

## GOOD VIBRATIONS

*Emphasis on "Australian Specials" at the September Eastern Creek meeting will provide a great opportunity for us to tell the rest of the Historic world about Australian-built air-cooled specials. The circuit is not ideal for our sort of cars, but we can still be there as a static display, and semi-complete cars will be equally welcome. One day, one day, we'll have a grid full of air-cooleds.*

### "AUSTRALIAN SPECIALS" AT EASTERN CREEK

"Australian Specials" will be the theme for the Historic Sports and Racing Car Association's Eastern Creek meeting on September 8-9. The thinking behind this was that specials are far more a part of our racing history than the Maseratis, Mercedes, Alfas and Ferraris which nowadays are endlessly featured at so many "historic" occasions.

Australian-built air-cooled specials have

their own distinctive place in our racing history, and our cars deserve to be well represented at Eastern Creek in September.

If you have the paperwork required to run your air-cooled car at this meeting, either in races or in regularities, please think about entering.

But in any case, this will be a great opportunity just to display our cars, even if some of them are incomplete. Eastern Creek has a large paddock area, we can rope off a suitable space, and HSRCA will provide entry passes, etc. Just the Sunday should be all we need.

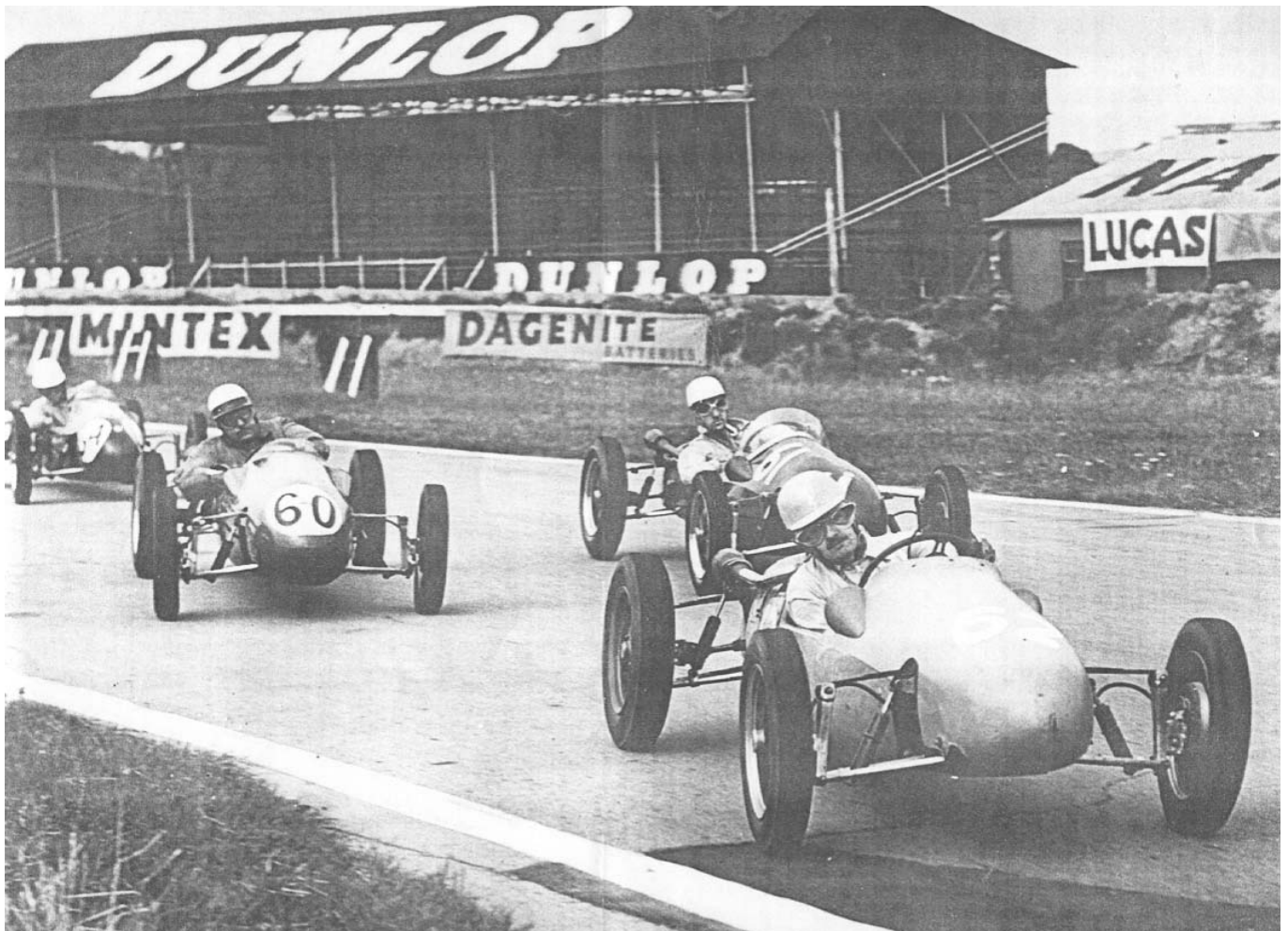
# LOOSE FILLINGS

## THE LOG

**T**O look on the bright side, there must undoubtedly have been long periods of time, prior to the recent revival of interest, when no air-cooled cars were known to have run, anywhere in Australia.

**Continued on page 2**

Supplied by Max Fisher, this photo shows Ron Frost leading Ivor Bueb (60), Stuart Lewis-Evans (61) and Trevor Taylor at Goodwood. A "posed" publicity photo? No crowd, little suspension deflection? More Ron Frost wisdom on page 4.



