture control unit, which responds to changes in inlet manifold depression. Fuel line pressure of around 100 lb/sq.in. is maintained by the pressure relief valve, which also returns any excess fuel to the tank. The injectors, one per cylinder, are located near the inlet valves in the manifold, and require a force of 50 lb/sq.in. to open them. The fuel spray formation is 60 degrees, in a hollow cone shape.

FAULTS AND FOREWARNING

Dirt and wear are the two main enemies of fuel injection systems. The second is hard to defend against; all mechanical parts wear out. But the first is treatable with regular maintenance, especially of the air and fuel filters.

Fuel injection faults generally make themselves known in one of four ways. Most commonly, fuel consumption becomes excessive, or the engine runs erratically over all or part of the rev range. In extreme cases, the engine won't start at all, or may start but won't respond to movement of the throttle. In the first three cases, the problem may be caused by the overfuel control lever.

The overfuel control lever is the device responsible for giving the engine an extra dose of fuel when it is started. Problems occur when it seizes or becomes worn. Check that it is fully responsive to manual control over its full range. When in the "off" position, there should be a clearance between the lever and its adjusting screw of between 0,004-0,008in.).

To keep things simple, we've matched the most common symptoms to their respective faults, under four headings. You'll find there is some crossover between each section, so it pays to read everything before attempting any diagnostic or repair work. The fuel metering distributor/control unit can be repaired, but it requires knowledge, expertise and the right calibration equipment

ENGINE WILL NOT START

If the engine fails to start, your first course of action is to switch on the ignition and check that the fuel pump is running. You should be able to hear it, but if not, locate the pump and feel the casing to see if it is vibrating. If you find the fuel pump is not working, take the following steps.

FUEL PUMP

It is possible to check the pump and motor in situ. This is done by removing the in-line connectors at the motor and connecting a voltmeter to the supply side of these cables. With the ignition switched on, a reading of 12v should be shown. No reading indicates a faulty supply current.

With the ignition switched off, connect an ammeter lead to one of the cables, and attach the other lead to the in-line connector. With the ignition on a reading of approximately 4 amps should be indicated. If no reading is indicated the unit should

be removed from the car for an internal inspection.

When dismantling the pump, special care is needed to avoid foreign matter from becoming attached to the yoke as a result of the field magnets. Also, during removal or replacement make sure the armature doesn't snap against the said magnets and cause damage to them.

To dismantle the pump, first remove the yoke fixing screws. Withdraw the yoke and armature for about 0,5in., at which point the two brushes will drop clear of the commutator. Push the brushes back into their respective boxes to allow the circlip on the armature shaft to clear the brushes, and then completely withdraw the yoke and armature. Finally, undo and remove six bolts which secure the pump element to the motor.

If new brushes are needed, pull the flexible part of the worn brush away and solder a new one into the same position.

Should the brushes be in perfect health, move on to the armature. Here, you need to check for short circuits in the winding. Also, check the armature insulation for any cracks, using a mains test lamp between each commutator bar and shaft.

It is possible to skim the commutator if it has become worn, although this is something of a delicate operation.

For the pump element and drive coupling, the only course of action is a visual inspection. If you discover any wear a new element is needed.

Fortunately the rubber seal which fits between the pump and motor can be replaced. Wear is apparent when discharges of petrol are found on the small drain pipe on the pump body casting.

To check for wear on the seal, take the following steps:

(i) Connect the pump inlet to a paraffin supply.

(ii) Connect a pipe to the pump outlet connection and immerse the other end in paraffin.

(iii) Connect the motor cables to a 12v DC supply.

(iv) With the pump running and held above the paraffin supply check for a continuous supply of bubbles. If these are present, the seal is defective

and will need changing.

Finally, when re-assembling the pump, care is needed to prevent the armature shaft from damaging the large rubber petrol seal when it passes through the base of the pump body. Do yourself a favour and smear the seal with a suitable grease, and also fit a protective cover to the end of the shaft.

Make sure the assembly marks are aligned when the yoke is fitted to the casing - failure to do so will result in reverse rotation.

Before the pump is refitted, the end float setting will need to be adjusted. This is achieved by slackening the end float adjuster lock nut and screwing in the adjuster until slight resistance is felt. Incidentally, the yoke should be vertical while adjustments are made. Screw the adjuster back a quarter of a turn to give the correct end float.

If the pump is functioning, the fault lies elsewhere in the system. The next items to be eliminated from your investigation are the injector feed lines.

