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# Turning Circle

April 1982 No. 2



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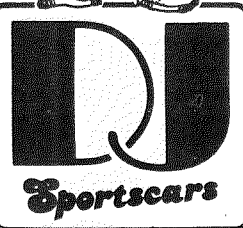
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TURNING CIRCLE

Editor: W. E. SUNDERLAND

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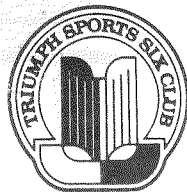
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## Editorial



Welcome to Turning Circle Number 2. Spitfire is our theme and what a car the Spitfire was in the 'Go-ahead 60's' and the 'Everybody's Got One 70's! Now we are left with all us budding enthusiasts.

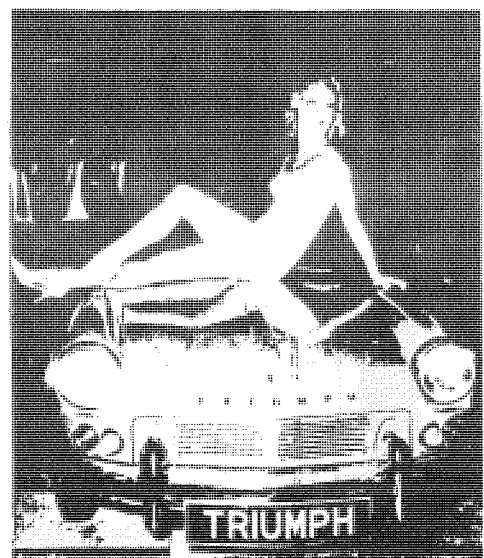
We cover the history of the car with various articles associated with the Spitfire and other Club cars. Turning Circle is, broadly speaking, an awareness to Club Members about a particular Club car in depth and this issue is something for Spitfire owners to lock up with all their valuables (or I hope it is looked upon in that light). Recently I have been going to sleep dreaming about them, or at least working out the necessary print material for this particular issue.

Although I have never owned a Spitfire myself yet, I often wish I could rip the roof off my GT6! This car is certainly popular and is fast becoming the biggest register within the Club. Not before time, as there are a large amount on the road.

Anyway, I hope you enjoy Turning Circle and the Courier which is in the middle.

Two stars in one show! Janine Gray and the Triumph Spitfire 4. Janine showed her appreciation of the new sports car by gracing its bonnet for the benefit of the photographers.

Not yet 21, she has starred in films and on television since the age of 13. Currently, she is filming in London in Walt Disney's "The Lives of Thomasina".



the new



TRIUMPH SPITFIRE 4

STYLED BY the brilliant Giovanni Michelotti, the Triumph Spitfire 4 is long, low and elegant with aerodynamic lines to take full advantage of the engine power. It is an all-welded unit which is firmly supported by the robust and rigid separate chassis used for the successful Triumph Herald 1200 models.

The sharply downswept bonnet line is enhanced by bold stainless steel wing headings which cover the joint of the wing side panel to the centre panel. In the event of damage, this reduces replacement costs considerably by simplifying detachment and refitting of the wings.

The car is also given ample protection from impact by large chrome wrap-around bumpers, complete with overriders, which are mounted on sturdy crash bars.

The bonnet and front wings are assembled in one piece, and hinged at the front to give easy access to the engine and front suspension components. This system also ensures that the bonnet can never open accidentally to obscure vision.

The windscreen is deep, sharply raked, well wrapped round and detachable for sporting events. This will reduce the frontal area from 13.5 sq. ft. (1.25 sq.m.) to less than 10 sq. ft. (0.93 sq.m.) and the car weight by 30 lbs. (13.6 kg.). Zone safety glass is fitted to give a 16 in. x 6 in. (41 cms. x 15 cms.) area ahead of the driver which remains clear in the event of a breakage.

The doors are 34 ins. (86.4 cms.) wide to give easy access to twin body-shaped bucket seats, and are fitted with automatic

retainers. The side windows are of the wind-up type, running within nylon guides for smoothness, and fully retracting to enable the elbow to be rested comfortably on the door. There are outside door handles which are fully lockable.

At the rear of the car, a 1½ Mans-type, snap action, 2in. diameter, fuel filler gives access to the 9 gallon (41 litres) tank which is mounted as far forward as possible to minimise changes in the fore and aft weight.

The boot, sensibly designed to take most normal luggage, will hold 6.7 cubic feet (0.19 cu.m.) of luggage, an unusually large amount for a sports car and which can be almost doubled by using the 5 cu. ft. (0.14 cu.m.) space behind the seats.

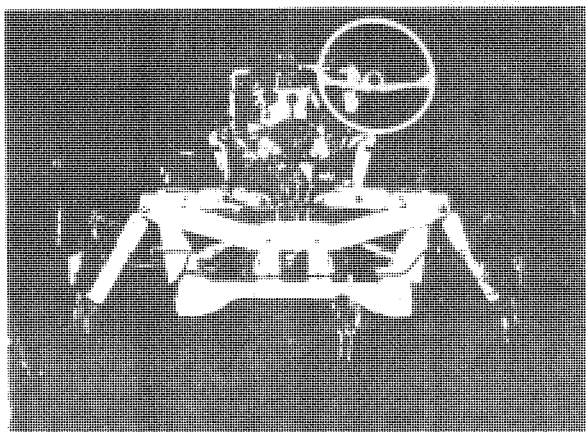
The power unit of the Spitfire is a twin carburettor version of the highly successful Herald 1200 unit which, with a 9 to 1 compression ratio, delivers 63 b.h.p. (nett) at 5750 r.p.m. This gives a maximum speed of between 91 and 93 m.p.h. (145-150 k.p.h.) and a 0-50 m.p.h. (0-80 k.p.h.) acceleration figure of only 12 seconds, while petrol consumption should be between 30 and 40 m.p.g. (7-9.5 litres/100 kilometres).

The Spitfire uses the same slick four-speed gearbox as the Triumph Herald 1200.

The Spitfire has four-wheel independent suspension, which coupled with the car's wide track and low overall height, gives it an extremely smooth ride and fantastic road adhesion even under the most violent driving conditions. To match this performance



The Spitfire chassis is in the great tradition of sports car design. Light, but incredibly strong, and braced at every stress-point to keep the Spitfire in shape throughout the hard life of a sports car. This chassis is a very strong reason why Spitfire drivers feel safe at the wheel.

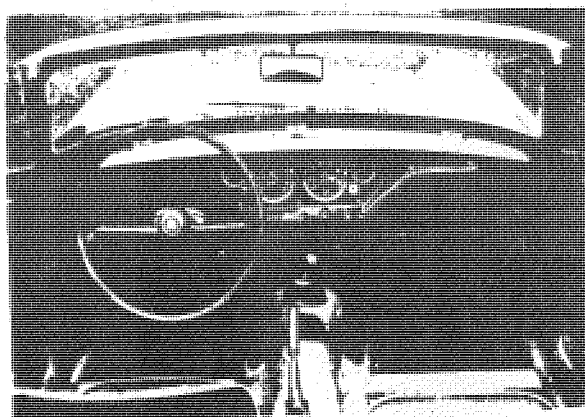


braking is provided by 9 inch caliper disc brakes at the front, with 7 inch diameter drum brakes of the leading and trailing shoe type on the rear wheels.

The car scores a world-wide first with its steering — at 24 feet, its turning circle is the smallest of any four-wheeled vehicle in the world, beating even the Herald 1200 in this respect. This feature gives unrivalled parking capability, traffic manoeuvrability and skid correction.

The steering system is of the rack and pinion type giving maximum directional control and extreme sensitivity. The system is also mounted on rubber to prevent the transmission of road shocks through the steering column.

The column is of the well-known Triumph "impactoscopic" type which collapses on impact. This device also allows of adjustment to individual choice — 4 inches fore and aft and 1 inch vertically.



The cockpit of the Spitfire is spacious. Wind-up windows leave the rushing wind swirls on the outside.

The Spitfire's hood is simple and neat — it provides a generous 35 inches (89 cm.) headroom when erect, but interferes in no way with carrying capacity when folded.

Internally the Spitfire is comprehensively equipped — the instrument panel, which is braced against vibration by a bracket between the floor and the fascia, includes a water temperature gauge, a fuel indicator, a revolution counter and a speedometer with trip. The lighting control lever, which is on the steering column also incorporates an instant daylight headlamp flasher.

The fascia panel also contains generous spaces for oddments and parcels, and a grab handle for the passenger.

The floor of the car is covered in moulded rubber, while the seats, made of durable leathercloth, have 12 fore and aft positions within a range of 71 inches (19 cms.). Leg room is generous — with the passenger seat in the fully forward position, even a six-footer can still sit with legs fully outstretched.

#### Car Performance

Acceleration	Speed Range	Time (secs.)
	20-40 m.p.h. (32-64 km.p.h.)	11.5
	30-50 m.p.h. (48-80 km.p.h.)	11.0
Top gear	40-60 m.p.h. (64-97 km.p.h.)	12.0
Through gears	0-50 m.p.h. (0-80 km.p.h.)	12.0
	0-60 m.p.h. (0-97 km.p.h.)	16.5
	Standing 1 mile	19.5
Maximum Speed	91-93 m.p.h. (147-150 km.p.h.)	depending upon conditions.
Braking	Maximum retardation .94 g. This is equivalent to stopping from 30 m.p.h. in approximately 32 ft.	
Transmission	Single dry plate 6 1/2 in. diameter. Hydraulically controlled.	
Clutch	Four forward speeds and reverse. Remote control gear lever centrally mounted behind gearbox.	
Gearbox	Synchromesh on 2nd, 3rd and top. Silent helical gears.	
Ratios	Top 3rd 2nd 1st & Rev.	
	1 1.39 2.16 3.75	
Overall ratios	4.11 5.73 8.87 15.40	
Propeller Shaft	All metal. Needle roller bearings.	
Rear Axle	Swing axle shafts. Axle centre rubber mounted.	
Drive Ratio	Hypoid bevel gears.	
Suspension	4.11	
Front	Independent suspension system with rubber bushed wishbone pivots. Patented screwed bottom bush (incorporating its own oil reservoir) and special wear-resisting top ball joint swivels. Coil springs controlled by telescopic type direct acting hydraulic dampers and anti-roll bar.	
Rear	Taper roller bearings in hub. Swing axle type independent suspension with transverse leaf spring and radius rods. Ball and needle roller bearings in hubs. Steel disc type.	
Wheels	Under frame portable jack.	
Jacking	Caliper disc brakes on front wheels, disc dia. 9". Drum brakes 7" dia. x 1 1/2" wide, of leading and trailing shoe type on rear wheels.	
Brakes	Front lining area 12 sq. in. Front swept area 144 sq. in. Rear lining area 34 sq. in. Rear swept area 55 sq. in. Total lining area 46 sq. in. Total swept area 199 sq. in. Pedal operates all four brakes hydraulically.	
Operation	Centrally mounted fly-off handlever operates rear brakes mechanically. Double backbone of closed channel section with channel outriggers.	
Frame	Rack and pinion type. Two spoke steering wheel 16" dia. Telescopic and collapsible type steering column, recommended adjustment ranges from 4" depressed to fully extended. Independent height adjustment through 1 1/2" 3/4" turns lock to lock.	
Steering	12 Volt, located under bonnet.	
Battery	Separate seats, adjustable fore and aft by easily operated control. Both seats tilt forward for access to rear compartment.	
Seating	Centrally grouped in instrument panel and comprising: Speedometer, Tachometer, Temperature Gauge, Fuel Gauge, Warning lights for main headlamp beam, Oil pressure and ignition are contained in speedometer dial.	
Instruments	Direction indicator warning light in fascia. Ignition lock, choke pull, screen wiper switch, side headlamps and instrument illumination master switch and screen washer push, located on fascia below instruments.	
Controls	Selection of main headlamp beam or dip by three position lever on steering col-	

#### Parcel and Luggage Accommodation

#### Locks

#### General Equipment

#### Interior

#### Exterior

umn, which incorporates a headlamp daylight flasher switch. Self-cancelling direction indicators controlled by lever on steering column. Horn push in steering wheel centre boss. Large lockable boot at rear. The spare wheel is housed on the boot floor. Luggage space behind rear seats and parcel tray below fascia.