Even so, and while written before Winton, The Log this time has precious little to report, and in fact two of the four mentions below should have been noted in the previous Log.

- ☛ January 21 – classic cars and bikes, Whenuapai N.Z. – Max Fisher, RGR 500
- ☛ February 24-25 – Historic races, Phillip Island: Mark Dymond, Cooper Mk IX Norton
- ☛ April 8 Wollongong MSC hillclimb, Dapto NSW – Terry Wright, Walton JAP 1100
- ☛ May 5 – hillclimb, Catalina Park NSW – Mike Bendeich, JMW Jawa 150

## KEITH RILSTONE

Veteran South Australian racer and special-builder Keith Rilstone, who built one of the earliest Vincent-powered specials, died suddenly in Adelaide at Easter, aged 74.

After racing an o.h.c. Minor-based special in the late 1940s, he produced his Vincent-powered single-seater at Collingrove hillclimb in March 1952 where he was immediately in competition with Murray Trenberth's (faster, and probably lighter) Vincent special (Australian Motor Sports photos right).

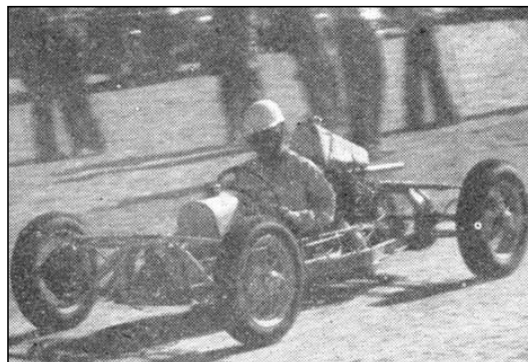
With zero roll-stiffness swing-axle rear end, the Trenberth car was reminiscent of a Kieft; the Rilstone car, apart from its knock-off wire wheels, was very much in the style of a Mk IV Cooper, with box-section ladder chassis and transverse leaf and wishbone suspension.

The car was bought by Sid Norris about 1960 and dropped out of sight, but it survives (as does the Trenberth car) and Vincent enthusiast Stewart Penn plans to restore it.