FEED LINES

To check the feed lines, disconnect one of the low tension cable connections at the coil in the fuel pump. Switch the ignition on, and gripping each feed line in turn, crank the engine. You should be able to feel the line pulse as fuel is let through. If you can feel a pulse (so to speak) in each line, it's unlikely that the fuel injection system is the cause of engine failure. Make sure that the feed line you are feeling is kept separate from the rest to avoid misleading reflected pulses.

If the pulses seem weak, the fault could lie with the injector. These often stick open on older systems, but this fault can be cured by connecting the injector to an air supply running at 80 lb/sq.in. pressure. If the injector remains stuck after this, a new one will need to be fitted.

A good visual check can be made by removing an injector from the manifold with the engine running. Have an empty jar ready to collect the petrol vapour. Place the injector in the jar and examine the flow of fuel. It should be steady and consistent, appearing like a fine mist. If the fuel is leaving the injector in

erratic spurts, a blow through with an air line will be required.
If after gripping all the feed lines in turn no pulsing can be felt, the fault is likely to lie with the metering distribution unit, a broken drive coupling may be the cause.

ERRATIC RUNNING

An engine which starts but runs erratically over the whole or part of the rev range may be suffering from a fuel injection fault.
Firstly, check the setting of the overfuel control unit, the correct adjustment of which was detailed in lst month's episode.
If this is correctly set up, the fault will be harder to find. Take the following steps to track down the cause in the least possible time.
(i) check each spark plug in turn, looking for one which is more fouled than the others.
This could be caused by the injector for one cylinder only sticking open; a common fault as we've already found. One was of checking the plugs is to short circuit each one in turn; the one which doesn't affect the engine note when shorted is your evidence. Remove, clean and re-fit the plug, and then go to work on the appropriate injector, cleaning it with the air line as previously discussed. Again, if this fails to rectify the fault, a new injector will need to be installed.

CHECK RELIEF VALVE

(ii) Where a failure affects all cylinders, but becomes more pronounced at a high engine speed, check the pressure and relief valve setting. This is done using a pressure guage, and the ideal pressure is 106lb/sq.in.
If the pressure is lower than this, adjustment can be carried out as follows:
(i) Disconnect the fuel feed pipe at the metering distributor, insert the T piece and connect the pressure guage.
(ii) Disconnect the return to supply pipe at the relief valve and blank off the return pipe.
(iii) Find a suitable container for fuel from the relief valve to be discharged into.
(iv) Switch on the ignition and note the pressure guage reading.

(v) Switch off the ignition and adjust the pressure and relief valve setting. To increase the fuel pressure, turn the screw slot clockwise. Switch on the ignition again, and re-check the reading. If the reading fluctuates, a new relief valve should be fitted. If after fitting a new relief valve the reading remains unstable, the fuel pump and motor should be examined.
(vi) Presuming that the reading is now correct, re-connect the return to supply pipe to the relief valve, switch on the ignition and re-check the pressure guage reading. If the reading shoots up, examine the return to supply pipe and check for kinks or twists.
With all these checks complete, and the appropriate actions taken, the injection system should have a clean bill of health. However, if problems remain even with the correct timing, the overfuel control lever correctly adjusted, the injectors clean and fuel pressure correct, it's time to replace the metering distributor/control unit.

HEAVY CONSUMPTION

Excessive consumption can be caused by any number of faults, not necessarily to do with the fuel injection system. Presuming other likely causes have been eradicated and the problem remains, here's what to do.
Firstly, check the overflow control lever is working correctly, and also that the adjustment setting is right.
Next, examine the pressure relief valve setting, using the method described for erratic running.
Once all other possible causes - plugs, points, pipes - have been eliminated, and the above checks made, the only item at fault can be the metering and control unit. The only cure - a new one!

ENGINE STARTS, NO RESPONSE

Two simple checks here: if both provide no cure the only course of action is a new metering distributor/control unit.
Firstly, ensure that the movement of the accelerator pedal is being relayed to the throttle butterfly. Secondly, remove and check that the pipe connecting

the manifold to the control unit is absolutely air tight.

SAFETY TIPS

Petrol is a dangerous substance. Don't smoke or use a naked flame when working on a fuel injection system.

Other precautions:

(i) The fuel pump should never be switched on while any normally pressurised part of the system is dismantled.

(ii) Do not run the pump for long periods with the engine switched off. To prevent this, disconnect the pump motor feed cables at the in-line connector whenever work that involves dismantling pipes is required, and also when the ignition must be on for long periods without the engine started.