When not in use, the hood may be stowed in Polythene bag in special compartment behind rear luggage space and hood sticks stowed above this and strapped in position. Driver's door locks externally and passenger's door internally.

Driving mirror. Passenger's grab handle. Ash tray in top fascia rail. Attachments for safety harnesses.

Lamps: Front: Flush fitting sealed beam headlamps incorporating pre-focus bulbs. Separate parking lamps and direction indicator flashers mounted below headlamps.

Rear: Integral rear lights, braking lamps and reflectors. Separate direction indicator flashers. Chromium plated number plate illumination lamp.

Self-parking twin electric screen wipers. Screen washer. Twin windone horns. Full width front bumper with chromium plated overriders. Wrap around rear bumpers with chromium plated overriders. Stainless steel wing finishing beads. Chromium plated nave plates. Tool roll, wheelbrace and jack. Spare wheel and tyre.

#### Interior Dimensions

centre of 71" travel:	In.	mm.
Seat width (each)	17	430
Seating width (between doors)	46 1/2	1180
Seat height front floor	21	535
Seat depth (fore and aft)	18 1/2	470
Head room from seat cushion	35	890
Steering wheel clearance from seat cushion	7	180
Steering wheel clearance from seat squab	18 1/2	465
Squab to clutch pedal	42 1/2	1085
Width of door opening at waist	28 1/2	725
Interior width between sills	45 1/2	1155
Maximum interior height	40	1015
Luggage space behind seats		
Length (mean)	13	330
Width between rear wheelarches	35 1/2	900
Height: Front (floor to top of seat squab)	21	535
Rear (floor to top of body)	20 1/2	525
Luggage Boot		
Height	14 1/2	370
Height above spare wheel	9	230
Depth (fore and aft)	20	510
Width	46 1/2	1185
Boot opening width	42	1065
Capacity	6.7 cu. ft.	19 cu. m.

#### Optional Items at Extra Cost

Heater and Demister.	Tonneau Cover.
Competition Dampers.	Wheel Rimbellishers.
Leather Seat Covering.	5.20-13 4 ply rated Whitewall Tyres.

#### STOP PRESS

Half way through the London Motor Show, the Spitfire has earned orders worth six million pounds, one and a half million of which come from Common Market Countries.

# THE TRIUMPH SPITFIRE

## Story Part I 1962 / 1964

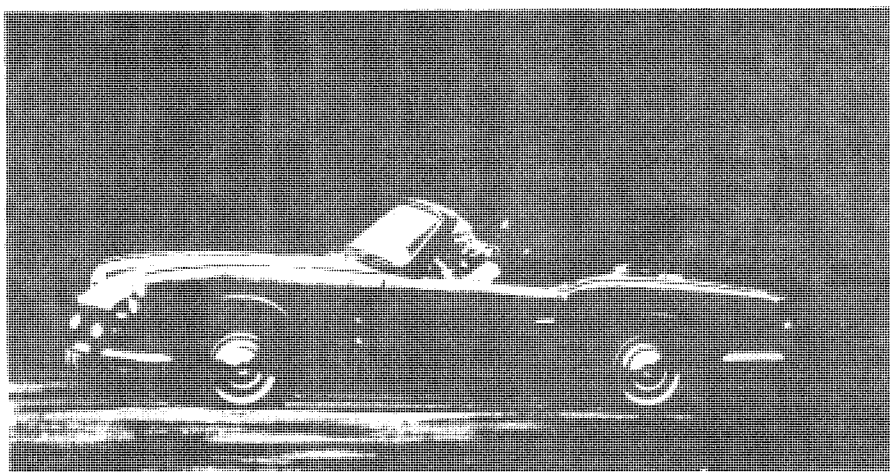
In 1961 the Standard-Triumph Motor Company decided that a new, cheap sports car was required to supplement the TR range. As the company was not in the best of financial situations, it was decided that existing mechanics would have to be employed and, if at all possible, some body panels as well.

The mechanics were to be used from the relatively new Triumph Herald, which had an engine dating back to the Standard 8. The car was to have a chassis which, at the time, was knocking progress on the head.

Then the job was given to the highly successful design firm, Giovanni Michelotti, who were already responsible for the TR's. The result was the original Spitfire 4 (meaning 4 cylinders). It was stylish, better looking than the rival Sprite and Midget and had a much more accessible engine, as the Herald bonnet principle had been employed.

The engine was basically a Herald 1200 with a toughened crank and a different camshaft. Twin SU carbs were used and this gave the car good acceleration. The interior was well trimmed and the instruments included a tachometer and a fly-off handbrake.

Performance was good with a maximum speed of 92 from 63bhp. The only flaw was the rear suspension, which was taken directly off the Herald. This meant that the rear wheels tucked in if corners were taken hastily. Nevertheless, the car was a success and in 1963 overdrive and a hardtop were offered as optional extras. The model was continued until 1964 when it was succeeded by the MK11.



New Triumph Spitfire 4  
takes the lead among light sports cars

## SPITFIRE TALK

The Herald family saloon was packed with revolutionary features and pioneered amongst other things the application of independent rear suspension to a popular British saloon. Even before the new cars were announced to the public existing production facilities were accurately forecast to be inadequate, hence the building of the three storey assembly factory at Canley. This was also to provide the home for a new two seater based on the Herald - the Spitfire. This car utilised a lot of the Herald components inheriting the saloon's tiny turning circle and generous luggage space.

Styled by the brilliant Giovanni Michelotti, the car first appeared at the London Motor Show in 1962 and was a stunningly good looking and an immediate success. Originally code named "Bomb" the actual name was not applied until late in the day and to quote Graham Robson, "caused controversy only among the dogooders, who thought that such a name would encourage furious driving among the new car's owners. Spitfire, in any case, evoked memories of RAF fighter aircraft in Britain and high spirited young ladies in North America".

The factory wanted to prove the worth of the Spitfire and they began to think about a competition programme. The MG and Austin-Healey Sprite were of course very much arch rivals and Triumphs wished to categorically demonstrate the superiority of their car. Triumph's Competitions Department were given a sizeable sum of money to plan for 1964 and beyond and, commencing at the end of 1963, a total of 9 very special Spitfires were set aside for a Race and Rally programme. Of course, the outcome is now history but as Graham Robson told us at the club's National Christmas Weekend event, January 1982, "the Spitfire was only beaten once in the whole of its works career by the Midgets and Sprites!".

Some of the major successes were as follows:-

### Rally Spitfires Alpine Rally 1964

ADU 7B Terry Hunter/Patrick Lier, 3rd in Class; Aaltonen's Works Mini won and Wadsworth's private Mini 2nd, (both running in modified "GT" form). Missed a Coupe des Alp by 1 minute.

### Tour de France 1964

ADU 7B Hobbie Slotemaker/Terry Hunter, 1st in Class, 5th on "GT" Handicap. 10th GT scratch.

### Paris 100 Km Race 1964

ADU 5B Jean-Francois Piot/Jean-Louis Marnat. 22nd overall, 1st in Class.

### Geneva Rally 1964

ADU 7B Terry Hunter/Patrick Lier. 2nd overall. 1st overall "GT" category. Also won team prize with help from a Swiss private entrant. Only beaten by Henri Greder's 4.7 litre Ford Falcon Sprint Saloon.

### Geneva Rally 1965

ADU 5B Jean-Jacques Thuner/John Gretener. 5th Overall and 1st in Class.

### Alpine Rally 1965

AVC 654B Simo Lampinen/Jyrki Ahava. 1st Overall Prototype category.

This was a sensational result as the Spitfires beat in the Prototype category Matra-Bonnets and even a 6-cylinder engined Porsche 904. The Spitfires were Prototypes as they were using the 1,296 c.c. engine which at the time had not even been released for the Triumph 1300 and was not available on the Spitfire road car until 1967. In this form they were producing approximately 110bhp plus and were accordingly quite formidable. Unfortunately, the international rally rules were to change outlawing the cars and this was therefore the last competitive outing for the Works Rally Spitfires.

## Race Spitfires

### Le Mans 1964

ADU 2B David Hobbs/Robbie Slotemaker. 21st Overall.

The car averaged 94.7mph achieved 133.5mph and beat the Works Sprite which finished 24th at 89.5mph.

### Sebring 1965

? Barker/Brian Feuerhelm. 2nd in Class. Bov Tullius/Charlie Gates. 3rd in Class.

### Le Mans 1965

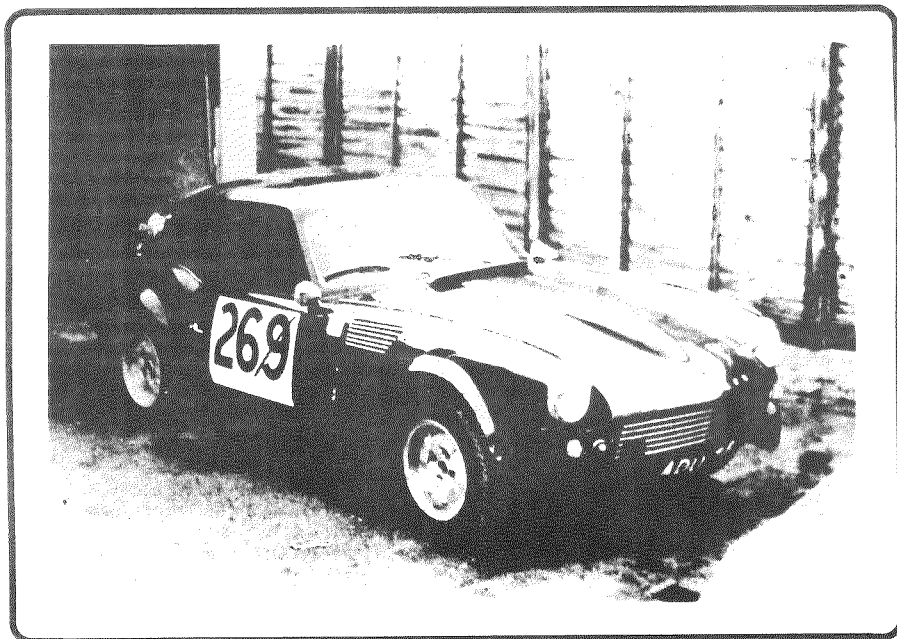
ADU 4B Jean-Jacques Thuner/Simo Lampinen. 1st in Class.

You will note that these were the Rally drivers and 4B was always thought of as the "Spare" car. It averaged 95.1mph, similar to the 1964 performance, but the top speed on the straight was up by perhaps 3 or 4mph.