In the late 1950s Keith Rilstone took over Eldred Norman's Zephyr special and transformed it into a serious challenger for Cooper Climaxes. He later ran several Elfins, then built a very effective 179 Holden-powered clubman, and had recently completed a Kawasaki-powered hillclimb car.

## BITS AND PIECES

- ☛ The Mk 9 Cooper Norton raced in New Zealand by the late Ron Frost, author of our Random Notes on 500cc Car Racing, is the car now owned and raced by the Dymond family.
- ☛ Graham Hoinville, whose article *The Peculiarities of Alcohol* appears elsewhere in this issue, says his Cooper Mk 9 JAP is still on his "list of things to do", but that it keeps getting pushed down the priorities.
- ☛ UK Historic Formula Junior Newsletter, which publisher Duncan Rabagliatti kindly sends to Loose Fillings publisher Garry



The Rilstone Vincent (left) and the Trenberth Vincent (above) at Collingrove SA hillclimb in 1952.

The Murray Trenberth car is now racing in the UK - any reader got a picture? Photos first appeared in Australian Motor Sport.

Simkin, suggested UK Historic FJ competitors might like to reserve a place for pre-race test session prior to the May Donington historic meeting. Cost for the session was a mere 100 pounds, and the Juniors were to have a whole hour to themselves! It's not just the weather that's better in a banana republic.

☛ Last issue we gave an incorrect phone number for Don Hall, at Dalkeith in West Australia, whose Manx-powered Mk 5 Cooper is (therefore) still for sale. The right number is 08 9386 2346.

☛ When Mike Bendeich produced his little green JMW at the last-ever Catalina Park hillclimb in May, a woman spectator asked if it really was a JMW. Having been assured it was, she then produced a mobile phone and excitedly rang constructor John Wynne in Queensland to tell him. Mike went looking for the lady but couldn't find her.

☛ Mike sent in two photos of a 650 Triumph-powered kart he built in 1964, which ran 14s at Castlereagh drags. It was also run at Pitt Town airstrip, where the technique was to "lift it over the fence, do a few laps, then leave!"

☛ Steve Murden, president of Tamworth Sporting Car Club, has found no fewer than ten different air-cooled cars in a preliminary check through eight years of TSSC result-sheets from Oxley hillclimb.

## COMING EVENTS

- ☛ August 8 – Wakefield Park – Golden Era Auto Racing club (GEAR) – non-CAMS mid-week regularities for mainly pre-1960 style cars. More info from Graeme Snape, 02 6945 3165
- ☛ August 12 – Wakefield Park – Vintage Sports Car Club Bol d'Or style meeting, simultaneously using a shortened version of the race circuit (for regularities) plus the hillclimb. CAMS paperwork not required. For more information call Robert Rowe, 02 9627 9455 (bus).

## RESTORING A VERY EARLY 500

THE late-1940s JAP-powered car built in Melbourne by Eddie Thomas, but apparently never completed, is steadily being rebuilt in Sydney by Alan Harper and his father in law. This car had a speedway-style tubular front axle with transverse leaf spring and a bronze steering box, perhaps Morris Cowley, which was popular in speedcars at that time. The swing-axle rear suspension and final drive uses many one-off castings, and has required careful assembly. With minimal evidence of bodywork and even less of shock-absorbers this is a fascinating example of the early (minimalist) approach to 500cc car design.

# THE PECULIARITIES OF ALCOHOL

BY GRAHAM HOINVILLE

I was very much impressed with the contents of *Alcohol as a Friend Parts 1 and 2*, as contained therein were so many good pieces of advice. It then occurred to me that the use of alcohol as a fuel was in danger of becoming a lost art, as those of us who competed in the pre-1955 era (when alcohol was “king”) are on the decline, as evidenced in the Vale sections of our motorsport publications.

Thus the writings of Demon Tweeks recorded for all time some very good advice on the skills necessary on carburation matters related to air-cooled racing cars which inevitably will be dependent on alcohol.