(iii) Always cover exposed fuel passages with blanking plugs.

(iv) Never re-fit previously used petrol seals - always replace them with new ones.

(v) Do not disturb the adjustment screws found at the end of the metering distribution/control unit.

(vi) Remember after dismantling and reassembling the fuel injection system, it may take a while for the system to be re-primed. Until it has done so, it will not work to the best of its capabilities. Be patient - don't try to re-prime the system with a battery in a low state of charge.

PARTS SUPPLY

Lucas inform us that all enquiries regarding fuel injection spares and service for Mk2 petrol injection systems should be made to:

Lucas Service (UK) Ltd..
171 Lichfield Road,
Aston, Birmingham. B65 SN.
Telephone: 021 327 1525.

HARK, THE HERALD ANGLE

with acknowledgement to

The Standard Car Review, Vol. 19 No. 10

article submitted by

Dave Carter

The story of how the Triumph Herald styling came about certainly put Harry Webster's wife and child to sleep, as Graham Robson accounts ....

Historians tend to spend hours sifting through boring archives and finding very little. In researching the birth of the Triumph Herald over the years, I thought I'd seen everything. Were there any pictures of the Michelotti prototype being built? No, there were not. Were there any of the original Michelotti sketches? None of those either. Until earlier this year, when Richard Bensted-Smith, whose early Herald "connection" was to be in that famous "Turn left for Tangier" trans-Sahara proving run, sent me some drawings. "Would you like to keep these?" he wrote. "I got them from Harry Webster in 1959 after the African run - they may be important."

Indeed they are. Although I'd heard about the brainstorming design and redesign process which Michelotti and Harry Webster had carried out in August and September 1957, I'd never seen any of the evidence. Here was the missing link, unveiled after nearly 30 years.

It doesn't seem possible, somehow. When you look at the styling of the dumpy little Standard Eight of 1953, and compare it with the smart and rather dashing lines of the Triumph Herald of 1959, you may wonder how one firm could possibly be responsible for both. It reminds me of the holidaymakers who drew up alongside a local and asked for directions to the next town - the local thought about it, scratched his head, and then replied: "Well, if I was you, I

wouldn't start from here!"

And that was Standard-Triumph's problem in 1956, when it first began to plan a successor to the Standard Eight/Ten models. Although the "SC" (Small Car) had already been a great sales success, it was never thought to be pretty, even when new, and was rapidly beginning to date. But if a new car, coded "Zobo", was to be ready for launch at the 1958 Motor Show, an industrial miracle was needed.

The problem had taken root between 1953 and 1955, though this all took time to become clear. Standard had no bodybuilding facilities of its own, and had agreed to take Standard Eight monocoques from Fisher & Ludlow, one of whose factories was at Tile Hill, on the outskirts of Coventry. This was all well and good, except that in August 1953, even as Standard Eight manufacture was starting, Fisher & Ludlow were taken over by BMC!

Next, in January 1954, came the ousting of Standard's dictatorial chairman and managing director Sir John Black. Alick Dick took over as the new top man, and appointed engineering chief Ted Grinham as his deputy. The dour, quite humourless Grinham became more difficult to work with than ever and one result of this was that in the autumn of 1955, Standard's gifted chief body engineer (and, by definition, chief stylist) Walter Belgrove, was abruptly sacked.

In the spring of 1966, therefore, when the directors decided to start work on a successor to the Standard Eight and Ten, they encountered two major problems. No one at Standard Triumph seemed to have the flair to style a new body shell, and BMC chairman Sir Leonard Lord refused to provide tooling and bodymaking facilities at Fisher & Ludlow.

For the time being, the styling impasse was allowed to drift, but the need to ensure future body supplies was urgent. Everyone blithely assumed that Pressed Steel (still independent at this time) would accept the job, but when they were approached, they turned it down. There was no political hangup - they were merely loaded up with new

model work from BMC, Rootes, and also smaller firms like Rover and Jaguar.

Pandemonium. What was Standard-Triumph to do? Fortunately, at about this time, Ted Grinham retired, and Harry Webster took over as chief engineer. Not only was Webster a very talented designer, but he liked motor sport as much as Grinham had chosen to ignore it - and some of his decisions had real flair.

If monocoque body supplies could not be found, Webster reasoned, why not revert to designing the new car with a separate chassis frame? That way, simpler bodies could be bought in sections, and from several sources, and bolted together, super-Meccano fashion: in that way, the chassis could also act as its own assembly jig in Britain, and also in overseas assembly plants.