The Spitfire, the MG Midget and the Austin-Healey Sprite provided a splendid opportunity for the young and not so young would-be racing drivers to take part in competitive events at low cost. The Spitfires unique turning circle has always particularly lent it to auto-tests, but its ruggedness and inbuilt reliability made it a successful motor car in any more prestigious racing events. Following the Works programme, people like Bill Bradley and Peter Cox raced ex-Works cars with considerable success. The TSSC in particular fortunate in having a very close association with the only two known Works cars left in existence - ADU 7B and ADU 8B, and I am in the process of preparing a definitive history of the Works cars, which hopefully will be published in the next 12 months.

If you've got a Spitfire, why don't you consider continuing its famous competition history by taking part in the TSSC Speed/Hillclimb/Sprint Championship?

By John Griffiths  
TSSC President



*Triumph Spitfire Mk 2—holds the road but hugs the corners!*

## Hairpins never trouble the Spitfire owner

*though he may have to sweep them out of the cockpit*

Without being the slightest bit ladylike, the Triumph Spitfire Mk 2 is a lady's car.

Not that the ladies go much for actually driving them, but you do see a lot of very talented passengers. Now why? What makes the Spitfire such a homage-wagon?

Possibly it's the way it reaches 90 mph with a deep, resonant purr—the sweet, unctuous sound of power.

Possibly even for is this just a boffin's

dream?) the girls appreciate the Spitfire's mechanical charms: four-wheel independent suspension; the chassis; the 24-foot turning circle.

Or maybe it's the PVC-covered bucket seats which hold them masterfully in snug reassurance.

But, you know what women are, probably they just like being seen in something that looks as if it came out of 'La Dolce Vita'. Not out of toyland.

Or... wait a minute. Go to the mirror. Open your shirt, ruffle your hair. You don't think it's got anything to do with the type of man that drives a Spitfire, do you?

TRIUMPH SPITFIRE MARK 2 C666.2.11  
HAROTOP MODEL 1699.19.7  
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## 100,000th Spitfire Leaves Coventry Factory



Number 100,000 at the end of the production line, with Mr. G. H. Turnbull sliding into the driving seat

Five years and four months after the model made its first public appearance, the 100,000th Triumph Spitfire rolled off the Coventry factory's assembly line in early February to mark yet another milestone in the history of Standard-Triumph. And although there was justifiable pride in this achievement, celebration of the event was kept to a minimum in a factory working at full stretch to meet demand.

Triumph's Director and General Manager, Mr. G. H. Turnbull, was there, relaxing for a few minutes, to drive the primrose Spitfire 3 off the track, and a small group of assembly workers gathered round. But within a very short time the affair was over and the track unaffected by the stoppage.

Although the reputation of Standard-Triumph as sports car manufacturer was made and consolidated by the famous TR series, the Spitfire was the first essay of the Company into the small sports car range.

The first of the marque, designated the Spitfire 4, appeared on the Company Stand at the 1962 Earls Court Motor Show, and was immediately a success. With the Show only five days old, it was announced that orders worth £6 million had been received from 144 of the 150 countries.

Designed and built on the basic Herald chassis design, the Spitfire was described as having 'aerodynamic lines to take full advantage of engine power'. It had the 1147 cc Herald engine and through the gears reached 50 mph in 12 seconds. It set a new standard of manoeuvrability by being the first four-wheeled vehicle to have a 24 ft turning circle, even tighter than the Herald.

Its successful introduction to the public was to begin five years of remarkable achievement. Within 12 months the Spitfire had become the first sports car to be used by a motoring school when it was chosen by Don Bernard of Bernard's School of Motoring, Leigh-on-Sea, as a vehicle for training learner drivers.

The same year, 1963, it was awarded the bronze medal in the Coachwork Competition at the Earls Court Show, appreciation being shown of its clean sporty lines.

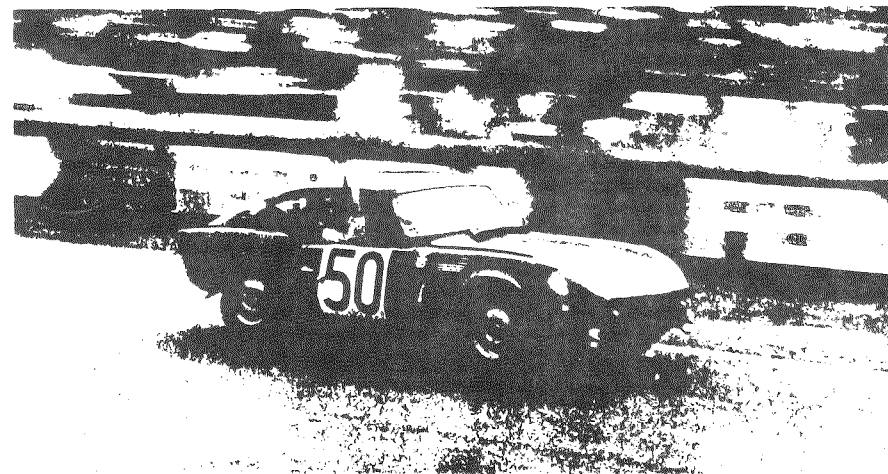
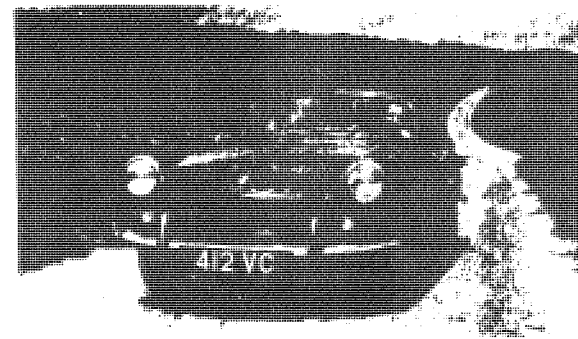
It was in 1964, however, that it began to make its mark in the competition world internationally. Stirling Moss chose a Spitfire for Valerie Prie to drive as one of the famous Stirling Moss Racing Team, and it was handed over

to her on May 1st.

In June three Spitfires were entered in the 24 Hours Du Mans, their first competition appearance, and with David Hobbs and Robbie Slotemaker sharing the driving a Spitfire was the second British car to finish having completed 2,270 miles (271 laps) at an average of over 100 mph for the full 24 hours of Le Mans. Another Spitfire, which unfortunately had to withdraw, driven by Phil and Marnat, set the best lap time for prototypes under 1300 cc.

Four Spitfires entered the Tour de France shortly afterwards, and in the 3,800 mile journey Slotemaker and Terry Hunter were first in the 1001-1300 cc GT class, Best British car in the GT category, fifth overall in the Handicap

The Spitfire 4 - forerunner of the 100,000



Success signal by David Hobbs on the Spitfire's first Le Mans appearance in 1964.

Event, and tenth in the overall placings.

In October, two Spitfires competed in the Geneva Rally and finished second overall (Hunter and Patrick Lier) and fifth overall (Jean-Jacques Thuner and John Greiner). They were first and second in the GT Category and first and second in the GT class 1001-1300 cc. Along with privately entered cars, who were fourth and fifth in Class, Spitfires won the team prize.

Other European successes that year included third in class in the Alpine Rally in June (Terry Hunter); first place in Coupe des Dames, Hiver Des Lions (Miles Schwartz and Senot), and first place Coupe des Dames, Elbeuf Rally (Miles Schwartz and Mme Vincent).

The Leyland-Swiss Racing Team,

Spitfire-equipped, made a startling success of their first entry into the Swiss Championship by winning six of the seven events in the GT Class (1000 to 1300 cc) five 'seconds' and five 'thirds'.

In America, where the Spitfire was still somewhat unique, the model won two of the ten SCCA Divisional Championships won by Triumph cars.

Also in the States, 1965 saw two Spitfires take second and third places in their Class at the Sebring Grand Prix of Endurance in March, just about the time the Spitfire Mk 2 was to make its appearance at the Geneva Motor Show.

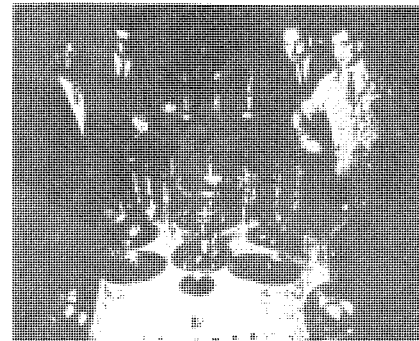
This new Spitfire, greatly modified comfort-wise, had improved performance from its 1147 cc engine. A new camshaft and novel fabricated exhaust

manifold raised the top speed to 96 mph and improved acceleration figures to 0-50 mph in 10 seconds. Other modifications included a no-loss cooling system and a diaphragm type clutch.

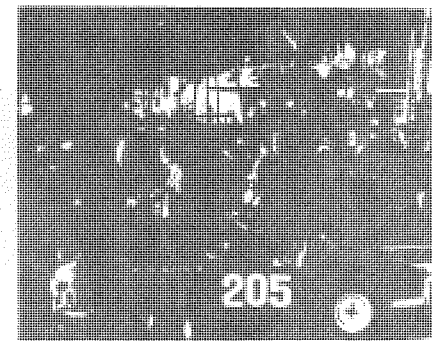
In Europe, Spitfires had gained second and third places in the 1001-1300 cc GT Class of the Monte Carlo Rally. Robbie Slotemaker and Alan Taylor receiving the Britax Award Fourth in Class was another Spitfire of the Leyland-Swiss Team.

So enthusiastic were the owners of Spitfires that in Britain a Spitfire Owners' Club was formed in the Manchester area early in 1965, and the Triumph Automobile Club of Holland entered a Spitfire in the Tulip Rally driven by Greenewegen and Lampien.

1964 trophies of the Leyland Swiss Racing Team. left to right: Binder, Muller, Rheiner and Thuner.



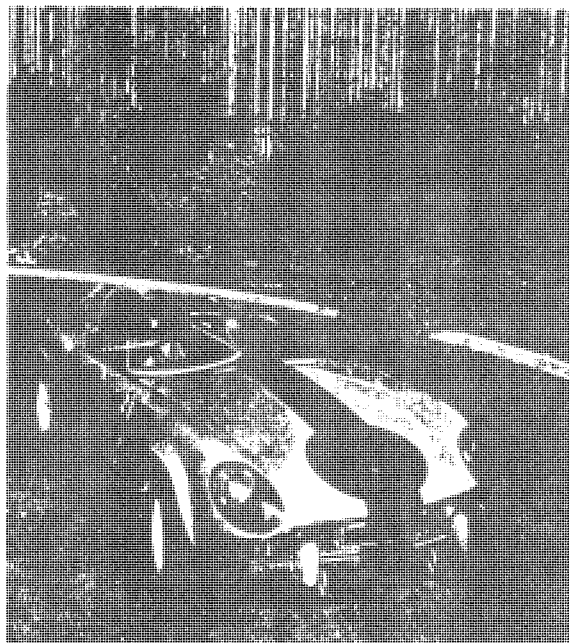
Thuner and Greiner complete the 1965 Monte.