However I did conclude those writings would be very much enhanced by a treatise on the rather unusual characteristics of alcohol, when compared with petrol. Such an article would give reasons for so many of Demon Tweeks’ vital hints, and together would hopefully avoid the use of alcohol fuel becoming a lost art.

I have chosen methanol as it is by far the most popular of the alcohols. I have treated the material under the respective headings of the physical characteristics of the material and in most cases these special characteristics provide the explanation as to how alcohol provides for the very needs of engines.

## Octane rating

This will be the first shock to the reader – the figure is 90. The inevitable question will be “How can we use compression ratios of 15:1 on such fuel?” To get the answer you have to read and digest this entire article!

## Calorific value

This indicates the amount of “power” available from a quantity of the fuel, and methanol at 5400 cal/gm is about half that of petrol at 11,200 cal/gm. Thus for a given quantity of air ingested into the engine a little more than twice as much methanol must be used to give the same power. This is a generally accepted fact.

## Total heat of evaporation

This relates to the cooling effect when the fuel is evaporated. Methanol with a figure of 307 cal/gm is more than twice petrol at 138 cal/gm. Thus using methanol will result in the charge being cooled at two and a quarter times more compared to petrol. However there is a compound effect here. Under the consequences of the lower calorific value of methanol, the amount of fuel will have been more than doubled so in all the cooling effect on the ingoing charge will be some five times that of

petrol when methanol is used.

## Rich mixture characteristics

Herein lies the most significant feature of alcohol as a fuel compared with petrol. In the case of petrol we know that increasing the mixture strength above the theoretical mixture can give more power – but within limitations. Perhaps around 5% to 10% is the limit, and further increase in richness causes dramatic loss of power. We are all familiar with cases of cars stopping by the roadside due to an automatic choke staying “on”, or a punctured carburettor float causing the carburettor to flood. However, such is not the case with alcohol.

On alcohol an engine can be running 100% rich and there is no loss of power output. The peculiarity of alcohol is that a substantially over-rich mixture causes no loss of power, the extra alcohol simply passes out the exhaust pipe unburned!

## What does this mean in practice?

The respective characteristics of alcohol, particularly the last-mentioned one means that very high compression ratios are possible (much higher than indicated by the octane rating of alcohol at a mere 90) due to the ability to tip in much more alcohol than is needed to produce the power – the additional alcohol simply being an internal coolant which prevents detonation within the cylinder.

As an example I quote the recommended jet sizes for the Vincent Black Lightning quoted in Phil Irving’s *Tuning for Speed*. Petrol 360, alcohol 1400. Remember, Amal jets were calibrated not by size, but by how much fuel they pass. In analysing the above jet recommendations you could conclude moving from 360 to say 750 was to compensate for the lower calorific value of alcohol, the remainder was internal coolant.

As emphasised by Demon Tweeks it is absolutely essential when using alcohol to ensure adequacy of supply. Inadequacy of supply to the main jet can have catastrophic results. An example of this was told to me by the late Frank Sinclair who melted pistons in his Vincent outfit at Little River. Due to a mis-calculation he had not taken enough fuel on board and he ran out. In those two or three seconds during which the carburettor bowls ran low the cooling effect of the excess alcohol was lost with the result pistons melted before the engine stopped due to lack of fuel.

In the early 1950s there were plenty of cases where side-valve Ford V8s specials with their inevitable overheating troubles would be changed over to alcohol as their

owner looked for a solution to the overheating.

Typically they were fitted with multiple carburettors of US manufacture and there were many cases where the owners struggled unsuccessfully to achieve the increased fuel flow necessary for alcohol.

The problem lay with the carburettor design – namely designed for petrol the internal passages were not large enough to flow sufficient alcohol. In fact in such cases you could remove the main jet and still not have enough fuel flow!

I can relate the steps I took to ensure adequate fuel supply on my supercharged MG TC in the early 1950s when running on alcohol (80% methanol – Shell 811 or BP M).

- ☛ Complete duplication of the fuel lines in 3/8” diameter from the tank to dual SU pumps.