Alick Dick and his general manager Martin Tustin liked this approach, approved it, and Dick immediately set out on a strategy of buying up body manufacturing and tooling businesses. Along the way he also pulled out of the tractor manufacturing agreement with Massey Harris Ferguson, picked up a lot of capital in the process, and laid the foundations for Standard-Triumph's own bodybuilding operation in Liverpool.

After this, designing the chassis and running gear was quite straightforward. Webster's team got on with the layout of the separate frame, the modified Standard Ten engine and gearbox, the rack and pinion steering, and the independent suspension - but the styling was a big headache.

Everyone had a go - Standard's own body engineers, Leslie Moore of Mulliners (a company on its way to becoming a subsidiary of Standard), and their subordinates - but the results were appalling. Harry Webster once said that: "We had tried and tried with all these styles in Coventry, and what we finished up with was a mechanical bathtub on wheels. I can't describe it as anything else. It looked dreadful."

Salvation came in the spring of 1957. Through a chance meet-

ing with entrepreneur Raymond Flower, Webster and Tustin came to know the young Italian stylist Giovanni Michelotti, who was soon signed up as a consultant.

Almost as a "test", he quickly dashed off the facelift which turned the Vanguard III into the more stylish Vanguard Vignale - and was then asked to look at the "Zobo" style. At that time, his brief was to improve, rather than to suggest a new shape altogether.

The first and only prototype "bathtub" - actually an open version of the style - sat on the original all-independent suspension chassis. It was sent to Turin, where Michelotti rolled up his sleeves and set to. Although the chassis was already at its finalised size, the original body looked too high and stubby.

Michelotti tinkered with it for weeks, moving the headlamps slightly inboard, wrapping the screen a little, giving it a more elegant roofline (not unlike the then-current Graber Alvis), and providing it with vertical bumper/overriders. Then he had another go, getting rid of the crown line kick-up over the rear wheel arches, adding wraparound bumpers, and producing a neat coupé style as an alternative. That was the situation on Thursday, 22 August 1957, when Harry Webster was on his way to a family holiday in Sorrento.

"On the way down I called in on Michelotti in Turin. There was still nothing doing, but I decided to call in on my way back from Sorrento in September."

The meeting which followed was by all accounts historic. On Thursday, 5 September 1957, Webster parked his car in a Turin side street outside Michelotti's design studio, leaving his wife and daughter to wait in the car because he did not expect to be long, and went in to see if there had been any improvement.

It was hopeless. Michelotti's improvements had gone no further, and it was still something of a bathtub which sat forlornly on the floor. Quite suddenly, it seems, Webster's patience snapped:

"Then I said something like, 'We're wasting our bloody time. Look, suppose you could start

from scratch, here in Italy, based only on this chassis, what would you propose?' To Michelotti, that was like a red rag to a bull. Within three or four minutes he had sketched up the Herald as we now know it, and we instantly started transferring this to a full scale draft."

The essence of that "three or four minute" sketch might have been brewing in Michelotti's fertile mind for some time (look at his first-ever TR3 'dream car' style of the same period to see the similarity), but all the excitement of that moment and of that first car is captured in the sketch reproduced here. On the same wheelbase and with the same wheels, there is the sexy line of the original Herald coupé, complete with the hooded headlamps, the straight-through accent lines on the flanks, and the neatly detailed fins that became so familiar after 1959. More changes would be made - especially to the shape of the coupé's rear window, but the main outlines were there right from the start.

In the frenzy, Harry Webster (who was an enthusiast and a workaholic and didn't mind who knew it) forgot all about his family. He and Michelotti worked on together, throughout the afternoon and into the evening. When he eventually returned to pavement level at midnight, he found his wife and daughter curled up inside his car, fast asleep!

There were more delights to come. Having started with the car which eventually became the Herald coupé, Michelotti worked throughout the night, penning the other cars in the proposed range, of which the saloon was the most important.

The next day Webster, who had stayed on in Turin overnight, cabled Alick Dick in Coventry to say "Hold everything, we've solved the problem." A day later he was back in Coventry with a sheaf of drawings - and a promise from Michelotti that the first prototype car could be ready by the end of the year if an immediate go-ahead was given.

The rest, as they say, is history, for Michelotti got the go-ahead, the prototype coupé was ready by Christmas Eve 1957, and the first prototype saloon shell fol-

lowed in April 1958. Not only that, but in the following months, Michelotti also styled and partly engineered a convertible, an estate car and two different types of van. He was, not surprisingly, to style for Triumph again!