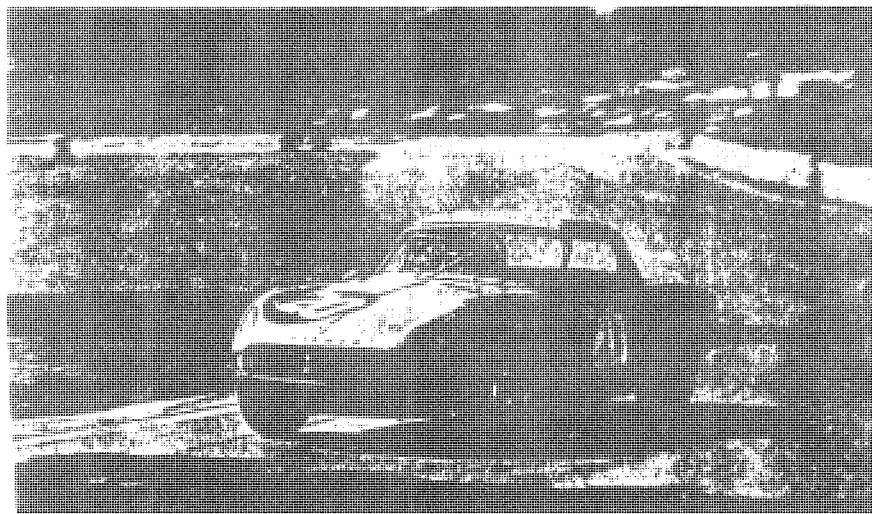


# MACAO SPITFIRE

A single-seat racing car prepared for the Macao Grand Prix in November, the unique Spitfire was 410 lb lighter than a production Mk. 2 and had the Le Mans Stage 2 engine, developing 108 bhp at 7,200 rpm. The rear end modified in fibre glass, had a headrest and fairing, and other major alterations were a 4:1:1 rear axle ratio, 22½ gallon fuel tank and 5½ J. magnesium alloy wheels.



Peter Cox at speed at Crystal Palace in the seventh round of the Dixon Trophy.



In June 1965 the Le Mans Race again saw the Spitfires harrrying the bigger competitors. Four Spitfires, the smallest cars in the race, made a remarkable impression, two finishing in fifth and sixth places overall in the GT category and first and second in the 1001-1300 cc Class. First home, Thuner and Simo Lampinen, completed 2,282 miles at an average of 95.07 mph. David Hobbs' Spitfire, which spun off in the 73rd lap, had the fastest lap time of 4 minutes 49.9 seconds, and topped 133 mph on the Mulsanne Straight.

Entered for the first time in the Sports and Prototype category, four Spitfires completed in the Alpine Rally of the same year. Driven by Lampinen and Jyrki Ahara and Thuner and Gretener, the cars were first and second in the 1001-1300 cc class.

In the States, Spitfires were first and second in Class G of the Kent (Washington) SCCA National Race at Pacific Railways, and were first in Class in September in the 9th Subida a Taffra Competition in the Canary Islands.

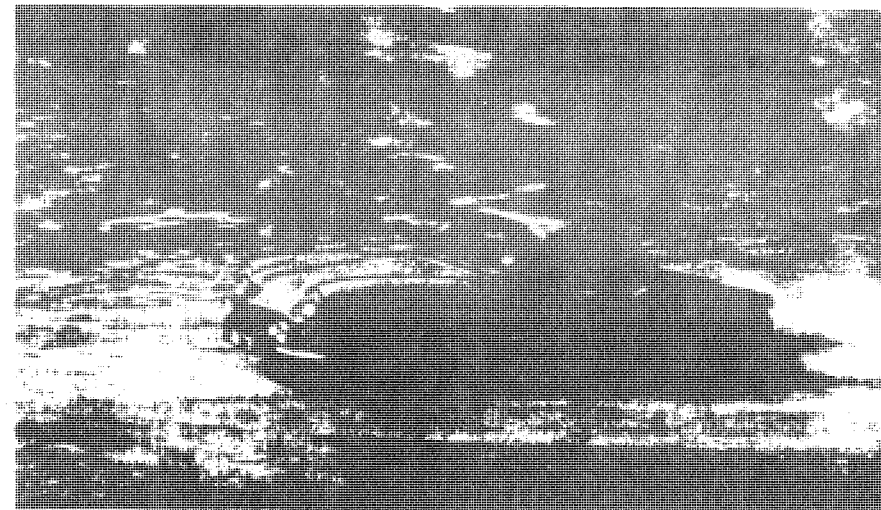
The only Triumph in the tough Jamaica Guards 500 mile Rally the same month, a Spitfire, became the first Sports Car ever to be overall winner, and driven by Bob West and Tony Ingelton, also notched first place in the Under 1250 cc Class.

In November of 1965 a completely unique Spitfire was introduced to the international scene. A single-seater finished in silver and black, it was built for the Macao Grand Prix and was to take fourth place. In the Automobile



Kas Kastner, Triumph's Competition Manager in the U.S., in dark glasses, at the scrutineering check for ground clearance before the Sebring Endurance Grand Prix in 1965.

At speed in the '64 Alpine Rally.





Club of Portugal's Trophy Race, also at Mucão, the Spitfire came home second and had the fastest official lap.

This year also saw the Leyland Swiss Team win outright nine of the eleven events, with an impressive list of 'seconds', 'thirds' and 'fourths' to add to the tally. Jean-Jacques Thuner, this year was second in the Swiss Championship.

1966, with the Spitfire now firmly established as a best-selling sports car, saw some respite from the competition field, but Thuner and Gretener were there again in the Geneva Rally to take first place in Class.

The Mk 2 was also to create considerable interest in Australia, where in February 1966, it made its first competition debut.

And to round off the year it was awarded the Coachwork Gold Medal at the Earls Court Show, was voted Best GT Sports car under \$2,500 by the American magazine 'Car and Driver', and was the best selling sports car in Europe. Not to mention the fact that Jean-Jacques Thuner became Swiss Champion by virtue of his successes driving a Spitfire of the Leyland-Swiss Team.

In March 1967 came the latest Spitfire, the Mk. 3. This time 100 mph was the top speed achieved by installing the successful 1296 cc engine, as used in the Triumph 1300, but in a modified form. Bhp was increased to 75 at 6,000 rpm, 8 bhp more than the Mk. 2 and 0-50 mph achieved in nine secs. To this was added a repositioned front bumper giving a more racy appearance; a foldaway hood and an improved interior and seating.

At the 1967 Motor Show, the Mk. 3 was awarded the coachwork bronze medal.

Towards the end of the year Peter Cox who has charge of the Competition Workshop at Standard-Triumph, Coventry, won the coveted F. W. Dixon Challenge Trophy of the BARC. The car? Valerie Pirie's Spitfire of the former Stirling Moss team, bought by Peter in 1966. So for one Spitfire at least, competition work had not ceased.

And for the record, the Spitfire is still selling at record rates, especially overseas where there is a healthy and continuing demand.

Of the first 100,000 Spitfires nearly 76,000 have been sold overseas. The US have taken 45,000 and Europe has accounted for a further 25,000 - over £30 million in foreign exchange.

100,000 is an outstanding figure - but if past records are to be considered as a pattern, for the Spitfire it could be only the start of even bigger things.

A Spitfire of the 'Ecurie Triumph' racing team of the New South Wales Branch of the TAA in Australia.



Robbie Slotemaker in his class winning Spitfire on the 1964 Tour de France.



Spitfire Mk. 3 first small sports car with 100 mph top speed.



## ANDREW TALBOT TRIUMPH FANATIC

Recently I had the pleasure of a Saturday afternoon with Mr Andrew Talbot at his 'Triumph Road and Race Tuning' workshop at Aston Lodge Yard, Aston Nr. Runcorn, Ches. Even on entering the 'yard', a courtyard of an old Cheshire Farmhouse, I knew I was definitely in the right place. Triumphs of every shape and size were to be seen everywhere in various states of dismantlement. Almost as far as the eye could see were Heralds, Vitesse, Spitfires, Toledos, 2000's and a Fiat! They even had a history - 'this Spitfire belonged to by ex-girlfriend' or 'I used to drive this Vitesse', pointing to a rusty hulk just outside the workshop. Of course the thought of Andrew Talbot driving anything other than a Triumph anyway .....

Andrew Talbot, who was unavailable in the morning - 'I always lie in on Saturday mornings', agreed to meet me either in the Pub at lunchtime or at his yard at 2.00 O'clock. When I arrived in my multicoloured GT6 with fellow GT6 owner and club member Dave Hughes, he was not to be seen. However, we soon found him at his house down the road and we followed him and his dog, back to the yard. We were then given a guided tour of the premises. On the wall of the main workshop were photographs taken during his modsports racing career when he raced Spitfires and a GT6 and Herald from 1968 till 1975. The Herald nearly brought a sad demise to his career as an unfortunate incident led to the backs of both the car and Mr Talbot being broken (it landed on its roof). After several months in hospital, he returned to the poor car to salvage what parts he could but not to racing 'owing to lack of finance' as he had made a full recovery.

Mr Talbot's ability to 'lap Midgets' with his self prepared Spitfire brought him to the attention of the Triumph factory. He had 'numerous parts from the Le Mans projects including a bodyshell for the extra-wide GT6 1966 Le Mans prototype, which was stopped by Donald Stokes in his 'motor racing does nothing for selling motor cars' campaign. He also has engines, original body moulds and some alloy panels. Most of the alloy body panels were destroyed and sold for scrap! The extra-wide GT6, cut down the middle with a 6" wide section put in a a-la Morris Minor, stands forlornly in the corner of a dark, cold shed. When I tried to take a photograph in these conditions, even with fast film and a wide-angle lens, he kindly insisted on wheeling the car outside (on its competition chassis) even though there were no wheels and a rusting hulk lay outside the shed door. We dragged this away, opened the door and carried it out (it was fairly light, being of fibreglass construction). After attaching a door with masking tape, and propping a wheel inside the wheelarch, Andrew at last allowed me to take photographs. I have never seen a Le Mans Spitfire before but I was impressed by the extra-side rear wings and the steeply raked windscreen.

During Andrew Talbot's racing career he occasionally saw a Le Mans Spitfire but it was non original apart from the engine and log-book. The problem was that Triumph, tended to use the same log-book for various cars and damaged cars were often sold, but never with log-books. Unfortunately without a genuine log-book, he has no chance of building a Le Mans car in spite of the fact that he has more genuine parts than most of the other documented 'Le Mans cars'. If he built one, the Historic Sports Car Club would not accept it. Eventually Andrew hopes to build it into a road car with a Dolomite engine, although it has no windshield (they are non standard) and the bonnet is missing. He could make a replica bonnet out of fibreglass, his speciality.

Fibreglass is now Andrew Talbot's main business. As someone not overimpressed with fibreglass, I was very impressed with the quality of his mouldings. They are accurate, being made from panels removed from the collection in the yard, and thicker and stronger than those I have seen before. Most of his customers own MKIV Spitfires (his double skinned valances are superb) but he can supply ANY panel for any Spitfire or GT6. Complete bodysells have been made to order, and from his racing experience he assures me that they would probably be as strong as steel. One item I liked was the extra-wide rear wing based on the Le Mans. Prices are competitive and any panel can be fitted on the premises. For example, Spitfire MKIV & valances are £21, rear body sections (wings, rear deck, rear panel) also for MKIV are £85. Any member contemplating using fibreglass would be well advised to send for his price list.

In his workshop we were shown a Spitfire being rebuilt for racing, for a customer I hasten to add. When I asked what was done with the rear suspension his reply was simply 'we throw it away'. Apparently the rears of racing Spitfires are converted to a type of wishbone system similar to the GT6. A couple of filing cabinets contained no files, but piles of special cylinder heads and other engine bits. These were developed, no doubt at great expense, by Triumphs for their Competition Department and were recovered literally from the dustbin.

Andrew Talbot now uses a Dolomite. 'The engine is 100% reliable'. The secret is to torque down the cylinder head properly, something Triumph dealers would not do. It would be nice if he could put his wide GT6 fitted with such an engine on the road. Unfortunately, Triumph never got around to making a windscreen and to have one specially would cost a lot of money. Any donations gratefully recieved, or alternatively let us give him our fibreglass replacement panel business!