- ☛ The 1½” SU was fitted with twin bowls. Each bowl had the fuel passages drilled oversize and used the larger needle and seat, the T-3.

- ☛ The extended banjo bolt that secured the bowls had holes drilled oversize.

- ☛ The main jet was the great 0.1875” and needles from the RM series so thick that there was little danger of accidentally bending a needle.

- ☛ One fuel pump delivered to each bowl, but a crossover was fitted to the incoming banjo fittings. This was designed to overcome the lateral G forces on corners.

## G forces

These forces would cause the fuel level of the bowl on the “outside” of the curve to rise and the needle and seat would close.

Without the cross-over that pump would be shut down. However the crossover pipe allowed that pump to continue delivering fuel to the inside bowl which was supplying all the fuel to the main jet while the car was negotiating the curve.

This cross-over allowed both pumps to operate regardless of the effect of cornering forces on the two bowls.

I hope these comments added to the contents of *Alcohol as a Friend* in some way prevent the use of alcohol becoming a lost art.

## STAMPS AND STICKERS

Garry Simkin is out of stamps so more are needed, especially from people who haven’t sent in a book of ten.

Terry Wright has CAMS style A for alcohol stickers for sale at \$7.50 each post free via Garry.

## RANDON NOTES ON 500 C.C.

### CAR RACING by Ron Frost Part 2

#### Fuel system

**A**LL orifices, right from tank to carburettor bowl must be 5/16" bore for alcohol fuel. Bowls must be rubber mounted against frothing. Frothing can rob a bowl of half its effective fuel volume. Twin S.U. Bowls must be fitted as these are capable of being pressurised at the needle to 2 1/2 lbs., per square inch. Pressurisation is necessary in a 500 car as on fast bends centrifugal force overcomes force of gravity and fuel stands still in lines and does not flow.

At least one large balancer pipe must be fitted across the car connecting side tanks with one another. Most reliable form of fuel Pumping system is arranged by mounting AC pump (or pumps) to run against cams on the rear axle. Fit a hand primer wire which can be operated from the "office" to keep header-tank full when the car is standing.

#### Oil lines

Always of generous bore. Do not use the type of set-up which incorporates flexible pipe secured by Jubilee clips. Have pipes specially made if necessary. Ensure that the unions are of a permanent nature and that the whole can stand some considerable pressure. On dry sump systems, ensure that oil tank has an adequately large breather pipe fitted into the filler neck, otherwise pressure may build up in the tank causing it to split.

Where "total loss" systems are used ensure that the oil tank is mounted sufficiently high up to give a good flow. Remember your oil supply is always cold in this type of system and its initial viscosity therefore remains unchanged. Green oil is used with great success in England today. If you use castor-base oil in your engine, use it also in your gearbox

#### General

The biggest enemy of the 500 car, is strangely enough, its engine. Being single cylinder, with such a large output it vibrates considerably more, comparatively, than any other type of engine. This vibration undoes nuts and bolts quicker than pneumatic speed-brace. It fatigues any metal thin enough to vibrate and has been known to cause drivers acute discomfort due to their omitting to ensure that they themselves were properly insulated from it.

Every nut and bolt must be wired locked, split-pinned, or be fitted with Simmonds type nuts. If only one nut and bolt is overlooked it will almost surely mean the difference between finishing the



Loose Fillings Editor caught in the act? Graham Howard was snapped by Terry Wright with the unfinished 500 started in the 1950s by the late Sid Smith. It has a four tube chassis, Cooper style suspension, 12 and 13" wheels and a 75" wheelbase.

race or not.

It might not be an exaggeration to say that 75% of all cars failing to finish a race do so because of insufficient attention being paid to the more insignificant nuts and bolts and fittings. When preparing the car, imagine that it flies. If it stops you are over a mountain and have nowhere to land -you will probably be more careful and less likely to say 'She's right'.