The fact that Standard-Triumph over-expanded its facilities just at the time when the market was about to down turn, that the Herald's handling did not match its looks, and that the build quality was simply not good enough to justify the high price is quite another story ....



THE SPITFIRE - A PROPOSITION?

from an article submitted by

Dave Gordon

HISTORY

The Spitfire - launched at the 1962 Motor Show - was developed from the Triumph Herald - itself evolved from the Standard 10.

Like the Herald, the Michelotti-styled Spitfire was to have a separate chassis frame - in fact, a shortened Herald unit. However, the Spitfire's frame had no outriggers - the sill assemblies of the new all-welded body contributed to the vehicle's overall strength.

The production car used an uprated twin carburettor version of the Herald's 1147cc engine (with a high lift camshaft and revised manifolding), producing 63 bhp and 90 mph. Disc brakes were fitted at the front.

The Spitfire had a removable hood, and a (fairly small) boot. The car featured a one-piece front end assembly, as in the Herald, and also inherited the Herald's incredibly small turning circle.

The MkII Spitfire of early 1965 had modified camshaft and tubular manifolds, uprating the engine, and allowing a top speed of approximately 95 mph. A diaphragm clutch was now employed, and the interior trim was revised.

In January, 1967, the Spitfire MkIII arrived, with an uprated version of the 1296cc engine from the front wheel drive Triumph 1300. This produced 75 bhp, and nearly 100 mph. The MkIII had a new front bumper, mounted ahead of the grille, new rear quarter bumpers, a neater, fold-away hood, and other styling changes.

From November 1970, Spitfires (now MkIV's) received a new swing-spring suspension system at the rear, and stiffer front anti-roll bar. This reduced rear wheel "tuck-in" when cornering hard, compared with the Herald-type "swing axle" suspension. An all-synchromesh (Toledo/Vitesse type) gearbox was now installed, and the final drive ratio was raised. Power output was actually lower than on the earlier models.

The MkIV cars later gained an air dam, wider rear tracks, and re-styled interior.

Triumph's (longer stroke) 1493cc engine from the front wheel drive 1500 was fitted to the Spitfire from 1973 for the United States market, and

from 1974, for British buyers.

The 71 bhp unit drove through a Marina/TR6 type gearbox, with Spitfire MkIV gear ratios, and gave a top speed of 100 mph.

The Spitfire then continued with just minor changes until August, 1980. There was no direct replacement.

BODY AND CHASSIS

The Spitfire has a strong chassis but it should be carefully checked for rust (particularly in the rear suspension "turrets" and just behind the front wheels) and for accident damage, especially at the front.

In a total restoration, the body can be separated from the chassis, although this time-consuming job is seldom actually necessary. Before you remove the body, ensure that the structure (particularly of the sills) is sound, and carry out the necessary rectification work first. Otherwise, the body may distort or collapse when lifted from the chassis, and be extremely difficult to re-fit. In addition, always label all wires and pipes before disconnection, and place all fasteners in marked containers. There are eight body mounting bolts to release; two immediately in front of the bulkhead, two in the floor through the main box sections, two through the rear parcel shelf, and two more beneath the petrol tank.

Arrange for at least four people to help lift the body off, and remove the doors, interior trim and bootlid, to reduce weight.

SILLS

When buying, look closely at the seams between the body floor and the inner sills, from inside and out (noting especially any rust around the seat belt mountings and the inner wheel arches). Repairs can be involved and therefore expensive, unless you do the work yourself. Rust is often severe, since the inner sill, outer sill and the sandwiched strengthening membrane join here.

Look closely at the outer sill panels, to establish whether they are rusty, or full of body filler, or are structurally insufficient oversill panels, concealing serious rust. Always check the fit of the doors for further evidence. If the rear upper edges of the doors foul on the front sections of the rear side panels, either the sill structures are weak, or new sills have been fitted without sufficient bracing of the vehicle. Either way, extensive work will be required.

It is wise to fully open each door and attempt to lift it up and down, to reveal whether the hinge pins are worn, and to show how sound the inner

sill area is.

When replacing Spitfire sills, it is essential that the work is properly carried out, and that only one side of the car is tackled at a time. The bodywork must be braced between the A and B posts while each sill is removed and the new one fitted, and the underside of the vehicle must be supported while the work is carried out. A jack, topped by a stout block of wood (approximately 18x3x2 inches) can be used to exert slight pressure along the inside edge of the floor, to maintain the correct position and door gaps.