PATRICK FALEUR



Spitfire Le Mans Success

Evolved A Worthy Brother

## GEAR BOX FUN ON SPITFIRE Mk.III

When I kept finding odd nuts and bolts in my lap after every drive, (they were traced to fascia and parcel tray fixings) it seemed I would put off no longer the search for the cause of my vibrations.

"How do you know the wheels are balanced?"

"Are you happy about the engine mounts?"

"How much wear is there in the universals?"

Questions, questions. It's funny how friends think it's helpful to ask another question in reply to yours.

Yes, I got the wheels balanced. Yes, I splashed out on a complete set of engine mounts, (rear in stock, two weeks wait for front). Yes, I laid under my car to waggle my universals. All to no avail.

"Run the wheels while on the jack", someone said.

"Lying on my back? - You must be joking", I said.

Then lo! A colleague offered his pit for this dubious test. So I did run the wheels on a jack and yes, the vibration could be felt and heard but located? I'm not so sure.

The prop. certainly looked to be running off centre (eccentric I think the term is) when viewed from the rear but why? No slack could be detected in either end joint. Closer inspection revealed the sliding joint dust cap loose and play was then found between the sliding shaft end and the main tube. Had the cause been found? Well, perhaps but what to do?

Previous to all these goings-on I had located a MKIII at a scrapyard almost complete, the seat runners were my prize on that occasion, together with the starter motor, one rear bumper and various bits, £6 well spent.

A trip was made and with carpets and gearbox cover removed when aha! The gearbox was fitted with an overdrive (mine wasn't!) - different propshaft!

"How much for the gearbox off the Spitfire, John?"

Oh! That one with overdrive?" (blast, he knew) "Good unit that, knew the last owner well, forty quid to you."

"I'll need the propshaft as well." Says I.

"No problem" says he "you can have it for a tenner."

Hmm! £50 - seems a lot to me. Overdrive would be nice and if the vibration is cured ....

"Yes OK" I says.

If any of you have tried to remove a gearbox single-handed, in the rain (not pouring hard mind you, just an unpleasant drizzle - you get just as wet in the end but it takes longer), with the car on top of four others, with its chassis resting on the roof underneath you have my sympathy. Anyway, I did it. Got home late for tea, filthy, oily and drown-rat-wet. Never mind, it would be worth it, I thought hopefully.

Alright, stop panicking you experts, I did remember to bring back the column switch, relay and wiring bits. Even got the rear mounting bracket - I had done my homework with a borrowed workshop manual.

Fitting occupied most of one weekend with no real problems. Electrics were a bit of a puzzle at first - take no notice of the diagram in the official manual in the overdrive section, diagram under electrics is OK.

A quick test drive late Saturday and yes the vibration was gone. Yes, also the overdrive worked. But, oh dear, third gear - it stayed in but what a noise!

So what now? Don't panic, take stock. I said to myself (just cry maybe). I listed the options:-

1. Fit old box and look for another prop.
2. Buy exchange box adapted for overdrive - quoted at £75.
3. Get gearbox specialist to swap boxes over if possible. Telephone quote again £75.
4. Hope noise goes away, some hope.
5. Do swap over myself (manual full of special tools and warnings for the inexperienced, (me)).



6. Persuade experienced friend to help in option 5. Father-in-law seemed willing.

This last option appeared best and cheapest. (How much did you pay? Friends asked incredulously).

"Bring me your old box - clean - and I'll see what it's like." Says my F.I.L.

This was done and the box announced fit. Special tools. Huh! A light tap on a brass rod and out the bearings came, circlip? Not so easy but bent wire and narrow screwdrivers did wonders.

How the crunch came.

"Take out your new box and overdrive and bring it over." He said.

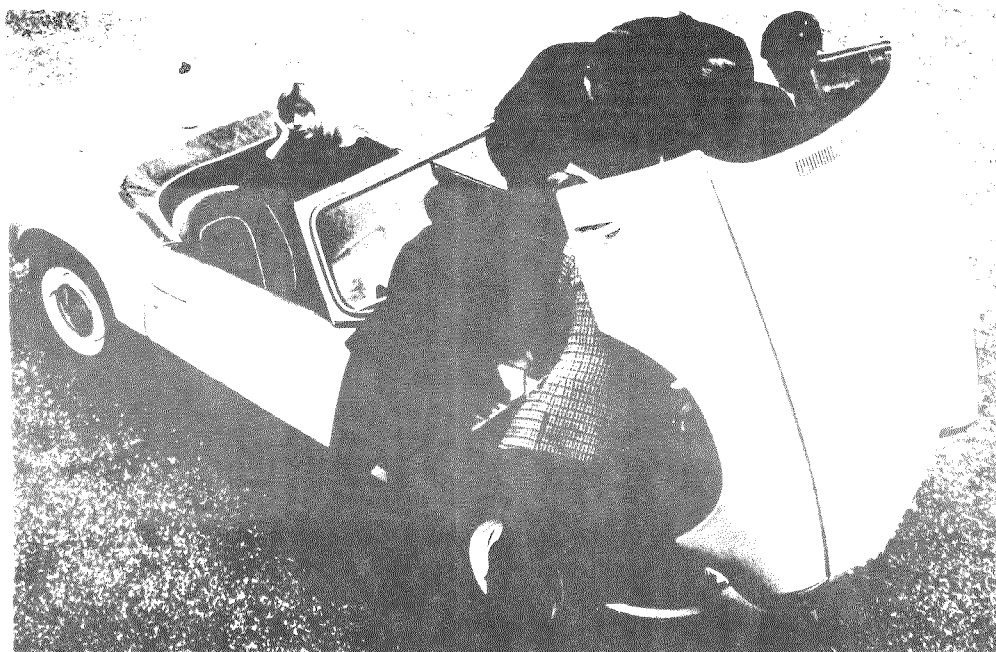
Quickly becoming the expert, three hours later the overdrive and gearbox were out and on the bench. All was soon revealed. Third gearwheel on the mainshaft was very wobbly and third gearwheel on the countershaft needed more than dentistry to mend those broken teeth. The rest of the box? Well, bits of steel floating around had taken their toll but was the mainshaft OK? (The only real difference between the two boxes). A complete strip by me now. (watching and learning but doing more so) revealed shaft to be fine. So simple swop? Well nearly. Finally, all was ready to go back in. In it went, no trouble and worked - yes worked. No vibration. No noisy third, no snatch on overdrive engagement. Everything smooth and quiet - so far. Fingers crossed.

So, if any of you are thinking of taking the plunge and playing with your gearbox, I say go ahead, you'll probably be as surprised as me when you see the size of it with bell housing and extension removed.

Finally, remember, the dividing line between experience and inexperience is having done it - even once. So go ahead, I did.

DAVID ROBINSON

## Triumph introduce the new Spitfire Mark 3 The big news is under the bonnet!



## SPITFIRE - Some aspects of tuning

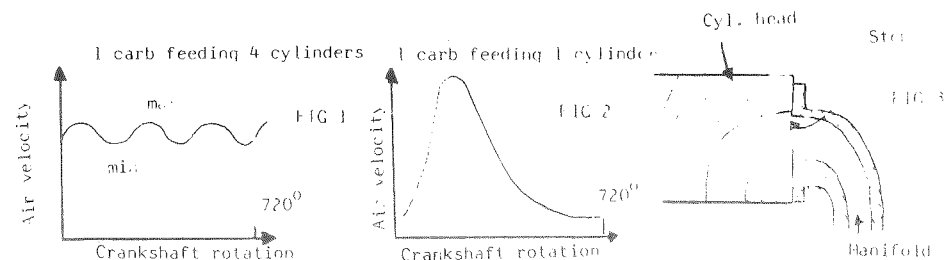
Tuning the Spitfire seems rather like a dying country craft nowadays. The 'trades' enthusiasm to supply tuning goodies petered out in the early eventies, leaving SAH and a handful of smaller tuners to keep things alive. SAH remain to this day as the prominent specialist, operating from Park Street, West Luton, Beds.

This article does not set out to explain each step in tuning an engine; instead it looks at what can be done, why it is done and what is available, whilst at the same time, illustrating a few minor modifications which can be handled by the raw beginner. It is hoped that the following information will put the enthusiast in a better position to discuss specific requirements with a suitable supplier/tuning specialist.

Tuning a car encompasses not only the engine but the drivetrain, suspension, brakes, bodywork and instruments. Let's look first at the engine in three sections:- 1. getting the air/fuel mixture in, 2. exploding the mixture to produce the power, 3. getting the burnt gas out. Inefficiency in any one of these sections will impair the performance of the remaining two, it therefore goes without saying, that all three must receive attention when tuning.

When considering a tune-up, it must be realised that the internal combustion engine is a grossly inefficient device, producing usable power between certain rev. limits; and whilst tuning increases, the maximum power available, that range of usable power becomes smaller and moves higher up the rev. scale. Hence the familiar characteristics of a tuned engine - needing to rev high and being difficult to drive in traffic where a wide, flexible power range is required.

Spitfire carburation was restricted in the interests of fuel economy, it therefore follows that the engine can take more, provided inlet and exhaust gas passages are improved too. On a four cylinder engine with single carb, each cylinder draws air through the carburettor in turn, therefore the air velocity through the carb rises and falls in a series of pulses (fig.1). On the Spitfire, where one carb. feeds only two cylinders, the pulses through each carb are less frequent and the difference between minimum and maximum air velocity is increased. If one carb is fitted to each cylinder, then the frequency of pulses is halved again, with a subsequent increase in maximum air velocity. From fig (2), it can be seen that air/fuel mixture now rushes through the carb. with a sudden increase in velocity compared to the smaller and more gradual increase when one carburettor serves four cylinders. This sudden surge to a high velocity air supply is ideal from an efficiency point of view and is the main reason for multiple carburation. Of course, four carburettors cannot be fitted to a Spitfire head, the answer being to fit a pair of twin-choke Weber carbs - the Weber being in effect, two carburettors in one. Simply fitting a larger pair of SU carbs will achieve little.



The design, and in particular the length, of the inlet manifold, affects the engine speed at which the previously mentioned 'surge' is greatest. It also affects fuel consumption. Both exhaust and inlet manifolds are castings, the bores of which do not match up perfectly with the ports in the cylinder head and a step is produced in the gas path, see fig (3). This causes turbulence which subsequently slows down the passage of gas. Further restriction is provided by the very rough, cast surface in the bores. The internal surfaces can be polished smooth with emery, etc., (just smooth to the touch - no need



for mirror finish); while the manifold openings are matched up to the cylinder head ports by grinding or filing away any steps as follows:-

Place a thin white card over the ports on the cylinder head and push some studs through the card into the tapped holes to hold it in position. Rub a pencil along the card to reproduce the outline of the ports, then remove the card and very carefully cut out the shapes of the ports. The card is then placed onto the manifold (once again held with studs), so the shape of the head ports can be marked against the manifold ports. Where the card cut-outs are larger, the manifold ports can be carefully enlarged to match. The head ports should also be polished smooth but not enlarged and machining marks can be polished out of the combustion chamber. This process of 'gas-flowing' will produce around 3bhp extra and give better 'part-throttle' fuel consumption.