Log carefully EVERY mile the engine runs, whether in practice or racing. Log too your chain life. Ensure chains have adequate lubrication at all times. Change them every 500 miles at least. Do not use spring-links. Always rivet your chains in position. Never use half-links at any time. Always tape and wire your throttle cable (outer) to its adjusting screw at both ends. Do the same with your clutch cable.

#### Plugs

The 'Hotter' the plug you can keep in your engine, the better ! Many an engine has been wrecked because the driver has been frightened of oiling a hot plug on the line and has chosen the line of least resistance, fitting a softer plug than he should. Up to a point, a weak mixture will cause an engine to develop more power than the correct safe mixture.

Some canny drivers use this knowledge very successfully in sprints and hill climbs. It will be seen from this that erring on the rich side can cause serious loss of power. 'Lifting the Foot' with a needle-controlled type carburettor may damage an engine if the needle is set (as is usually the case) on the weak side for clean pick-up, as the engine will be running only on what it can

draw from the needle jet.

For plug readings engine must be at maximum temperature and pressure. Therefore run car around for a while until engine is at working temperature. Fit a clean plug. Run it for the best part of a mile FLAT OUT IN TOP gear. Suddenly shut off and coast to a standstill. Remove plug. The centre electrode should be ebony-black and shiny except for that portion where the spark occurs.

This small moon-shaped area should be the colour of the original cleaned electrode (i.e.) normal copper metal (when the centre electrode is a copper one). There should not be the slightest trace of excessive heat at this point. A smear of oil when the plug is wiped on the back of the hand, is highly desirable.

Weakness is shown by any colour lighter than ebony-black from brown to white. This state can be caused by (a) too soft a plug, (b) too much retard or advance, (c) incorrect tappet clearance, (d) fuel starvation, (e) weak mixture, (f) poor fuel, (g) weak magneto, (h) incorrect exhaust pipe length and shape, (i) wrong valve timing.

Note.. The best method of "warming up" an engine is to make it work (i.e. run the car rather than let the engine idle. Research has shown that the oil temperature cannot be raised to ideal heat by this latter method. *To be continued*

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than you will from your low 500 car. Good 500 drivers do not so much see the bends as remember them.

During the race, be very circumspect with whom you "neck & neck". If you do not know the other driver, give him plenty of room. If you are the following driver, expect the worst at any moment and behave as if the responsibility for avoiding a crash is entirely yours. When making your inspection of the track, memorise the places you can safely run off the road in case you have to take sudden avoiding action. Keep your eyes peeled for spilt oil or loose surface on bends and alter your line (even though it may be a slightly slower line), rather than drive through it in company.

Because you can drive an ordinary type car well it does not necessarily follow that you will become a 500 ace overnight. In 1951 the famous drivers Reg Parnell and Bob Gerard stated 500 racing. At the end of that season they had only just reached the Senior class. High average speeds are obtained by exploiting cornering and braking potentiality of the car.

Remember too that every movement of the steering wheel causes one or other of the rear wheels to skid, immediately causing the car to brake slightly. This explains why, when a 500 spins, it stops dead from high speeds. It will be understood from this that every inch of the road must always be used in order that the steering wheel be used as little as possible.

If the danger in 500 racing lies in being punched in the side when taking fast curves at speed or sliding into something side-on whilst spinning. Both these occurrences will cause the car to roll over (most likely it will bounce off its wheels, over, and on to its wheels again). This has often happened twice and three times in one manoeuvre. The driver usually ends his days simply because, whilst this is all going on, he can neither get out of the car nor get down into it. Consequently he gets a sound bashing on the ground as the car turns. The antidote for this is to have a solidly mounted roll-bar fixed to the car and for the driver to have parachute type quick-release harness strapping him to his seat. This has already proved very successful.

Ensure that the sides of the seat fit you very snugly. Remember what feels tight in the pits is not tight in the race. At high speed it is very disconcerting to have to struggle (among many other things) against a force that seems to want to pluck you right out of the car. Do not hand on to the car by the steering wheel. Use rather the sides of your legs against the chassis; this will let you feel the slightest reaction to the steering instantly. Don't omit to fit

pads for your legs, incidentally.