Always leave the doors on the car while each sill is offered up and welded into place; they provide a useful guide to precise positioning of the panels.

If renewing a floor pan as well as the sill, fit the outer sill first, then the sandwiched diaphragm membrane, followed by the inner sill, then "hook" the replacement floor pan onto the inner panel. If renewing a sill assembly but not the floor, fit the inner panel first, then the inner membrane and finally the outer sill.

OTHER BODY ASPECTS

With the bonnet open, check for rust between the wheelarches and the wings - the panels often separate here - and look for evidence of bodged repairs around the wheel arches. Check also that the bulkhead is sound, as well as the front wing closing panels. Examine the battery mounting area - if the drain hole is blocked, rust is likely here.

Shut the bonnet and examine the area around the sidelamps, particularly on Mk1 and 2 cars. On these models and the Mk3's, look at the (single skinned) valance, below the front bumper. MkIV and 1500 versions have double-skinned valances, which rust from the inside. On these late models, also examine the "quarter" panels below the front bumper - these often rust, especially around the lamp units, but are easily replaced. Luckily glass fibre replacements are available for these panels and the valance.

At the rear of the car, check the wheel arch lips, which often suffer. As with the front arches, repair panels are available.

The rear wing bottoms can fill with water from within the boot (due to seal leaks). These and the boot floor are therefore often holed. In addition, the bootlid rusts along its trailing edge and in the extreme rear corners. The lower sections of the doors also rust badly. Door skins are available (but not the frames - the existing ones must be repaired).

Most major panelwork rectification is relatively straightforward on a

Spitfire, even changing a front or rear wing. This is easier on the cars with exposed wing seams. The front wings can be separated from the bonnet by drilling out the existing spot welds. The rear wings are removed in the same way, but also have to be separated from the sills, and the rear door post.

INTERIORS

It is worth trying to find a car - especially if looking at Mk1, 2 or 3 models - with sound, original upholstery. Trim parts for the early cars are scarce, and expensive. The seat frames often break, resulting in the backrest moving independently of its base. These are easy to strengthen and to repair.

ENGINES

The 1147cc and 1296cc engines are reliable, long-lasting units, given regular maintenance. However, "top end" rattle is common after high mileages, due to rocker gear wear. Another problem which can occur is excessive crankshaft end float, due to the thrust washers becoming dislodged. This will also give rise to a strange feel to the clutch, although this can be caused by excessive play in the clutch release pivot.

The 1296cc engines fitted to the MkIV Spitfires have larger crankshafts than earlier units, and are identifiable by their bigger pulley nuts (without indentation). Unfortunately the "heavy crank" engines tend to suffer more from "bottom end" problems than the earlier cars.....

The 1493cc engines installed in the final Spitfires are prone to piston/ring troubles, as well as excessive wear in the crankshaft. The thrust washers can wear and the resulting movement in the crankshaft can chew up the cylinder block. Check by getting an assistant to push the clutch pedal while watching the crankshaft pulley nut.

On all units it is quite common for the oil pressure light to stay on for a few seconds from a cold start, but if the time is excessive, and the bearings rattle loudly until the lamp goes out, the big ends, crankshaft and/or oil pump are worn.

It is easy to check whether a Spitfire has the correct engine, by examining the unit's number. All Spitfire engines should have an "F" prefix; Mk1/2 cars - FC, Mk3 models - FD, MkIV - FH (FK, USA cars), 1500 - FH (FM, USA cars).

The excellent access and straightforward design means that working on any Spitfire engine is relatively easy. Except for the earliest units, parts

are readily available.

All Spitfire engines can be tackled with a normal DIY toolkit, although you will need a strong 1,5 inch AF ring or socket spanner with which to shift the crankshaft pulley nut, which is difficult to release.

TRANSMISSIONS

The same type of basic gearbox was fitted to all pre-1500 Spitfires. The early cars (up to MkIII's) lacked synchromesh on first gear, but the all-synchro type fitted to MkIV's can be installed on any pre-1500 Spitfire (the propeller shaft flange at the gearbox end will need to be replaced too).

The synchromesh is often worn in the early, Herald-type gearboxes fitted to pre MkIV Spitfires. Noisy (worn) bearings and imprecise gear selection are other common troubles. However, this is often simply due to wear in the nylon bushes in the remote control gearchange mechanism. New bushes are cheap and easy to install.

The single rail Marina/TR6 derived unit fitted to 1500 Spitfires usually lasts well. However, check for imprecise gear changes and/or worn synchromesh.