The inlet ports will take some enlargement but such work goes hand in hand with fitting larger inlet valves, re-shaping and enlarging the combustion chamber around the inlet valves and raising the compression ratio. This type of work is best left to the specialist who can modify your own head or sell an exchange modified version. A different camshaft will take advantage of such refinements and change the engine's characteristics by opening the valves further or for a longer period, or by a combination of both. To cope with this treatment, stronger valve springs are fitted, indeed, if the rev. range is to be increased after tuning, then stronger springs are required to prevent valve bounce. The disadvantages of stronger springs are that they accelerate wear on the cam and cam-followers and absorb a little more of the engine's power, therefore it is usual to fit the weakest springs possible that will prevent valve bounce. Here again, the advice of a specialist should be taken and the appropriate springs should be purchased along with the new camshaft.

Compression ratio is increased by removing metal from the underside of the head, using a 'surface grinding' machine, after calculating the amount to be removed for the desired compression ratio. This is done by filling the inverted combustion chamber with a suitably fluid, oil/paraffin mixture from a burette. The volume of fluid used is the volume of the combustion chamber. This volume must be reduced to increase the compression ratio and the new volume is obtained from the formula:-

$$\frac{V}{\text{CR}1} = \frac{\text{SV}}{4} \quad \text{Where SV is the Swept Volume per cylinder (i.e. 1147cc)} = 289\text{cc}$$

As an example, if a compression ratio of 10:1 is required on an 1147cc engine, then

$$\frac{V}{10-1} = \frac{289}{9} = 32.1\text{cc}$$

From this we must subtract the volume remaining between the block face and the piston when at the top of it's stroke, and also the volume formed by the thickness of the compressed head gasket (see fig 4). We now have the new volume for the combustion chamber and, once again with the head inverted, this volume of fluid is poured into the chamber from the burette. The level is now below the face of the cylinder head and the distance between the surface and the liquid level is carefully measured. This distance is the amount which needs to be machined off the cylinder head to achieve the desired CR.

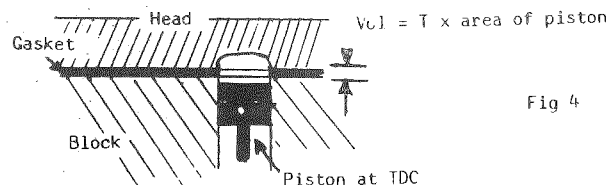


Fig 4

MK1 and 11 Spitfires are suitable for compression ratios up to 10:1, whilst later engines will take 11:1. Once skimmed, the head will sit slightly lower, leaving the push rods too long. To counteract this, shims equal in thickness to the amount skimmed from the head, are fitted under the rocker pedestals to lift the rockers back to their

original height. The higher compression ratio takes advantage of improved air/fuel supply and exhaust extraction by allowing the mixture a greater expansion range after ignition, which produces more work at the piston. It also changes the way the fuel is burnt, causing higher temperatures and 'knocking', the latter being accounted for by using a higher octane fuel or alterations to ignition timing or both. (In the absence of high octan petrol, 'Octane Booster' is suitable).

Since a higher CR will exert greater strain on bearings, big end bolts, valve gear etc., the engine must be in good condition before such modifications are carried out. Likewise, the structure of the car must be capable of taking extra strain. The 1300 engine is stronger for this purpose as is the 1500, though the latter, with it's long stroke is not capable of such high revs., leaving the 1300 more suitable for tuning. With a balanced crankshaft and better bearings, the 1300 engine will rev to around 7,000 rpm. MK1 engines can be strengthened by fitting MK11 bottom end and pistons but apart from this, there are no design weaknesses. Engine balancing helps considerably. The clutch, flywheel and crankshaft are professionally balanced as an assembly, whilst the con-rods and pistons can be matched to the nearest gram using a chemists scale. Select the lightest component and remove material from the remainder until all are equal. Whilst balancing, the flywheel can be lightened to improve acceleration in the low gears - at the expense of smooth running but this is not a job for the amateur.

Bearing wear will be reduced by the correct use of an oil cooler but this should be supplemented with an oil temperature gauge since over cooling of the oil can also create problems. Ideal temperature is around 85 deg. C.

Overheating of the cylinder head can be expected if the cooling system is not in Al condition. A Kenlows electric fan is useful and will release around 8bhp extra to the road wheels.

The exhaust system can be greatly improved and the MK1 Spitfire will benefit from a four branch manifold, later models having this as standard. All variants are improved by fitting an SAH manifold, particularly when coupled up to the SAH exhaust and silencer system. The standard silencer absorbs considerable power because the gas passage is restricted by baffles, unlike the tuned system in which the silencer is of the 'Straight through' type.

Some improvement in braking and handling will be required. Again, SAH can help with handling by way of uprated front road springs and a negative camber rear leaf spring. Lowering the Spitfire does not improve roadholding and turning leaves upside down on the rear spring to achieve camber changes is not recommended.

The standard wheels leave a lot to be desired width-wise however, GT6/Vitesse 4J rims can be fitted, and even 5½" wheels (depending on tyre selection), without modifications to bodywork. Early MK1V cars can be made to handle superbly by fitting 165 Radials to the standard rims and using wheel spacers all round with standard suspension. Adjustable dampers all round will improve cornering stability on all models.

Spitfire braking is generally good, requiring only a set of hard linings and a strong foot for most tuning applications. A servo will help but will reduce the amount of 'feel' in the brake pedal.

One last point is that of insurance. All modifications should be declared as otherwise, they could render the policy invalid. In fact, if any form of tuning is contemplated, the insurers should be consulted first to check their reaction and any rise in premium.

EDDIE EVANS  
TECHNICAL SECRETARY

# Love At First Sight

I thought members might be interested to see these snaps of my first car. As you see, the car is a 1949 Triumph Roadster, bought for £125 in 1959, from a dealer in the Govan Road area, Glasgow.

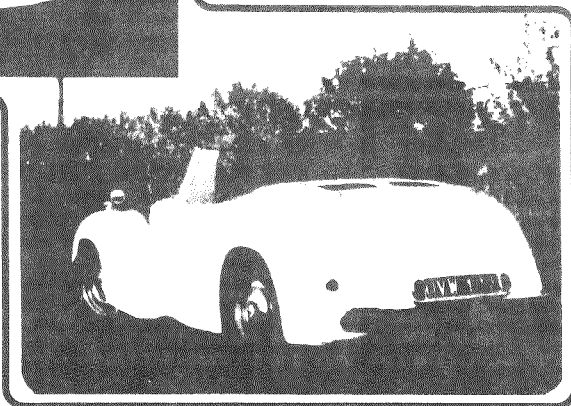
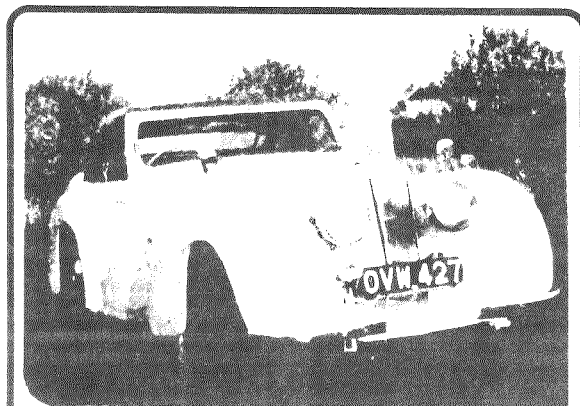
Watching 'Bergerac' Sunday nights on TV, my misspent youth comes flooding back. Ah! The romance of it all; those far off sunny summer days, flying down to the Ayrshire coast, hood down, girlfriend of the month, wind rushing through my hair - and the hole in the floor behind the Driver's seat. What a car, what a girl friend, what a hair-piece!

I won't go into all the technical details of the car (or the girlfriend) but several points I found very pleasing. For example, the press button starter, three windscreen wipers which could be operated manually from the dash if the motor failed, the long, sleek, elegant lines (sorry, that was the girlfriend), the suicide doors, the flick-up trafficators, the fold-up windscreen which formed part of the boot lid. I could go on forever about the roadster but I know there is not the space.

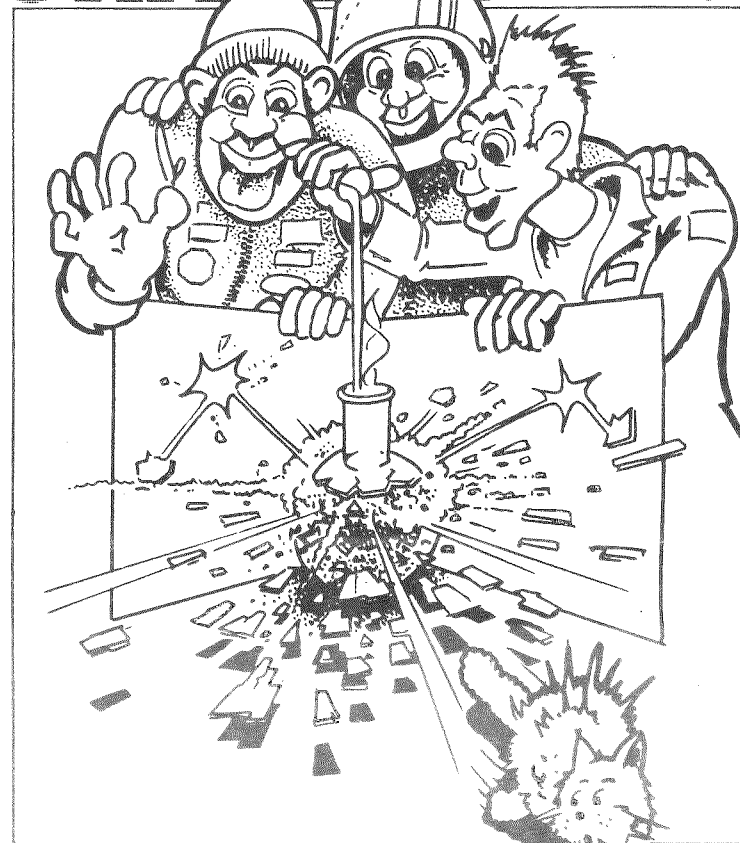
After nearly three years of trouble-free ownership, I tried to sell her to one of Scotland's main Ford Dealers. He gave me ten seconds to get off his forecourt! Another one offered me his service revolver to end it all. I finally sold it to my big brother for £60, from there she disappeared into the mists of the local scrap-yard.

The Roadster was the first of 14 Triumphs, and the best out of a total of 40 cars I've had the pleasure of owning. From that you will have gathered that I'm interested in cars but my loyalty has remained with Triumphs.

JIM DONNELLY



# BURNING DESIRE



*Octane boosters are coming back with a bang (as it were), and now you can run those high compression ratios once again. But that's not all...*

## A CCC investigation

Watching TV or listening to the radio, it seems that the news broadcasts always have something that affects all of us in some adverse way.

The bad news (about two years ago) was the axing of 5-star 100 octane fuel, and many cars which were designed to run on 5-star fuel had to be re-tuned out of a detonation situation and to accept 4-star, which is, typically, around 97 octane. Most of the re-tuning took the form of ignition retarding and richening-up the mixture to eliminate detonation, but whichever way you look at it, performance was lost. Professional engine builders, putting together competition engines or

high performance road engines, came to terms with the octane reduction by virtue of two factors. Firstly, we find that, traditionally, British race engine builders are more conservative than most

**A cool-running engine can beneficially utilize 14/1 on 100+ octane fuel.**

of their foreign counterparts when it comes to deciding what compression ratio to use for a given application. Here, an example may serve to illustrate the point. A cool-running race 'A' Series engine can beneficially utilize a 14/1 CR on 100+ octane

fuel, yet most British engine builders will run CRs in the 13 - 13.3 range. In other words, they are using a ratio below that which could safely be used.