Do not thrash your engine beyond what you know are safe limits merely to make up for your inexperience as a driver. Use your first meetings as opportunities to learn the very specialised driving technique needed to pilot these cars swiftly. Make a definite aim of 1.FINISHING, 2.NOT SPINNING, 3.NOT MISSING ONE GEAR CHANGE, 4. NOT OVER REVVING AT ANY TIME. If you can accomplish this in your first race you are well on the way to being a successful 500 driver.

Top line drivers devote very much time and thought to the selection of the correct set of gear ratios for a particular track. The best equipped carry as many as 3 gearboxes with them to a meeting, each containing completely different sets of ratios. While this is probably too much for most pockets, gear changing in, for example, is a very simple task indeed. In any case, always aim at minimising the NUMBER of changes you have to make per lap.

In hillclimbs particularly, aim at running in one gear and never more than two. ALWAYS aim at doing the largest percentage of a lap (or hill) in top gear. Correct gearing may easily save more seconds per lap than many hours of so-called engine tuning. It is rarely that a so-called highly-tuned and specialist-prepared engine is the reason for a race being won.

NOTE Whilst the clutch is lifted, the car is coasting. So many things contribute to the success of the man who can gain that second per lap which represents perhaps a road distance of over 100 ft., and engine performance comes well down the list. The driver's skill and judgment are first and foremost. These must be backed by first-class braking and roadholding. Wheel-bearings, gear-box and transmission must have friction loss of the very lowest order. (one famous tuner polishes the teeth of every gear in his gear-box). One second per lap could mean 100 ft per lap

which, in a 50 lap, race would mean a lead of nearly a mile - a very considerable lead indeed ..

Racing drivers are very frail creatures. They are for ever looking for that 'secret reason' why the top liner always keeps in front. If Moss wins with a Cooper, then everyone who hopes to succeed must have a Cooper; when he changes to a Kieft with continued success, then everyone buys a Kieft. If Joe Soap is known to prepare Moss's engine Joe Soap becomes inundated with orders to prepare other people's engines. The racing driver refuses to believe that he also is not a Stirling Moss. If only he could get his hands on the same

## Technique

Never, under any circumstances, let your engine back-fire when the car is being push-started. Always use an advance-retard mechanism and start car FULLY retarded. Advance immediately it is running. Never let your engine run in any position but FULL advance. Many an exhaust valve has been ruined in the pits by this method. **To be continued**

### Next issue Technique continued

Run your engine for at least five minutes at a steady 2,500 revs. Do NOT blip the engine up and down. Preferably jack-up the rear wheels and let them turn over in low gear whilst warming-up.

Have your pedals arranged so that you can 'heel & toe' the brake and throttle for fast corners. Always wear shoes that have no welt, (e.g. sandshoes). Always tuck trousers into socks. Smear pedal faces with Adfast or Bostick cement.

A layer of cotton-waste under the driving seat will prevent oil from the engine compartment finding its way into the office.

Always watch your rev-counter like a hawk. Never let your engine down by allowing it to exceed its maximum safe revolutions. Remember Your needle is always 'slow' therefore if you want to peak at 6,000 r.p.m., lift your foot at 5,750 on the clock. Ensure that ALL your gear-changes are above reproach. Do not use your engine as a brake. The foot brakes will pull you up from any speed with plenty to spare. In fact they can quite easily lock the wheels at 100 per. Therefore, spare your motor and use it only in the gears getting out of corners.

The maximum strain you can impose on your car, right from the spokes of the rear wheels through to the big-end and fly-wheel assembly, is accelerating from a standstill. Watch this point carefully and think about it.

When racing on a strange track, try and arrange to have a walk around it first, or better still, have a run round it in a normal motor car. You will be able better to appreciate the bends and learn their contours