A Spitfire clutch (or gearbox) change is easier than on most cars. Remove the fibreglass transmission cover and release the propeller shaft, then the gearbox can be removed from under the dashboard, from within the vehicle. The multitude of couplings in the drivetrain should be checked for wear, especially the two universal joints on the propeller shaft, and those on the driveshafts. Listen for a "clicking" emitted between "power off" and "power on", also a knocking, or vibration through the car.

Check too for clutch judder; this could be due to oil-soaked engine/gearbox mounts.

STEERING AND SUSPENSION

Always check the lower trunnions for evidence of lubrication. Two problems, eventually resulting in suspension collapse, affect neglected cars - failure of the trunnion (due to lack of lubrication), and seizure of its "through-bolt". It is vital that, whenever the wishbone assembly or trunnion is dismantled, the lower through-bolt is coated with grease or an anti-seize compound. If it seizes in the trunnion bushes, the suspension will, again, collapse.

Further checkpoints include the wheel bearings, the steering joints (track rod ends), the track itself (including the gaiters), the universal joint between the rack and the steering column, the steering column upper bush,

and its central joint where clamped to the dash.

Even complete overhaul of the front suspension is quite straightforward, due to the excellent access available.

Check the car's ride height, since the rear springs are prone to settling. As the rear spring of the "swing spring" 1500 models weakens, the car displays excessive negative camber; in such cases, renew the spring. Replacement of worn springs is relatively straightforward.

USE OF ENGLISH

from a list supplied by

Charles Mitchell

What follows is an extract from Charles' Jap Plastic car's workshop manual which makes us think how crazy and mixed-up we are.

ENGLISH	AMERICAN
Accelerator	Gas Pedal
Aerial	Antenna
Anti-roll bar	Stabiliser or sway bar
Big-end bearing	Rod bearing
Bonnet (engine cover)	Hood
Boot (luggage compartment)	Trunk
Bulkhead	Firewall
Cam follower/tappet	Valve lifter or tappet
Carburettor	Carburetor
Catch	Latch
Choke/venturi	Barrel
Circlip	Snap-ring
Crownwheel	Ring-gear (of differential)
Damper	Shock absorber
Disc (brake)	Rotor/disk
Distance piece	Spacer
Drop head coupe	Convertible
Earth (electrical)	Ground
Engineer's Blue	Prussian blue

THE WAY TO ENGINEER THINGS

by

Brian Brown

Having built up the Spitfire named Casper (The friendly ghost) ex Andy, named by Andy and Anne Greening of Knysna, I must say I enjoy motoring in this little baby. My wife has somehow laid claim to this car although I did all the sweating of down to metal and spray, spray, flat, flat and all that. Hours and lost pleasures saw me bring the Spit home all white and shining. My wife said, "Old chap, that is my set of wheels", and I stood there and could not say a word, as I do have a TR.

She has her other set of wheels also but the Spit is her special set, as she says! But now my brain worked this whole thing out nicely. If the weather is hot, she will use the Spit. If a little bit cool she will say, "I will use my usual set of wheels". Well, I leave for work at 7.00 AM and that is always cool and I say I will take the Spit to our workshop for this or that. On weekends I somehow engineer things my way to gun the Spit all over the place. The thing to remember is you must outsmart your wife, not by brain power (because we all know the brainpower of our wives), but by smart thinking other movements like taking the weather into account.

Pull the Spit out of the garage and suggest that the cool weather is just not on for her to use it that particular day. When she has gone out in her usual set of wheels you are free to get going full out in her Spit.

This one particular day (a Sunday) I really was rearing to go for a run in the Spit. Well. the weather was cool and windy and I got up early to clean and check the Spit. I told the wife, "the car is ready for you, but have you seen the weather outside?" She had not surfaced yet and said, "no, why?, is it bad out there?" I answered, "yes it is, bad according to TV and it is cold and

windy". Well, she got up and looked out the window and said, "it is bad out there by the look of things, you had better put the Spit back in the garage". This was all engineered of course as I wanted to use it myself. I said, "well, my dear, if you are not going to use it I will take it for a run".

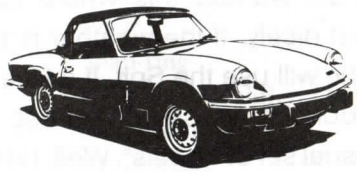
I had my run and fun and arrived back home all bushy tailed and bright eyed as it was a good run in the little open car. The weather had cleared of course and all was fine except my wife's mood! She was all fire and unrelenting as she said I had planned this whole plot of the bad weather and all that.