When the octane reduction was brought about, a lot of engine builders made marginal drops in their CR ranging between nothing to about half-a-ratio, depending on how high they were going before. Now, a common CR for 97 octane fuel for a Series 'A' engine, is typically around 12.7 - 13/1. At this point, things don't look too bad, but there is more to it than meets the eye. Whereas most engine builders had almost a whole ratio buffer between them and possible de-

tonation; now, on 97 octane fuel, they may have half-a-ratio or less buffer between them and certain detonation.

Talking recently to some race engine builders involved in build-

**Metro Challenge cars will be the first to run into detonation, but a whole load of other race machinery will be close on their heels.**

ing the Metro Challenge cars, I noticed that all of them, without exception, had experienced detonation whilst dyno testing, and all had to make a concession, by

one form or another, to delay the effects of detonation. The Metro Challenge cars are just the tip of the iceberg. Not unexpectedly, because of their heated intake manifolds, the Metro Challenge cars are going to be the first to run into detonation problems, but there will be a load of machinery close on their heels. If CRs have to be lowered much below their present level, horsepower will drop quite substantially. Remember, in order to make a race car work the engine must have a high CR. The difference between an engine running at, say 10/1 and 13/1 on a race cam, can be as much as 15% of the power output.

On a rally car, which has silencers to contend with, we find that dropping the CR can really spoil the power of the lower RPM range at which the motor just comes on the cam. Apart from this, it is also likely to sap a good proportion of the top end power. The net result is that the driver is going to be busier with the gear lever.

If the possibility of having to accept reduced power outputs sounds disheartening to you, then here's the rest of the bad news that I hinted about at the beginning of the story: several fuel companies have announced they are going to make further cuts in the lead content of their pump fuel. This means we can expect another drop in octane. It is not unreasonable to assume that our fuel supply will, in terms of octane levels, probably closely parallel that of the USA, and if you look at the accompanying graph, you will see that octane levels have plummeted in the States.

Sure, it's not likely to happen as quickly here, because of certain emission regulations which are only enforced in the States. However, it has been established that fuel of around 92 octane (RON) gives the best mileage per barrel of crude oil, so both car manufacturers and fuel companies are aiming at reducing octane requirements and availability to this figure. If this comes about, you can expect to go to the petrol station and buy one octane level of fuel only, and that'll be 92. It need not be pointed out that 92 octane is not going to cut it for a high performance engine.

## Booster

So much for the bad news. Now for the good. Aldon Automotive Ltd., Brierley Hill, W. Midlands DY5 3JZ (Tel: 0384-785081) have an octane booster that really works. We stress "really works", because through our various contacts at Universities and in the industry, we have managed to get a variety of so-called octane boosters tested. Most of these are not available on the UK market, which, in some cases, is very fortunate because they simply did not produce the results claimed of them. An octane booster which produces half of a tenth of an octane increase is hardly worth having. On the other hand, the Aldon product does produce positive results. Just how much octane increase it gives, varies from fuel to

fuel. When used in the prescribed dose of 1-litre per 20 gallons, and tested in a variety of 4-star fuels, the worst result was to produce a fuel with an octane rating of 99.7, but the best figure achieved was 100.4. Slightly over-dosing at the rate of 1-litre per 14 gallons and tested in a high compression, high performance engine, the octane is up to an equivalent of about 101. At this point, no further.

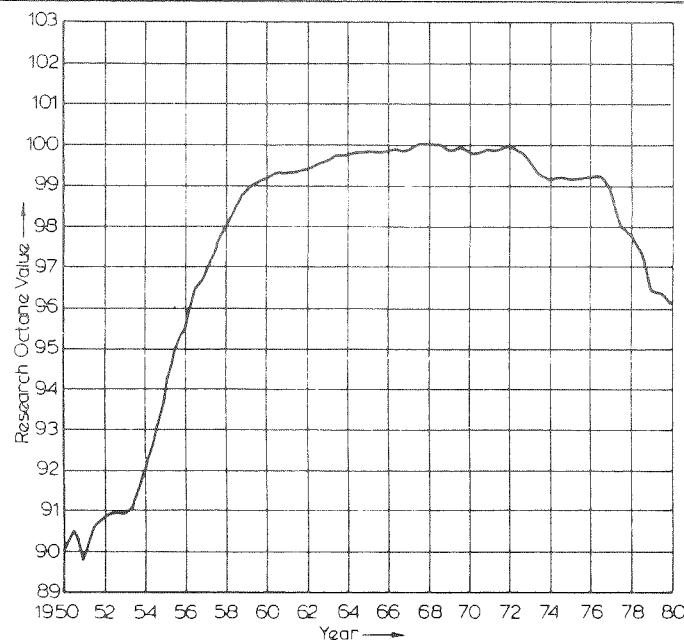
## The less lead, the better Aldon's octane booster works.

or increases in booster concentration did anything to further increase the octane level. This means that by treating currently available 4-star, the very least that can be achieved is an octane level equivalent to the old 5-star, and in many cases the octane level can be pushed a useful amount above the old 5-star.

Okay, so what does this mean to the competitive driver? Well, if you are involved in drag racing, sprinting or hillclimbing, new regulations this year indicate that you can legally use an octane booster in your petrol. This is good news for an engine which doesn't suffer heat soak because it's used only for the short duration of its runs. The CR can be put up, usually to about half-a-ratio higher than would be the case for, say, a circuit race engine.

It is often reported that CRs much over 13/1 don't do too much for horsepower. This may

The graph below shows how the octane value of forecourt fuel has varied over the past three decades. Fuels in the U.K. have tended to follow a similar sort of trend. Though octane levels are not likely to plummet quite as fast as they have done in the States during the past five years, a steady decline can more or less be expected.



be so when short-period cams are used, but there are very sound engineering reasons why long period cams need higher compressions. To give you an idea of what can be achieved, some dyno figures from a 2-litre single overhead cam Ford engine may serve to illustrate the point.

The fuel involved was of 102 octane. The engine was race-tuned employing a cam with 322° timing. That's a couple of degrees more than something like a Cosworth A8. During development of the engine, the CR was progressively raised until no further power increases were found. Going from 13/1 to 14.5/1 resulted in a 10hp increase. A CR of 15/1 was tried but no measurable gains were found, either because the engine did not want any more CR or because it was on the verge of detonation. In other words, trace detonation had possibly just set in. I'm not saying every engine can stand that sort of CR, but certainly the majority of engines racing these days can withstand more compression than they are actually using. Just how much power can be realised will depend upon the engine in question.

So much for hill climb engines. How about circuit race engines? Here we have a slightly different set of parameters. It would appear that anything which improves the octane is not allowed in circuit racing, as yet. However, looking at it from the competitor's point of view, if our engine

suffers detonation, who picks up the bill for new pistons? It isn't the RAC, it's the racer.

As it happens, Aldon's octane booster is made up of hydro carbon derivatives. Therefore when it is mixed with petrol, it will not show up in anything but the most elaborate fuel tests. In fact, the simplest way of testing to see if the fuel has been doped with Aldon's octane booster is to run it in an octane testing engine. However, using that as a means of objecting to the fuel's use is going to be difficult, since the regulations allow you to use pump fuel, and who's to know that this isn't two-and-a-half year-old 5-star pump fuel? Whereas cheating cannot be condoned, we feel that the time is close at hand when the RAC must look at the

## A lot of ordinary road engines suffer detonation, which a mild booster mix will cure.

octane levels of fuel used for racing. After all, if every competitor is using an octane boosted fuel, the only people who are going to lose out are the piston manufacturers!

## The future

Right now we are stuck with octane levels around 97 octane, but as was said previously, the fuel manufacturers intend—in the foreseeable future—to pull more lead out of the fuel. As a result, octane levels are going to

# BURNING DESIRE

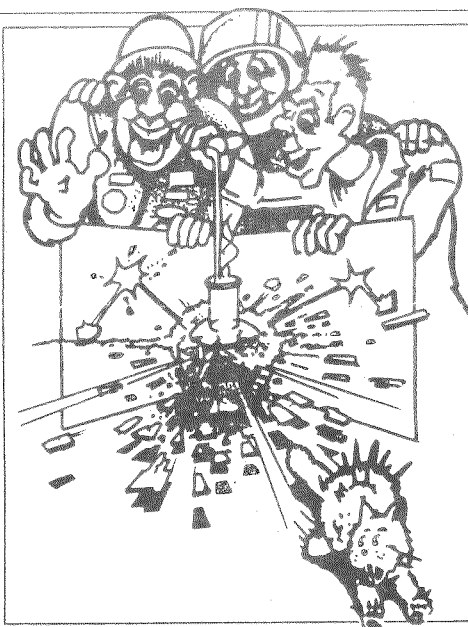
drop further. The question is, will an octane booster such as Aldon's suffice? Again, some numbers show that Aldon's octane booster has some interesting qualities. The less lead that is in the fuel, the better Aldon's octane booster works. In fact, using it in the prescribed quantities, it can boost a 92 octane, low-lead fuel to around 97 or 98 octane. So the very worst that could happen, even if the fuel companies pulled all the lead out, is that Aldon's octane booster would give us the capabilities of a good, present day, 4-star fuel.

Of course there are a lot of ordinary road engines which suffer mild detonation due to inadequate fuel octane. One of my own vehicles suffers such mala-

## Retarding the ignition or dropping the CR, drops horsepower and fuel economy.

dies. By using a very mild mix of booster to fuel, i.e. 1 litre/50-60 gallons, it is possible to put the octane up enough without incurring a vast expense in overall fuel costs. For instance, a mild mix of octane booster to fuel, say about half of the prescribed amount, does not reduce the octane increase by a half. In fact the octane increase is nearer two-thirds of that given by the recommended full dose. So, very often, we find that just a small quantity of octane booster can push the octane up by 1-1½ points, which is often all that is necessary to avoid detonation problems on a road-going engine.

If you are running, or are contemplating running, a turbo-charged engine, you are going to love this stuff. It will give you enough increase in octane to allow you to run an extra 2 or 3lbs



boost, or in marginal cases it will allow you to get away with bolting a turbocharger on without having to go to the expense of lowering the CR. Remember, when you drop the CR on an engine, you also lower MPG figures.

## Supply

Since this octane booster is new on the market, not all our favourite speed shops are stocking it. However, Aldon do supply about 50 speed equipment and accessories shops in the Midlands, so if you are Midlands-based, you should be able to get this booster without too much difficulty. I am sure Aldon will tell you where your nearest dealer is. In other areas, it is available from the following concerns: Avonbar Racing Ltd., 219 New Haw Road, Addlestone, Weybridge, Surrey (09328-61867); Burton Performance Centre, 621 Eastern Avenue, Ilford, Essex (01-554-2281); Hooper of Bristol Ltd., 1 Maypole Square, Church Road, Hanham, Bristol (0272-676563); Howley Racing, Winwick Road, Warrington WA2 7PA (0925-369591); Sportsline, 10 & 11 Brandon Terrace, Cannonmills, Edinburgh (031-556-3507).

No doubt there will be appointed distributors in other areas. Just keep an eye on the ads in CCC and you will find out where you can buy it. It will cost you £2.95 per litre.

## 100+, HOW DOES IT COMPARE?

An octane booster's effect varies with the type of base-fuel, so exact comparisons can only be made under identical conditions. However, as a guide only, we can make general comparisons between Aldon's 100+ and other commonly known single compound octane boosters. The chart below gives a general indication of how much more 'potent' it is by comparison.

Compound	This amount	treats	this number of galls
100+	1 litre		20.0
Benzene	1 litre		2.1
Alcohol	1 litre		4.0
Toluene	1 litre		2.3
Xylene	1 litre		2.5

From these numbers it can be seen that 100+ is eight times more effective than Xylene and almost ten times as effective as Benzene.



# REBUILDING A SPITFIRE -

## Two Members' Experiences

Having read your introduction to the December Courier, I thought I may as well motivate myself and tell you about the restoration of Triumph Spitfire, registration number DRW 507B (any previous owners?).

I brought it in August 1979 for £220 with MOT and a days tax left. It had the original MK1 hardtop as its only extra. I was 14 then and during my Christmas holidays my father and I set about dismantling it. Every bit came apart and was checked and replaced when necessary. Over the next year we renovated the chassis and running gear, the body sitting in the corner waiting its turn. The chassis was in reasonably good condition for its age, the only welding needed being on the front outriggers, where, believe it or not, Triumph never put any drain holes.

The engine was rebored, with new pistons and bearing shells by Moore's Engineering in Cambridge (recommended). Then the whole transmission (engine, propshaft, diff and half shafts), were all given a beautiful white paint job before re-assembling. The chassis and suspension were a mixture of red and black.

The chassis etc. finished, it was now the body's turn. At first sight it didn't look too bad (!) but, once we had started, there was no stopping. I'm sure there are many of 'our' cars driving happily around without the drivers' knowing they're potential death-traps. When we were removing the interior trim etc. one of the seatbelt mounts behind the seat and close to the sills, just pulled straight out of its mounting due to there being no metal left to hold it in! Well worth checking if your car is this sort of age. Next we removed the sills which came away with most of the floor attached to them. We had intended on welding up the old floor but, after this it looked as though the job would be never ending. So, after a phone call to Spitfires (UK) to ensure we could get a complete new floor and sills, we hacksawed the body in half, crossing the sills and centre tunnel. We had to settle for a MK111 floor (sorry purists!!) but on measuring it up the only difference we could see was a narrowing of the centre propshaft tunnel towards the rear. We started welding on the bulkhead, replacing and making panels and flanges, constantly offering up the new floor as a reference. A new battery box was brought from Marshalls of Cambridge (Unipart dealer) and this welded in place. The front structurally sound now and ready for sand-blasting, we started on the back.

We began by getting two new rear wings from Linrod Triumph Spares. With the old wings removed, it was relatively easy to build up the old inner arches. Warning: getting the correct curvature of the inner arch takes a lot of offering up of the new wings but it is worth getting it right, as the better the fit, the less creaking and groaning you'll get when the car is in use.

The edges of the boot floor were non-existent and this was all built up by lots of panel beating and seam welding. Throughout the whole restoration, fibreglass is being avoided as much as possible because judging by the amount we literally pulled out during the dismantling, it is useless for repairs to steel cars; it's alright on the fibreglass ones, but please, it doesn't work on steel ones.

Next came the bootlid which needed a new strip seam welded across the lower edge of it. The thin plate placed behind this was also very rusty, needing to be chopped away and built up to its previous shape.

Repairs finished, the body is now in 'kit' form and ready for sand-blasting and spraying, a job for next holidays. We're sticking to the original colour, Triumph Signal Red. Also, just to let you know where all our old Spitfires are going, we were able to lay our hands on an old MK111 (JDE 735G), which for the year previous to when we got it had been happily driving around with no MOT - keep going Spitfires, we love you!

C E HEINLEIN

If any owners of Spitfires or GT6's are planning to do body or chassis repairs they may want some tips. On my MK1 GT6, I removed the body from the chassis. Reference to a Workshop Manual will show you where the 12 bolts are; two of which, (just behind the seat), are well hidden by a layer of sticky, black sound deadening material. Also, don't forget the inner seatbelt eye bolts holding the body on. If replacing the front outriggers, then do so BEFORE parting the body from the chassis, otherwise you will have problems aligning the body to the outriggers. I removed my old outriggers with an anglegrinder but you could resort to hacksaw/cold chisel. DO NOT FORGET to completely remove the pipe from the petrol tank.

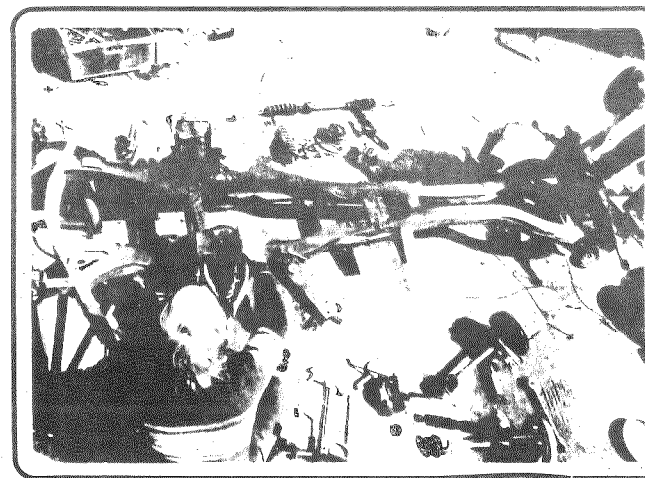
If you replace your sills, then it is best to do so with body/chassis joined together. This is so as not to cause any distortion of the body shell, which could happen without the support of the chassis. If you cannot afford new rear wings, but your rear wheel arches are rotten, you may find a 'Rear Sill extension' panel very useful. This panel is actually the bottom part of the wing where it joins the sill, an area which tends to rot away. These can be bought from 'Abercorn Panels, 76a Albany Road, Coventry, tel: 74030 and 8 Queenland Avenue, Earlsdon, Coventry.

They also stock front outriggers, door skins, footwells and even more panels for Heralds. When fitting sills etc., it is a good idea to underseal the inside of the sill before fitting. However, don't get underseal on the mating edges of the panels or else they will be difficult to weld. After welding and undersealing panels you seal all the joints and seams with a good sealment. I used 'Carseal' from Expandite Ltd.

I believe in paying for a good underseal, I recommend 'Adup', Flow Products Ltd.

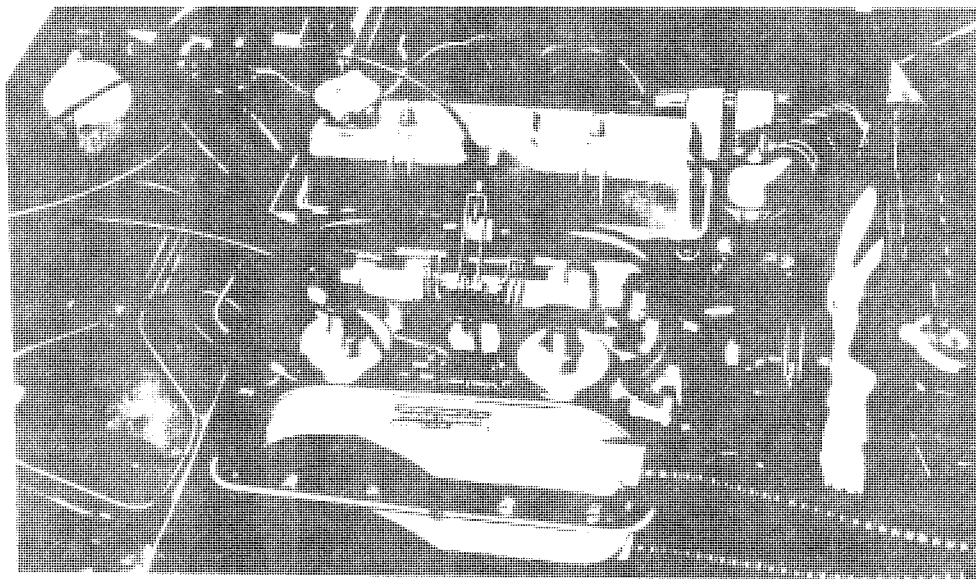
Don't worry if you can't weld, you could always pop-rivet on sills/wings and then get someone else to weld for you. But ensure that mating surfaces are clean and tightly fitted where welding is to be done.

Mr T Bendell



DOWN TO THE  
"NITTY  
GRITTY"

## A TRUE SPORTSCAR



The Triumph Spitfire 1500, a true sports car whose classic lines express the harmony of power and grace which is the car's hallmark. The Spitfire is one of the few cars that can give you the refinements of modern motoring with traditional sports car excitement. Thorough engineering and careful attention to detail combine to give genuine ruggedness and performance with remarkable comfort and safety.

The Spitfire's distinguished 1493 cc engine is incredibly strict with its fuel - but enormously generous with its power. Developing 71 b.h.p. at 5,000 r.p.m. the sharp, confident acceleration can take you up to the 100 m.p.h. mark. And steady cruising at 50 m.p.h. can give you the real economy, enhanced further by the optional overdrive - up to 50.6 miles to the gallon. *Performance figures from Autocar.*

Safety and reliability are Spitfire watchwords. The all-round independent suspension, positive and accurate rack and pinion steering, radial tyres and an anti-roll bar up front - all make for cornering and roadholding both carefree and firm. And the 9-inch discs on the front wheels combined with drums on the rear give you the kind of braking power to match the Spitfire's vivid performance.

The chassis has a double backbone of braced steel. And the windscreen is laminated for extra safety. The Spitfire is built for safety throughout. It has a new matt black driver's door mirror and windscreen wipers. At the front a moulded spoiler gives added high-speed stability, and the wrap-round, chromium plated bumper and plastic coated under-riders give proper impact protection.

The back, too, is protected by a wrap-round bumper. Reversing lights and hazard warning lamps are standard Spitfire equipment. A generous and convenient boot with an automatic light and a full 7 cu. ft. of space is just one part of the many practical and well designed qualities which the Spitfire has in abundance.

Driving in the country or town, the Spitfire gives you the

pleasure of deep firm comfort. The reclining contoured seats have head restraints as standard. Seat facings are in flame retardant houndstooth fabric, trimmed in expanded vinyl-coated fabric. True sports specification instrumentation is set into fine walnut veneer fascia, surrounded by impact-absorbing padding. A full width moulded pile carpet on the floor, two front parcel shelves, a centre arm-rest - all help give you that feeling of style and comfort. Refinements such as the interior recessed door handles, the 'Fasten Belts' warning light, a cigar lighter and padded steering wheel make up the Spitfire's outstanding attention to detail. Steering column switches control the two-tone horns, side and headlights with dipping and flashing direction indicators, two-speed electric windscreen wipers with a flick wipe action and the electric windscreen washers. The gear lever and hand brake are perfectly positioned for instant action. The all-synchromesh gear change is fast and smooth and the tachometer gives you greater precision when going quickly through the gears. The Spitfire has an anti-dazzle dipping rear view mirror and inertia reel seat belts to complete your safety. The Spitfire gives you power, comfort and safety - and the open air as well. The Spitfire models offer you the choice of a hood which goes up or down in seconds, or a fully trimmed detachable hard top which converts the free and easy sports car into a refined closed coupe. Few cars these days can give you the exhilaration of open air driving and inspire confidence in restrictive city motoring.

The integral hood fastens into place to make a really draught free cover. And with the two speed blower you can control the interior environment to suit your comfort. The hood itself has a zip-around rear window and is made in tough, easily cleaned black vinyl. The snug fitting tonneau cover has a centre zip for 'driver only' open air motoring.

The Triumph Spitfire 1500 stands out from the crowd. It is the true sports car.

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