Now there I was standing with halo and all that and a Cupid look on my face and trying to explain that I did not control the weather.

"How do I control the weather?, it is against all my abilities!" But somehow I got blamed for the weather change or what it was the morning early before.

It all boggles the mind at times but keep engineering and try and keep one ahead of the wife who claims ownership of one of your sports cars. We do of course go out in the Spit and the TR together a lot if the weather is fine. But as I say, you must engineer things and keep one ahead always!



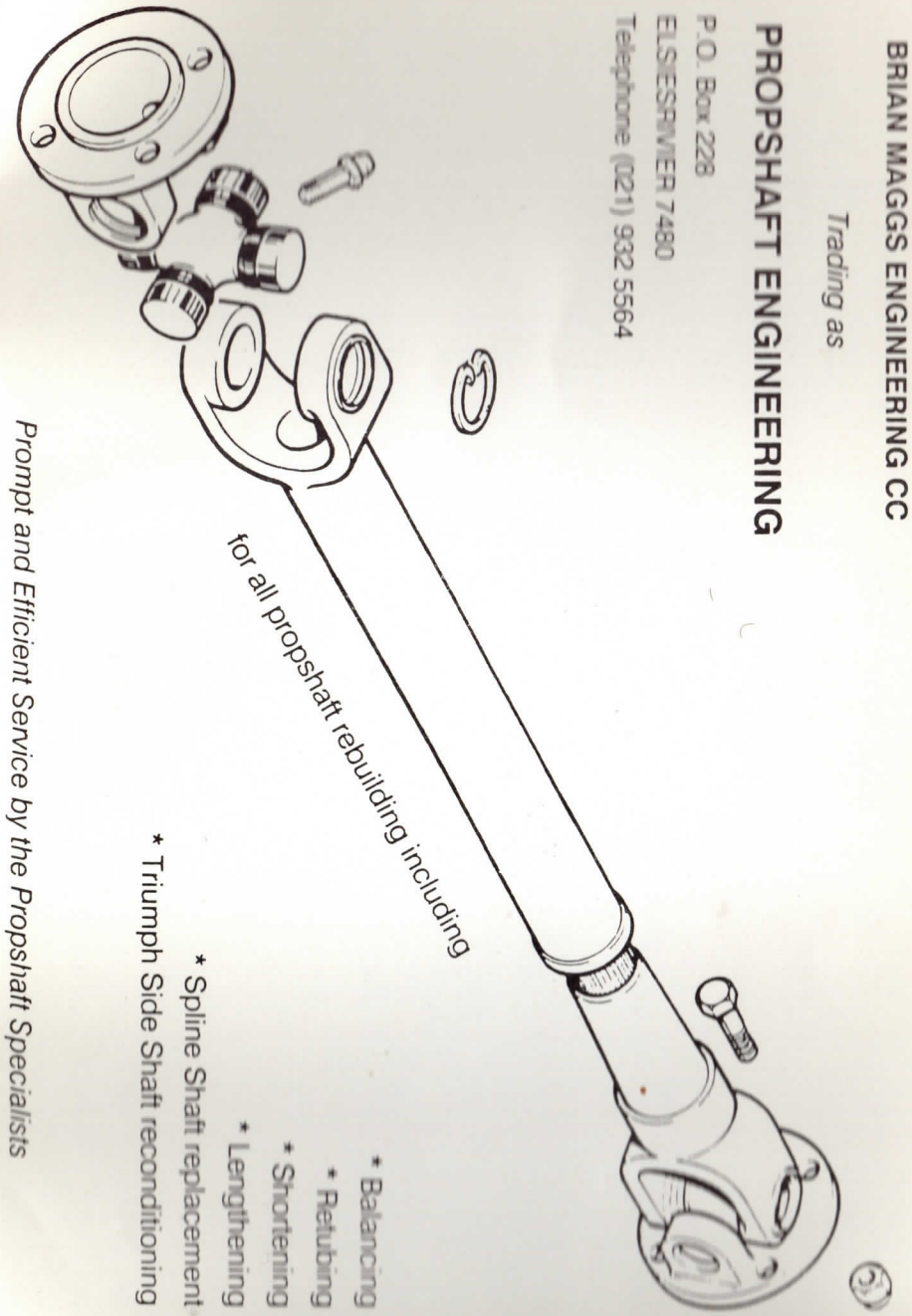


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